



# MODULE-2

## CASE STUDY

Prepared by: Raj Kumar Suman



# CLOUD COMPUTING COMPONENTS



NETWORK



COMPUTE



STORAGE



DATABASE



# TASK TO DO

---

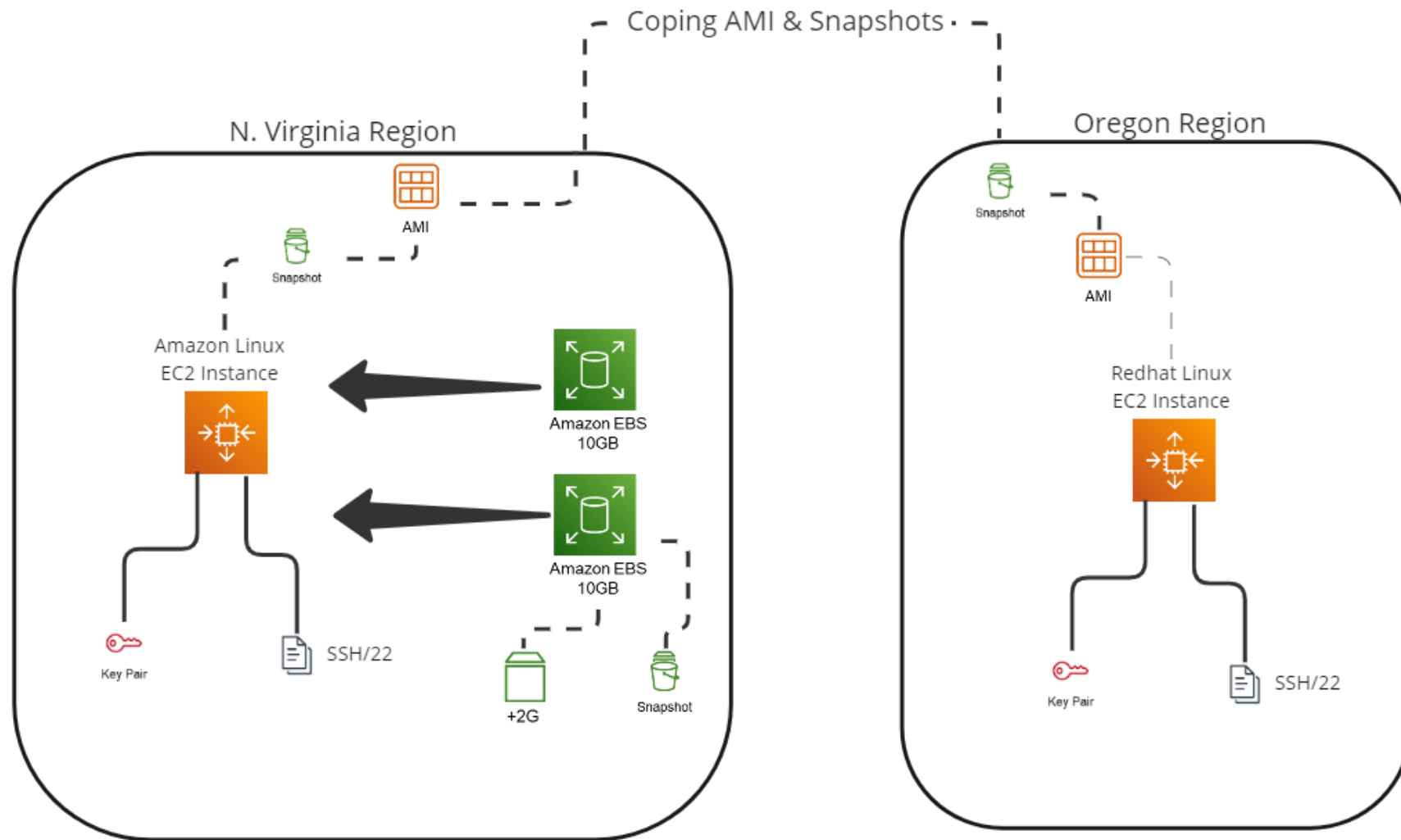
## **Problem Statement:**

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

## **You have been asked to:**

1. Create an Instance in 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 us-west-2 (Oregon) region
  3. Build two EBS volumes and attach them to the instance in us-east-1 (N. Virginia) region
  4. Delete one volume after detaching it and extend the size of other volume
  5. Take backup of this EBS volume
-

# BLUEPRINT




# PLAN OF ACTION

- Create Linux EC2 instance under us-east-1 region with user data to create webserver quickly.
- Create/add key pair & appropriate security group while creating EC2 instance.
- Create an Image using above instance (Creating an Image will create a snapshot also)
- Copy AMI to us-west-2 (Oregon) region (It will replicate AMI along with respective snapshots.
- Create 2 each 10GB EBS volumes and attached it to us-east-1 instance.
- Login to instance & check for the newly added disk information using `fdisk -l`.
- Delete one EBS after detaching it & extend the size of other EBS volume from 10G to 12G.
- Take snapshot of 12GB EBS volume for backup purpose.



# Launch Amazon Linux EC2 instance under us-east-1 (N. Virginia) region

 Services  [Alt+S]

EC2 CloudFormation VPC RDS Route 53 S3 IAM DynamoDB CloudShell EFS Lambda

## 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

 [Add additional tags](#)


### ▼ Application and OS Images (Amazon Machine Image) [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below


Recents

Quick Start


Amazon Linux




macOS




Ubuntu




Windows



Red Hat



S



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

### ▼ Summary

Number of instances [Info](#)

Software Image (AMI)

Amazon Linux 2 Kernel 5.10 AMI...[read more](#)  
ami-09d3b3274b6c5d4aa

Virtual server type (instance type)


t2.micro


Firewall (security group)

default

Storage (volumes)

1 volume(s) - 8 GiB

 **Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier



[Cancel](#) [Launch instance](#)

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# Add keypair to that instance

aws

Services

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[Alt+S]

EC2

CloudFormation

VPC

RDS

Route 53

S3

IAM

DynamoDB

CloudShell

EFS

Lambda

N. Virginia

vCloud

Instance type

Info

Instance type

t2.micro

Family: t2 1 vCPU 1 GiB Memory

On-Demand Linux pricing: 0.0116 USD per Hour

On-Demand Windows pricing: 0.0162 USD per Hour

Free tier eligible

Compare instance types

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

MyKeyPair

Create new key pair

Network settings

Info

Edit

Network

Info

vpc-0f4f8a293dbb5f7b1 | Default

Subnet

Info

No preference (Default subnet in any availability zone)

Summary

Number of instances

Info

1

Software Image (AMI)

Amazon Linux 2 Kernel 5.10 AMI...read more

ami-09d3b3274b6c5d4aa

Virtual server type (instance type)

t2.micro

Firewall (security group)

default

Storage (volumes)

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Add user data to make instance a webserver as per assignment.

aws

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VPC

RDS

Route 53

S3

IAM

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CloudShell

EFS

Lambda

N. Virginia

vCloud

Select

Metadata response hop limit [Info](#)

Select

Allow tags in metadata [Info](#)

Select

User data [Info](#)

```
#!/bin/bash
# Use this for your user data (script from top to bottom)
# install httpd (Linux 2 version)
yum update -y
yum install -y httpd
systemctl start httpd
systemctl enable httpd
echo "<h1>Hello World from $(hostname -f)</h1>" > /var/www/html/index.html
```

☐ User data has already been base64 encoded

▼ Summary

Number of instances [Info](#)

1

Software Image (AMI)

Amazon Linux 2 Kernel 5.10 AMI...[read more](#)  
ami-09d3b3274b6c5d4aa

Virtual server type (instance type)

t2.micro

Firewall (security group)

default

Storage (volumes)

1 volume(s) - 8 GiB

Free tier:

In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier

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






Once instance launched, create an image using “image & templates” under action tab.






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   N. Virginia vCloud

EC2 > Instances > i-045a8ec47f0ba2d10 > 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 instance.

Instance ID


 i-045a8ec47f0ba2d10 (Module 2-Case-Study)

Image name

AMI of i-045a8ec47f0ba2d10

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

Image description - *optional*

This AMI is part of assignment for module 2 case study.

Maximum 255 characters

No reboot

☐ Enable

Instance volumes

Volume type	Device	Snapshot	Size	Volume type	IOPS	Throughput	Delete on termination	Encrypted
EBS	/dev/...	Create new snapshot fr...	8	EBS General Purpose S...	100		<input checked="" type="checkbox"/> Enable	<input type="checkbox"/> Enable

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Under EC2>AMI/snapshots you will be able to see created AMI along with its snapshot.

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▼ Images  
AMIs **New**  
AMI Catalog

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

Owned by me Find AMI by attribute or tag < 1 > ⚙

<input type="checkbox"/>	Name	AMI ID	AMI name	Source	Owner	
<input type="checkbox"/>	AMI of i-045a8ec47f0ba2d10	<a href="#">ami-0417bfebbf601d264</a>	AMI of i-045a8ec47f0ba2d10	560891677678/AMI of i-045a8ec47f0ba2d10	560891677678	Pi

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▼ Elastic Block Store  
Volumes  
**Snapshots**  
Lifecycle Manager


▼ Network & Security  
Security Groups  
Elastic IPs

### Snapshots (1)

Owned by me Search < 1 > ⚙

<input type="checkbox"/>	Name	Snapshot ID	Size	Description	Storage...	Snapshot status
<input type="checkbox"/>	-	<a href="#">snap-076c2c697d7e19cce</a>	8 GiB	Created by CreateImage(i-045a8ec47f0ba2d10) for ami-0417bfebbf601d264	Standard	✔ Completed

# Copy an AMI to Oregon region using action tab under EC2>AMI

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EC2 > AMIs > ami-0417bfebbf601d264 > 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-0417bfebbf601d264](#) (AMI of i-045a8ec47f0ba2d10)

AMI copy name

AMI copy description

Destination Region

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

US West (Oregon) ▼

☐ Encrypt EBS snapshots of AMI copy

Encrypts all snapshots in the AMI copy with the same key.

Cancel Copy AMI

Go to respective region to check for availability of copied AMI & it's snapshots.

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AMI Catalog

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Volumes

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

Owned by me Find AMI by attribute or tag

Recycle Bin EC2 Image Builder Actions Launch instance from AMI

<input checked="" type="checkbox"/>	Name	AMI ID	AMI name	Source
<input checked="" type="checkbox"/>	AMI of Oregon region	ami-04c8f1e2be4b6cd06	AMI of i-045a8ec47f0ba2d10	560891677678/AMI of i-045a8ec47f0b...

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**Snapshots**


### Snapshots (1/1)












Owned by me Search

Recycle Bin Actions Create snapshot

<input checked="" type="checkbox"/>	Name	Snapshot ID	Size	Description	Storage...	Snapshot st...
<input checked="" type="checkbox"/>	Snapshot of Oregon...	snap-0171b74a22180a727	8 GiB	Copied for DestinationAmi ...	Standard	✓ Complete

Launch an instance in Oregon region using AMI copied from us-east-1 region.

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EC2 Global View

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▼ Instances

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Instance Types

Launch Templates

Spot Requests



Savings Plans



Reserved Instances New

Dedicated Hosts





Scheduled Instances

Instances (1/1) [Info](#)

 [Connect](#) [Instance state ▼](#) [Actions ▼](#) [Launch instances](#) 


<input checked="" type="checkbox"/>	Name ▼	Instance ID	Instance state ▼	Instance type ▼	Status check	Alarm status
<input checked="" type="checkbox"/>	Webserver-Oregon-region	i-04e862ba5a8997152	 Running 	t2.micro	-	No alarms

Instance: i-04e862ba5a8997152 (Webserver-Oregon-region)












Platform  Linux/UNIX (Inferred)	AMI ID  ami-04c8f1e2be4b6cd06 (AMI of Oregon region)	Monitoring disabled
Platform details  Linux/UNIX	AMI name  AMI of i-045a8ec47f0ba2d10	Termination protection Disabled

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# Create 2 EBS volumes each of 10GB & attached it to N. Virginia instance.

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Successfully attached volume [vol-025b69620475b6544](#) to instance [i-045a8ec47f0ba2d10](#).

You can now create Amazon Data Lifecycle Manager policies to automate snapshot management directly from this screen. Select the volumes to back up, and then choose **Actions, Create snapshot lifecycle policy**. For more information, see the [Knowledge Center article](#).

Volumes (3)

☐

Volume ID

T.

Size

Availa...

Volu...

Attached Instances

Volume sta...

Encryption


☐

[vol-0dcde52eb4b435d45](#)


gp2

8 GiB

us-east-1a

 In-use

[i-045a8ec47f0ba2d10 \(Module 2-Case-Study\): /dev/xvda \(attached\)](#)

 Okay

Not encrypted


☐

[vol-0be47571469b9598c](#)


gp2

10 GiB

us-east-1a

 In-use

[i-045a8ec47f0ba2d10 \(Module 2-Case-Study\): /dev/sdf \(attached\)](#)

 Okay

Not encrypted


☐

[vol-025b69620475b6544](#)


gp2

10 GiB

us-east-1a

 In-use

[i-045a8ec47f0ba2d10 \(Module 2-Case-Study\): /dev/sdg \(attaching\)](#)

 Okay

Not encrypted

Select a volume above

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Login to instance to check the availability of 2 newly attached EBS volume using fdisk -l.

← → ↻

us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-045a8ec47f0ba2d10&osUser=ec2-user&regio...

🔍 📄 ☆ ⚙️ 🗑️ 👤 ⋮

aws

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📄 RDS

📄 Route 53

📄 S3

📄 IAM

📄 DynamoDB

📄 CloudShell

📄 EFS

📄 Lambda

```
https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-81-122 ~]$ uname -a
Linux ip-172-31-81-122.ec2.internal 5.10.147-133.644.amzn2.x86_64 #1 SMP Fri Oct 14 01:16:24 UTC 2022 x86_64 x86_64 x86_64 GNU/Linux
[ec2-user@ip-172-31-81-122 ~]$ sudo fdisk -l
Disk /dev/xvda: 8 GiB, 8589934592 bytes, 16777216 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
Disklabel type: gpt
Disk identifier: 2330CCC2-270B-42AA-8CB6-AB640F80B1B4

Device            Start      End  Sectors  Size Type
/dev/xvda1         4096 16777182 16773087   8G Linux filesystem
/dev/xvda128        2048     4095     2048   1M BIOS boot

Partition table entries are not in disk order.

Disk /dev/xvdf: 10 GiB, 10737418240 bytes, 20971520 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 /dev/xvdg: 10 GiB, 10737418240 bytes, 20971520 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
[ec2-user@ip-172-31-81-122 ~]$
```

i-045a8ec47f0ba2d10 (Module 2-Case-Study)

PublicIPs: 44.212.14.204 PrivateIPs: 172.31.81.122

✕

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Detach one EBS volume and extend the size of other EBS volume from 10GB to 12GB.

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Volumes:

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Lifecycle Manager

▼ Network & Security  
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Elastic IPs  
Placement Groups  
Key Pairs  
Network Interfaces

▼ Load Balancing  
Load Balancers

**Requested volume modification for volume vol-025b69620475b6544.**  
The volume is being modified.

Volumes (1/3) Actions ▼ Create volume

Search

	Volume ID	T.	Size	Availa...	Volume ...	Attached Instances	Volume sta...	Encryption
<input type="checkbox"/>	vol-0dcde52eb4b435d45	gp2	8 GiB	us-east-1a	✓ In-use	i-045a8ec47f0ba2d10 (Module 2-Case-Study): /dev/xvda (attached)	✓ Okay	Not encrypt
<input type="checkbox"/>	vol-0be47571469b9598c	gp2	10 GiB	us-east-1a	✓ Available	-	✓ Okay	Not encrypt
<input checked="" type="checkbox"/>	vol-025b69620475b6544	gp2	12 GiB	us-east-1a	✓ In-use	i-045a8ec47f0ba2d10 (Module 2-Case-Study): /dev/sdg (attached)	✓ Okay	Not encrypt

Volume ID: vol-025b69620475b6544

**Details** | Status checks | Monitoring | Tags

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Go to instance console and check for update disk information (One EBS volume with the size of 12GB)

us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-045a8ec47f0ba2d10&osUser=ec2-user&regio...

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```
[ec2-user@ip-172-31-81-122 ~]$ sudo fdisk -l
Disk /dev/xvda: 8 GiB, 8589934592 bytes, 16777216 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
Disklabel type: gpt
Disk identifier: 2330CCC2-270B-42AA-8CB6-AB640F80B1B4

Device            Start      End  Sectors  Size Type
/dev/xvda1        4096 16777182 16773087   8G Linux filesystem
/dev/xvda128      2048      4095     2048   1M BIOS boot

Partition table entries are not in disk order.

Disk /dev/xvdg: 12 GiB, 12884901888 bytes, 25165824 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
[ec2-user@ip-172-31-81-122 ~]$
```

i-045a8ec47f0ba2d10 (Module 2-Case-Study) ×

PublicIPs: 44.212.14.204 PrivateIPs: 172.31.81.122

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# Create snapshot of 12GB EBS volume for backup purpose.

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**Volumes**

**Requested volume modification for volume vol-025b69620475b6544.**  
The volume is being modified.

Volumes (1/3) Actions ▼ Create volume

Search

	Volume ID	T.	Size	Availa...	Volume ...	Attached Instances	Volume sta...	Encryption
<input type="checkbox"/>	vol-0dcde52eb4b435d45	gp2	8 GiB	us-east-1a	✓ In-use	i-045a8ec47f0ba2d10 (Module 2-Case-Study): /dev/xvda (attached)	✓ Okay	Not encrypt
<input type="checkbox"/>	vol-0be47571469b9598c	gp2	10 GiB	us-east-1a	ⓘ Available	-	✓ Okay	Not encrypt
<input checked="" type="checkbox"/>	vol-025b69620475b6544				✓ In-use	i-045a8ec47f0ba2d10 (Module 2-Case-Study): /dev/sdg (attached)	✓ Okay	Not encrypt

Create volume  
Modify volume  
Create snapshot

← → ↺ us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Snapshots:

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**Snapshots**  
Lifecycle Manager

**Snapshots (1/2)** Recycle Bin Actions ▼ Create snapshot

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	Name	Snapshot ID	Size	Description	Storage...	Snapshot status
<input checked="" type="checkbox"/>	-	snap-01a6bd44b8f68d361	12 GiB	Snapshot of vol-025b69620475b6544 (12GB)	Standard	✓ Completed
<input type="checkbox"/>	-	snap-076c2c697d7e19cce	8 GiB	Created by CreateImage(i-045a8ec47f0ba2d10) for ami-0417bfebbf601d264	Standard	✓ Completed



THANK YOU