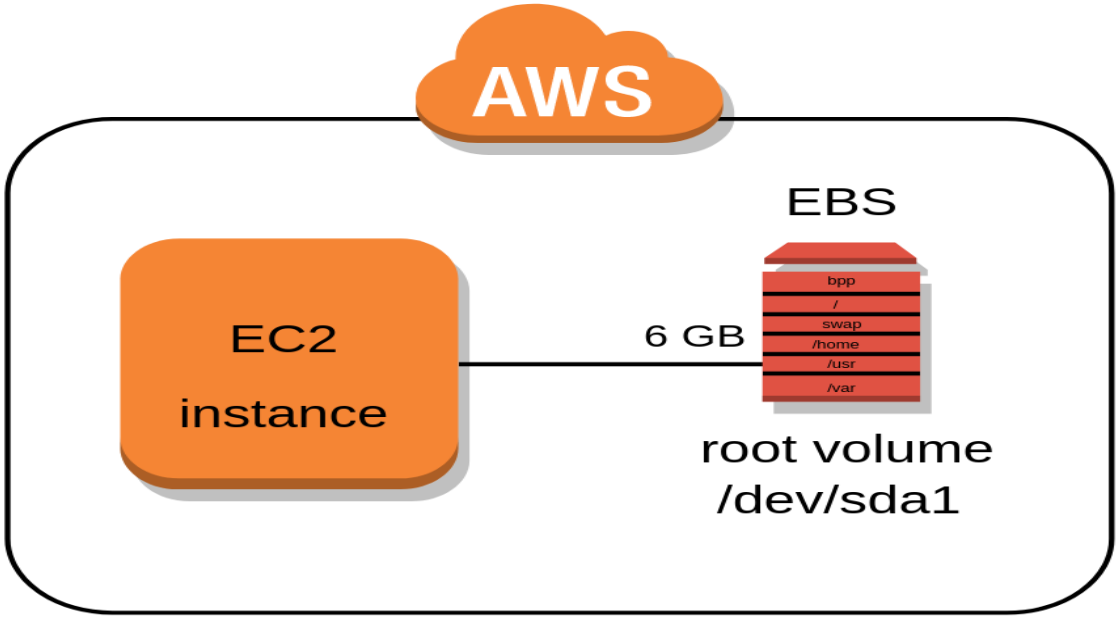
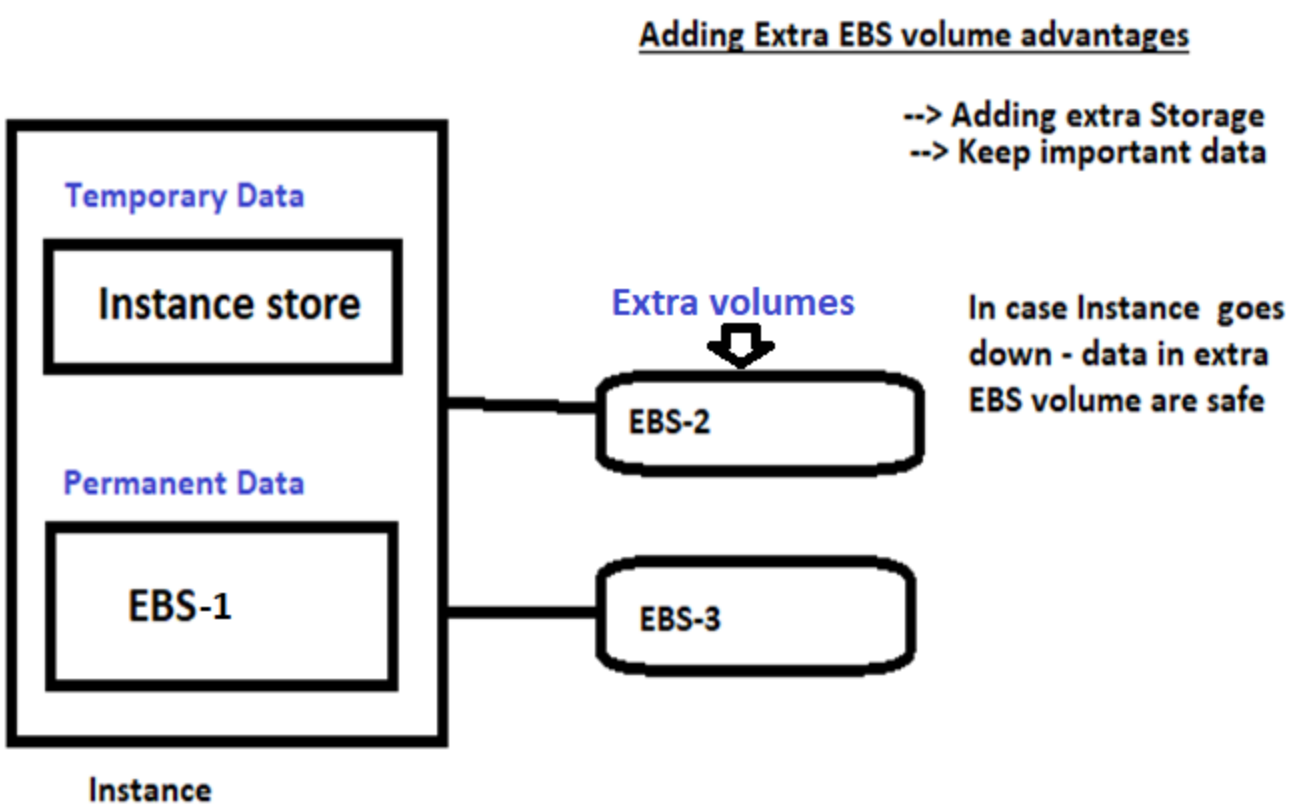
Elastic Block Store (Amazon EBS)

An Amazon EBS volume is a durable, block-level storage device that you can attach to a single EC2 instance.

You can use EBS volumes as primary storage for data that requires frequent updates, such as the system drive for an instance or storage for a database application.




Adding Extra EBS volume advantages
--> Adding extra Storage
--> Keep important data
Temporary Data
Instance store
Permanent Data
EBS-1
Instance
Extra volumes
EBS-2
EBS-3
In case Instance goes down - data in extra EBS volume are safe

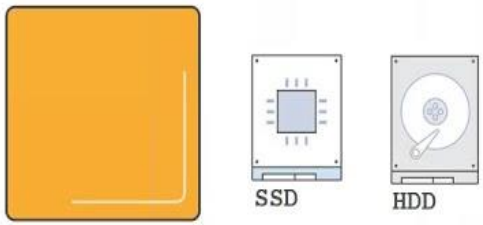
Topics to be covered--EBS

1. EBS Introduction
2. Creating Volume
3. Attaching Volume
4. Making partition and accessing it
5. Detach and attach to other instance
6. Creating snapshot
7. Create volume in other subnet using snapshot
8. Attaching to other instance
9. Modifying Volume
10. Migrating volume from one region to other
11. Migrating volume from one account to other
12. Modifying Instance
13. Troubleshoot lost key pair of linux instance

EC2 Instance Store *vs* EBS

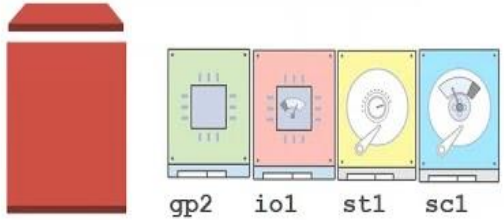
EC2 Instance Store

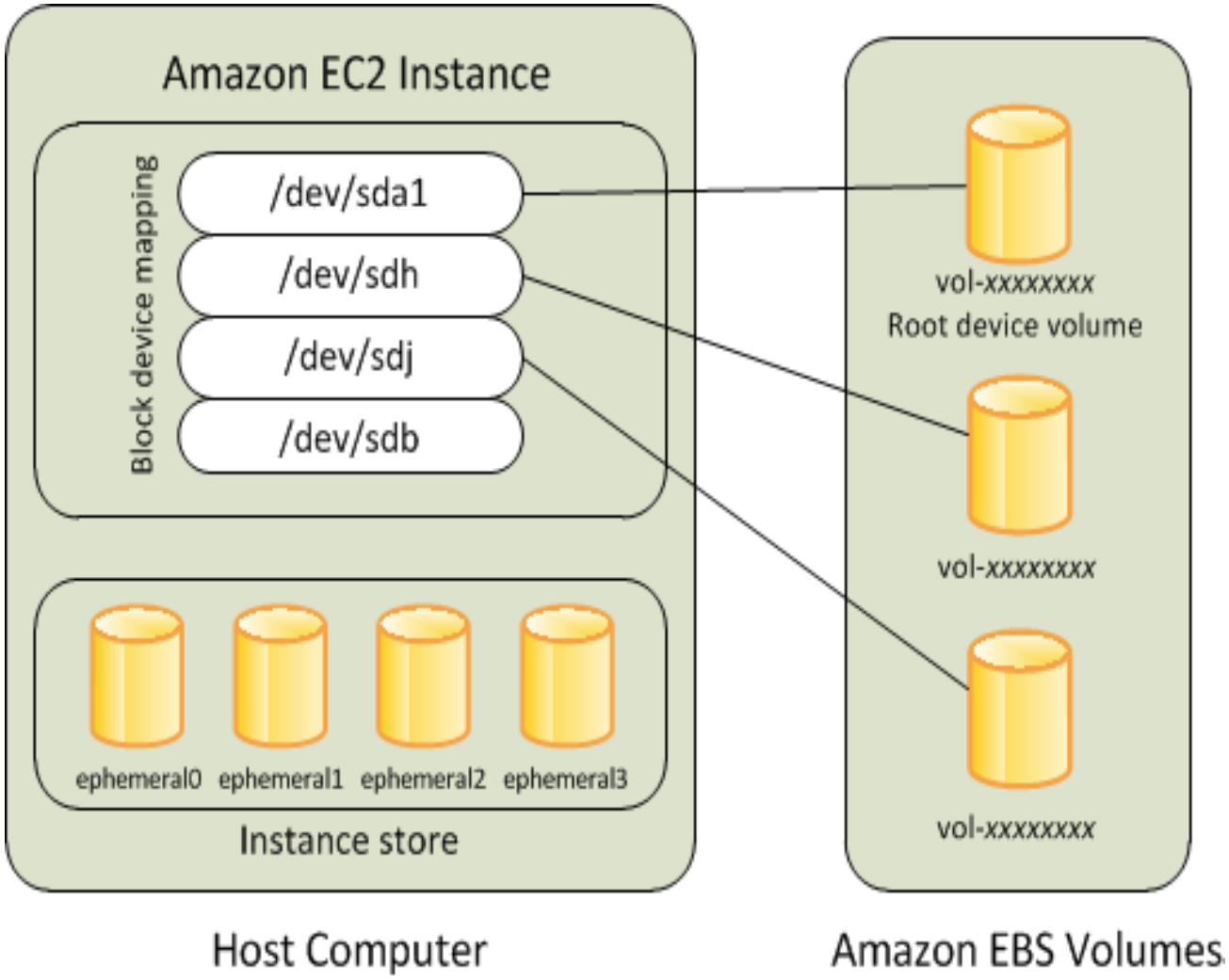
- Local to instance
- Non-persistent data store
- Data not replicated (by default)
- No snapshot support
- SSD or HDD



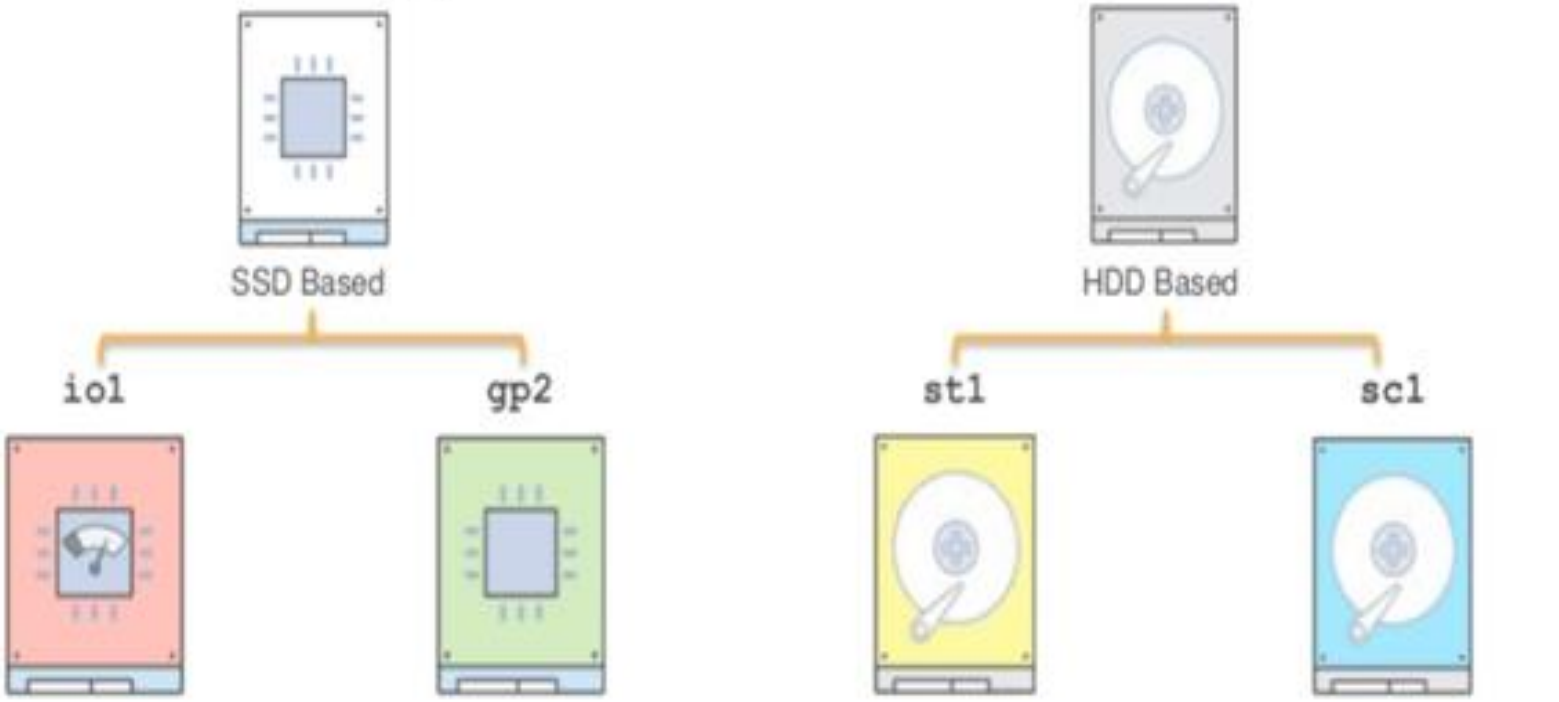
Elastic Block Store

- Persistent block storage volumes
- 99.999% availability
- Automatically replicated within its Availability Zone (AZ)
- Point-in-time snapshot support
- Modify volume type as needs change
- SSD or HDD
- Auto recovery




Amazon EC2 Instance
Block device mapping
/dev/sda1
/dev/sdh
/dev/sdj
/dev/sdb
ephemeral0
ephemeral1
ephemeral2
ephemeral3
Instance store
vol-xxxxxxxx
Root device volume
vol-xxxxxxxx
vol-xxxxxxxx
Host Computer
Amazon EBS Volumes

EBS Volume Types & Performance



Creating an Amazon EBS Volume

- You can create an Amazon EBS volume that you can then attach to any EC2 instance within the same Availability Zone. You can choose to create an encrypted EBS volume, but encrypted volumes can only be attached to selected instance types.

- You can apply tags to EBS volumes at the time of creation. With tagging, you can simplify tracking of your Amazon EC2 resource inventory. Tagging on creation can be combined with an IAM policy to enforce tagging on new volumes.

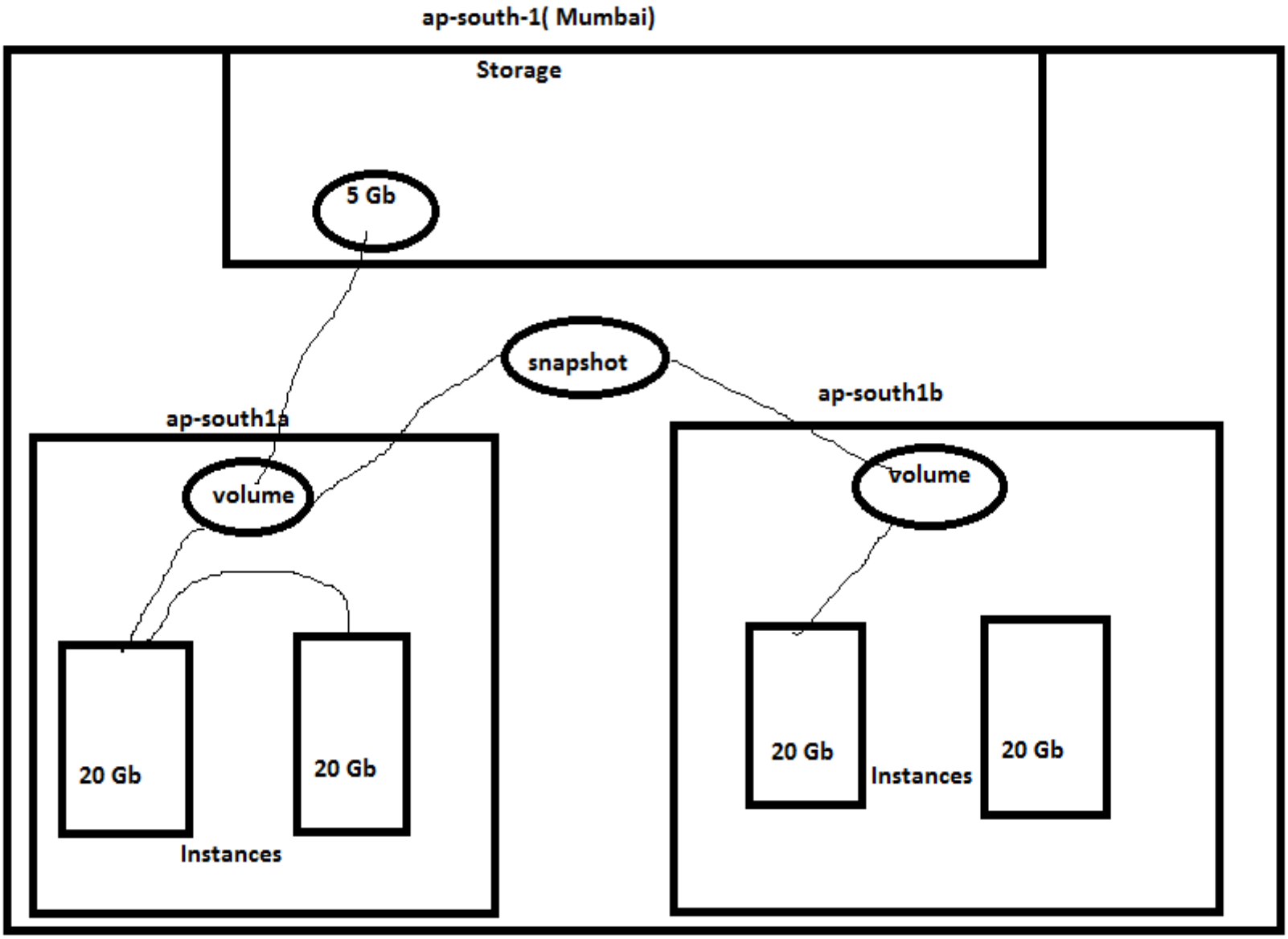
How to create EBS and attach to instance

Create two Windows Instance in same subnet

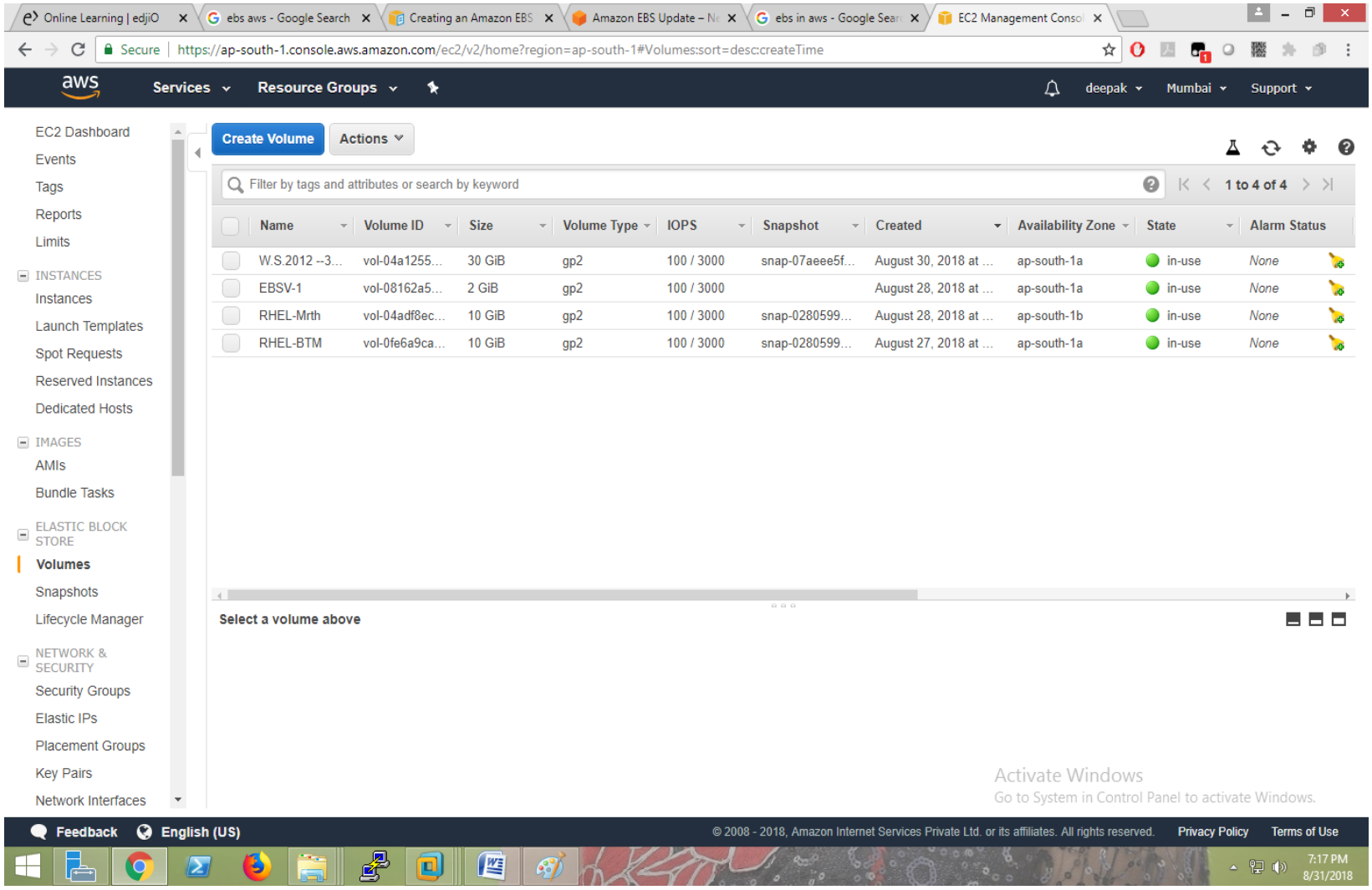
In AWS console – EC2 – volume –Add volume– Select size (5 GB) – Add tag : Name – managed disk-1 – create

After creating –select it –action –attach volume—select instance –Attach—close

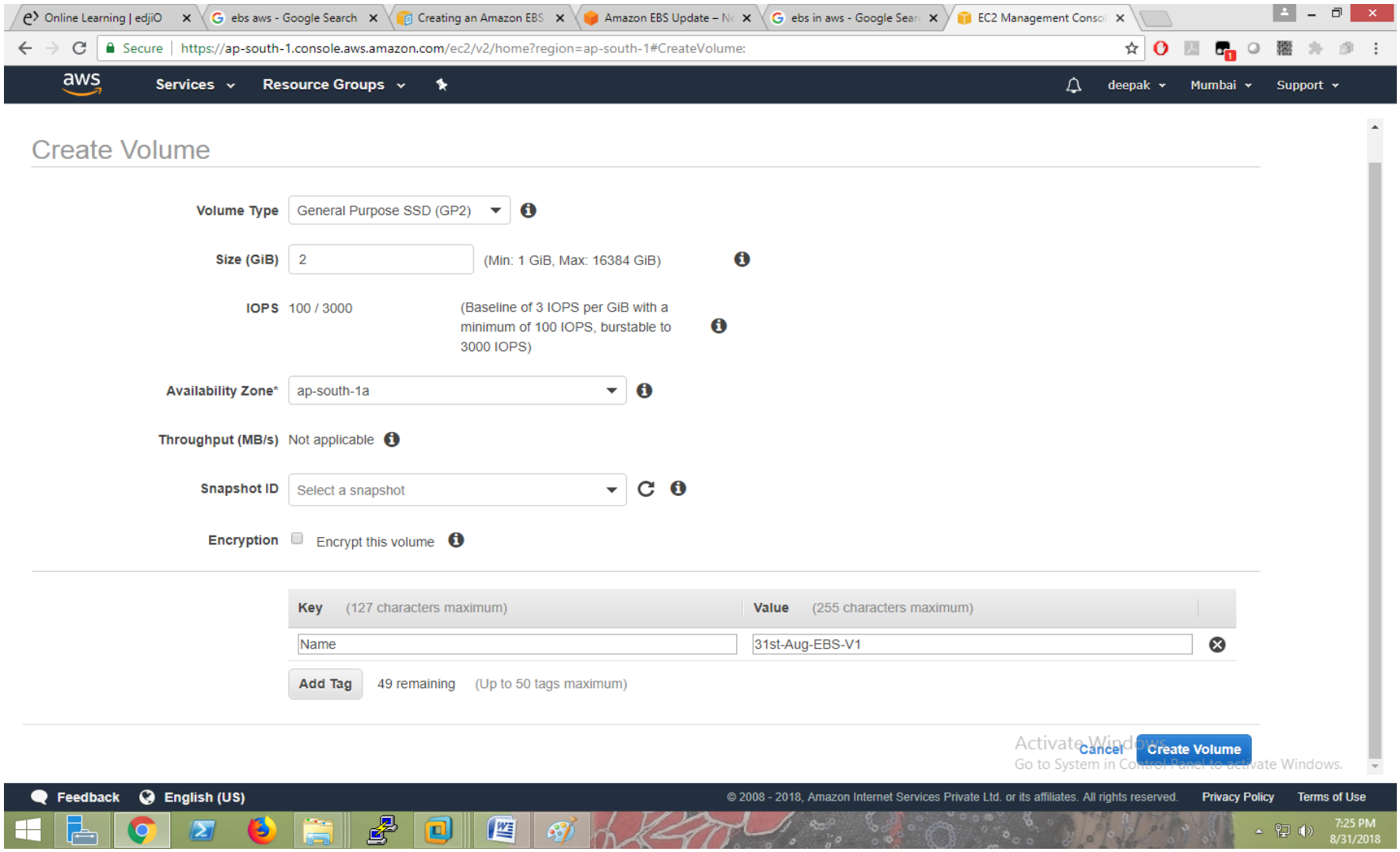
Now open the instance and create partition to access it


ap-south-1(Mumbai)
Storage
5 Gb
snapshot
ap-south1a
volume
20 Gb
20 Gb
Instances
ap-south1b
volume
20 Gb
20 Gb
Instances

Open EC2 Console-Click on volume

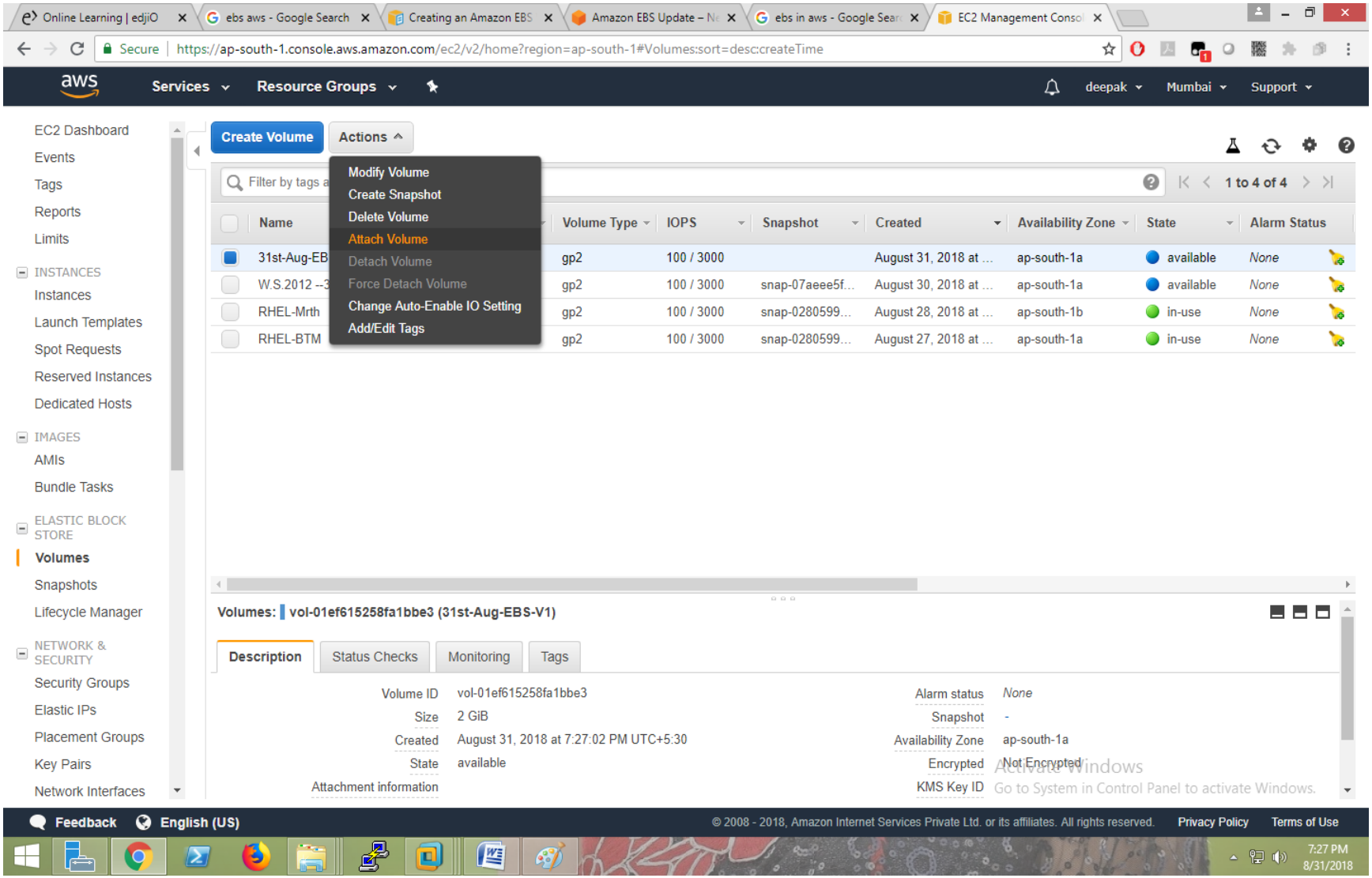


Give the EBS size and add tag then create volume

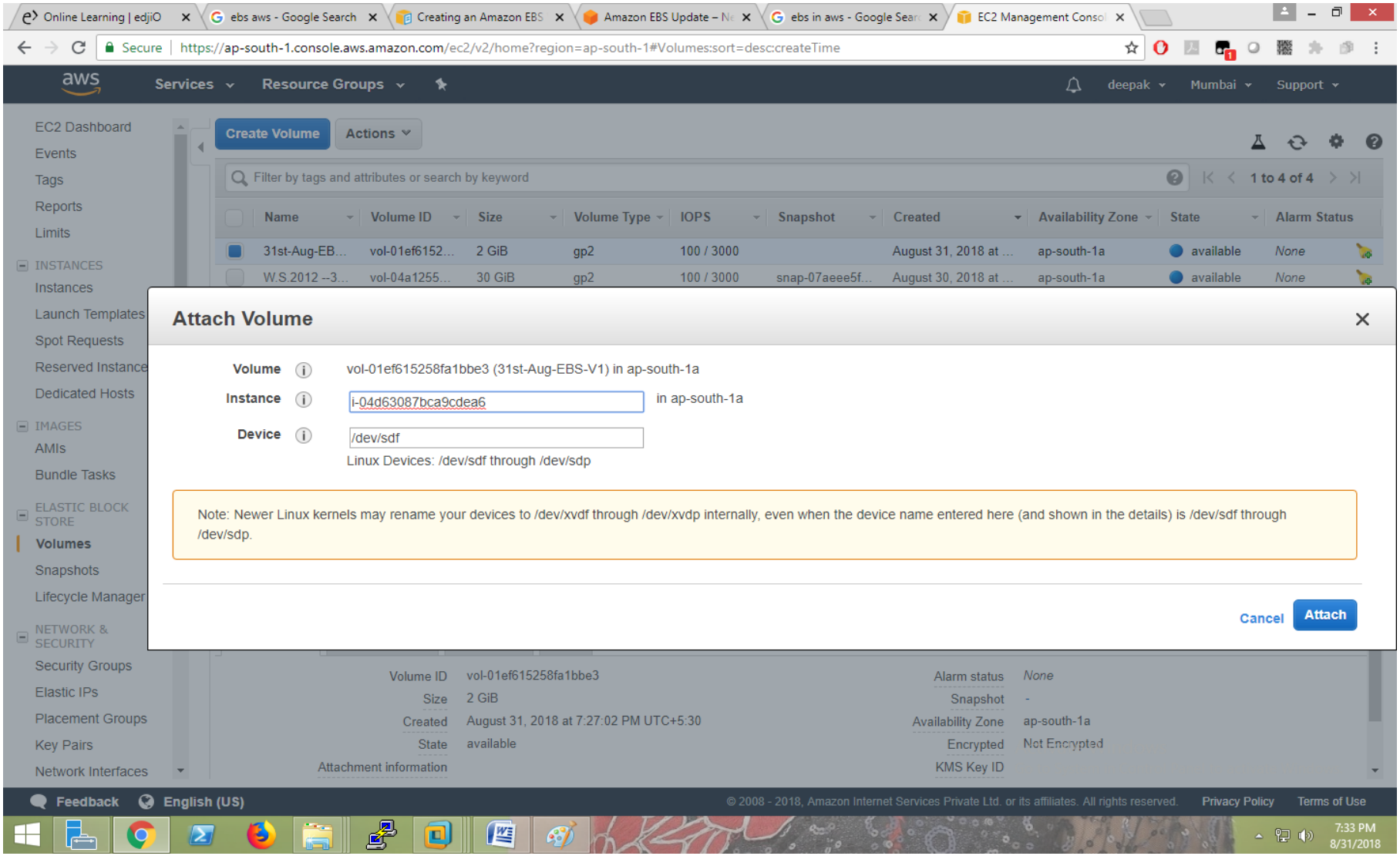


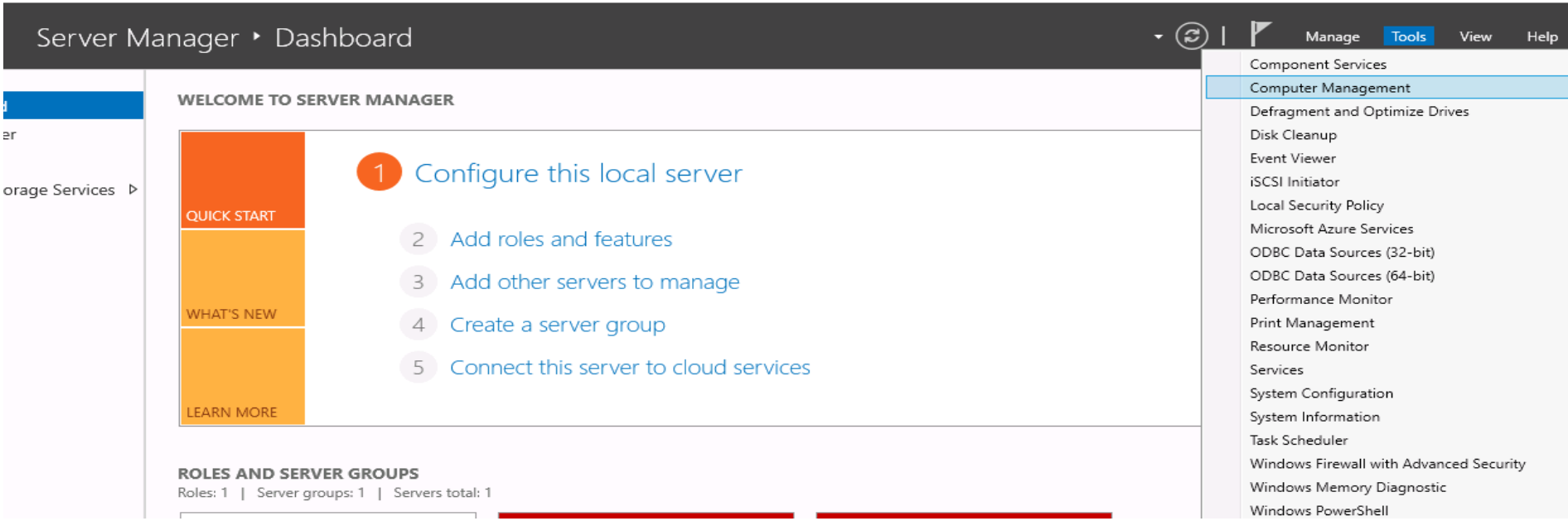
Attaching Volume

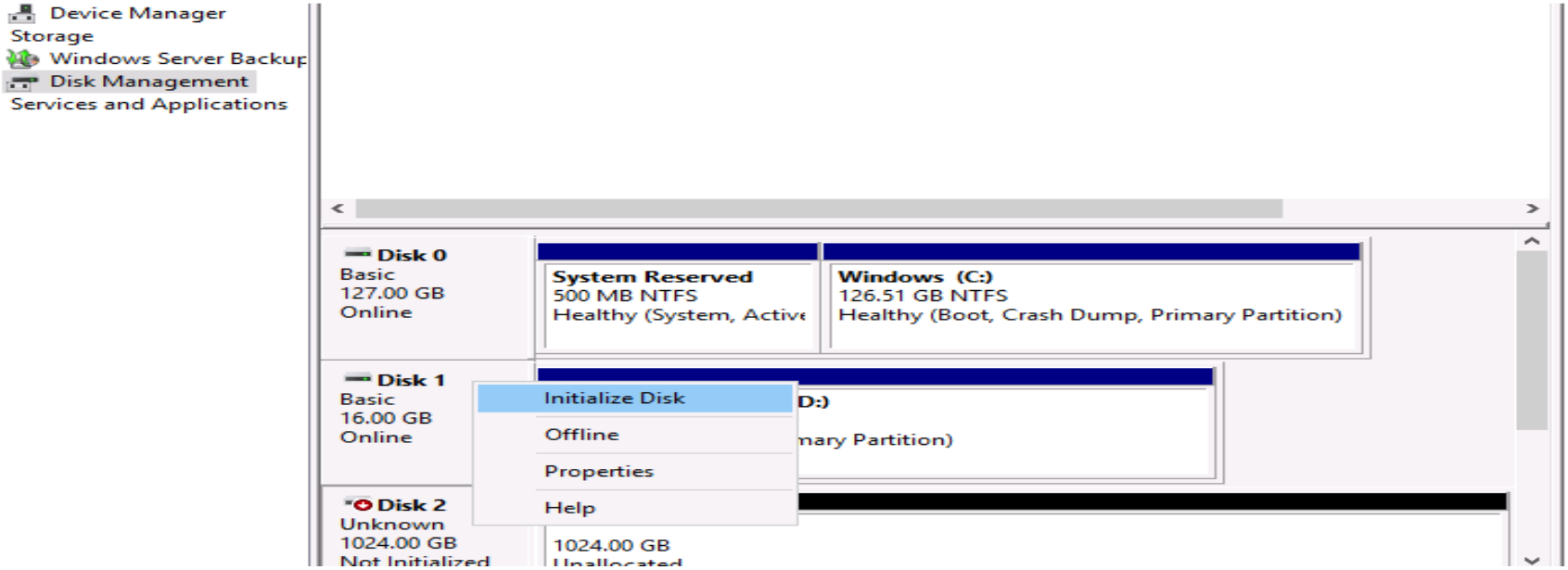
Select the created volume-Action-Attach Volume

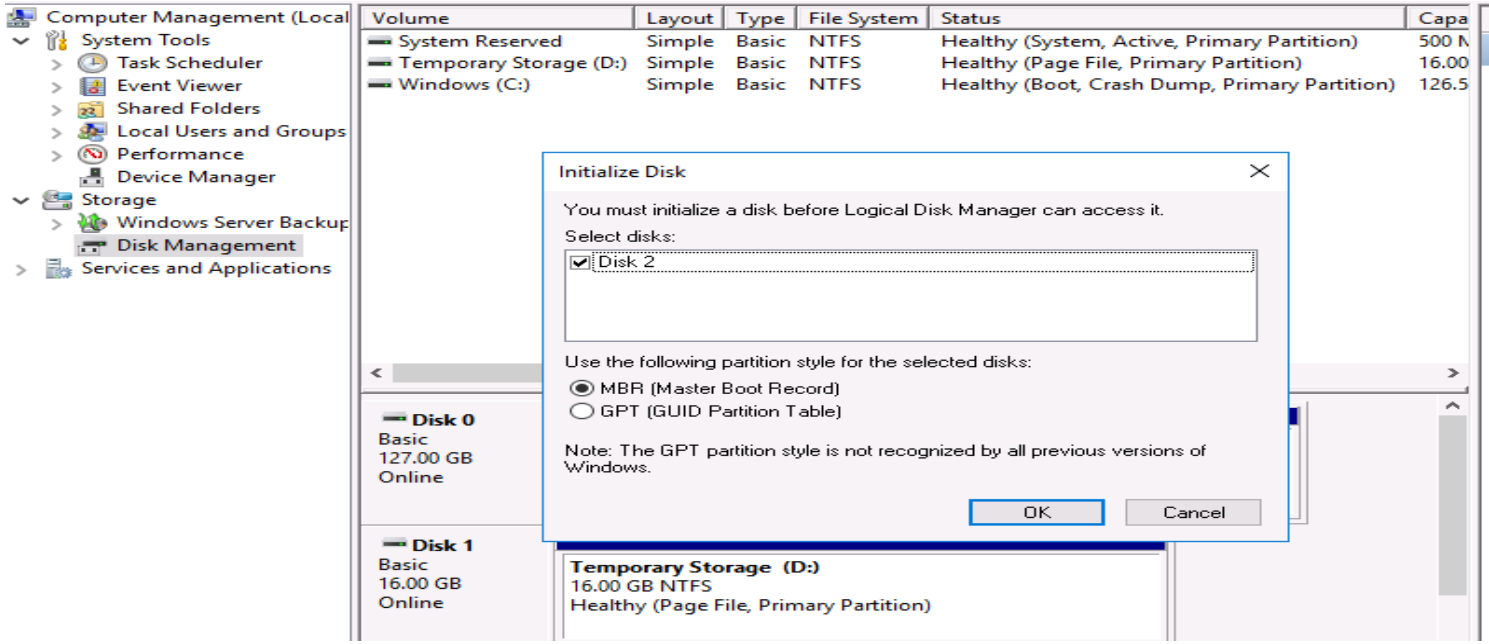


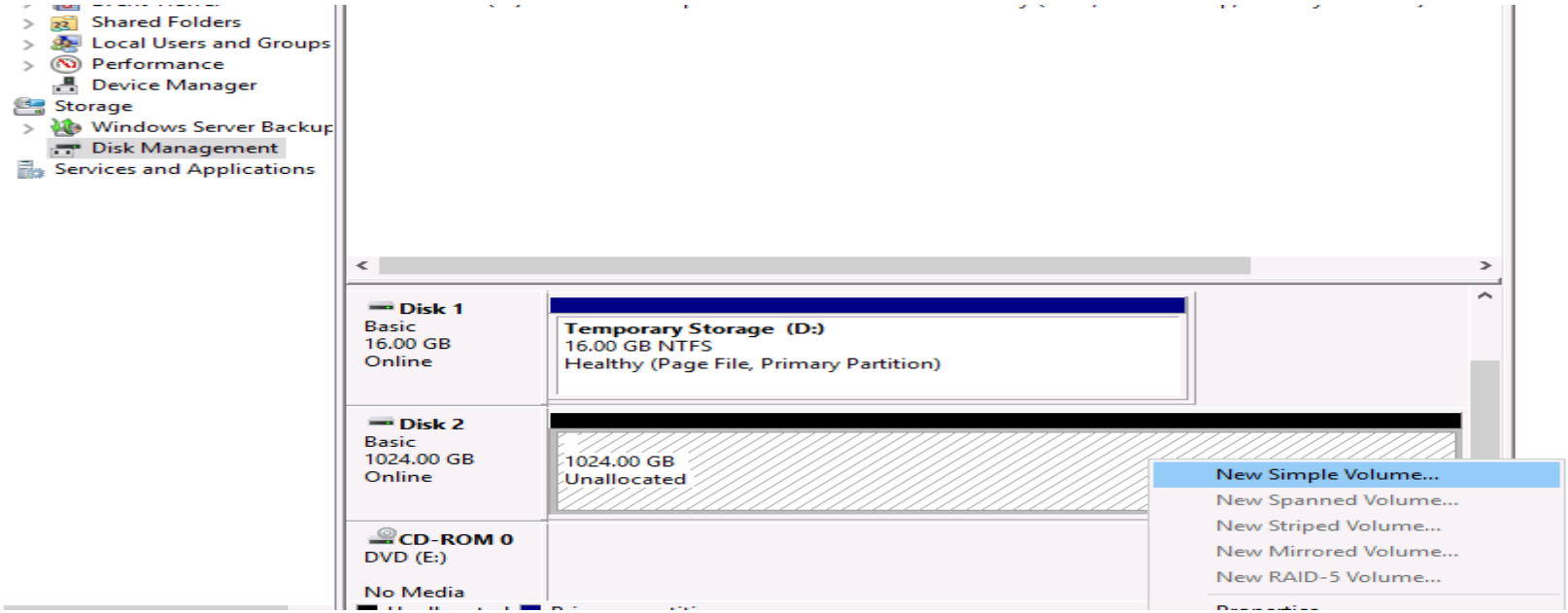
Select the running instance available on same availability zone

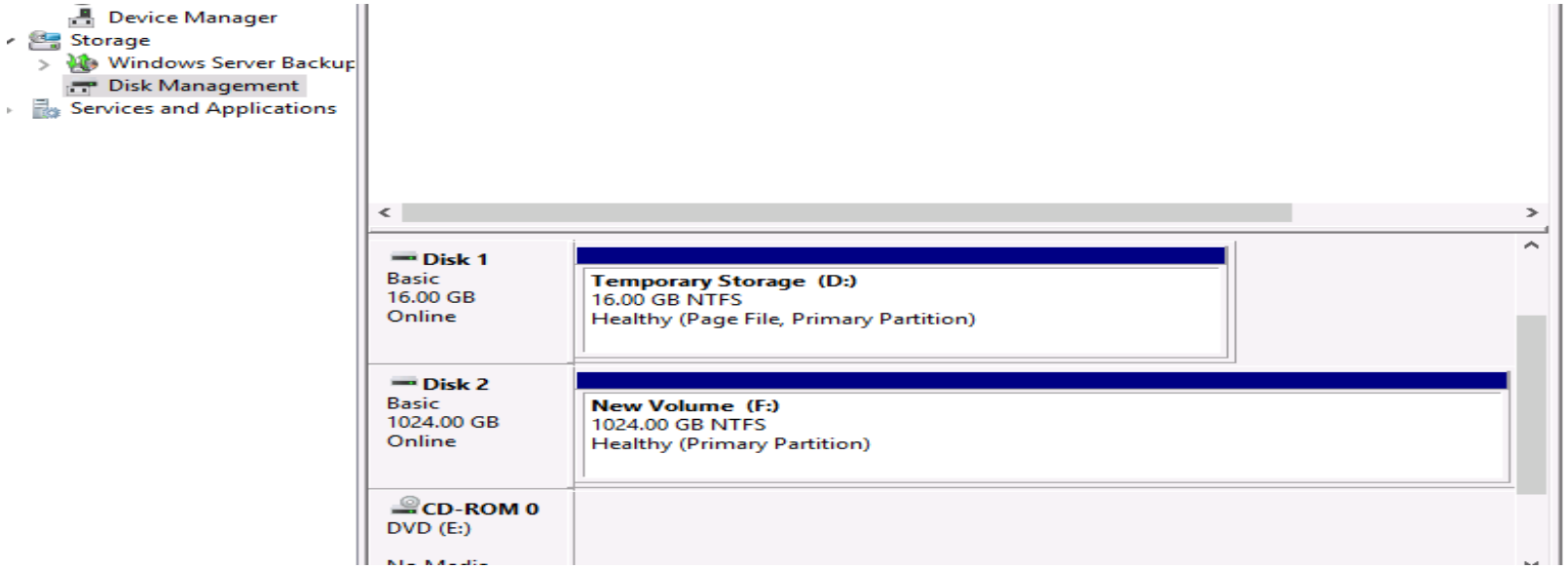


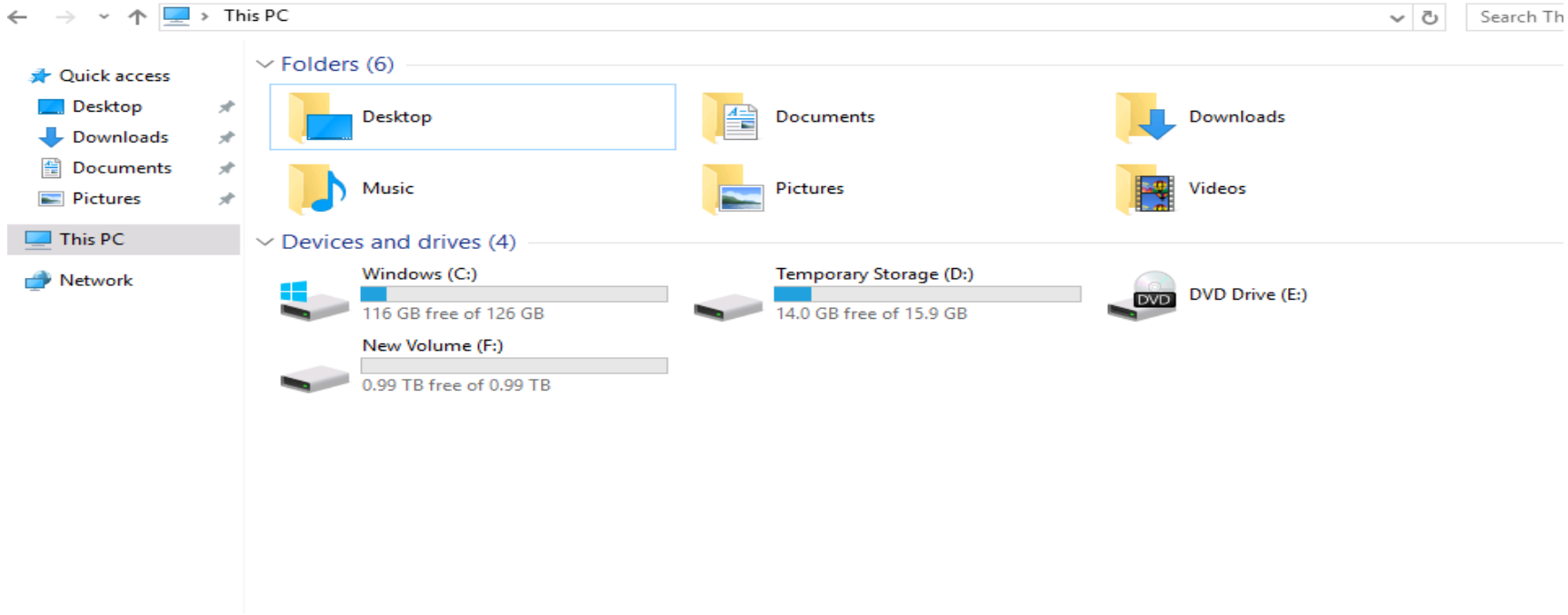

Server Manager ▸ Dashboard
Manage
Tools
View
Help
Component Services
Computer Management
Defragment and Optimize Drives
Disk Cleanup
Event Viewer
iSCSI Initiator
Local Security Policy
Microsoft Azure Services
ODBC Data Sources (32-bit)
ODBC Data Sources (64-bit)
Performance Monitor
Print Management
Resource Monitor
Services
System Configuration
System Information
Task Scheduler
Windows Firewall with Advanced Security
Windows Memory Diagnostic
Windows PowerShell
orage Services
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
ROLES AND SERVER GROUPS
Roles: 1 | Server groups: 1 | Servers total: 1


Device Manager
Storage
Windows Server Backup
Disk Management
Services and Applications
Disk 0
Basic
127.00 GB
Online
System Reserved
500 MB NTFS
Healthy (System, Active
Windows (C:)
126.51 GB NTFS
Healthy (Boot, Crash Dump, Primary Partition)
Disk 1
Basic
16.00 GB
Online
Initialize Disk
Offline
Properties
Help
D:)
nary Partition)
Disk 2
Unknown
1024.00 GB
Not Initialized
1024.00 GB
Unallocated


Computer Management (Local
System Tools
Task Scheduler
Event Viewer
Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Windows Server Backup
Disk Management
Services and Applications
Volume
Layout
Type
File System
Status
Capa
System Reserved
Simple
Basic
NTFS
Healthy (System, Active, Primary Partition)
500 M
Temporary Storage (D:)
Simple
Basic
NTFS
Healthy (Page File, Primary Partition)
16.00
Windows (C:)
Simple
Basic
NTFS
Healthy (Boot, Crash Dump, Primary Partition)
126.5
Actions
Disk Management
More Actions
Initialize Disk
You must initialize a disk before Logical Disk Manager can access it.
Select disks:
Disk 2
Use the following partition style for the selected disks:
MBR (Master Boot Record)
GPT (GUID Partition Table)
Note: The GPT partition style is not recognized by all previous versions of Windows.
OK
Cancel
Disk 0
Basic
127.00 GB
Online
Disk 1
Basic
16.00 GB
Online
Temporary Storage (D:)
16.00 GB NTFS
Healthy (Page File, Primary Partition)


Shared Folders
Local Users and Groups
Performance
Device Manager
Storage
Windows Server Backup
Disk Management
Services and Applications
Disk 1
Basic
16.00 GB
Online
Temporary Storage (D:)
16.00 GB NTFS
Healthy (Page File, Primary Partition)
Disk 2
Basic
1024.00 GB
Online
1024.00 GB
Unallocated
CD-ROM 0
DVD (E:)
No Media
New Simple Volume...
New Spanned Volume...
New Striped Volume...
New Mirrored Volume...
New RAID-5 Volume...


Device Manager
Storage
Windows Server Backup
Disk Management
Services and Applications
Disk 1
Basic
16.00 GB
Online
Temporary Storage (D:)
16.00 GB NTFS
Healthy (Page File, Primary Partition)
Disk 2
Basic
1024.00 GB
Online
New Volume (F:)
1024.00 GB NTFS
Healthy (Primary Partition)
CD-ROM 0
DVD (E:)


This PC
Search Th
Quick access
Desktop
Downloads
Documents
Pictures
This PC
Network
Folders (6)
Desktop
Documents
Downloads
Music
Pictures
Videos
Devices and drives (4)
Windows (C:)
116 GB free of 126 GB
Temporary Storage (D:)
14.0 GB free of 15.9 GB
DVD Drive (E:)
DVD
New Volume (F:)
0.99 TB free of 0.99 TB

Attaching and Detaching the EBS volume (Windows)

1)Attach EBS volume in one instance ---keep some data there.

2) Detach the volume and attach to the second instance.

3) Open/connect the second instance---server manger—computer management – disk management –right click on added disk – make online.

4) Come to my computer –you will get your volume here

Create partition in linux

After adding disk to linux Instance – connect the Instance using mobaextrem or any tool

$ sudo su

fdisk –l

fdisk /dev/xvdf

type –n then p then type 1 then press 2 times enter then type w

#mkfs.xfs /dev/xvdf1

#mkdir /share1

#mount /dev/xvdf1 /share1

#cd /share1 :-- this is your external disk space

Permanently mounting File system

vi /etc/fstab

At the end of line add

/dev/sdb1 /share1 xfs defaults 0 0

```
(chroot) livecd / # cat /etc/fstab
# /etc/fstab: static file system information.
#
# noatime turns off atimes for increased performance (atimes normally aren't
# needed); notail increases performance of ReiserFS (at the expense of storage
# efficiency).  It's safe to drop the noatime options if you want and to
# switch between notail / tail freely.
#
# The root filesystem should have a pass number of either 0 or 1.
# All other filesystems should have a pass number of 0 or greater than 1.
#
# See the manpage fstab(5) for more information.
#

# <fs>                  <mountpoint>    <type>          <opts>          <dump/pass>

# NOTE: If your BOOT partition is ReiserFS, add the notail option to opts.
#/dev/BOOT              /boot           ext2            noauto,noatime  1 2
#/dev/ROOT              /               ext3            noatime         0 1
#/dev/SWAP              none            swap            sw              0 0
#/dev/cdrom             /mnt/cdrom      auto            noauto,ro       0 0
#/dev/fd0               /mnt/floppy     auto            noauto          0 0

/dev/hda1               /boot           ext2            defaults        1 2
/dev/hda2               none            swap            sw              0 0
/dev/hda3               /               ext3            noatime         0 1
```

Attaching and Detaching the EBS volume (Linux)

1)Attach EBS volume in one instance ---keep some data there.

2) Detach the volume and attach to the second instance.

3) Open/connect the second instance-

$sudo su

fdisk –l

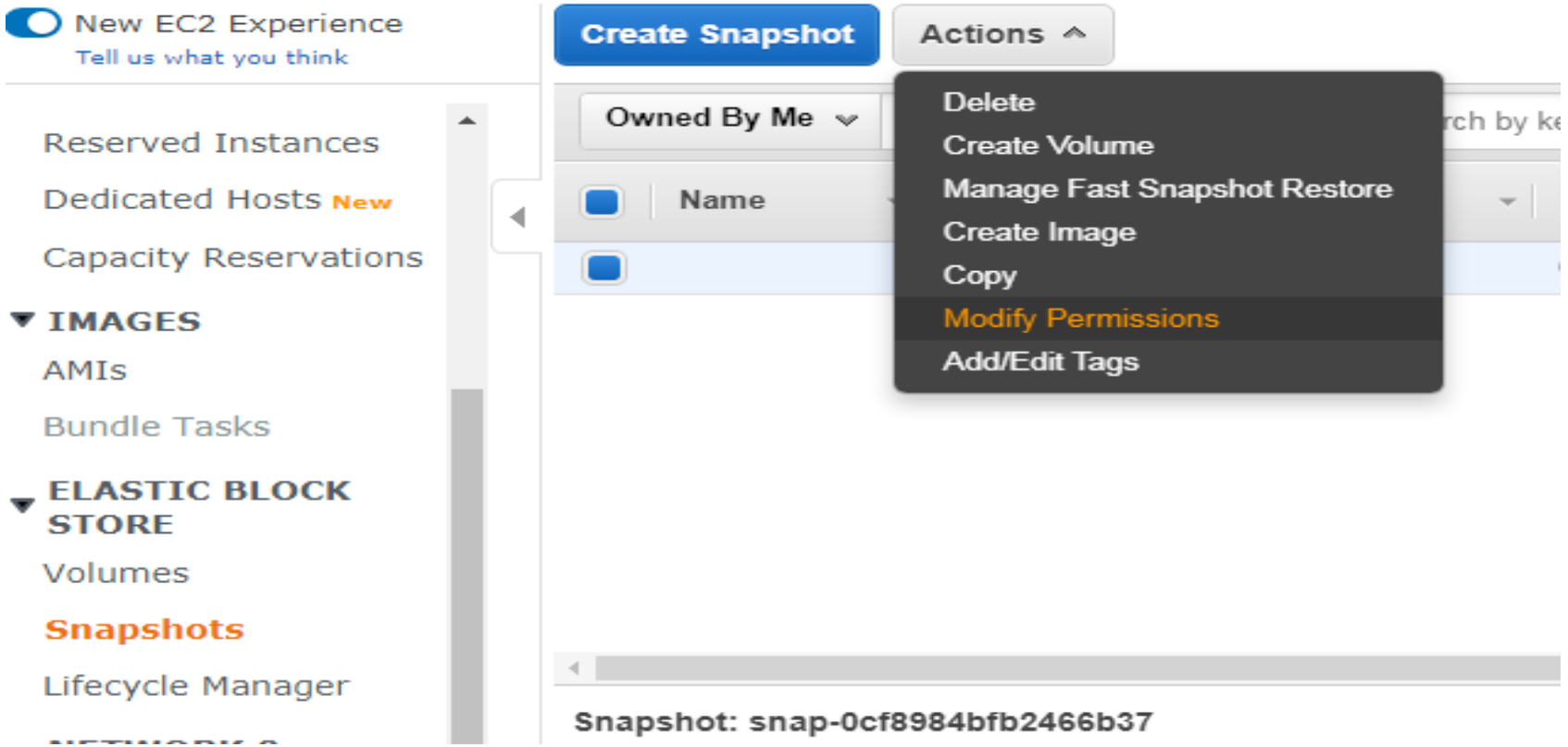
mkdir /storage1

mount /dev/xvdf1 /storage1

cd /storage1

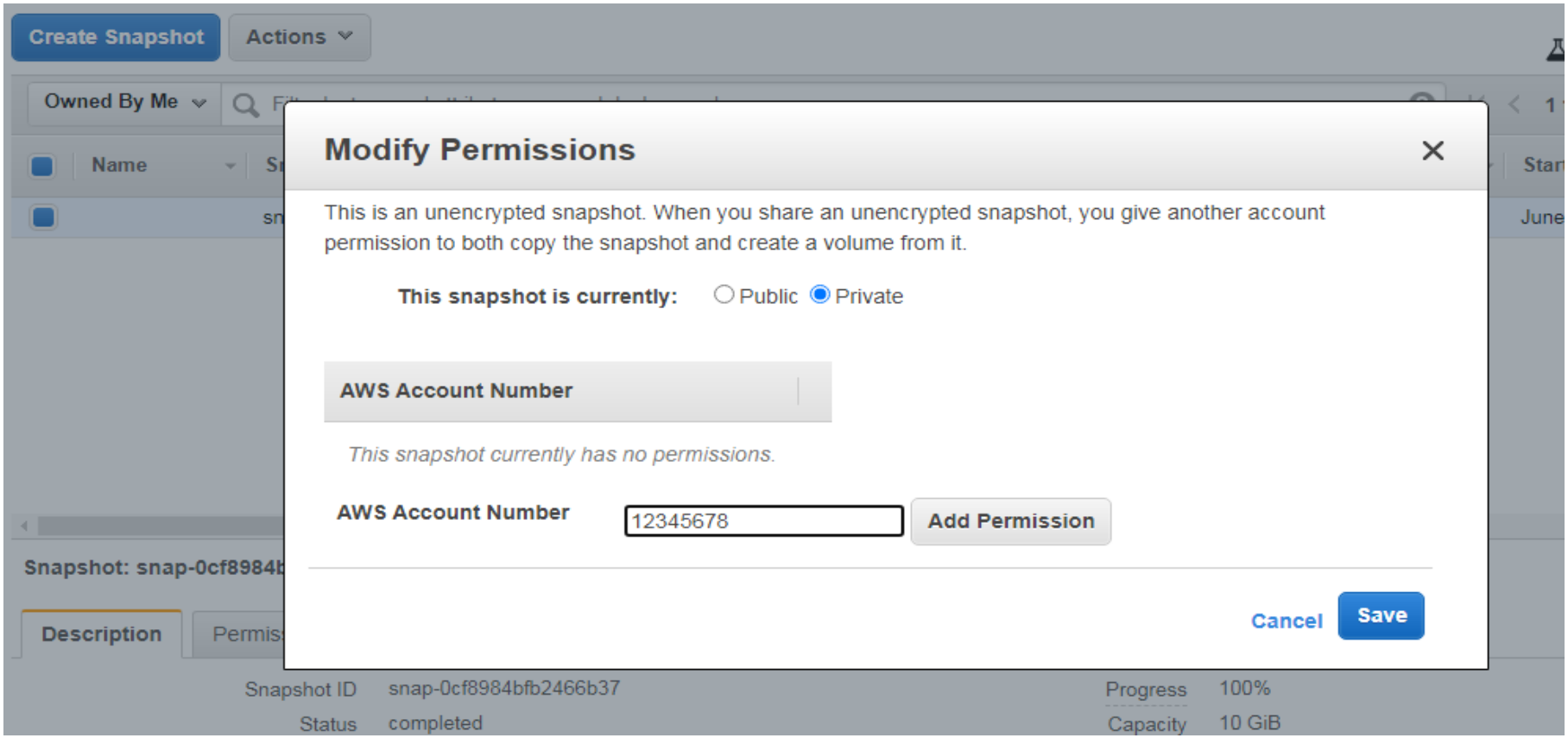
Migrating volume from one Account to other

Select the volume—Action –Create snapshot-then go to snapshot-action—modify permissions



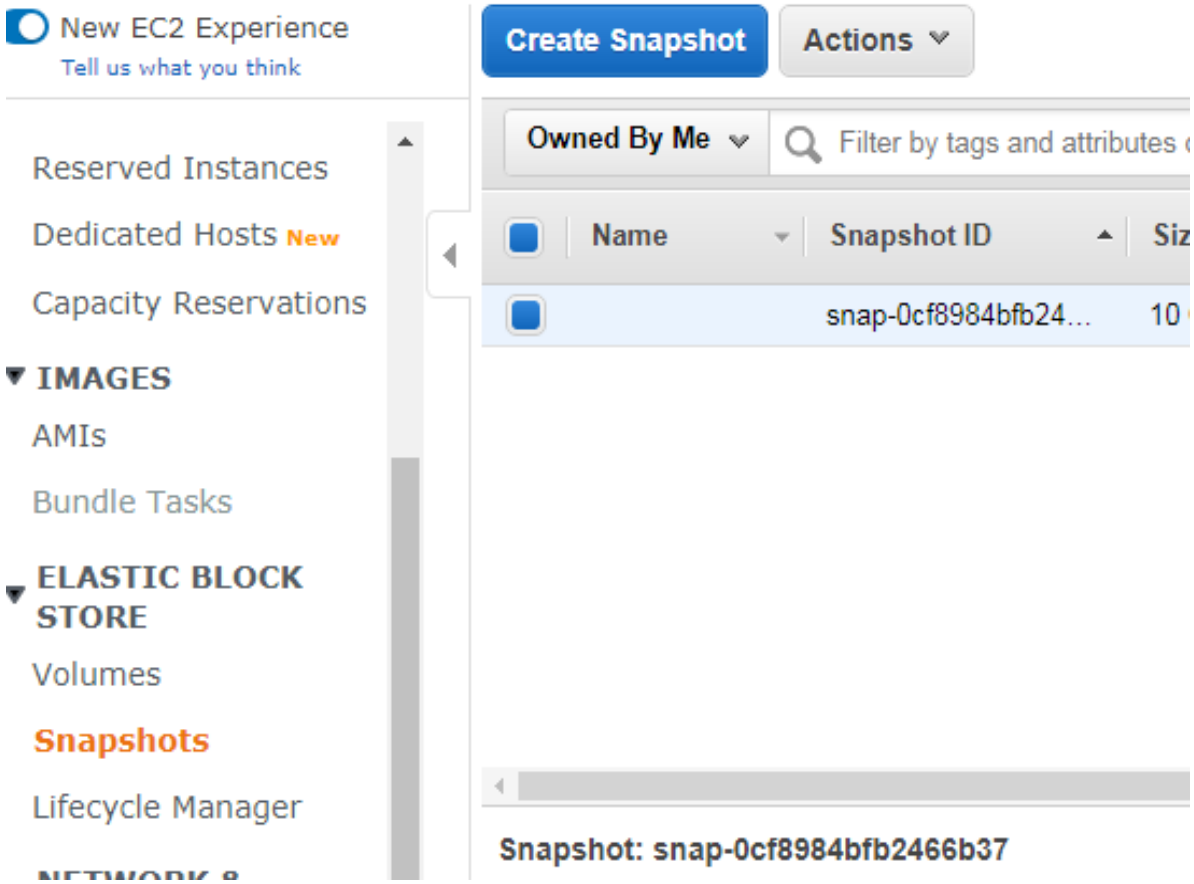
Migrating volume from one Account to other

Put other aws account number here



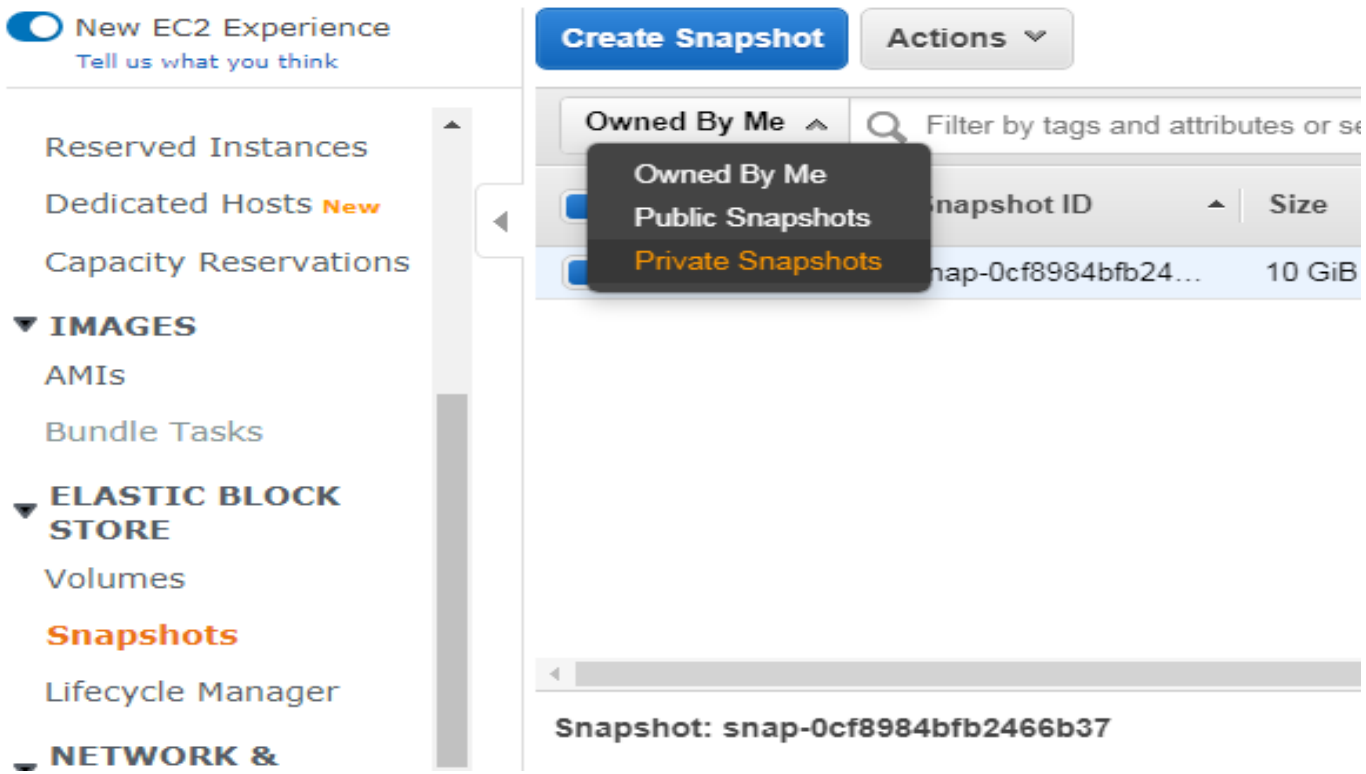
How to check in other account

1) EC2 --- Elastic block store --snapshot—click on owned by me--



How to check in other account

Owned by me –public snapshot—You will get share snapshot from other account –--go to action—create volume



Migrating volume from one Region to other

Create Snapshot—Go to snapshot---Action—Copy –select destination—Singapore—copy

Go to Singapore –select the snapshot –Action—Create Volume

Now attach to any Instance and check the data

Modifying Volume--Instance

Modifying Root Volume of Instance

1) Modify the volume size from aws console volume.

2) Connect the instance

df –h

lsblk

growpart /dev/xvda 1

lsblk

We increased block storage, but we also need to increase file system:

xfs_growfs /dev/xvdf1

df –h

Modifying Volume--EBS

Modifying Root Volume

1) Modify the volume size from aws console volume.

Note: ebs should have xfs file system (hint: mkfs.xfs /dev/xvdf1)

df -h

lsblk

growpart /dev/xvda 1

lsblk

#xfs_growfs /dev/xvdf1

df -h

Troubleshooting

1) How to recover lost keypair and access the instance.

Ans:

a) Create one more recovery instance.

b) Stop the victim instance

c) Go to volume – select victim instance—action—detach volume

d) Again go to action—attach volume—select—recovery instance

e) Connect recovery instance –

lsblk

mkdir /recovery

#mount -o nouuid /dev/xvdf2 /recovery

df -h

cat /home/ec2-user/.ssh/authorised_keys >> /recovery/home/ec2-user/.ssh/authorised_keys

#umount /recovery

Troubleshooting

f) Go aws –volume—select victim instance—action –detach volume—

g) Again go to action –attach volume—select stopped server –device: /dev/xvda ---attach

h) Now go to ec2 instance—copy public ip of victim instance and connect