



AWS  
re:Start  
LAB

# Working with Amazon EBS



**WEEK 10**





# Overview

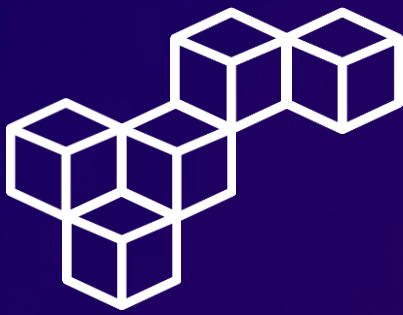
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Amazon Elastic Block Store (Amazon EBS) is a scalable, high-performance block storage service designed for use with Amazon EC2 instances. It provides persistent storage volumes that can be attached to EC2 instances, enabling data to persist independently of the instance's lifecycle. EBS volumes offer a range of performance options, including SSD-backed volumes for high-performance applications and HDD-backed volumes for large, throughput-intensive workloads. This flexibility allows users to optimize storage performance and cost according to their specific needs.

EBS volumes can be easily managed and scaled up or down, providing a seamless experience for handling growing storage requirements. Snapshots of EBS volumes can be created and stored in Amazon S3, providing a reliable backup solution and facilitating easy data recovery. Additionally, EBS supports encryption, ensuring that data at rest is secure. With its integration with other AWS services and its robust performance, Amazon EBS is a critical component for managing storage in cloud-based applications.

## Topics covered

- Create an EBS volume.
- Attach and mount an EBS volume to an EC2 instance.
- Create a snapshot of an EBS volume.
- Create an EBS volume from a snapshot.

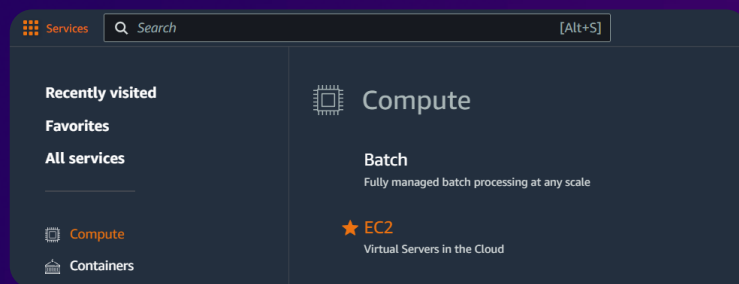


# Task 1

## Creating a new EBS volume

### Step 1: Access the EC2 Management Console

Open the AWS Management Console, and select EC2.



### Step 2: Review instances

Navigate to the **Instances** section, an EC2 instance named **Lab** has already been launched for your lab. Make note of the Availability Zone for the **Lab** instance.

Instances (1) Info

Refresh

Connect

Instance state ▾




Actions ▾

Launch instances ▾

Find Instance by attribute or tag (case-sensitive)

All states ▾

<1>⚙️

<input type="checkbox"/>	Name 	Instance ID	Instance state ▾	Status check	Availability Zone ▾	Public IPv4 ... ▾	Private IP address ▾
<input type="checkbox"/>	Lab	i-089b3ad8bbd5f3b19	<div><div>Running</div><div></div></div>	<div><div>2/2 checks passed</div></div>	us-west-2a	35.87.208.43	10.1.11.4



# Task 1

## Creating a new EBS volume

### Step 3: Create volume

Navigate to the **Volumes** section, you see an existing (8 GiB) volume that the EC2 instance is using. Choose [Create volume](#).

Volumes (1) <a href="#">Info</a>								
<input type="text" value="Search"/>								
<input type="checkbox"/>	Name	Volume ID	Type	Size	Snapshot	Availability Zone	Volume state	Attached resources
<input type="checkbox"/>	-	vol-0bbd8c5c346e6eee5	gp2	8 GiB	snap-0bdd...	us-west-2a	<span>✔</span> In-use	i-089b3ad8bbd5f3b19 (Lab): /dev/xvda...

### Step 4: Volume settings

In the **Volume settings** section, configure the following settings.

**Volume settings**

Volume type [Info](#)

General Purpose SSD (gp2)

Size (GiB) [Info](#)

1

Availability Zone [Info](#)

us-west-2a

**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



# Task 2

## Attaching the volume to an EC2 instance

### Step 1: Review Volume state

Select the newly created volume **My Volume** when the Volume state changes to **Available**. Then, from the Actions menu, choose **Attach volume**.

Volumes (1/2) Info

Search

<

### Step 2: Attach volume

From the Instance dropdown list, choose the **Lab** instance. The Device name field is set to `/dev/sdf`, make note of this device identifier. Choose **Attach volume**. The Volume state of your new volume should now be **In-use**.

**Basic details**

Volume ID

vol-0df352df4f900eaa6 (My Volume)

Availability Zone

us-west-2a

Instance [Info](#)

i-089b3ad8bbd5f3b19

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

Device name [Info](#)

/dev/sdf



# Task 3

## Connecting to the Lab EC2 instance

### Step 1: Connect to the Lab instance

Navigate to the **Instances** section, select the **Lab** instance, and connect to the instance using EC2 Instance Connect.

Instances (1/1) <a href="#">Info</a>							
<input type="text" value="Find Instance by attribute or tag (case-sensitive)"/>				All states ▾		< 1 > ⚙	
<input checked="" type="checkbox"/>	Name <a href="#">↗</a>	Instance ID	Instance state ▾	Status check	Availability Zone ▾	Public IPv4 ... ▾	Private IP address ▾
<input checked="" type="checkbox"/>	Lab	i-089b3ad8bbd5f3b19	Running	2/2 checks passed	us-west-2a	35.87.208.43	10.1.11.4

### Step 2: Review connection

A new browser tab opens with the EC2 Instance Connect terminal window.

```
#_
~\  ####
~\  #####\
~\  \###\
~\  \##/
~\  V~'  ^-->
~~~~
~~~~
~~~~
~~~~
~/m/'

Amazon Linux 2
AL2 End of Life is 2025-06-30.

A newer version of Amazon Linux is available!

Amazon Linux 2023, GA and supported until 2028-03-15.
https://aws.amazon.com/linux/amazon-linux-2023/

[ec2-user@ip-10-1-11-4 ~]$
```



# Task 4

## Creating and configuring the file system

### Step 1: Review the available storage

To view the storage that is available on your instance, in the EC2 Instance Connect terminal, run the `df -h` command. The output shows the original 8 GB disk volume. Your new volume is not yet shown.

```
[ec2-user@ip-10-1-11-4 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        465M   0  465M   0% /dev
tmpfs           473M   0  473M   0% /dev/shm
tmpfs           473M 408K  472M   1% /run
tmpfs           473M   0  473M   0% /sys/fs/cgroup
/dev/nvme0n1p1  8.0G  1.6G   6.5G  20% /
tmpfs           95M   0   95M   0% /run/user/1000
[ec2-user@ip-10-1-11-4 ~]$
```

### Step 2: Create an ext3 file system

To create an ext3 file system on the new volume, run the following `mkfs` command.

```
[ec2-user@ip-10-1-11-4 ~]$ sudo mkfs -t ext3 /dev/sdf
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
65536 inodes, 262144 blocks
13107 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
8 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
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-10-1-11-4 ~]$
```





# Task 4

## Creating and configuring the file system

### Step 3: Create a directory

To create a directory to mount the new storage volume, run the following `mkdir` command.

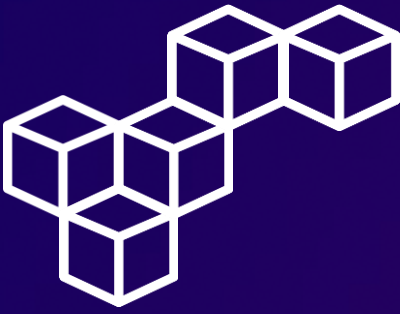
```
[ec2-user@ip-10-1-11-4 ~]$ sudo mkdir /mnt/data-store  
[ec2-user@ip-10-1-11-4 ~]$
```

### Step 4: Mount the volume

To mount the new volume, run the following `mount` command. The `echo` command line ensures that the volume is mounted even after the instance is restarted. To view the configuration file to see the setting on the last line, run the following `cat` command.

```
[ec2-user@ip-10-1-11-4 ~]$ sudo mount /dev/sdf /mnt/data-store  
[ec2-user@ip-10-1-11-4 ~]$ 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-10-1-11-4 ~]$ cat /etc/fstab  
#  
UUID=e1c8828e-1de8-4a09-abb1-a211a3d69be0 / xfs defaults,noatime 1 1  
/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2  
[ec2-user@ip-10-1-11-4 ~]$
```





# Task 4

## Creating and configuring the file system

### Step 5: Review the available storage

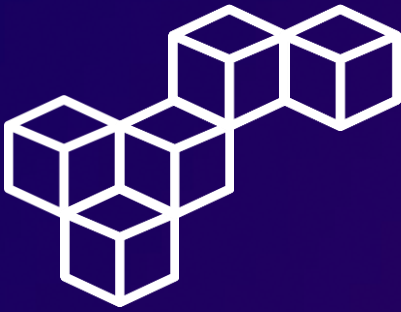
To view the available storage again, run the `df -h` command. The output now contains an additional line: `/dev/nvme1n1`.

```
[ec2-user@ip-10-1-11-4 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        465M   0  465M   0% /dev
tmpfs           473M   0  473M   0% /dev/shm
tmpfs           473M 408K  472M   1% /run
tmpfs           473M   0  473M   0% /sys/fs/cgroup
/dev/nvme0n1p1  8.0G  1.6G   6.5G  20% /
tmpfs           95M   0   95M   0% /run/user/1000
/dev/nvme1n1    975M  60K  924M   1% /mnt/data-store
[ec2-user@ip-10-1-11-4 ~]$
```

### Step 6: Create a file on the mounted volume

To create a file and add some text on the mounted volume, run the following `sh` command. To verify that the text has been written to your volume, run the following `cat` command.

```
[ec2-user@ip-10-1-11-4 ~]$ sudo sh -c "echo some text has been written > /mnt/data-store/file.txt"
[ec2-user@ip-10-1-11-4 ~]$ cat /mnt/data-store/file.txt
some text has been written
[ec2-user@ip-10-1-11-4 ~]$
```



# Task 5

## Creating an Amazon EBS snapshot

### Step 1: Create snapshot

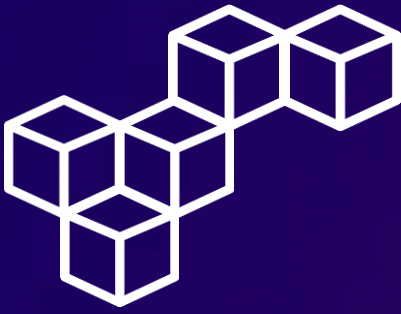
Navigate to the **Snapshots** section, and select [Create snapshot](#).

The screenshot shows the AWS Snapshots console. At the top, there's a 'Snapshots' header with an 'Info' link. Below it is a search bar with the placeholder 'Search'. To the right of the search bar are buttons for 'Recycle Bin', 'Actions', and a prominent orange 'Create snapshot' button. Below these is a table header with columns: Name, Snapshot ID, Volume size, Description, Storage tier, Snapshot status, and Started. A message at the bottom of the table area states: 'You currently have no snapshots in this Region.'

### Step 2: Snapshot settings

In the **Snapshot settings** section, configure the following settings.

The image shows two side-by-side configuration panels. The left panel is titled 'Snapshot settings' and has a 'Resource type' section with 'Volume' selected (indicated by a blue circle). Below this is a 'Volume ID' dropdown menu with the value 'vol-0df352df4f900eea6'. The right panel is titled 'Tags' and has a description: '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.' It contains two input fields: 'Key' with the value 'Name' and 'Value - optional' with the value 'My Snapshot'.



## Task 5

# Creating an Amazon EBS snapshot

### Step 3: Delete file

In your EC2 Instance Connect terminal window, to delete the file that you created on your volume, run the following **rm** command.

```
[ec2-user@ip-10-1-11-4 ~]$ sudo rm /mnt/data-store/file.txt  
[ec2-user@ip-10-1-11-4 ~]$
```

### Step 4: Review file deletion

To verify that the file has been deleted, run the following **ls** command. The message **ls: cannot access /mnt/data-store/file.txt: No such file or directory** displays. Your file has been deleted.

```
[ec2-user@ip-10-1-11-4 ~]$ ls /mnt/data-store/file.txt  
ls: cannot access /mnt/data-store/file.txt: No such file or directory  
[ec2-user@ip-10-1-11-4 ~]$
```

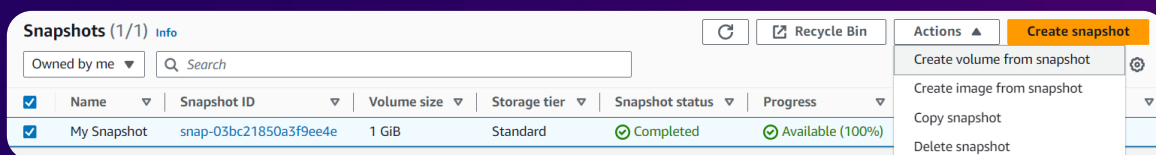


# Task 6

## Restoring the Amazon EBS snapshot

### Step 1: Create volume from snapshot

Navigate to the **Snapshots** section, select **My Snapshot**. From the Actions menu, choose **Create volume from snapshot**.



### Step 2: Volume settings

In the **Volume settings** section, configure the following settings.

**Volume settings**

Snapshot ID

snap-03bc21850a3f9ee4e (My Snapshot)

Volume type

General Purpose SSD (gp2)

Size (GiB)

1

Availability Zone

us-west-2a

**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.

Key

Name

Value - optional

Restored Volume



# Task 6

## Restoring the Amazon EBS snapshot

### Step 3: Review Volume state

In the **Volumes** section, select the newly created volume **Restored Volume** when the Volume state changes to **Available**. Then, from the Actions menu, choose **Attach volume**.

Volumes (1/3) Info

Q Search

	Name	Volume ID	Type	Size	Snapshot	Availability Zone	Volume state
<input type="checkbox"/>	-	vol-0bbd8c5c346e6eee5	gp2	8 GiB	snap-0bdd...	us-west-2a	In-use
<input type="checkbox"/>	My Volume	vol-0df352df4f900eaa6	gp2	1 GiB	-	us-west-2a	In-use
<input checked="" type="checkbox"/>	Restored Volume	vol-077e0acf0eed0fd6c	gp2	1 GiB	snap-03bc...	us-west-2a	Available

Actions

Create volume

Modify volume

Create snapshot

Create snapshot lifecycle policy

Delete volume

Attach volume

Detach volume

### Step 4: Attach volume

From the Instance dropdown list, choose the **Lab** instance. The Device name field is set to `/dev/sdg`, make note of this device identifier. Choose **Attach volume**. The Volume state of your new volume should now be **In-use**.

Basic details

Volume ID

vol-077e0acf0eed0fd6c (Restored Volume)

Availability Zone

us-west-2a

Instance

i-089b3ad8bbd5f3b19

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

Device name

/dev/sdg



## Task 6

# Restoring the Amazon EBS snapshot

### Step 5: Create a new directory

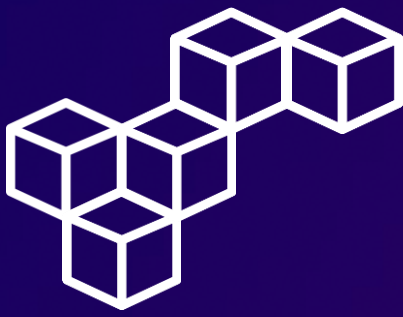
To create a directory for mounting the new storage volume, in the EC2 Instance Connect terminal, run the following [mkdir](#) command.

```
[ec2-user@ip-10-1-11-4 ~]$ sudo mkdir /mnt/data-store2  
[ec2-user@ip-10-1-11-4 ~]$
```

### Step 6: Mount the new volume

To mount the new volume, run the following [mount](#) command. To verify that the volume that you mounted has the file that you created earlier, run the following [ls](#) command. You should see the file.txt file.

```
[ec2-user@ip-10-1-11-4 ~]$ sudo mount /dev/sdg /mnt/data-store2  
[ec2-user@ip-10-1-11-4 ~]$ ls /mnt/data-store2/file.txt  
/mnt/data-store2/file.txt  
[ec2-user@ip-10-1-11-4 ~]$
```



# Conclusions

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## Creating an EBS Volume

Creating an EBS volume provides scalable, persistent storage for EC2 instances.

## Attaching a Volume to an EC2 Instance

Attaching an EBS volume to an EC2 instance is crucial for expanding storage capacity and enhancing data durability.

## Creating and Configuring the File System

Creating and configuring the file system ensures the EBS volume is ready for data storage and access by the instance.

## The `mkfs` and `mount` commands

Utilize `mkfs` to format the EBS volume with a specific file system, and `mount` to attach it to a directory in the EC2 instance's file system.

## Creating an Amazon EBS Snapshot

Capture a point-in-time backup of an EBS volume with Amazon EBS snapshots.

## Restoring an Amazon EBS Snapshot

Easily restore an EBS volume to a previous state by using an Amazon EBS snapshot.





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