

# Module 2: Case Study - 1

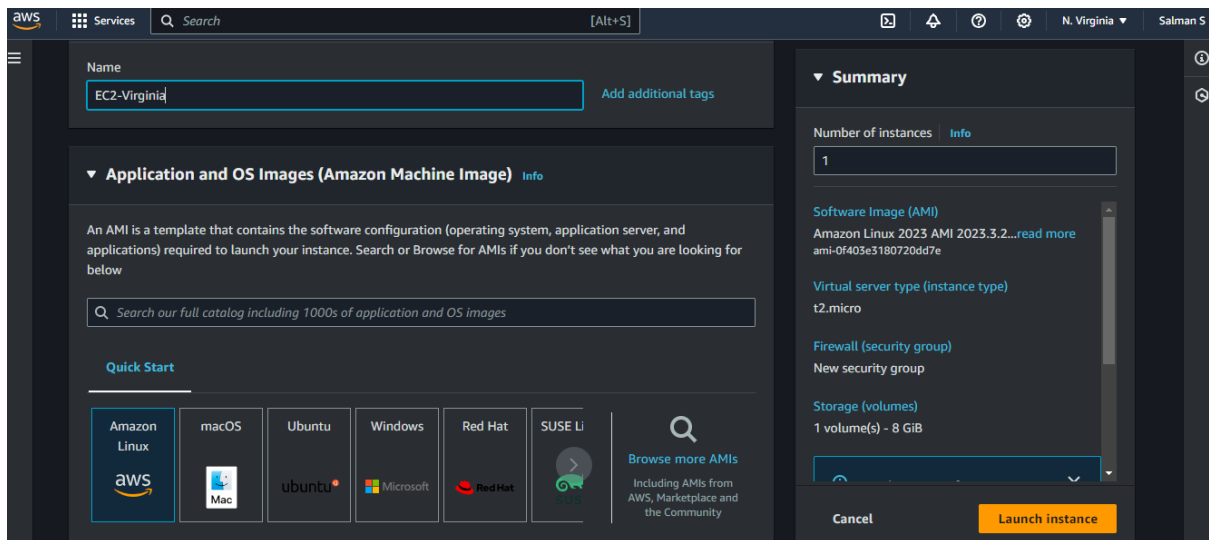
## Problem Statement:

You work for XYZ Corporation. Your corporation is working on an application and they require secured web servers on Linux to launch the application.

## Tasks To Be Performed:

1. Create an instance in the US-East-1 (N. Virginia) region with Linux OS and manage the requirement of web servers of your company using AMI.
2. Replicate the instance in the US-West-2 (Oregon) region.
3. Build two EBS volumes and attach them to the instance in the US-East-1 (N. Virginia) region.
4. Delete one volume after detaching it and extend the size of the other volume.
5. Take backup of this EBS volume.

### 1. Creating Amazon Linux EC2



2. Select **Free Tier AMI** which provided by AWS and Select **Free Instance Type**

### Amazon Machine Image (AMI)

**Amazon Linux 2023 AMI** Free tier eligible

ami-0f403e3180720dd7e (64-bit (x86), uefi-preferred) / ami-0237525b5672165b3 (64-bit (Arm), uefi)  
Virtualization: hvm ENA enabled: true Root device type: ebs

### Description

Amazon Linux 2023 AMI 2023.3.20240304.0 x86\_64 HVM kernel-6.1

Architecture	Boot mode	AMI ID	
64-bit (x86)	uefi-preferred	ami-0f403e3180720dd7e	Verified provider

### ▼ Instance type [Info](#) | [Get advice](#)

#### Instance type

**t2.micro** Free tier eligible

Family: t2 1 vCPU 1 GiB Memory Current generation: true  
On-Demand Windows base pricing: 0.0162 USD per Hour  
On-Demand SUSE base pricing: 0.0116 USD per Hour  
On-Demand RHEL base pricing: 0.0716 USD per Hour  
On-Demand Linux base pricing: 0.0116 USD per Hour

☒ All generations [Compare instance types](#)

3. Select Key Pair

### ▼ Key pair (login) [Info](#)

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

Salman

[Create new key pair](#)

4. Enable **Auto Public** and **Select your SG** and Leave Default Subnet

Network | Info

vpc-052c6fc0932543ae9

Subnet | Info

No preference (Default subnet in any availability zone)

Auto-assign public IP | Info

Enable

Firewall (security groups) | Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☐ Create security group ☒ Select existing security group

Common security groups Info

Select security groups ▼

Salman sg-008d5bc38febfde08 ✕  
VPC: vpc-052c6fc0932543ae9

Compare security group rules

Security groups that you add or remove here will be added to or removed from all your network interfaces.


5. Click **Advanced Details**

► **Advanced details** Info

6. I am Going Write a Script to **Install Webserver** For **Client** with using of User Data

User data - optional | Info

Upload a file with your user data or enter it in the field.

 Choose file

```
#!/bin/bash
sudo yum update -y
sudo yum install httpd -y
sudo systemctl enable httpd
sudo systemctl start httpd
sudo echo "<center><h3>Hi I Am Client Webserver $(hostname -f)</h3></center>"
> /var/www/html/index.html|
```

7. Successfully Launched and Remember Public IP to copy and past on browser

The screenshot shows the AWS Management Console interface for an EC2 instance. At the top, there's a search bar and a filter set to 'Running'. Below this, a table lists the instance details:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
EC2-Virginia	i-016d3b3ea00b16a27	Running	t2.micro	Initializing	View alarms +	us-east-1a

Below the table, the 'Instance: i-016d3b3ea00b16a27 (EC2-Virginia)' details are shown. The 'Instance summary' section includes:

- Instance ID: i-016d3b3ea00b16a27 (EC2-Virginia)
- Public IPv4 address: 3.88.227.173 (open address)
- Private IPv4 addresses: 172.31.23.189
- Instance state: Running
- Public IPv4 DNS: ec2-3-88-227-173.compute-1.amazonaws.com (open address)

8. Before that Make sure u have allow http port 80 then only Browser will works

The screenshot shows the 'Inbound rules' section of a security group. It lists two rules:

Name	Security group rule ID	Port range	Protocol	Source
-	sgr-0e8a9fa574f7af82e	22	TCP	0.0.0.0/0
-	sgr-070ffbc88b790639	80	TCP	0.0.0.0/0

9. Now see what the Data we provides in user data its visible on browser so our script is correct

The screenshot shows a web browser window with the address bar displaying '3.88.227.173'. The page content reads: 'Hi I'm Client Webserver ip-172-31-23-189.ec2.internal'.

10. Click Instances and Go To Actions>Image and Templates>Create Image

The screenshot shows the AWS Management Console interface for an EC2 instance. The 'Actions' menu is open, and the 'Create image' option is selected. The instance details are visible in the background:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
EC2-Virginia	i-016d3b3ea00b16a27	Running	t2.micro	Initializing	View alarms +	us-east-1a

The 'Instance: i-016d3b3ea00b16a27 (EC2-Virginia)' details are also visible, including the public IPv4 address 3.88.227.173 and private IPv4 addresses 172.31.23.189.

11. Give **Image Name** As Per ur wish and **Click Created**

EC2 > Instances > i-016d3b3ea00b16a27 > Create image

## Create image Info

An image (also referred to as an AMI) defines the programs and settings that are applied when you launch an EC2 instance. You can create an image from the configuration of an existing EC2 instance.

Instance ID  
i-016d3b3ea00b16a27 (EC2-Virginia)

Image name

Maximum 127 characters. Can't be modified after creation.

12. Ang Go **AMI's** section and **Select Created Image** go to **Actions** and **Copy AMI**

Amazon Machine Images (AMIs) (1/1) Info

[Refresh](#) [Recycle Bin](#) [EC2 Image Builder](#) **Actions** [Launch instance from AMI](#)

Owned by me

AMI ID = ami-0b11761e47f51fc0f [Clear filter](#)

<input checked="" type="checkbox"/>	Name	AMI name
<input checked="" type="checkbox"/>	Virginia-Image	

AMI ID: ami-0b11761e47f51fc0f

[Details](#) [Permissions](#) [Storage](#) [Tags](#)

- Copy AMI
- Edit AMI permissions
- Request Spot Instances
- Manage tags
- Deregister AMI
- Change description
- Configure fast launch
- Manage AMI Deprecation
- Register instance store-backed AMI
- Disable AMI

Source	Owner
211125783778/Virginia-Image	211125783778

AMI ID	Image type	Platform details	Root device type
ami-0b11761e47f51fc0f	machine	Linux/UNIX	EBS
AMI name	Owner account ID	Architecture	Usage operation
Virginia-Image	211125783778	x86_64	RunInstances

13. As Per Our Task We have **Copy Oregon** then Select **Destination as a Oregon**

EC2 > AMIs > ami-0b11761e47f51fc0f > Copy AMI

## Copy AMI Info

Create a copy of an Amazon Machine Image in a Region.

### Copy Amazon Machine Image (AMI)

Original AMI ID  
ami-0b11761e47f51fc0f

AMI copy name

AMI copy description

Destination Region  
A copy of the original AMI will be created in the destination Region.

#### 14. Create Copy AMI

**Tags - optional**  
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

☒ **Tag image and snapshots together**  
Tag the image and the snapshots with the same tag.

☐ **Tag image and snapshots separately**  
Tag the image and the snapshots with different tags.

No tags associated with the resource.

**Add new tag**

You can add up to 50 more tags.

**Cancel** **Copy AMI**

#### 15. And Go To Oregon Region and Create Instances

Services Search [Alt+S] Oregon Salman S

EC2 > Instances > Launch an instance

### Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

**Name and tags** Info

Name: EC2-Oregon [Add additional tags](#)

**Summary**

Number of instances: 1 Info

Software Image (AMI): [Copied ami-0b11761e47f51fc0f ...read more ami-0aa0e797ecd734b92]

Virtual server type (instance type): t2.micro

#### 16. Go To My AMI's and Select Our Copied AMI

**My AMIs** **Quick Start**

☒ Owned by me ☐ Shared with me

[Browse more AMIs](#)  
Including AMIs from AWS, Marketplace and the Community

**Amazon Machine Image (AMI)**

Virginia-Image  
ami-0aa0e797ecd734b92  
2024-03-14 10:02:47.000Z Virtualization: hvm ENA enabled: true Root device type: ebs

**Description**  
[Copied ami-0b11761e47f51fc0f from us-east-1] Virginia-Image

Architecture	AMI ID
x86_64	ami-0aa0e797ecd734b92

17. Select **Key Pair**

▼ **Key pair (login)** [Info](#)

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

salman-1 ▼ [Create new key pair](#)

18. Select **Security Group**

VPC - *required* [Info](#)

vpc-07dd934b89177e5b6 (default) ▼ [Create new vpc](#)

Subnet [Info](#)

No preference ▼ [Create new subnet](#)

Auto-assign public IP [Info](#)

Enable ▼

Firewall (security groups) [Info](#)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☐ Create security group ☒ Select existing security group

Common security groups [Info](#)

Select security groups ▼

launch-wizard-1 sg-02441504f4aa52e0f X  
VPC: vpc-07dd934b89177e5b6

[Compare security group rules](#)

Security groups that you add or remove here will be added to or removed from all your network interfaces.

19. And **Wait for AMI is Copying** and after some time click again launch and it **will Launch Successfully**

[EC2](#) > [Instances](#) > Launch an instance

✔ **Success**  
Successfully initiated launch of instance (i-07f1ce65e9e55b5f8)

▼ **Launch log**

Initializing requests	✔ Succeeded
Launch initiation	✔ Succeeded

20. Click **Instances and Copy Public IP**

The screenshot shows the AWS Management Console. At the top, there's a search bar and navigation tabs. The 'Instances' tab is selected, showing a list of instances. Below the list, the details for instance 'i-07f1ce65e9e55b5f8' (EC2-Oregon) are displayed. The 'Details' tab is active, showing the instance summary, status, and networking information. A tooltip indicates that the 'Public IPv4 address' has been copied.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability
EC2-Oregon	i-07f1ce65e9e55b5f8	Running	t2.micro	Initializing	View alarms +	us-west-2b

**Instance: i-07f1ce65e9e55b5f8 (EC2-Oregon)**

**Details** | Status and alarms New | Monitoring | Security | Networking | Storage | Tags

**Instance summary** Info

Instance ID: i-07f1ce65e9e55b5f8 (EC2-Oregon)

IPv6 address: -

Public IPv4 address: 54.148.240.159 [open address](#)

Private IPv4 addresses: 172.31.26.62

Public IPv4 DNS: ec2-54-148-240-159.us-west-2.compute.amazonaws.com [open address](#)

Instance state: Running

21. Allow Http Port

The screenshot shows the AWS Security Groups console. The 'Inbound rules' tab is selected, showing a list of rules. The first rule is for port 80 (HTTP) and the second is for port 22 (SSH).

Name	Security group rule ID	Port range	Protocol	Source
-	sgr-047c357bfefa35ef1	80	TCP	0.0.0.0/0
-	sgr-0431265553b102872	22	TCP	0.0.0.0/0

22. Now Our **AMI Successfully** Copied from **Virginia**

The screenshot shows a terminal window with a message from a client webserver. The message is: "Hi I'm Client Webserver ip-172-31-23-189.ec2.internal".

```
Hi I'm Client Webserver ip-172-31-23-189.ec2.internal
```

23. Now Go To **EBS Volumes** and Click **Create Volume**

The screenshot shows the AWS Elastic Block Store console. The 'Volumes' tab is selected, showing a list of volumes. The 'Create volume' button is visible.

Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot	Created
-	vol-0277bfd8a00590ef	gp3	8 GiB	3000	125	snap-0afaa08...	2024/03



24. Now **Select Volume** as Per Ur Wish and Select **Availability Zone** were Instances launched

Volume type **Info**

General Purpose SSD (gp3) ▼

**General Purpose SSD gp3 is now the default selection. gp3 provides up to 20% lower cost per GB than gp2.**  
[Learn More](#)

Size (GiB) **Info**

4 ▼

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.

Throughput (MiB/s) **Info**

125

Min: 125 MiB, Max: 1000 MiB. Baseline: 125 MiB/s.

Availability Zone **Info**

us-east-1a ▼

25. Like Repeat Twice and Create 2 Volumes **Totally I Created 4 GiB and 5 GiB**

aws Services [Alt+S] N. Virginia Salman S

EC2 Dashboard X

EC2 Global View

Events

Console-to-Code Preview

▼ Instances

Instances

Instance Types

Successfully created volume vol-088ba8e8518f45fa3.

Volumes (3) **Info**

Search

Actions ▼ Create volume

	Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot	Created
<input type="checkbox"/>	-	vol-0277bfb8a00590ef	gp3	8 GiB	3000	125	snap-0afaa08...	2024/03
<input type="checkbox"/>	-	vol-04d567c1fc17feab3	gp3	4 GiB	3000	125	-	2024/03
<input type="checkbox"/>	-	vol-088ba8e8518f45fa3	gp3	5 GiB	3000	125	-	2024/03

26. And **Select Volume and Go To Actions** and **Click Attach Volume**

Volumes (1/3) **Info**

Search

Actions ▲ Create volume

	Name	Volume ID	Type	Size	IOPS	Throu
<input type="checkbox"/>	-	vol-0277bfb8a00590ef	gp3	8 GiB	3000	125
<input checked="" type="checkbox"/>	-	vol-04d567c1fc17feab3	gp3	4 GiB	3000	125
<input type="checkbox"/>	-	vol-088ba8e8518f45fa3	gp3	5 GiB	3000	125

Modify volume

Create snapshot

Create snapshot lifecycle policy

Delete volume

Attach volume

27. Select **Instances ID** and Give Name **As Per Ur Wish** and Attach the Both The Volume like this  
One I Gave Device Name **/dev/xvdf** and another **/dev/xvdg**

Volume ID  
vol-04d567c1fc17feab3

Availability Zone  
us-east-1a

Instance **Info**  
i-016d3b3ea00b16a27

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

Device name **Info**  
/dev/xvdf

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

**Info** 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**.

Cancel Attach volume

28. This Are Commands to **Mount** Ur **EBS Volume** to Your Server

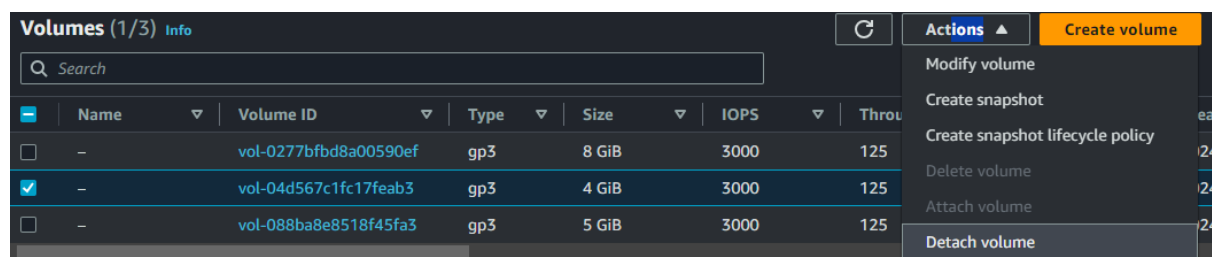
1. `lsblk`
2. `sudo mkfs -t ext4 /dev/xvdf`
3. `sudo mkdir ebs`
4. `sudo mount /dev/xvdf ebs`

1. `lsblk`
2. `sudo mkfs -t ext4 /dev/xvdg`
3. `sudo mkdir ebs-1`
4. `sudo mount /dev/xvdg ebs-1`

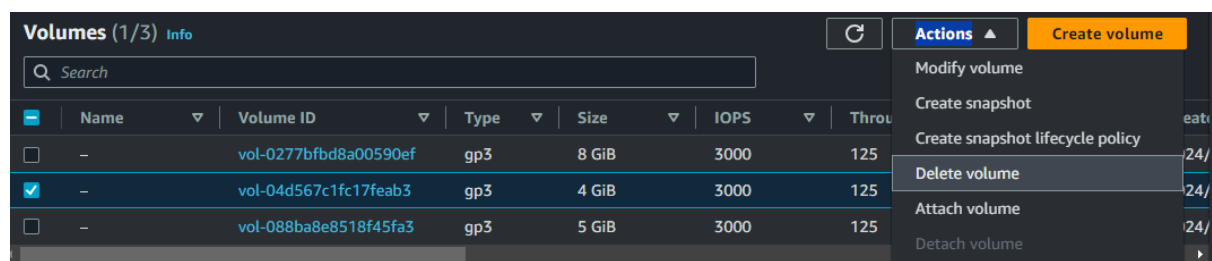
29. After Implementing the Commands Successfully Mounted

```
[ec2-user@ip-172-31-23-189 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        4.0M   0    4.0M   0% /dev
tmpfs           475M   0    475M   0% /dev/shm
tmpfs           190M  2.9M   188M   2% /run
/dev/xvda1      8.0G  1.6G   6.4G  20% /
tmpfs           475M   0    475M   0% /tmp
/dev/xvda128    10M   1.3M   8.7M  13% /boot/efi
tmpfs           95M   0     95M   0% /run/user/1000
/dev/xvdf       3.9G   24K   3.7G   1% /home/ec2-user/ebs
/dev/xvdg       4.9G   24K   4.6G   1% /home/ec2-user/ebs-1
[ec2-user@ip-172-31-23-189 ~]$ lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
xvda            202:0    0   8G  0 disk
├─xvda1         202:1    0   8G  0 part /
├─xvda127       259:0    0    1M  0 part
└─xvda128       259:1    0   10M  0 part /boot/efi
xvdf            202:80   0    4G  0 disk /home/ec2-user/ebs
xvdg            202:96   0    5G  0 disk /home/ec2-user/ebs-1
[ec2-user@ip-172-31-23-189 ~]$
```

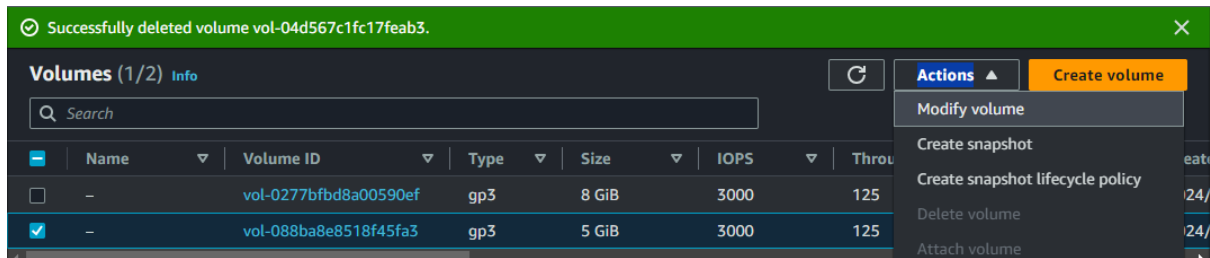
30. As Per The Task One Volume Need to Detach Volume



31. After Detaching and Go Same Actions Again and U will Get the Delete Volume and Click Delete



32. Now **Modifying Another** Volume **Go Actions** and Click **Modify Volume**



33. I Modified **5 to 7 GiB** and Click Modify

Volume ID

vol-088ba8e8518f45fa3

Volume type Info

General Purpose SSD (gp3)

Size (GiB) Info

7

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.

Throughput (MiB/s) Info

125

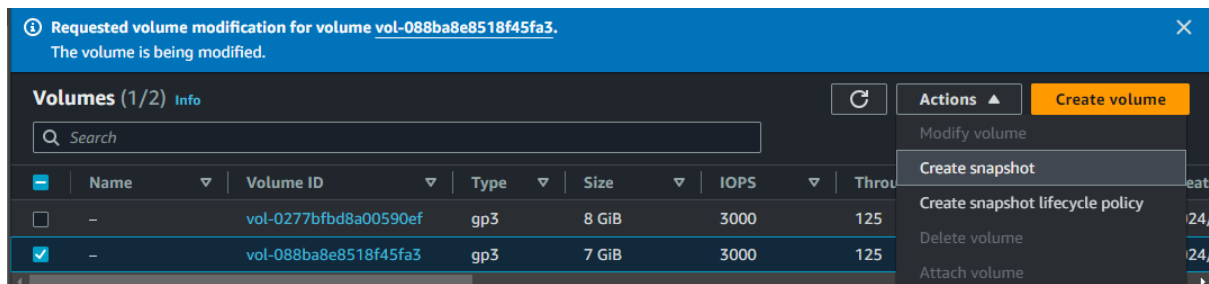
Min: 125 MiB, Max: 1000 MiB. Baseline: 125 MiB/s.

Cancel Modify

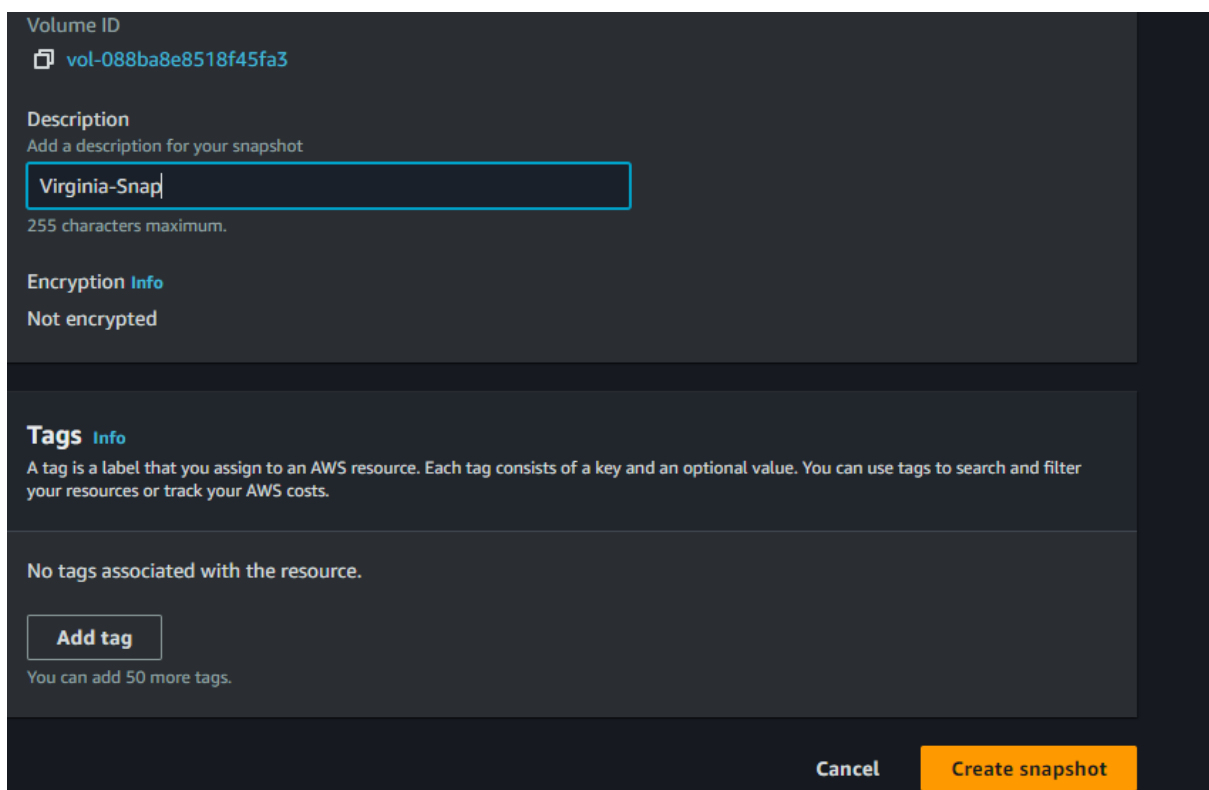
34. Now **Check df -h** and Now its **Updated Successfully** and also **Previous one Deleted**.

```
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
xvda      202:0    0   8G  0 disk 
├─xvda1    202:1    0   8G  0 part /
├─xvda127  259:0    0   1M  0 part 
└─xvda128  259:1    0  10M  0 part /boot/efi
xvdg      202:96    0   7G  0 disk /home/ec2-user/ebs-1
[ec2-user@ip-172-31-23-189 ~]$
```

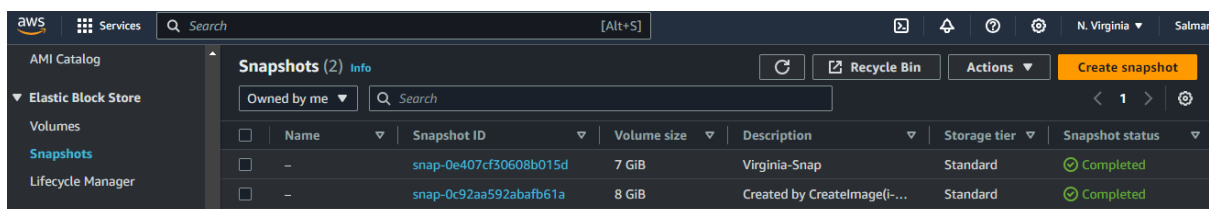
35. Now Again **Go To Volume** and **Go To Actions** and Select **Create Snapshot**



36. Snap Name and Click Create



37. Now We can See the **Snapshot of our Volume**, What **We have Stored in this Volume** we can Backup Our Data Like this.



Thank You