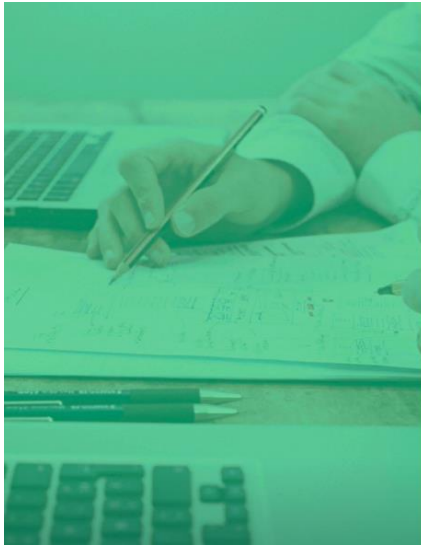


## EBS Encryption:



# EBS Encryption

EBS encrypts your volume with a data key using the industry-standard AES-256 algorithm. Amazon EBS encryption uses AWS Key Management Service (AWS KMS) customer master keys (CMK) when creating encrypted volumes and snapshots.

## What Happens When You Encrypt an EBS Volume?

- ✓ Data at rest is encrypted inside the volume.
- ✓ All data in flight moving between the instance and the volume is encrypted.
- ✓ All snapshots are encrypted.
- ✓ All volumes created from the snapshot are encrypted.



## EBS Encryption



### Handled Transparently

Encryption and decryption are handled transparently (you don't need to do anything).



### Snapshots

Snapshots of encrypted volumes are encrypted.



### Latency

Encryption has a minimal impact on latency.



### Root Device Volumes

You can now encrypt root device volumes upon creation.



### Copying

Copying an unencrypted snapshot allows encryption.

# 4 Steps to Encrypt an Unencrypted Volume

- ✓ Create a snapshot of the unencrypted root device volume.
- ✓ Create a copy of the snapshot and select the encrypt option.
- ✓ Create an AMI from the encrypted snapshot.
- ✓ Use that AMI to launch new encrypted instances.

## Encrypted Volumes

- ✓ Data at rest is encrypted inside the volume.
- ✓ All data in flight moving between the instance and the volume is encrypted.
- ✓ All snapshots are encrypted.
- ✓ All volumes created from the snapshot are encrypted.

## How to Encrypt Volumes

- ✓ Create a snapshot of the unencrypted root device volume.
- ✓ Create a copy of the snapshot and select the encrypt option.
- ✓ Create an AMI from the encrypted snapshot.
- ✓ Use that AMI to launch new encrypted instances.

EC2 Hibernation:

We have learned so far we can stop and terminate EC2 instances. If we stop the instance, the **data is kept on the disk (with EBS)** and will remain on the disk until the EC2 instance is started. If the instance is terminated, then by default **the root device volume will also be terminated.**



When we **start our EC2 instance**, the following happens:

- ✓ **Operating system** boots up
- ✓ User data script is run (**bootstrap scripts**)
- ✓ **Applications start** (can take some time)

## EC2 Hibernation

When you hibernate an EC2 instance, the operating system is told to perform hibernation (suspend-to-disk). Hibernation **saves the contents** from the instance memory (RAM) to your Amazon EBS root volume. We persist the instance's Amazon EBS root volume and any attached Amazon EBS data volumes.

### When you start your instance out of hibernation:

- The **Amazon EBS** root volume is restored to its previous state.
- The **RAM** contents are reloaded.
- The processes that were previously running on the instance are resumed.
- Previously attached data volumes are **reattached and the instance retains its instance ID**.



<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/Hibernate.html>

## EC2 Hibernation

With EC2 hibernation, **the instance boots much faster**. The operating system does not need to reboot because the in-memory state (RAM) is preserved. This is useful for:

- 1 **Long-running processes**
- 2 **Services that take time to initialize**



## What You Need to Know about **EC2 Hibernation**

- ✓ **EC2 hibernation** preserves the in-memory RAM on persistent storage (EBS).
- ✓ **Much faster to boot up** because you **do not need to reload the operating system**.
- ✓ **Instance RAM** must be less than **150 GB**.
- ✓ **Instance families include** C3, C4, C5, M3, M4, M5, R3, R4, and R5.
- ✓ **Available for** Windows, Amazon Linux 2 AMI, and Ubuntu.
- ✓ **Instances can't be hibernated** for more than **60 days**.
- ✓ **Available for** On-Demand instances and Reserved Instances.