



**Department of Computer Science & Engineering
Premier University.**

CSE 482: Contemporary Course of Computer Science
Laboratory.

Lab 4: Working with Amazon Elastic Block Store (EBS)

Submitted By:

Name	Sajjad Hosen Emon
ID	0222310005101105
Section	C
Semester	7 th
Submission Date	10/2/2026

Remarks

Lab 4: Working with Amazon Elastic Block Store (EBS)

Objective

The objective of this lab is to develop practical knowledge about Amazon Elastic Block Store (EBS) by creating a storage volume, attaching it to an Amazon EC2 instance, configuring a file system, and performing data backup using snapshots. This lab also demonstrates how data can be restored from a snapshot to ensure storage reliability and persistence in a cloud computing environment.

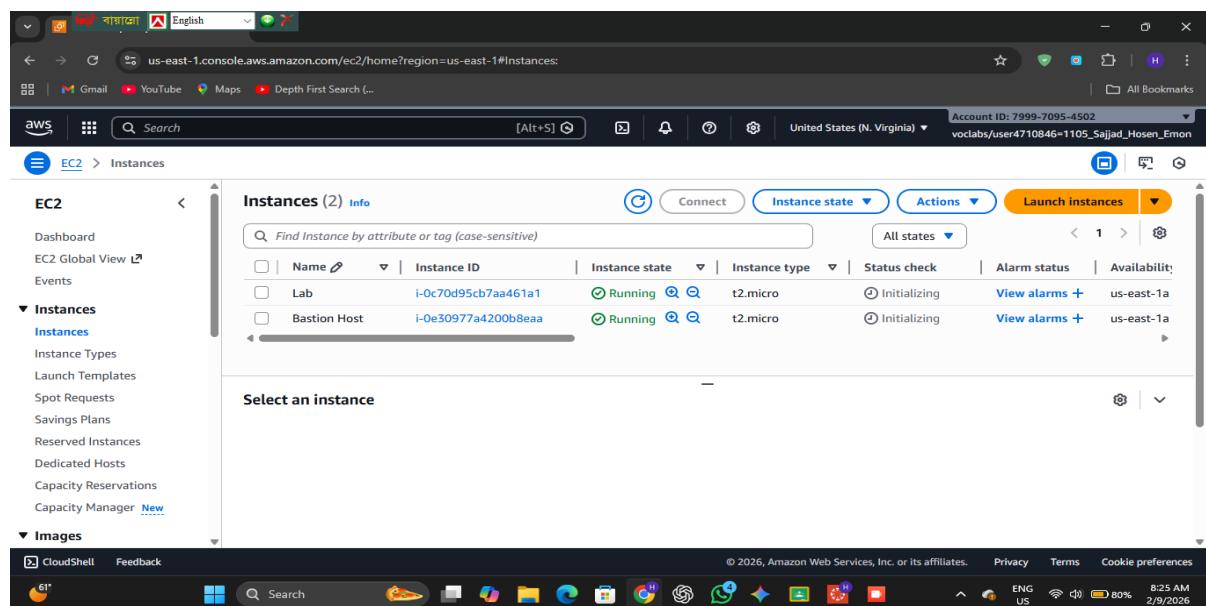
Scenario

Amazon Elastic Block Store (EBS) is a block-level storage service designed for use with Amazon EC2 instances. It provides persistent storage that remains available even after an instance is stopped. In this lab, a running EC2 instance requires additional storage. Therefore, a new EBS volume is created and attached to the instance. After formatting and mounting the volume, data is written to it. A snapshot is then created to back up the stored data. Finally, the snapshot is used to create a new volume, which is attached and mounted to verify that the data has been successfully restored.



Working Procedure

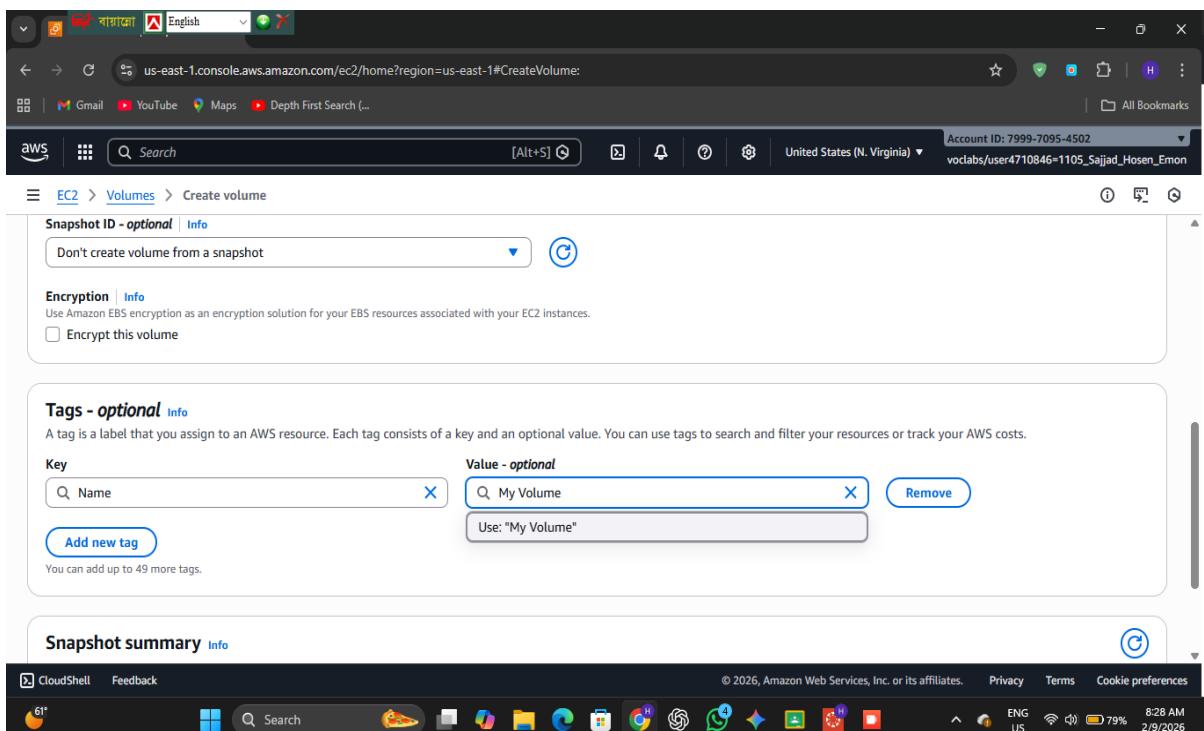
1. Logged in to the AWS Management Console and opened the EC2 Dashboard.



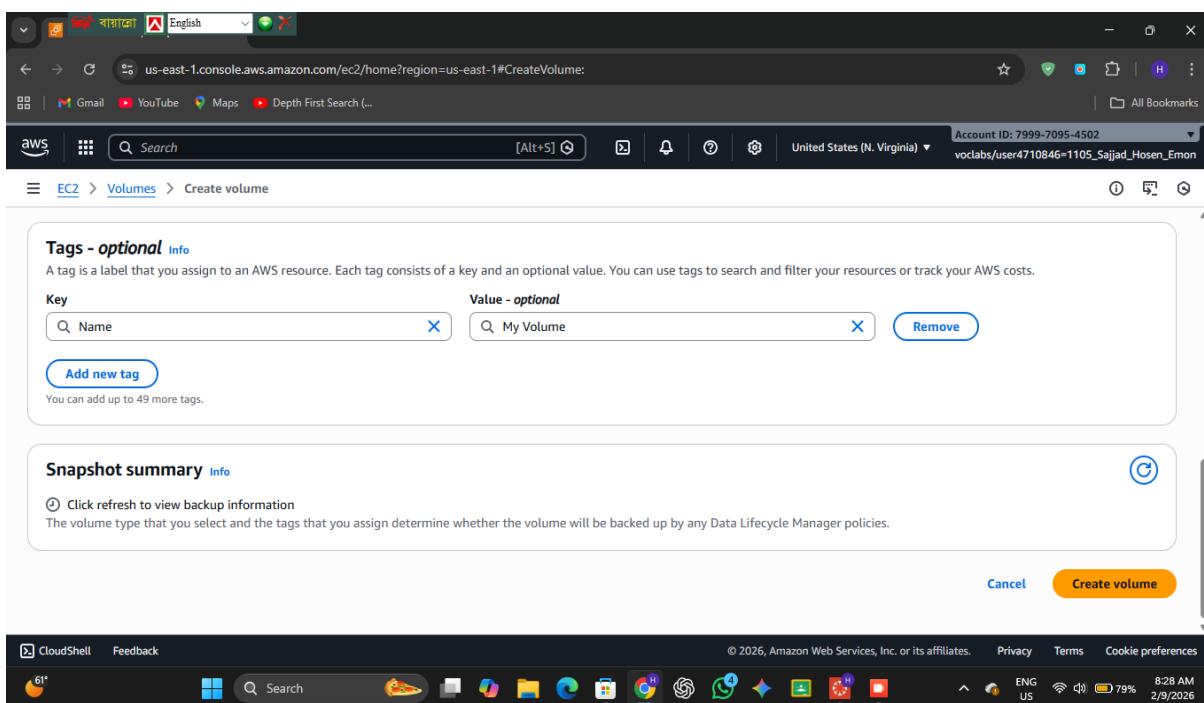
- Navigated to the Volumes section and selected Create Volume.

- Selected **General Purpose SSD (gp2)** as the volume type.
- Set the volume size to **1 GiB**.

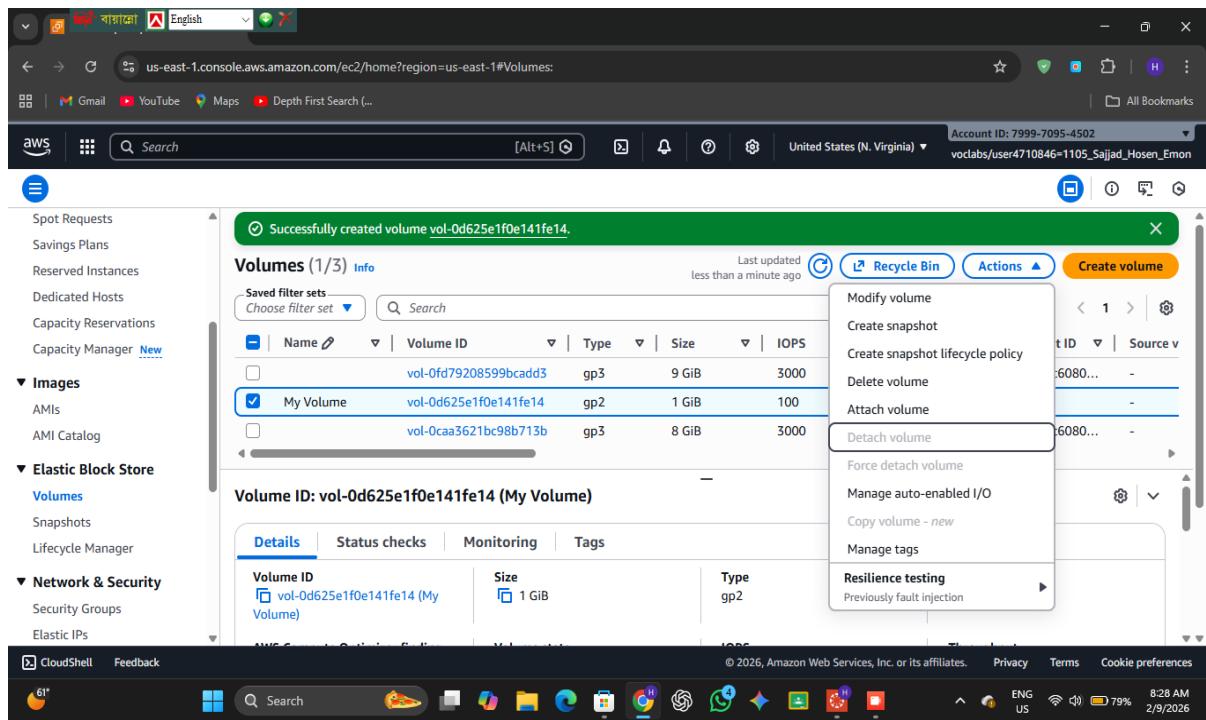
- Chose the same Availability Zone as the running EC2 instance.
- Added a tag with the **name My Volume** for identification.



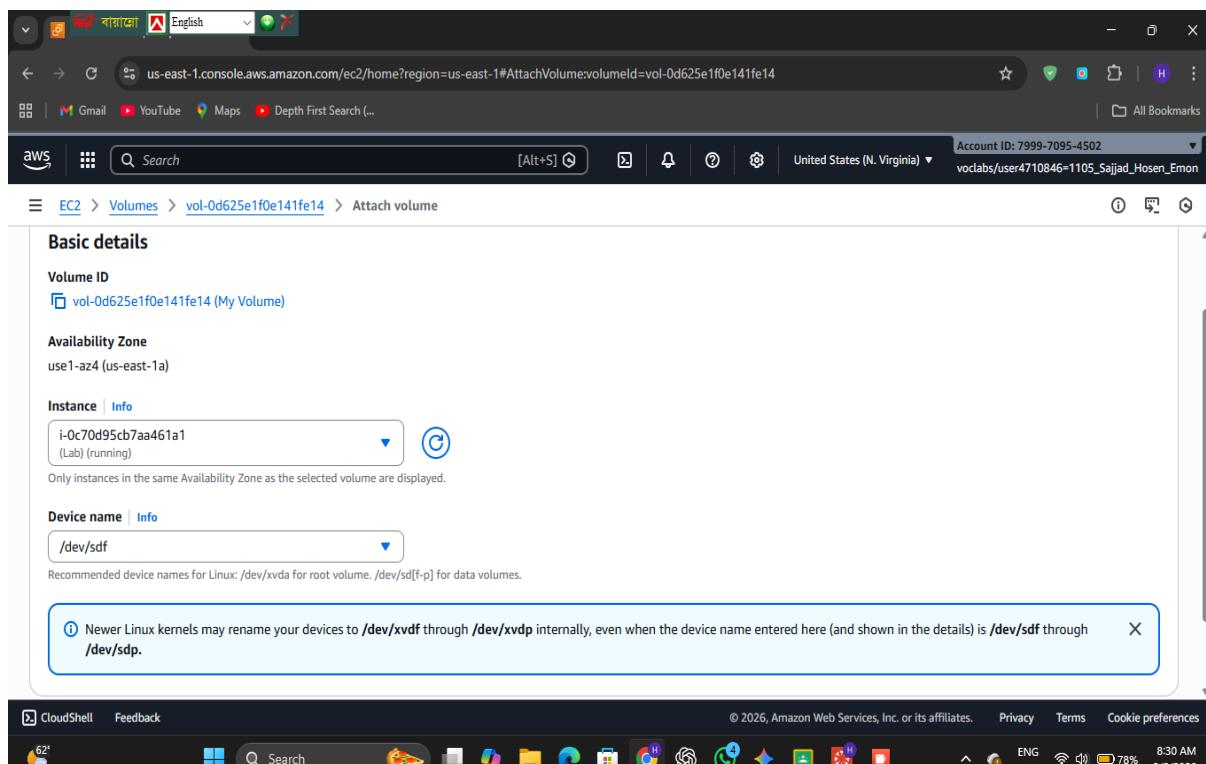
7. Created the volume and waited until its status became Available.



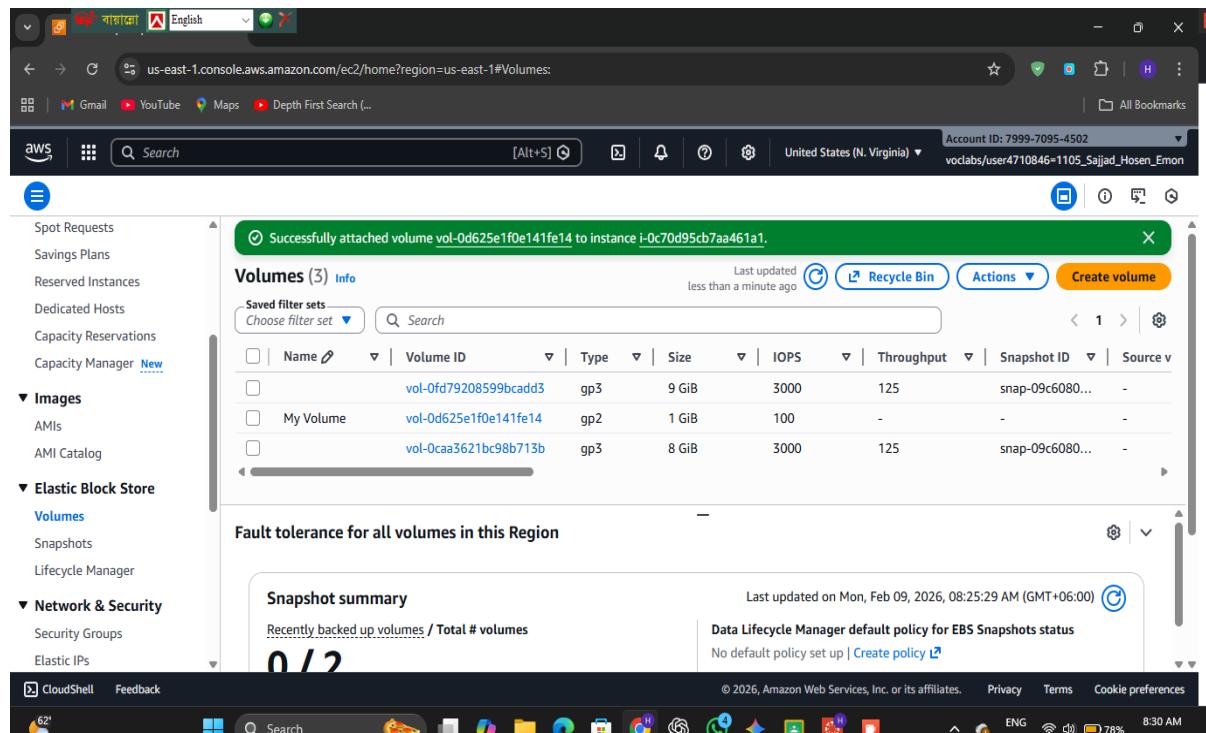
8. Selected the newly created volume and clicked Attach Volume.



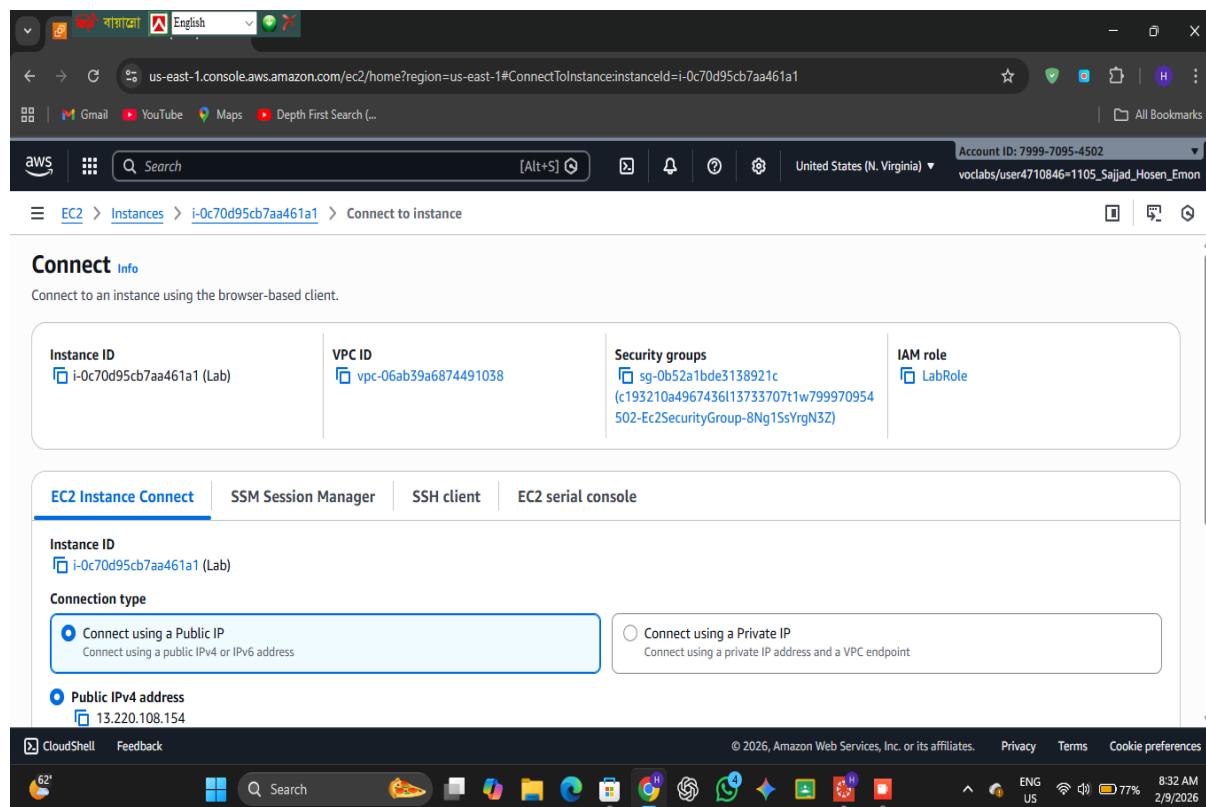
9. Chose the Lab EC2 instance and assigned the device name /dev/sdf.



10. Attached the volume successfully and confirmed the status changed to In-use.



11. Opened the Instances section and connected to the EC2 instance using EC2 Instance Connect.



12. Checked the available storage using the df -h command.

```

Version 2023.10.20260202:
Run "/usr/bin/dnf check-release-update" for full release and version update info
,
  #####      Amazon Linux 2023
  ##_###\ \
  ~\_\###\ \
  ~~ \###| \
  ~~ \#/   https://aws.amazon.com/linux/amazon-linux-2023
  ~~ V~`'-->
  ~~ /_/
  ~~ /_/
  /m/
[ec2-user@ip-10-1-11-217 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        4.0M   0    4.0M  0% /dev
tmpfs          481M   0   481M  0% /dev/shm
tmpfs          193M  448K 192M  1% /run
/dev/xvda1       8.0G  1.6G  6.4G  20% /
tmpfs          481M   0   481M  0% /tmp
/dev/xvda128     10M   1.3M  8.7M  13% /boot/efi
tmpfs          97M   0    97M  0% /run/user/1000
[ec2-user@ip-10-1-11-217 ~]$ i-0c70d95cb7aa461a1 (Lab)
Public IPs: 13.220.108.154 Private IPs: 10.1.11.217

```

The screenshot shows a CloudShell terminal window. The terminal output displays the creation of a new volume and its file system. It includes a welcome banner for Amazon Linux 2023, a command to run a package update, and the execution of the `df -h` command to show disk usage. Below the terminal, the AWS CloudShell interface is visible, showing the instance ID, public and private IP addresses, and the current date and time.

13. Created a file system on the new volume using sudo mkfs -t ext3 /dev/sdf.

```

[ec2-user@ip-10-1-11-217 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        4.0M   0    4.0M  0% /dev
tmpfs          481M   0   481M  0% /dev/shm
tmpfs          193M  448K 192M  1% /run
/dev/xvda1       8.0G  1.6G  6.4G  20% /
tmpfs          481M   0   481M  0% /tmp
/dev/xvda128     10M   1.3M  8.7M  13% /boot/efi
tmpfs          97M   0    97M  0% /run/user/1000
[ec2-user@ip-10-1-11-217 ~]$ sudo mkfs -t ext3 /dev/sdf
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 262144 4k blocks and 65536 inodes
Filesystem UUID: 0c8dc999-b281-421a-8542-3adb291f2b9d
Superblock backups stored on blocks:
            32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done
[ec2-user@ip-10-1-11-217 ~]$ i-0c70d95cb7aa461a1 (Lab)
Public IPs: 13.220.108.154 Private IPs: 10.1.11.217

```

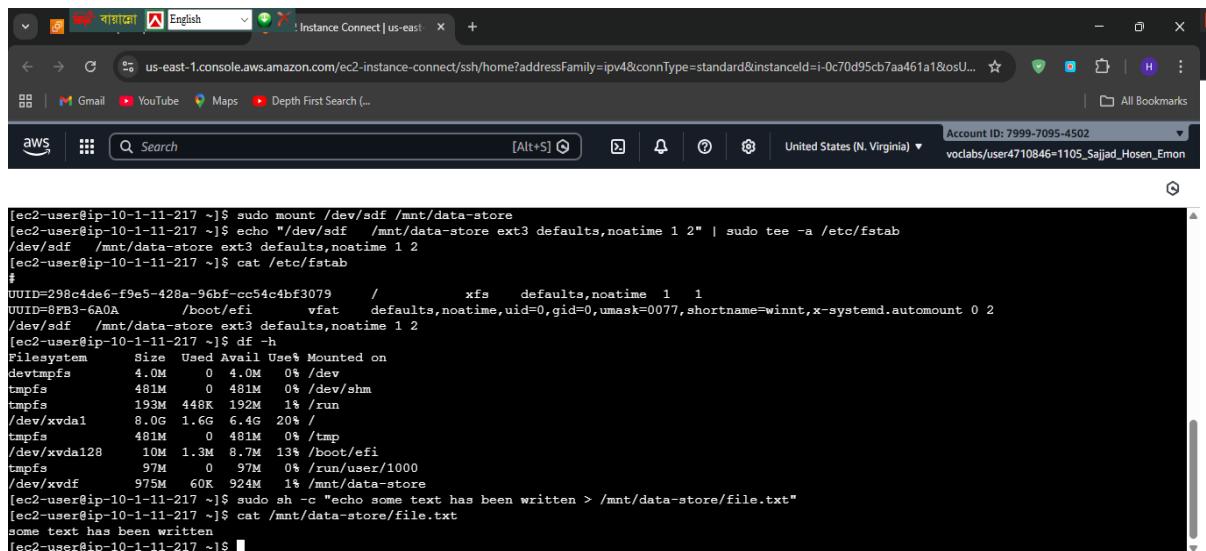
This screenshot shows the continuation of the CloudShell session. The user runs the `mkfs -t ext3 /dev/sdf` command to create a new ext3 file system on the `/dev/sdf` device. The terminal output shows the process of creating the file system, including the UUID and superblock backup locations. Below the terminal, the AWS CloudShell interface is visible, showing the instance ID, public and private IP addresses, and the current date and time.

14. Created a directory /mnt/data-store to use as a mount point.

15. Mounted the volume to the directory using sudo mount /dev/sdf /mnt/data-store.

16. Updated the /etc/fstab file to enable automatic mounting after reboot.

17. Created a text file inside the mounted volume to store data.



```

[ec2-user@ip-10-1-11-217 ~]$ sudo mount /dev/sdf /mnt/data-store
[ec2-user@ip-10-1-11-217 ~]$ echo "/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2" | sudo tee -a /etc/fstab
[ec2-user@ip-10-1-11-217 ~]$ cat /etc/fstab
#
UUID=298c4de6-f9e5-428a-96bf-cc54c4bf3079   /           xfs  defaults,noatime 1  1
UUID=8FB3-6AOA   /boot/efi    vfat  defaults,noatime,uid=0,gid=0,umask=077,shortname=winnt,x-systemd.automount 0 2
/dev/sdf   /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-217 ~]$ cat /etc/fstab
Filesystem      Size   Used  Avail   Use%  Mounted on
/devtmpfs        4.0M   0     4.0M   0%   /dev
tmpfs          481M   0     481M   0%   /dev/shm
tmpfs          193M  448K  192M   1%   /run
/dev/xvda1       8.0G  1.6G  2048M  20%  /
tmpfs          481M   0     481M   0%   /tmp
/dev/xvda128     10M  1.3M  8.7M  13%  /boot/efi
tmpfs          97M   0     97M   0%   /run/user/1000
/dev/xvdf       975M  60K  924M   1%   /mnt/data-store
[ec2-user@ip-10-1-11-217 ~]$ sudo sh -c "echo some text has been written > /mnt/data-store/file.txt"
[ec2-user@ip-10-1-11-217 ~]$ cat /mnt/data-store/file.txt
some text has been written
[ec2-user@ip-10-1-11-217 ~]$

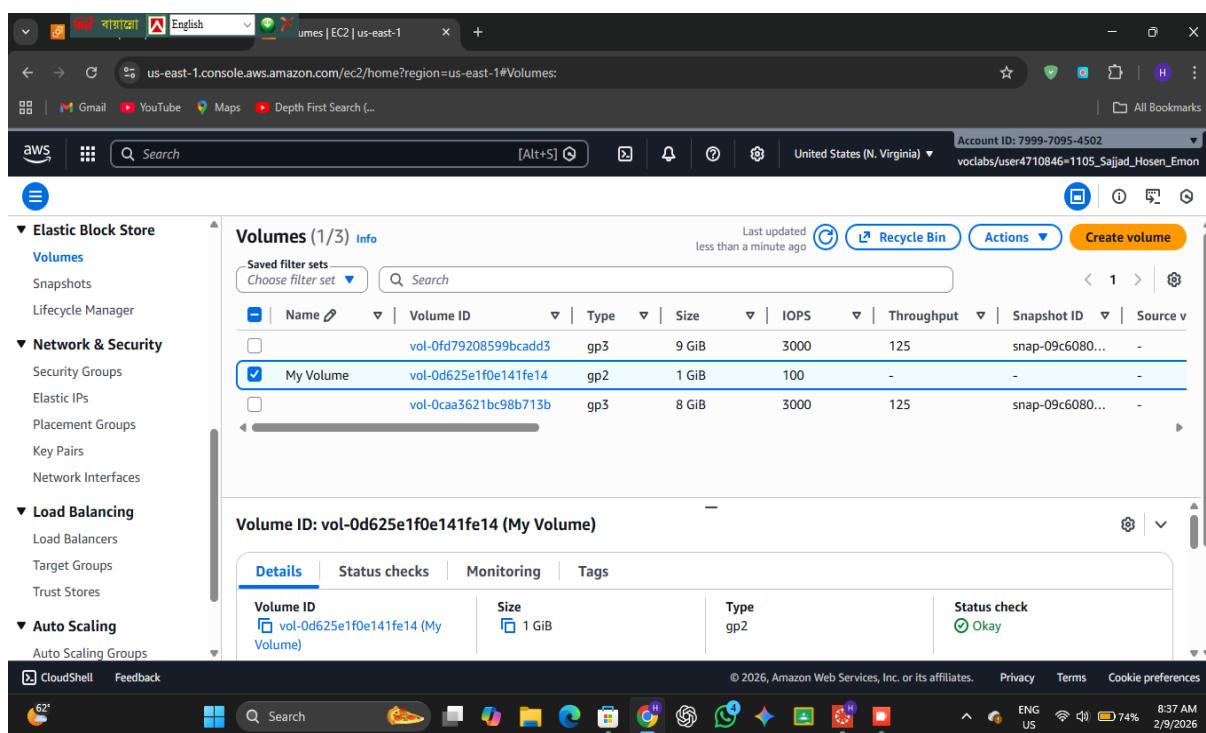
```

i-0c70d95cb7aa461a1 (Lab)

PublicIPs: 13.220.108.154 PrivateIPs: 10.1.11.217

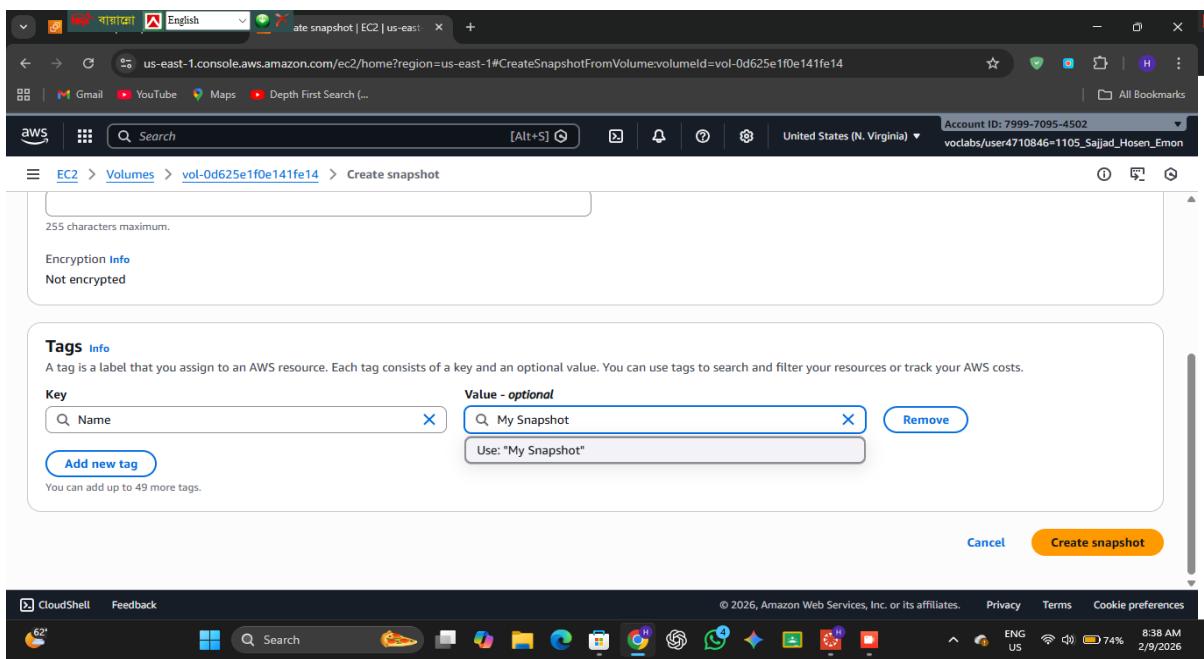
18. Verified the file to confirm that data was written successfully.

19. • Returned to the EC2 console and selected the previously created volume **My Volume**.

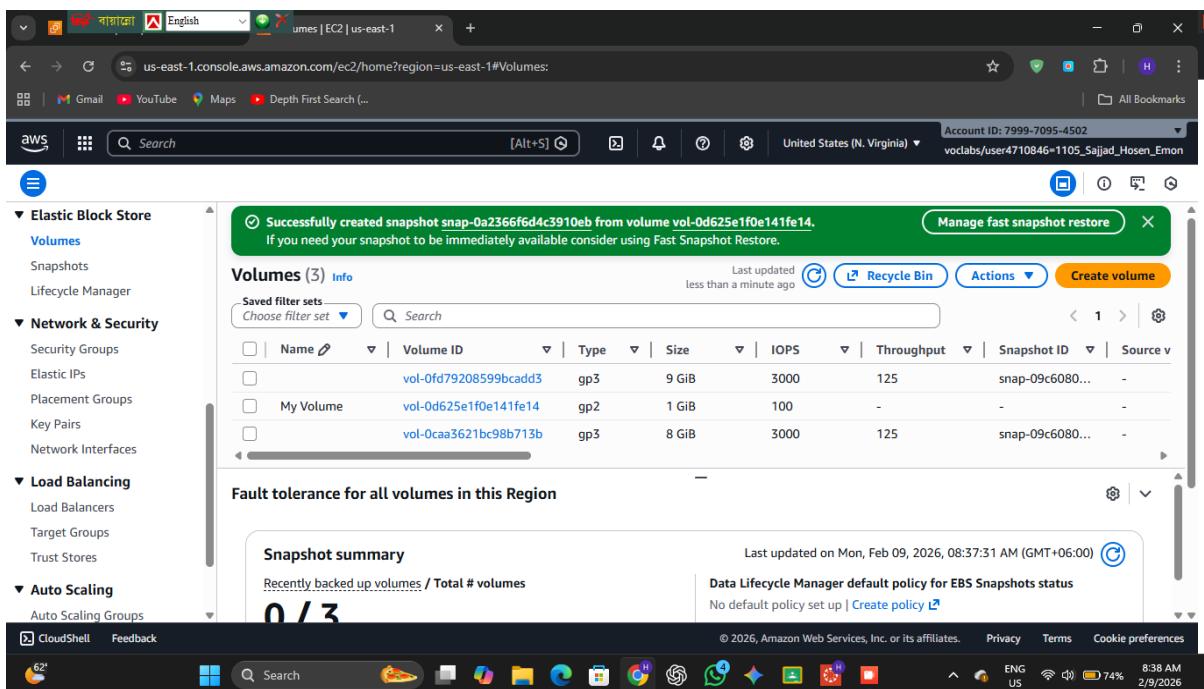


Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot ID	Source
vol-0fd79208599bcadd3	gp3	9 GiB	3000	125	-	snap-09c6080...	-
My Volume	vol-0d625e1f0e141fe14	gp2	1 GiB	100	-	-	-
vol-0caa3621bc98b713b	gp3	8 GiB	3000	125	-	snap-09c6080...	-

20. • Clicked on Actions → Create Snapshot to create a backup of the volume.



21. • Provided the snapshot name **My Snapshot** for easy identification.
22. • Initiated the snapshot creation process and waited until the status changed from **Pending** to **Completed**.



23. • After the snapshot was created, connected back to the EC2 instance terminal.
24. • Deleted the previously created file from the original volume to simulate data loss.
25. • Verified that the file was successfully deleted from the directory.

```

A newer release of "Amazon Linux" is available.
Version 2023.10.20260202:
Run "/usr/bin/dnf check-release-update" for full release and version update info
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Amazon Linux 2023
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https://aws.amazon.com/linux/amazon-linux-2023

Last login: Mon Feb  9 02:32:22 2026 from 18.206.107.28
[ec2-user@ip-10-1-11-217 ~]$ sudo rm /mnt/data-store/file.txt
[ec2-user@ip-10-1-11-217 ~]$ ls /mnt/data-store/
lost+found
[ec2-user@ip-10-1-11-217 ~]$ 

```

i-0c70d95cb7aa461a1 (Lab)
PublicIPs: 13.220.108.154 PrivateIPs: 10.1.11.217

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62° Search ENG US 72% 8:42 AM 2/9/2026

26. • Navigated to the **Snapshots** section in the EC2 console.
27. • Selected **My Snapshot** and clicked **Create Volume from Snapshot**.
28. • Chose the same Availability Zone as the EC2 instance to ensure compatibility.
29. • Entered the name **Restored Volume** for the new 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 **Value - optional**

You can add up to 49 more tags.

Snapshot summary Info

Click refresh to view backup information

The volume type that you select and the tags that you assign determine whether the volume will be backed up by any Data Lifecycle Manager policies.

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64° Search ENG US 70% 8:45 AM 2/9/2026

30. • Created the new volume from the snapshot.

31. • Selected the restored volume and clicked **Attach Volume**.

The screenshot shows the AWS CloudWatch Metrics interface. At the top, there are three tabs: 'Metrics' (selected), 'Logs', and 'CloudWatch Metrics Insights'. Below the tabs, there's a search bar and a 'Create new metric filter' button. The main area displays a table of metrics with columns: Metric Name, Value, Unit, and Last Value. One row in the table is highlighted in yellow.

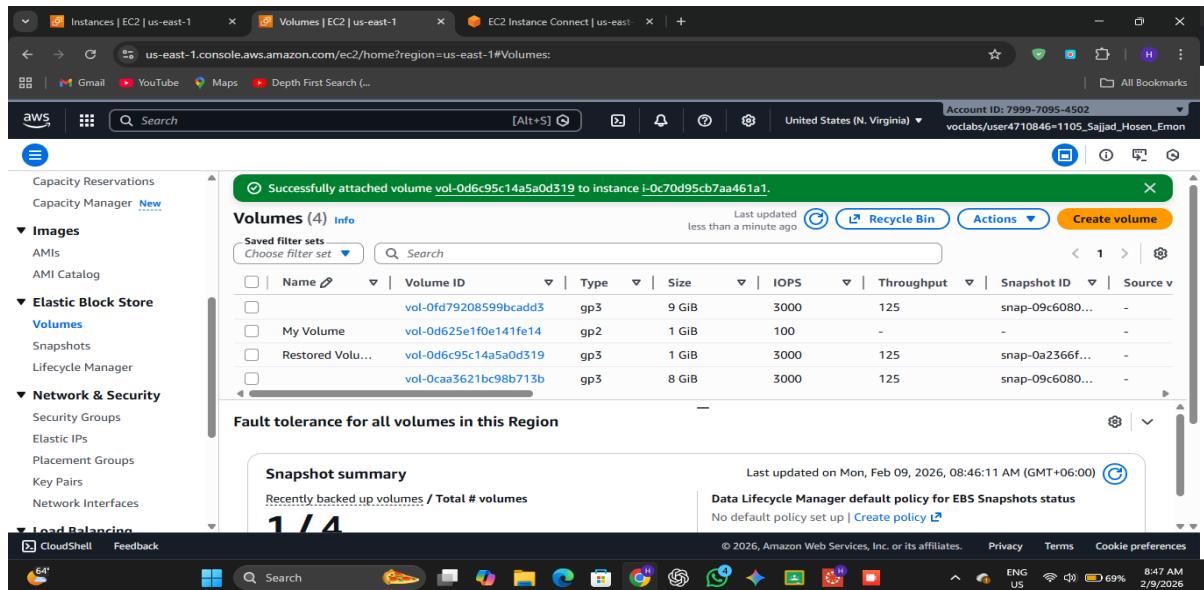
Metric Name	Value	Unit	Last Value
Amazon CloudWatch Metrics Insights - Metrics Insights Metrics	1	Count	1

32. • Chose the Lab EC2 instance and assigned the device name /dev/sdg.

The screenshot shows the AWS CloudWatch Metrics interface. At the top, there are three tabs: 'Metrics' (selected), 'Logs', and 'CloudWatch Metrics Insights'. Below the tabs, there's a search bar and a 'Create new metric filter' button. The main area displays a table of metrics with columns: Metric Name, Value, Unit, and Last Value. One row in the table is highlighted in yellow.

Metric Name	Value	Unit	Last Value
Amazon CloudWatch Metrics Insights - Metrics Insights Metrics	1	Count	1

33. • Confirmed that the restored volume status changed to **In-use**.



34. • Opened the EC2 terminal again to configure the restored storage.
35. • Created a new directory `/mnt/data-store2` to serve as the mount point.
36. • Mounted the restored volume using the command `sudo mount /dev/sdg /mnt/data-store2`.
37. • Listed the files in the mounted directory to verify the restoration process.
38. • Confirmed that `file.txt` was recovered successfully, proving that the snapshot restoration worked correctly.
39. Created a new directory `/mnt/data-store2` for mounting the restored volume.
40. Mounted the restored volume using `sudo mount /dev/sdg /mnt/data-store2`.
41. Checked the directory and verified that the previously stored file was successfully recovered.

```
A newer release of "Amazon Linux" is available.
Version 2023.10.20260202:
Run "/usr/bin/dnf check-release-update" for full release and version update info
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Amazon Linux 2023
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https://aws.amazon.com/linux/amazon-linux-2023
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Last login: Mon Feb 9 02:32:22 2026 from 18.206.107.28
[ec2-user@ip-10-1-11-217 ~]$ sudo rm /mnt/data-store/file.txt
[ec2-user@ip-10-1-11-217 ~]$ ls /mnt/data-store/
lost+found
[ec2-user@ip-10-1-11-217 ~]$ sudo mkdir /mnt/data-store2
[ec2-user@ip-10-1-11-217 ~]$ sudo mount /dev/sdg /mnt/data-store2
[ec2-user@ip-10-1-11-217 ~]$ ls /mnt/data-store2/
file.txt  lost+found
[ec2-user@ip-10-1-11-217 ~]$ 
```

i-070d95cb7aa461a1 (Lab)

Public IPs: 13.220.108.154 Private IPs: 10.1.11.217

42. Submission report:

Submission Report

```
[Executed at: Sun Feb 8 18:49:04 PST 2026]

gradeFile = /mnt/vocwork5/grader/eee_G_2692329 asn4967435_6 asn4967436_1 tmp temp_uf_02082026 ebl6ki260bd31EAhTHJ
reportFile = /mnt/vocwork5/grader/eee_G_2692329 asn4967435_6 asn4967436_1 tmp temp_uf_02082026 rbjk1rhsqf15cQNo3JD
/mnt/vocwork5/grader/eee_G_2692329 asn4967435_6 asn4967436_1 tmp temp_uf_02082026 ebl6ki260bd31EAhTHJ
Started: 2026-02-08 18:48:57
region: us-east-1
profile: default

Evaluating Task 1 - Create EBS volume
Lab instance AZ: us-east-1a
Lab instance public IP: 13.220.108.154
found volume size: 9
found volume size: 1
Volume name: My Volume
New volume id: vol-0d625e1f0e141fe14

For any checks where you did not receive full points, there are sometimes helpful details
ded in the submission report.
```

Submission Report

```
New volume AZ: us-east-1a
New volume state: in-use
Task 1 - Success! Evidence found that a new 1 GB EBS volume named My Volume was created in the same Availability Zone as the
found volume size: 1
    Volume name: Restored Volume
    Found restored volume id: vol-0d6c95c14a5a0d319
found volume size: 8

Evaluating Task 2 - Attach volume
New EBS volume vol-0d625e1f0e141fe14 attached to Lab instance
Task 2 - Success! Evidence found that a new EBS volume named My Volume was attached to the instance.

Evaluating Task 4 - Volume mounted
Found key for instance.
Result of df -h query on Lab instance:
"Filesystem      Size  Used Avail Use% Mounted on\n/devtmpfs        4.0M     0  4.0M  0% /devtmpfs          481M     0
Task 4 - Success! Evidence found in the df -h output that the EBS volume was mounted as /dev/xvdf.
```

Submission Report

```
Evaluating Task 4 - Volume mounted
Found key for instance.
Result of df -h query on Lab instance:
"Filesystem      Size  Used Avail Use% Mounted on\n/devtmpfs        4.0M     0  4.0M  0% /devtmpfs          481M     0
Task 4 - Success! Evidence found in the df -h output that the EBS volume was mounted as /dev/xvdf.

Evaluating Task 5 - Snapshot created
Found snapshot of volume ID: vol-0d625e1f0e141fe14
Volume ID of the 1 GB volume attached to Lab instance: vol-0d625e1f0e141fe14
Task 5 - Success! Evidence found that a snapshot was created and that the volume ID of the 1GB volume attached to the Lab i

Evaluating Task 6 - Snapshot restored
evidence found of /dev/xvdg and /mnt/data-store2 in df -h output.
Task 6 - Success! Evidence found that the snapshot was restored and mounted.

Completed: 2026-02-08 18:49:03

For any checks where you did not receive full points, there are sometimes helpful details
ded in the submission report.
```

43. Total score

		Submit	Submission Report	Grades
Total score		25/25		
Task 1 - Create EBS volume		5/5		
Task 2 - Attach volume		5/5		
Task 4 - Volume mounted		5/5		
Task 5 - Snapshot created		5/5		
Task 6 - Snapshot restored		5/5		

44.

Conclusion

In this lab, Amazon EBS was used to create persistent storage for an EC2 instance. The volume was successfully attached, formatted, and mounted for data storage. A snapshot was created to ensure backup, and the data was restored by creating a new volume from the snapshot. This lab highlighted the importance of Amazon EBS in providing reliable, scalable, and durable storage solutions in cloud computing.