

Module-2: Case Study

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

1. Set region as N. Virginia (use-east-1)

h for services, features, blogs, docs, and more

[Alt+S]



N. Virginia

Hariharan Narayanan

Instances (1/4) Info													
Search													
	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP	IPv6 IPs	Monitoring	Security group name
<input type="checkbox"/>	-	i-04fa6dfb996f59293	Terminated	t2.micro	-	No alarms	us-east-1c	-	-	-	-	disabled	-
<input type="checkbox"/>	-	i-0b56814db5a9be94f	Terminated	t2.micro	-	No alarms	us-east-1c	-	-	-	-	disabled	-
<input type="checkbox"/>	-	i-0314e9728153dccc7	Terminated	t2.micro	-	No alarms	us-east-1c	-	-	-	-	disabled	-
<input checked="" type="checkbox"/>	-	i-04ac0ae7b725eb9b8	Running	t2.micro	-	No alarms	us-east-1c	ec2-52-91-226-119.co...	52.91.226.119	-	-	disabled	module_2_case_study_sg

Instance: i-04ac0ae7b725eb9b8

Details

Security

Networking

Storage

Status checks

Monitoring


Tags

▼ Security details


IAM Role

-

Security groups


 [sg-06cd6816c4df57857 \(module_2_case_study_sg\)](#)

▼ Inbound rules




Security group rule ID	Port range	Protocol	Source	Security groups
sgr-0abe36a66dfb00ece	80	TCP	::/0	module_2_case_study_sg
sgr-02bddb7b046b68d0f	22	TCP	0.0.0.0/0	module_2_case_study_sg
sgr-067c43de762123b56	80	TCP	0.0.0.0/0	module_2_case_study_sg

▼ Outbound rules



Security group rule ID	Port range	Protocol	Destination	Security groups
sgr-0323f8e7ddd87167b	All	All	0.0.0.0/0	module_2_case_study_sg

Owner ID

 09876

2. As per steps provided in Module 2 assignment 1

- 2.1. Create an Ubuntu EC2 instance
- 2.2 Add inbound security group rules to allow for SSH and HTTP requests
- 2.3 Install nginx in the instance
- 2.4. Open the IP address of the instance in a browser and verify nginx default landing page is displayed

Instances (1/4) Info

Q Search

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP	IPv6 IPs
<input type="checkbox"/>	-	i-04fa6dfb996f59293	Terminated	t2.micro	-	No alarms	us-east-1c	-	-	-	-
<input type="checkbox"/>	-	i-0b56814db5a9be94f	Terminated	t2.micro	-	No alarms	us-east-1c	-	-	-	-
<input type="checkbox"/>	-	i-0314e9728153dccc7	Terminated	t2.micro	-	No alarms	us-east-1c	-	-	-	-
<input checked="" type="checkbox"/>	-	i-04ac0ae7b725eb9b8	Running	t2.micro	2/2 checks passed	No alarms	us-east-1c	ec2-52-91-226-119.co...	52.91.226.119		

Connect
View details
Manage instance state
Instance settings
Networking
Security
Image and templates
Monitor and troubleshoot

Create image
Create templ
Launch

3. Select the image and then select Action → Image and Templates → Create AMI

EC2 > Instances > [i-04ac0ae7b725eb9b8](#) > 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-04ac0ae7b725eb9b8](#)

Image name

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

Image description - optional

Maximum 255 characters

No reboot
☐ Enable

Instance volumes

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

Add volume

During the image creation process, Amazon EC2 creates a snapshot of each of the above volumes.

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.

Key	Value - optional
<input type="text" value="name"/>	<input type="text" value="module_2_case_study_ec2_instance_ami"/>
<input type="text" value="createdBy"/>	<input type="text" value="Hariharan Narayanan"/>

Add tag

You can add 48 more tags.

Cancel Create image

4. Type the AMI name

5. Type AMI description

6. Create Tags as needed

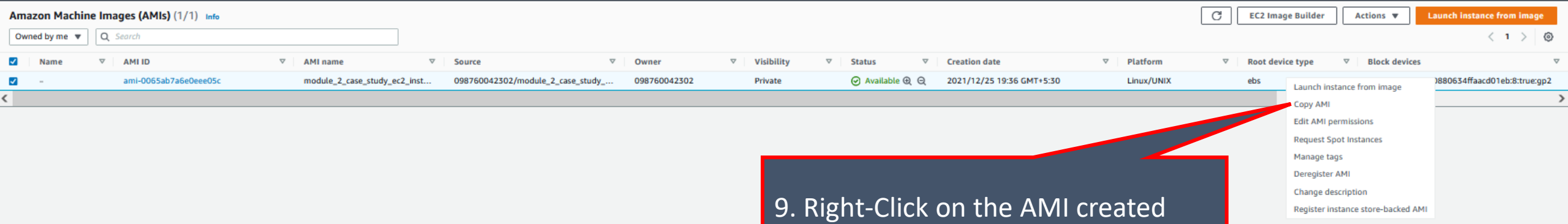
7. Create image

Amazon Machine Images (AMIs) (1) Info

Owned by me Q Search

	Name	AMI ID	AMI name	Source	Owner
<input type="checkbox"/>	-	ami-0065ab7a6e0eee05c	module_2_case_study_ec2_inst...	098760042302/module_2_case_study...	098760042302

8. Go to AMIs page in the EC2 dashboard. Wait until AMI image state shows as Available



9. Right-Click on the AMI created and select "Copy AMI"

EC2 > AMIs > ami-0065ab7a6e0eee05c > Copy AMI

Copy AMI

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

Copy Amazon Machine Image (AMI)

Original AMI ID
ami-0065ab7a6e0eee05c

AMI copy name
module_2_case_study_ec2_instance_ami_copy

AMI copy description
[Copied ami-0065ab7a6e0eee05c from us-east-1]

Destination Region
A copy of the original AMI will be created in the destination Region.
US West (Oregon)

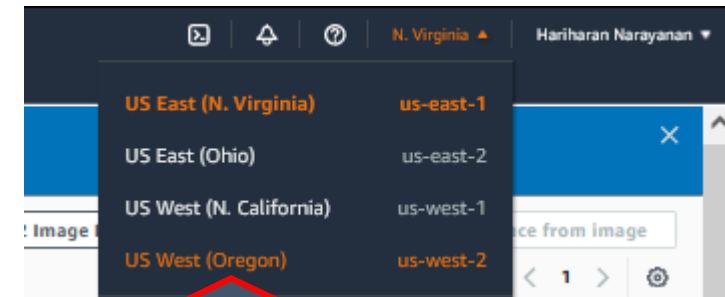
☐ Encrypt EBS snapshots of AMI copy
Encrypts all snapshots in the AMI copy with the same key.

Cancel Copy AMI

10. Enter name

11. Choose destination Oregon

12. Copy AMI



13. In the top-right, choose US West (Oregon) us-west-2 as the region

Amazon Machine Images (AMIs) (1) Info

Owned by me Search

Name	AMI ID	AMI name
-	ami-0c54c02c4a63922d8	module_2_case_study_ec2_instance_ami_copy

14. Verify that the AMI copy from step 12 is visible in Oregon region

Navigation bar: N. Virginia, Hariharan Narayanan

Buttons: e Builder, Actions, Launch instance from image

Progress: 1

Root device type: ebs

Block devices: /dev/sda1=snap-08...

15. Go back to N. Virgina region

17. Create volume

EC2 Dashboard

EC2 Global View

Events

Tags

Limits

Instances

- Instances
- Instance Types
- Launch Templates
- Spot Requests
- Savings Plans
- Reserved Instances
- Dedicated Hosts
- Scheduled Instances
- Capacity Reservations

Images

- AMIs
- AMI Catalog

Elastic Block Store

- Volumes
- Snapshots
- Lifecycle Manager

Volumes (1)

Filter volumes

	Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot	Created	Availability Zone	Volume state	Alarm status	Attached Instances	Volume sta...	Encryption	KMS key ID	KMS key aL...	Multi-Atta...
<input type="checkbox"/>	-	vol-08accd488089cb0d6	gp2	8 GiB	100	-	snap-0f7a6ea...	2021/12/25 19:17 GMT+5:...	us-east-1c	In-use	No alarms	+ i-04ac0ae7b725eb9b8: /de...	Okay	Not encrypted	-	-	No

Select a volume above

16. Choose "Volumes" under "Elastic Block Store"

Create volume [Info](#)

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

Volume settings

Volume type [Info](#)

General Purpose SSD (gp2)

Size (GiB) [Info](#)

100

Min: 1 GiB, Max: 16384 GiB. The value must be an integer.

IOPS [Info](#)

300 / 3000

Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS.

Throughput (MiB/s) [Info](#)

Not applicable

Availability Zone [Info](#)

us-east-1c

Snapshot ID - optional [Info](#)

Don't create volume from a snapshot



Encryption [Info](#)

Use Amazon EBS encryption as an encryption solution for your EBS resources associated with your EC2 instances.

☐ Encrypt this volume

Tags - optional [Info](#)

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.

Key

name

createdBy

Add tag

You can add 48 more tags.

Value - optional

module_2_case_study_ebs_1

Hariharan Narayanan

Remove

Remove

Cancel

Create volume

21. Repeat same steps to create another EBS volume

Volumes (3)

Filter volumes

<input type="checkbox"/>	Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot	Created	Availability Zone	Volume state
<input type="checkbox"/>	-	vol-08acc488089cb0d6	gp2	8 GiB	100	-	snap-0f7a6ea...	2021/12/25 19:17 GMT+5:...	us-east-1c	✔ In-use
<input type="checkbox"/>	-	vol-0a16bd4553f3e4e6b	gp2	100 GiB	300	-	-	2021/12/25 20:07 GMT+5:...	us-east-1c	✔ Available
<input type="checkbox"/>	-	vol-033d9f088ca14875d	gp2	100 GiB	300	-	-	2021/12/25 20:07 GMT+5:...	us-east-1c	⌚ Creating

18. Select same region given for EC2 instance

19. Create tags as needed

20. Create Volume

Volumes (1/3)

🔍 *Filter volumes*

	Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot	Created	Availability Zone	Volume state	Alarm status
<input type="checkbox"/>	-	vol-08accd488089cb0d6	gp2	8 GiB	100	-	snap-0f7a6ea...	2021/12/25 19:17 GMT+5:...	us-east-1c	In-use	No alarms
<input checked="" type="checkbox"/>	-	vol-0a16bd4553f3e4e6b	gp2	100 GiB	300	-	-	2021/12/25 20:07 GMT+5:...	us-east-1c	Available	No alarms
<input type="checkbox"/>	-	vol-033d9f088ca14875d	gp2	100 GiB	300	-	-	2021/12/25 20:07 GMT+5:...	us-east-1c	Available	No alarms

22. Right-click on an EBS volume, select "Attach Volume"

Attach volume [Info](#)

Attach a volume to an instance to use it as you would a regular physical hard disk drive.

Basic details

Volume ID

vol-0a16bd4553f3e4e6b

Availability Zone

us-east-1c

Instance Info


i-04ac0ae7b725eb9b8

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

Device name Info

```
/dev/sdf
```

Linux device names: /dev/sdf through /dev/sdp

 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`.

23. Select the EBS instance created earlier to attach

25. Repeat steps 20-24 for the 2nd EBS instance

24. Select Attach Volume

Cancel

Attach volume

```
ubuntu@ip-172-31-92-149:~$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0        7:0      0   25M  1 loop /snap/amazon-ssm-agent/4046
loop1        7:1      0  55.5M  1 loop /snap/core18/2253
loop2        7:2      0  61.9M  1 loop /snap/core20/1242
loop3        7:3      0  67.2M  1 loop /snap/lxd/21835
loop4        7:4      0  42.2M  1 loop /snap/snapd/14066
xvda         202:0     0    8G   0 disk
└─xvda1      202:1     0    8G   0 part /
xvdf         202:80    0  100G   0 disk
xvdg         202:96    0  100G   0 disk
ubuntu@ip-172-31-92-149:~$ sudo file -s /dev/xvdf
/dev/xvdf: data
```

26. In EBS instance, confirm that both EBS instances are visible as xvdf and xvdg

27. Check that file type is “data” confirming no file system is created

```
ubuntu@ip-172-31-92-149:~$ sudo mkfs -t xfs /dev/xvdf
meta-data=/dev/xvdf            isize=512    agcount=4, agsize=6553600 blks
        =                       sectsz=512    attr=2, projid32bit=1
        =                       crc=1        finobt=1, sparse=1, rmapbt=0
        =                       reflink=1
data      =                       bsize=4096   blocks=26214400, imaxpct=25
        =                       sunit=0      swidth=0 blks
naming    =version 2           bsize=4096   ascii-ci=0, ftype=1
log        =internal log      bsize=4096   blocks=12800, version=2
        =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime  =none                extsz=4096   blocks=0, rtextents=0
ubuntu@ip-172-31-92-149:~$ sudo file -s /dev/xvdf
/dev/xvdf: SGI XFS filesystem data (blksz 4096, inosz 512, v2 dirs)
```

28. Create an XFS file system mounted on /dev/xvdf corresponding to one EBS volume

29. Verify that XFS filesystem is created on /dev/xvdf

30. Repeat steps 25-28 on the other EBS volume


```
ubuntu@ip-172-31-92-149:~$ mkdir ebs1
ubuntu@ip-172-31-92-149:~$ mkdir ebs2
ubuntu@ip-172-31-92-149:~$ sudo mount /dev/xvdf ebs1
ubuntu@ip-172-31-92-149:~$ ls ebs1
ubuntu@ip-172-31-92-149:~$ sudo mount /dev/xvdg ebs2
ubuntu@ip-172-31-92-149:~$ ls ebs2
```

31. Mount both the EBS volumes

```
ubuntu@ip-172-31-92-149:~$ sudo umount --detach-loop ebs1
ubuntu@ip-172-31-92-149:~$ mount
```

32. Unmount the volume for one EBS and confirm that it is removed

Volumes (1/3)

Filter volumes

	Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot	Created
<input type="checkbox"/>	-	vol-08accd488089cb0d6	gp2	8 GiB	100	-	snap-0f7a6ea...	2021/12/25 19:17 GMT
<input checked="" type="checkbox"/>	-	vol-0a16bd4553f3e4e6b	gp2	100 GiB	300	-	-	2021/12/25 20:07 GMT
<input type="checkbox"/>	-	vol-033d9f088ca14875d	gp2	100 GiB	300	-	-	

Volume ID: vol-0a16bd4553f3e4e6b

Details | Status checks | Monitoring | Tags

- Create volume
- Modify volume
- Create snapshot
- Create snapshot lifecycle policy
- Delete volume
- Attach volume
- Detach volume

33. Detach the volume corresponding to ebs1

34. Delete the volume similarly after Detach

Volumes (1/2)

	Name	Volume ID	Type	Size	IOPS	Throughput	Snapsh
<input type="checkbox"/>	-	vol-08accd488089cb0d6	gp2	8 GiB	100	-	snap-01
<input checked="" type="checkbox"/>	-	vol-033d9f088ca14875d	gp2	100 GiB	300	-	-

35. Select Modify Volume on second EBS volume

Create volume

Modify volume

EC2 > Volumes > vol-033d9f088ca14875d > Modify volume

Modify volume [Info](#)

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

Volume details

Volume ID

vol-033d9f088ca14875d

Volume type [Info](#)

General Purpose SSD (gp2)

Size (GiB) [Info](#)

120

36. Change size from 100 to 120 GiB

Min: 1 GiB, Max: 16384 GiB. The value must be an integer.

IOPS [Info](#)

360/3000

Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS.

Cancel

Modify

	Actions	Create volume
<	1	>
Availability Zone	Volume state	Alarm status
us-east-1c	In-use	No alarms
us-east-1c	In-use - modifying	No alarms

38. Wait for Modify status to change to "In-use"

37. Click on Modify

Volumes (1/2)

Q Filter volumes

	Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot
<input type="checkbox"/>	-	vol-08accd488089cb0d6	gp2	8 GiB	100	-	snap-0f7a6ea...
<input checked="" type="checkbox"/>	-	vol-033d9f088ca14875d	gp2	120 GiB	360	-	

- Create volume
- Modify volume
- Create snapshot

39. right-click on resized volume and select "Create Snapshot"

Create snapshot Info

Create a point-in-time snapshot to back up the data on an Amazon EBS volume to Amazon S3.

Details

Volume ID

vol-033d9f088ca14875d

Description

Add a description for your snapshot

module_2_case_study_ebs_snapshot

255 characters maximum.

Encryption Info

Not encrypted

Tags Info

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.

Key

name

createdBy

Add tag

You can add 48 more tags.

Value - optional

lule_2_case_study_ebs_snapshot

Remove

Hariharan Narayanan

Use "Hariharan Narayanan"

Remove

Cancel

Create snapshot

40. Select a name

- Elastic Block Store
- Volumes New
- Snapshots New
- Lifecycle Manager New

43. Select Snapshots under EBS menu

41. Create Tags as needed

42. Create Snapshot

Snapshots (2)

Owned by me

Q Filter snapshots by attributes and tags

	Name	Snapshot ID	Size	Description
<input type="checkbox"/>	-	snap-0ffaff49e863b3679	120 GiB	module_2_case_study_ebs...
<input type="checkbox"/>	-	snap-0880634ffaacd01eb		Created by CreateImage(i-...

44. Verify that snapshot is created