

# Lab 04

## CLOUD COMPUTING

### CS-4075

Course Instructor:

Sir Zaheer Sani

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**Roll No:** 20i-2465

**Section:** SE-A

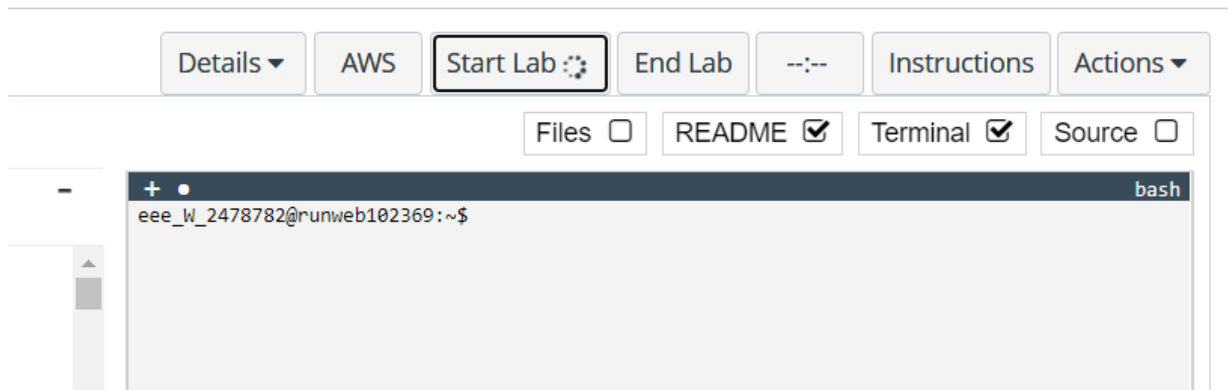
**Due Date:** Nov 15, 2023



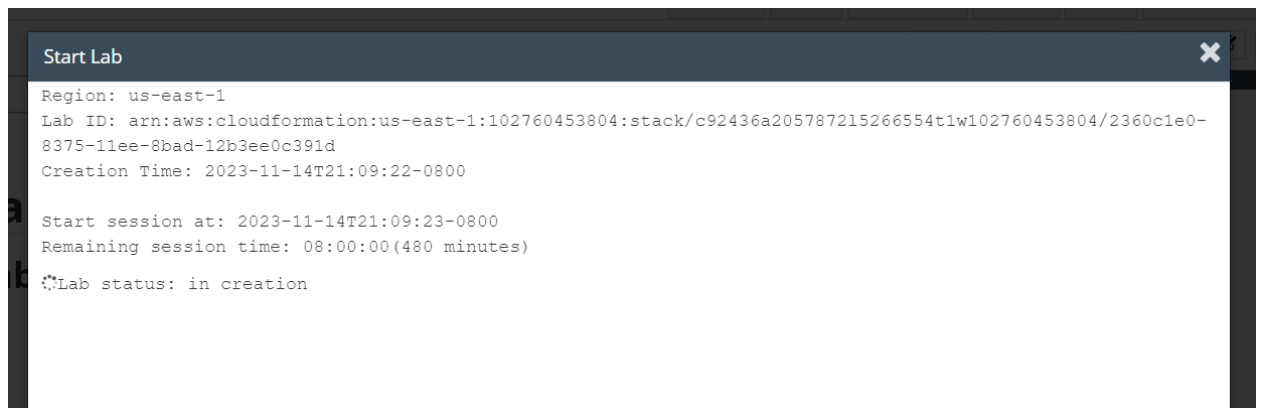
# Lab 4

## Accessing the AWS Management Console

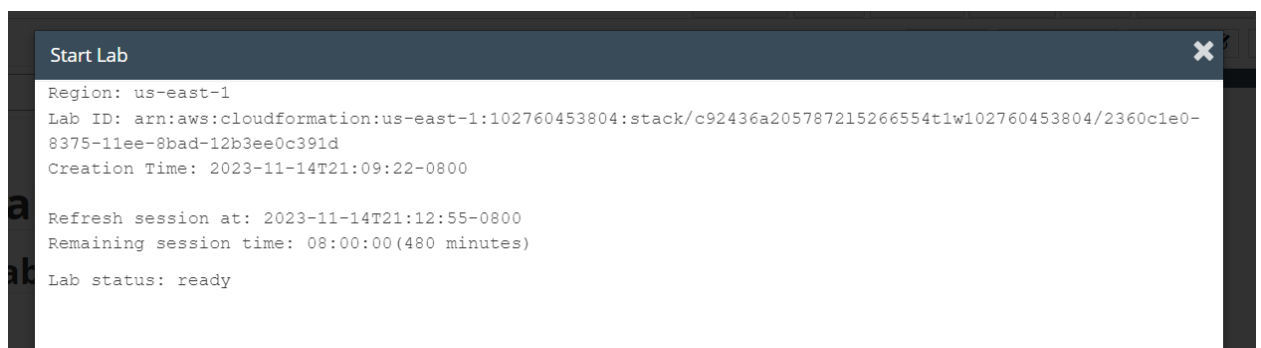
1. At the top of these instructions, click **Start Lab** to launch your lab.



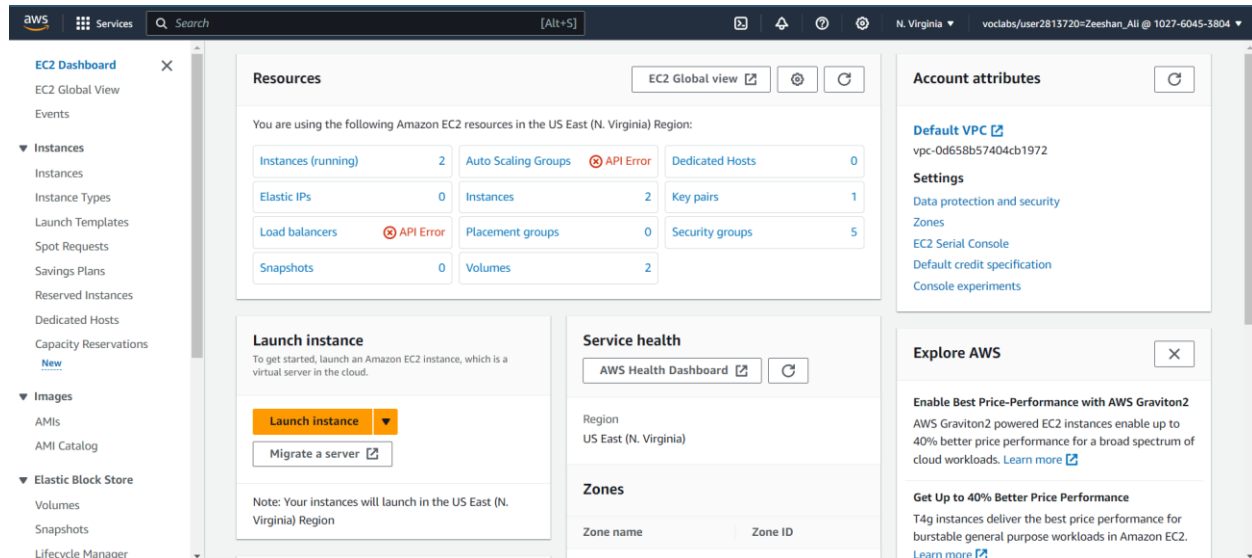
A Start Lab panel opens displaying the lab status.



2. Wait until you see the message "**Lab status: ready**", then click the **X** to close the Start Lab panel.

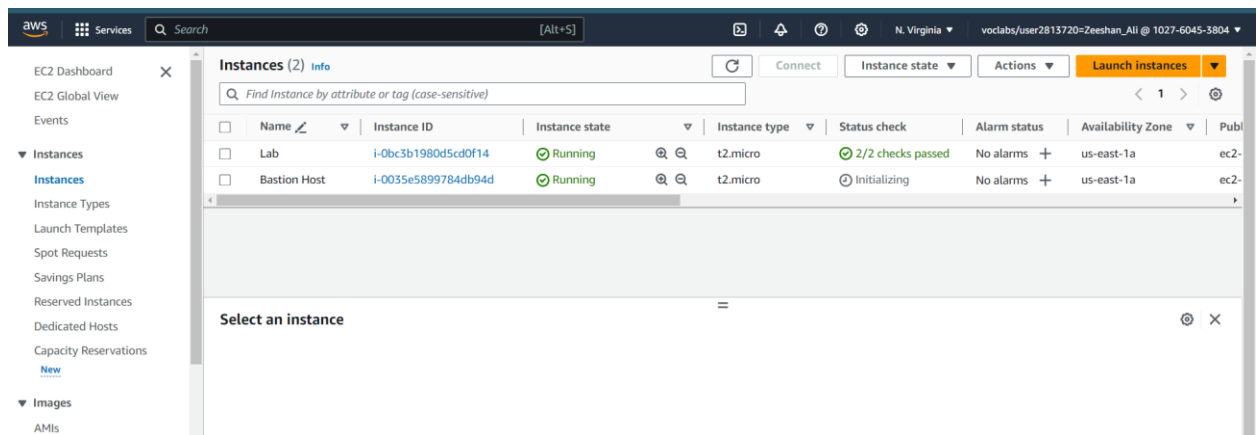


3. At the top of these instructions, click **AWS**



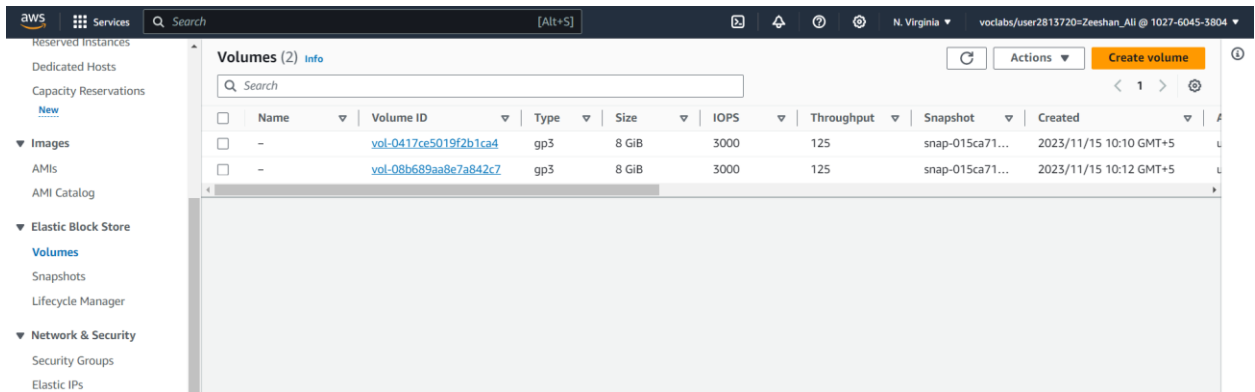
## Task 1: Create a New EBS Volume

5. In the **AWS Management Console**, on the **Services** menu, click **EC2**.
6. In the left navigation pane, choose **Instances**.



An Amazon EC2 instance named **Lab** has already been launched for your lab.

7. Note the **Availability Zone** of the instance. It will look similar to *us-east-1a*.
8. In the left navigation pane, choose **Volumes**.



9. Choose **Create volume** then configure:
- **Volume Type:** *General Purpose SSD (gp2)*
  - **Size (GiB):** 1. **NOTE:** You may be restricted from creating large volumes.
  - **Availability Zone:** Select the same availability zone as your EC2 instance.
  - Choose **Add Tag**
  - In the Tag Editor, enter:
    - **Key:** Name
    - **Value:** My Volume

aws

Services

Search

[Alt+S]

EC2 > Volumes > Create volume

## 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](#)

1

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

IOPS [Info](#)

100 / 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-1a ▼


10. Choose **Create Volume**




12. In the **Actions** menu, choose **Attach volume**.

13. Choose the **Instance** field, then select the instance that appears (Lab).

14. Choose **Attach volume**. The volume state is now *In-use*.


 Services  [Alt+S]




# 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-0200cf550ffae363](#)


Availability Zone  
us-east-1a


Instance [Info](#)  
 

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

Device name [Info](#)

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

 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**.

 Services  [Alt+S] N. Virginia voclabs/user2813720=Zeeshan\_Ali @ 1027-6045-3804

EC2 Dashboard

EC2 Global View

Events

▼ Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans







Reserved Instances

Dedicated Hosts

Capacity Reservations

Successfully attached volume vol-0200cf550ffae363 to instance i-0bc3b1980d5cd0f14.

## Volumes (3) [Info](#)

|                 | Availability Zone | Volume state   | Alarm status | Attached Instances                            | Volume sta...  | Encryption    | KMS key ID |
|-----------------|-------------------|--|--------------|---|--|---------------|------------|
| /15 10:10 GMT+5 | us-east-1a        |  In-use | No alarms    | + <a href="#">i-0bc3b1980d5cd0f14 (Lab...</a> |  Okay | Not encrypted | –          |
| /15 10:12 GMT+5 | us-east-1a        |  In-use | No alarms    | + <a href="#">i-0035e5899784db94d (Ba...</a>  |  Okay | Not encrypted | –          |
| /15 10:20 GMT+5 | us-east-1a        |  In-use | No alarms    | + <a href="#">i-0bc3b1980d5cd0f14 (Lab...</a> |  Okay | Not encrypted | –          |

## Task 3: Connect to Your Amazon EC2 Instance

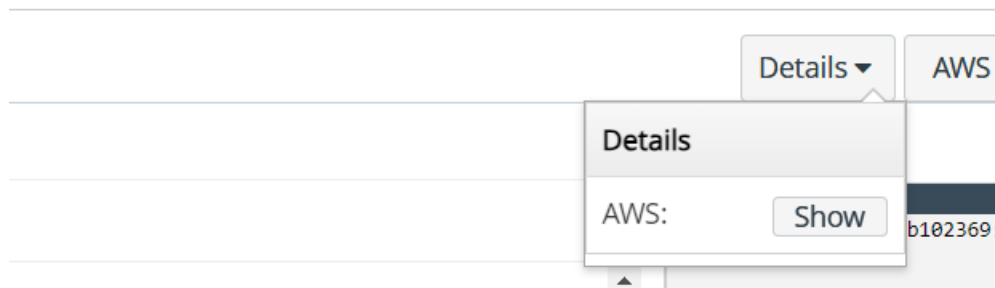
### Windows Users: Using SSH to Connect



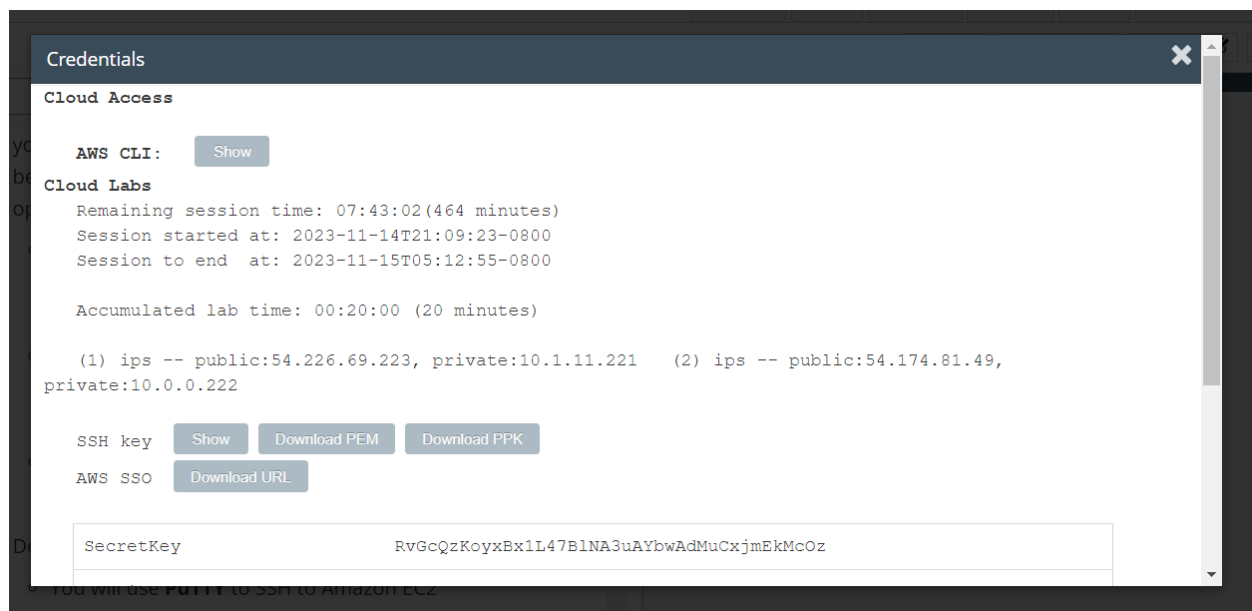
15. Read through the three bullet points in this step before you start to complete the actions, because you will not be able to see these instructions when the Details panel is open.

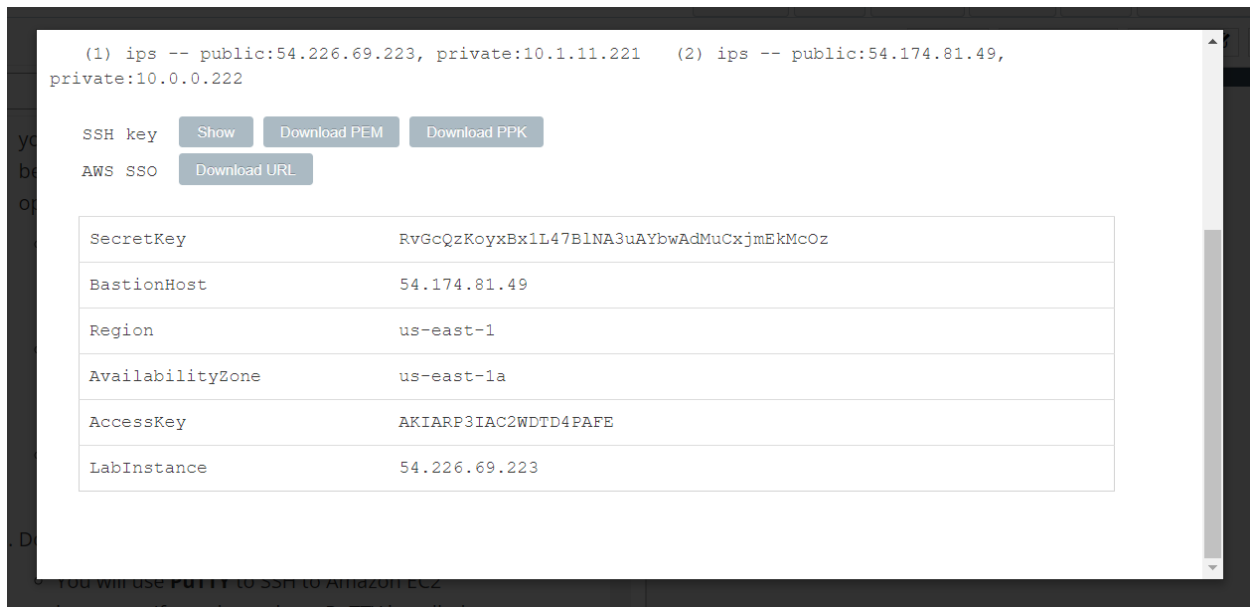
- Choose the **Details** drop down menu above these instructions you are currently reading, and then choose **Show**. A Credentials window will open.

## Lab 4 - Working with EBS



- Choose the **Download PPK** button and save the **labsuser.ppk** file. Typically your browser will save it to the Downloads directory.
- Then exit the Details panel by choosing the **X**.





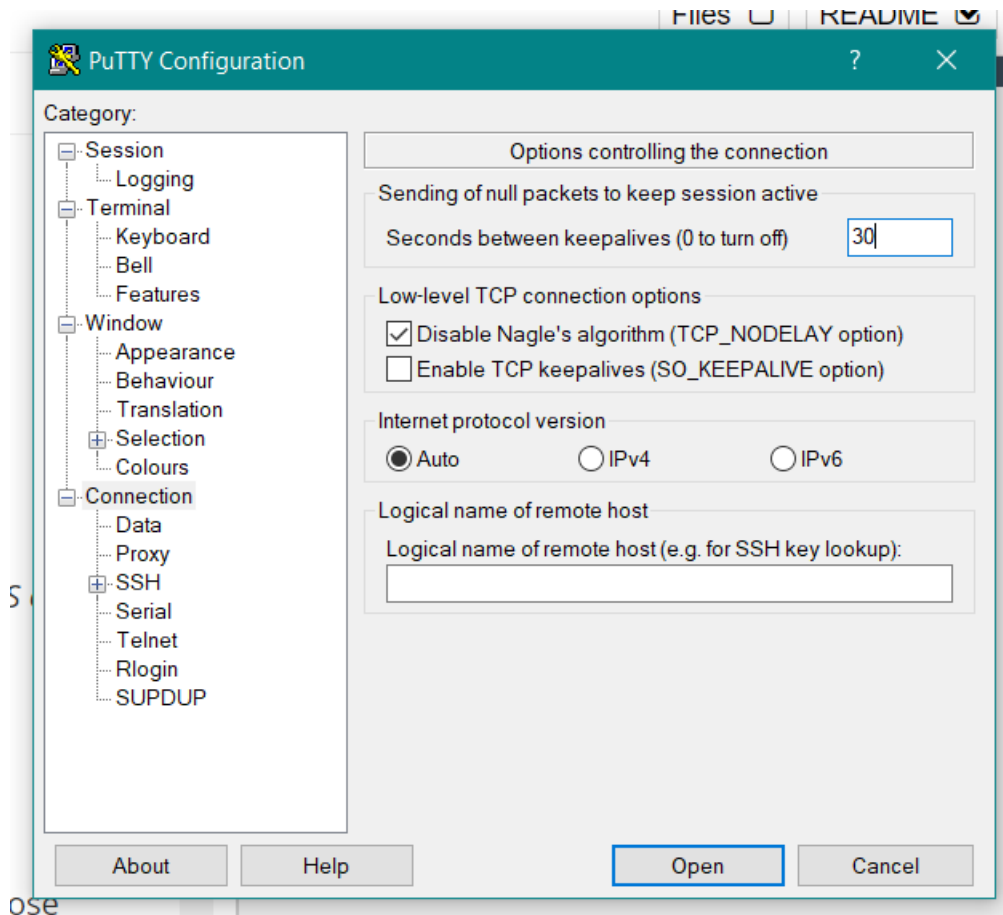
16. Download needed software.

- You will use **PuTTY** to SSH to Amazon EC2 instances. If you do not have

17. Open **putty.exe**

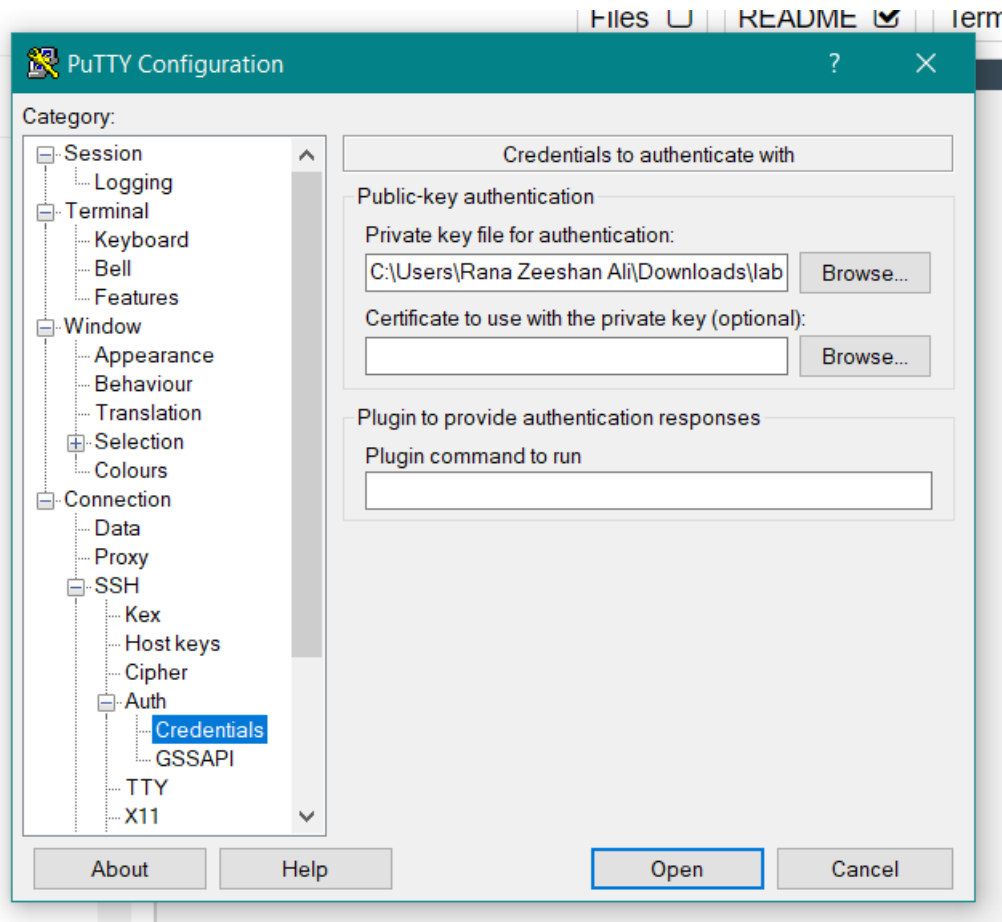
18. Configure PuTTY to not timeout:

- Choose **Connection**
- Set **Seconds between keepalives** to 30

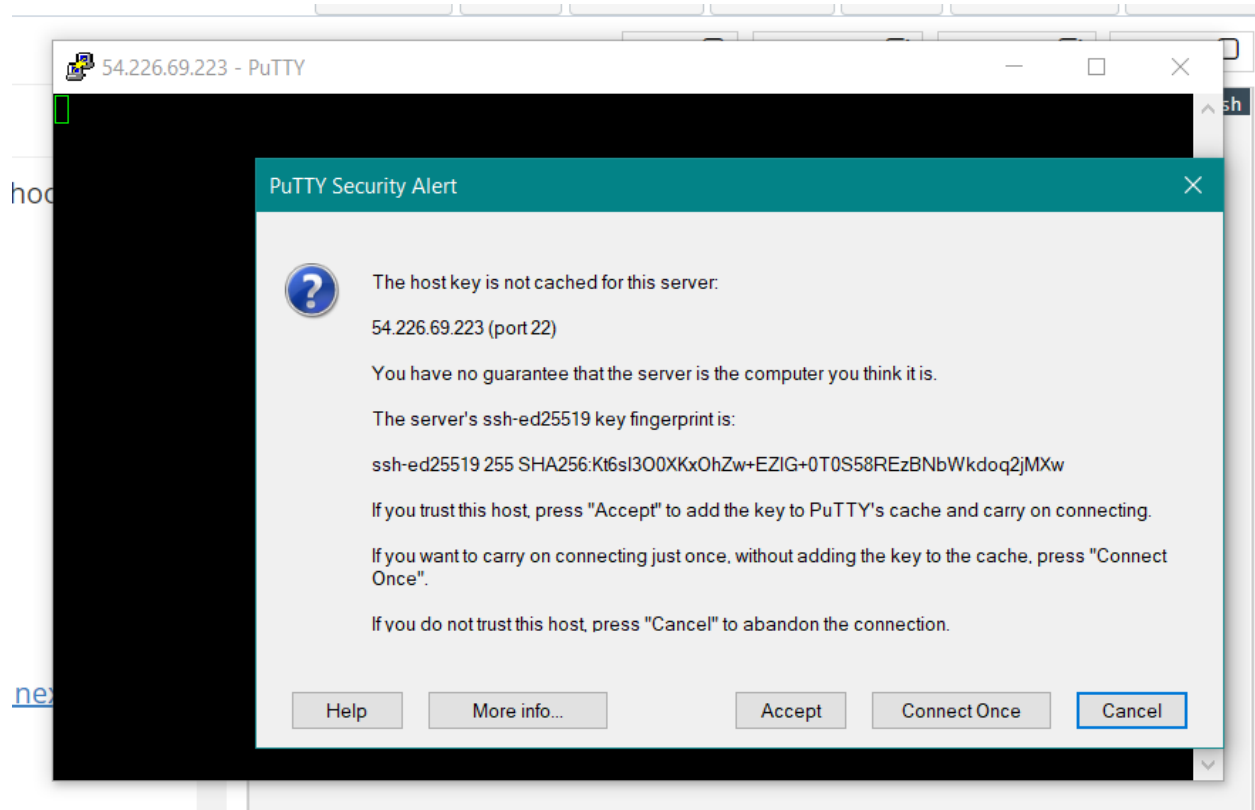


#### 19. Configure your PuTTY session:

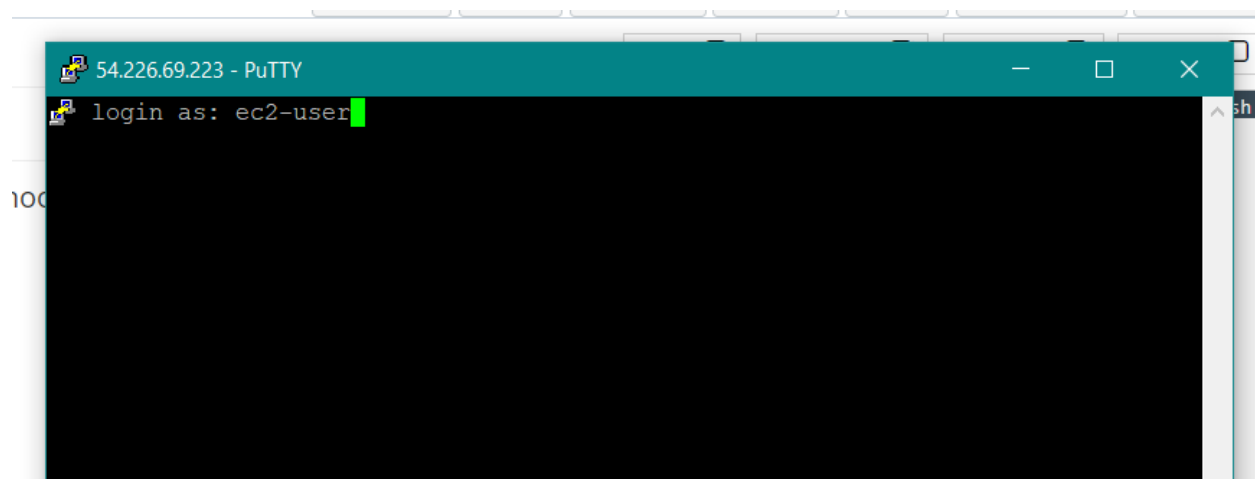
- Choose **Session**
- **Host Name (or IP address):** Paste the *Public DNS or IPv4 address* of the Lab instance that you noted earlier.
- Back in PuTTY, in the **Connection** list, expand **SSH**
- Choose **Auth** and expand **Credentials**
- Under **Private key file for authentication:** Choose **Browse**
- Browse to the *labsuser.ppk* file that you downloaded, select it, and choose **Open**
- Choose **Open** again



20. To trust and connect to the host, choose **Accept**.



21. When prompted **login as**, enter: `ec2-user`



## Task 4: Create and Configure Your File System

### 30. View the storage available on your instance:

A screenshot of a terminal window titled "ec2-user@ip-10-1-11-221:~". The terminal shows the following sequence of commands and outputs:  

```
login as: ec2-user  
Authenticating with public key "imported-openssh-key"  
#_#####  
~\##### Amazon Linux 2023  
~~\#####  
~~\###|  
~~\#/ https://aws.amazon.com/linux/amazon-linux-2023  
~~V~' '->  
~~~~  
~~.-.  
__/_/' -/_/  
_/m/' -/_/
```

  
The prompt "[ec2-user@ip-10-1-11-221 ~]\$" is visible at the bottom, followed by a green cursor. On the far left edge of the image, there are partial labels "tar" and "it".

You should see output similar to:

[illegible]

This shows the original 8GB disk volume. Your new volume is not yet shown.

31. Create an ext3 file system on the new volume:

```
[ec2-user@ip-10-1-11-221 ~]$ sudo mkfs -t ext3 /dev/sdf
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 262144 4k blocks and 65536 inodes
Filesystem UUID: 7e548fd9-facf-4869-8973-78a4f858e5f6
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
```

32. Create a directory for mounting the new storage volume:

33. Mount the new volume:

To configure the Linux instance to mount this volume whenever the instance is started, you will need to add a line to */etc/fstab*.

34. View the configuration file to see the setting on the last line:

```
[ec2-user@ip-10-1-11-221 ~]$ sudo mkdir /mnt/data-store
[ec2-user@ip-10-1-11-221 ~]$ sudo mount /dev/sdf /mnt/data-store
[ec2-user@ip-10-1-11-221 ~]$ echo "/dev/sdf    /mnt/data-store ext3 defaults,noatime 1 2" | sudo tee -a /etc/fstab
/dev/sdf    /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-221 ~]$ cat /etc/fstab
#
UUID=66eb3733-37f3-4398-9990-e97c15b01e5b    /                xfs      defaults,noatime 1 1
UUID=A208-E305    /boot/efi        vfat     defaults,noatime,uid=0,gid=0,umask=0077,shortname=winnt,x-systemd.automount 0 2
/dev/sdf    /mnt/data-store ext3 defaults,noatime 1 2
```

35. View the available storage again:

```
[ec2-user@ip-10-1-11-221 ~]$ 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  1.5G   6.5G  19% /
tmpfs           475M   0    475M   0% /tmp
O /dev/xvda128   10M   1.3M   8.7M  13% /boot/efi
tmpfs           95M   0     95M   0% /run/user/1000
/dev/xvdf       975M   60K   924M   1% /mnt/data-store
```

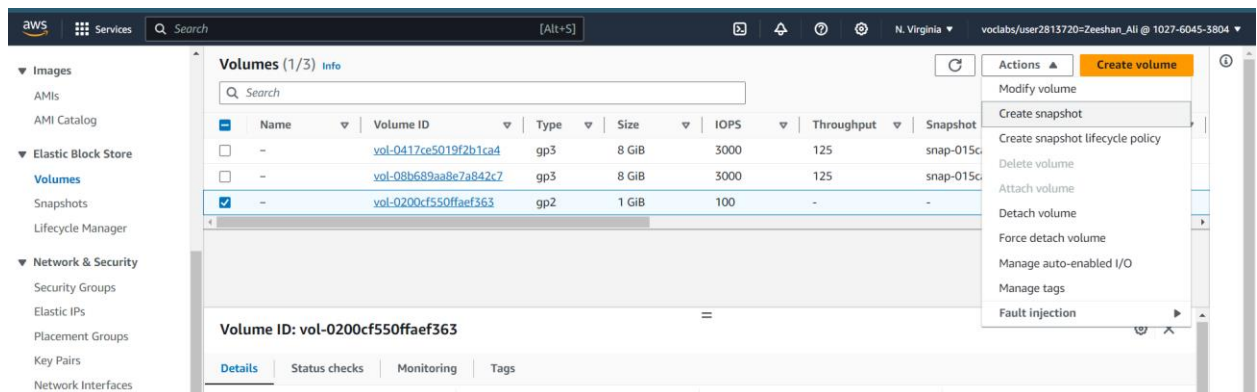
36. On your mounted volume, create a file and add some text to it.

```
[ec2-user@ip-10-1-11-221 ~]$ sudo sh -c "echo some text has been written > /mnt/data-store/file.txt"
[ec2-user@ip-10-1-11-221 ~]$ cat /mnt/data-store/file.txt
some text has been written
[ec2-user@ip-10-1-11-221 ~]$
```

## Task 5: Create an Amazon EBS Snapshot

38. In the **AWS Management Console**, choose **Volumes** and select **My Volume**.

39. In the **Actions** menu, select **Create snapshot**.



40. Choose **Add tag** then configure:

- **Key:** Name
- **Value:** My Snapshot
- Choose **Create snapshot**



aws

Services

Search

[Alt+S]

EC2 > Volumes > vol-0200cf550ffaef363 > 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-0200cf550ffaef363

Description

Add a description for your snapshot

lab Snapshot

255 characters maximum.

Encryption

Info

Not encrypted

### Tags

Info

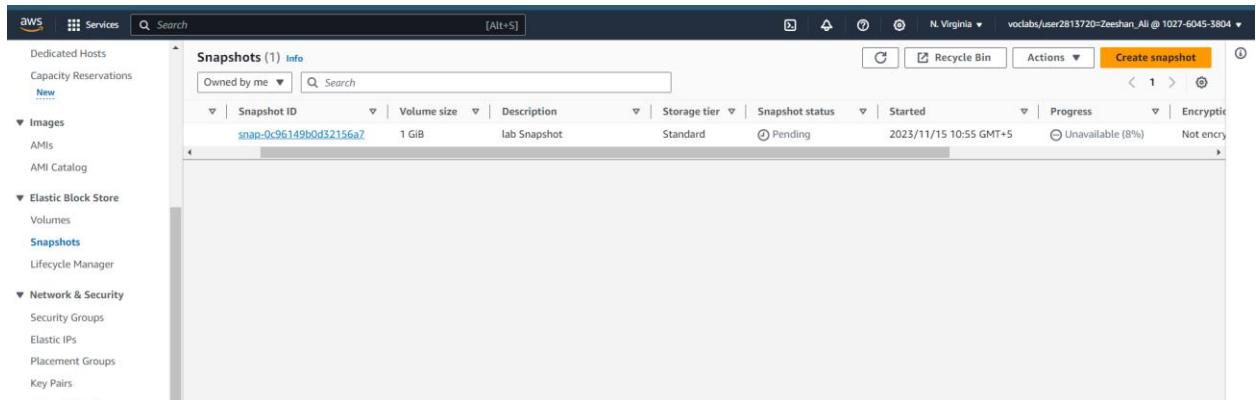
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

| Key   | Value - optional         |                   |
|---|--------------------------|-------------------|
| <div>Q Name</div>                                       | <div>Q My Snapshot</div> | <div>Remove</div> |
| <div>Add tag</div> <div>You can add 49 more tags.</div> |                          |                   |

Cancel

Create snapshot

41. In the left navigation pane, choose **Snapshots**.



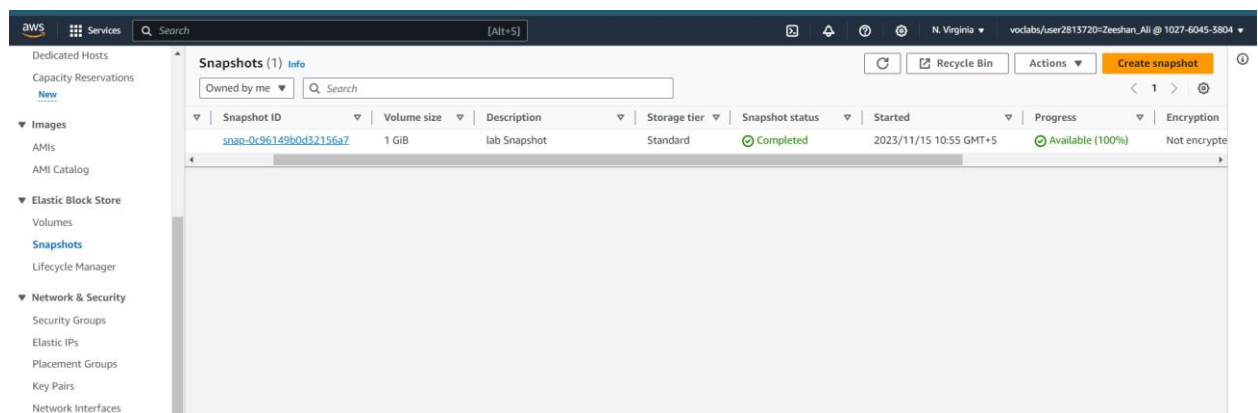
42. In your remote SSH session, delete the file that you created on your volume.
43. Verify that the file has been deleted.

```
some text has been written
[ec2-user@ip-10-1-11-221 ~]$ sudo rm /mnt/data-store/file.txt
[ec2-user@ip-10-1-11-221 ~]$ ls /mnt/data-store/
lost+found
[ec2-user@ip-10-1-11-221 ~]$ sudo rm /mnt/data-store/file.txt
rm: cannot remove '/mnt/data-store/file.txt': No such file or directory
[ec2-user@ip-10-1-11-221 ~]$ ls /mnt/data-store/
lost+found
```

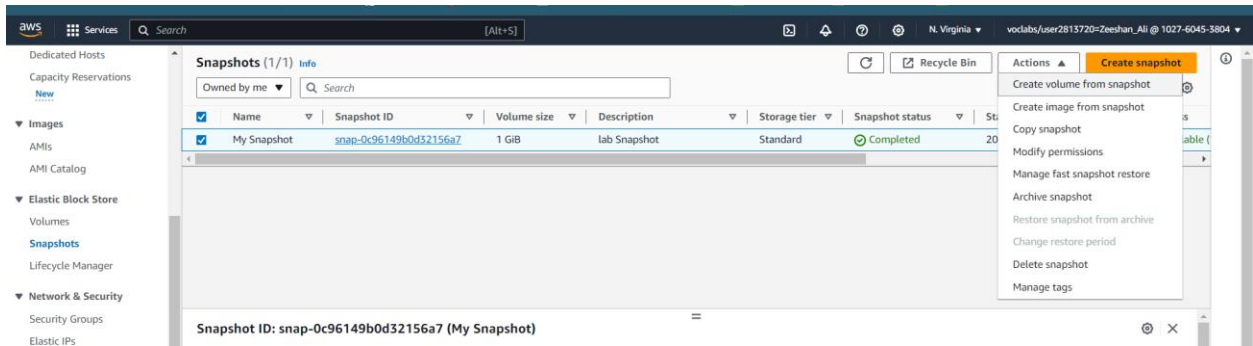
## Task 6: Restore the Amazon EBS Snapshot

### Create a Volume Using Your Snapshot

44. In the **AWS Management Console**, select **My Snapshot**.



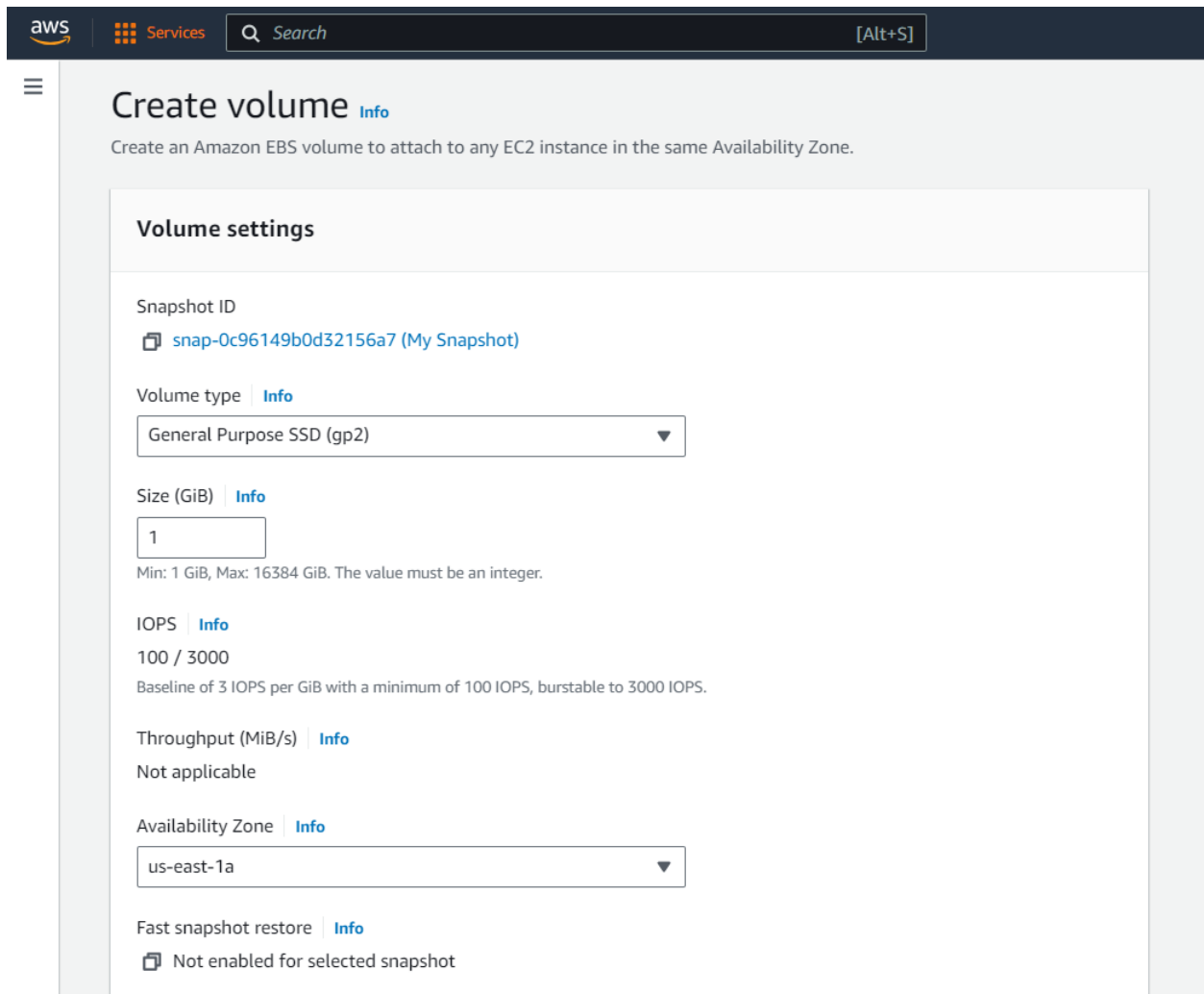
45. In the **Actions** menu, select **Create volume from snapshot**.



46. For **Availability Zone** Select the same availability zone that you used earlier.

47. Choose **Add tag** then configure:

- **Key:** Name
- **Value:** Restored Volume
- Choose **Create volume**



☐ 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 Value - optional

You can add 49 more tags.

Success: Successfully created volume vol-0430560a7a872744c.

**Snapshots (1)** [Info](#)

Owned by me

| <input type="checkbox"/> | Name        | Snapshot ID            | Volume size | Description  | Storage tier | Snapshot status | Started                | Progress         |
|--------------------------|-------------|------------------------|-------------|--------------|--------------|-----------------|------------------------|------------------|
| <input type="checkbox"/> | My Snapshot | snap-0c96149b0d32156a7 | 1 GiB       | lab Snapshot | Standard     | Completed       | 2023/11/15 10:55 GMT+5 | Available (100%) |

## Attach the Restored Volume to Your EC2 Instance

48. In the left navigation pane, choose **Volumes**.

49. Select **Restored Volume**.

50. In the **Actions** menu, select **Attach volume**.

**Volumes (1/4)** [Info](#)

| <input type="checkbox"/>            | Name            | Volume ID             | Type | Size  | IOPS | Throughput | Snapshot        | Created    |
|-------------------------------------|-----------------|-----------------------|------|-------|------|------------|-----------------|------------|
| <input type="checkbox"/>            | -               | vol-0417ce5019f2b1ca4 | gp3  | 8 GiB | 3000 | 125        | snap-015ca71... | 2023/11/15 |
| <input type="checkbox"/>            | -               | vol-08b689aa8e7a842c7 | gp3  | 8 GiB | 3000 | 125        | snap-015ca71... | 2023/11/15 |
| <input type="checkbox"/>            | My Volume       | vol-0200cf550faef363  | gp2  | 1 GiB | 100  | -          | -               | 2023/11/15 |
| <input checked="" type="checkbox"/> | Restored Volume | vol-0430560a7a872744c | gp3  | 1 GiB | 3000 | 125        | snap-0c96149... | 2023/11/15 |

**Actions**

- Modify volume
- Create snapshot
- Create snapshot lifecycle policy
- Delete volume
- Attach volume**
- Detach volume
- Force detach volume
- Manage auto-enabled I/O
- Manage tags
- Fault injection

51. Choose the **Instance** field, then select the (Lab) instance that appears.

52. Choose **Attach volume**


aws Services Search [Alt+S]

EC2 > Volumes > vol-0430560a7a872744c > 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-0430560a7a872744c (Restored Volume)**


Availability Zone  
us-east-1a

Instance [Info](#)  
 

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

Device name [Info](#)

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



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**





aws Services Search [Alt+S]

EC2 Dashboard EC2 Global View Events

▼ Instances  
Instances  
Instance Types  
Launch Templates  
Spot Requests  
Savings Plans  
Reserved Instances  
Dedicated Hosts  
Capacity Reservations  
[New](#)

Successfully attached volume vol-0430560a7a872744c to instance i-0bc3b1980d5cd0f14.

### Volumes (4) [Info](#)

| <input type="checkbox"/> | Name            | Volume ID                             | Type | Size  | IOPS | Throughput | Snapshot        | Created                | Availability Zone | Volume state   | Alarm st |
|--------------------------|-----------------|---------------------------------------|------|-------|------|------------|-----------------|------------------------|-------------------|--|----------|
| <input type="checkbox"/> | -               | <a href="#">vol-0417ce5019f2b1ca4</a> | gp3  | 8 GiB | 3000 | 125        | snap-015ca71... | 2023/11/15 10:10 GMT+5 | us-east-1a        |  In-use | No alarm |
| <input type="checkbox"/> | -               | <a href="#">vol-08b689a8e7a842c7</a>  | gp3  | 8 GiB | 3000 | 125        | snap-015ca71... | 2023/11/15 10:12 GMT+5 | us-east-1a        |  In-use | No alarm |
| <input type="checkbox"/> | My Volume       | <a href="#">vol-0200cf550faef363</a>  | gp2  | 1 GiB | 100  | -          | -               | 2023/11/15 10:20 GMT+5 | us-east-1a        |  In-use | No alarm |
| <input type="checkbox"/> | Restored Volume | <a href="#">vol-0430560a7a872744c</a> | gp3  | 1 GiB | 3000 | 125        | snap-0c96149... | 2023/11/15 11:03 GMT+5 | us-east-1a        |  In-use | No alarm |

## Mount the Restored Volume

53. Create a directory for mounting the new storage volume:

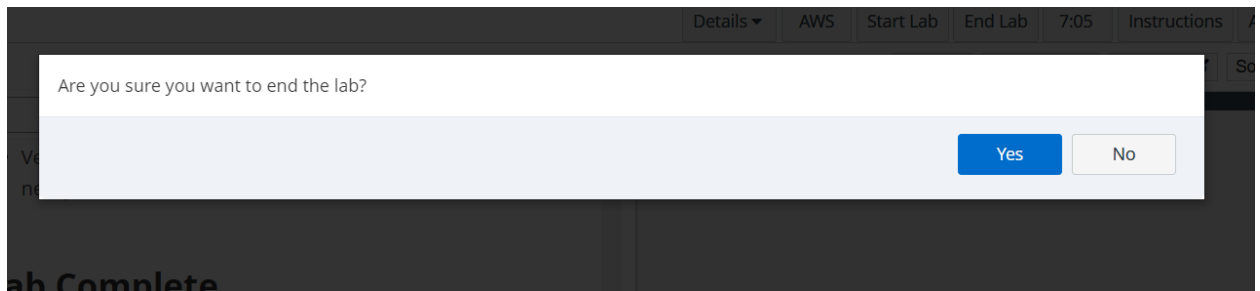
54. Mount the new volume:

55. Verify that volume you mounted has the file that you created earlier. You should see file.txt.

```
[ec2-user@ip-10-1-11-221 ~]$ sudo mkdir /mnt/data-store2
[ec2-user@ip-10-1-11-221 ~]$ sudo mount /dev/sdg /mnt/data-store2
[ec2-user@ip-10-1-11-221 ~]$ ls /mnt/data-store2/
file.txt  lost+found
[ec2-user@ip-10-1-11-221 ~]$
```

## Lab Complete

56. Choose **End Lab** at the top of this page and then click **Yes** to confirm that you want to end the lab.



57. Choose the **X** in the top right corner to close the panel.

