AWS Academy Cloud Foundations

Module 7: Storage

Module overview

Topics

- Amazon Elastic Block Store (Amazon EBS)
- Amazon Simple Storage Service (Amazon S3)
- Amazon Elastic File System (Amazon EFS)
- Amazon Simple Storage Service Glacier

Demos

- Amazon EBS console
- Amazon S3 console
- Amazon EFS console
- Amazon S3 Glacier console

Lab

- Working with Amazon EBS

Activities

- Storage solution case study

Knowledge check

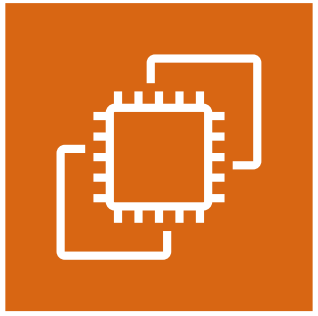
Module objectives

After completing this module, you should be able to:

- Identify the different types of storage
- Explain Amazon S3
- Identify the functionality in Amazon S3
- Explain Amazon EBS
- Identify the functionality in Amazon EBS
- Perform functions in Amazon EBS to build an Amazon EC2 storage solution
- Explain Amazon EFS
- Identify the functionality in Amazon EFS
- Explain Amazon S3 Glacier
- Identify the functionality in Amazon S3 Glacier
- Differentiate between Amazon EBS, Amazon S3, Amazon EFS, and Amazon S3 Glacier

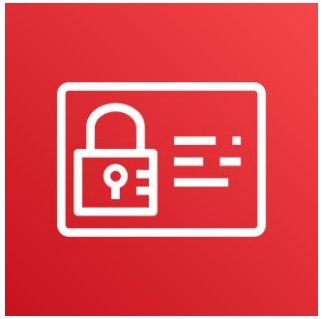
Core AWS services

Amazon Virtual Private Cloud (Amazon VPC)



Amazon Elastic Compute Cloud (Amazon EC2)

Storage



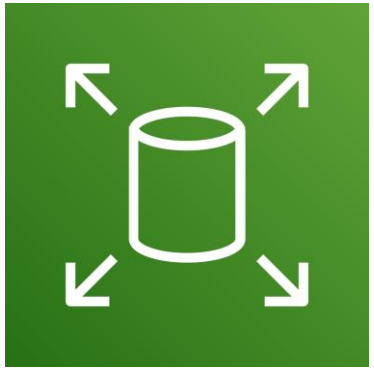
AWS Identity and Access Management (IAM)

Database

Module 7: Storage

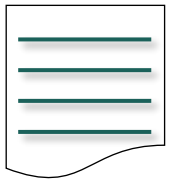
Section 1: Amazon Elastic Block Store (Amazon EBS)

Storage

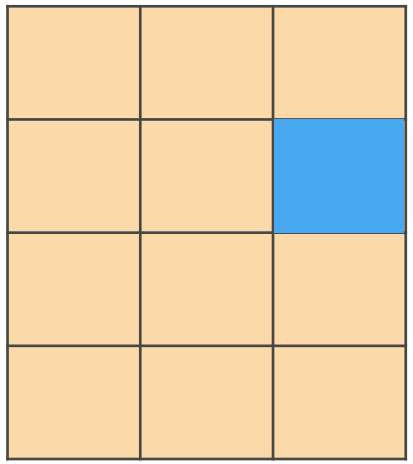


Amazon Elastic Block Store
(Amazon EBS)

AWS storage options: Block storage versus object storage

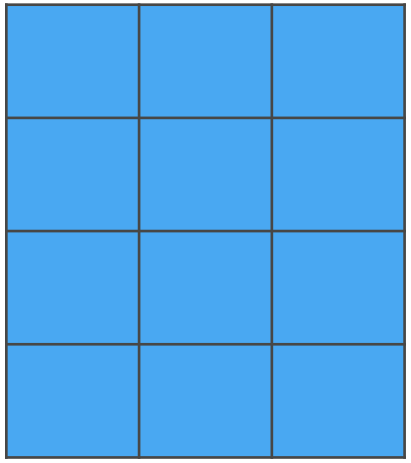


What if you want to change one character in a 1-GB file?



Block storage

Change one block (piece of the file) that contains the character



Object storage

Entire file must be updated

Amazon EBS

Amazon EBS enables you to **create individual storage volumes** and **attach them** to an Amazon EC2 instance:

- Amazon EBS offers block-level storage.
- Volumes are automatically replicated within its Availability Zone.
- It can be backed up automatically to Amazon S3 through snapshots.
- Uses include –
  - Boot volumes and storage for Amazon Elastic Compute Cloud (Amazon EC2) instances
  - Data storage with a file system
  - Database hosts
  - Enterprise applications

Amazon EBS volume types

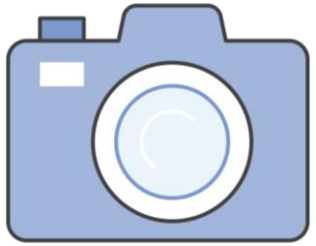
	Solid State Drives (SSD)		Hard Disk Drives (HDD)	
	General Purpose	Provisioned IOPS	Throughput-Optimized	Cold
Maximum Volume Size	16 TiB	16 TiB	16 TiB	16 TiB
Maximum IOPS/Volume	16,000	64,000	500	250
Maximum Throughput/Volume	250 MiB/s	1,000 MiB/s	500 MiB/s	250 MiB/s

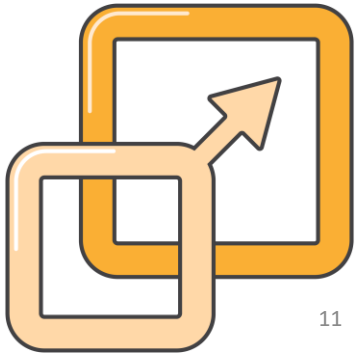
Amazon EBS volume type use cases

Solid State Drives (SSD)		Hard Disk Drives (HDD)	
General Purpose	**Provisioned IOPS**	**Throughput-Optimized**	**Cold**
• This type is recommended for most workloads • System boot volumes • Virtual desktops • Low-latency interactive applications • Development and test environments	• Critical business applications that require sustained IOPS performance, or more than 16,000 IOPS or 250 MiB/second of throughput per volume • Large database workloads	• Streaming workloads that require consistent, fast throughput at a low price • Big data • Data warehouses • Log processing • It cannot be a boot volume	• Throughput-oriented storage for large volumes of data that is infrequently accessed • Scenarios where the lowest storage cost is important • It cannot be a boot volume

Amazon EBS features

- Snapshots –
  - Point-in-time snapshots
  - Recreate a new volume at any time
- Encryption –
  - Encrypted Amazon EBS volumes
  - No additional cost
- Elasticity –
  - Increase capacity
  - Change to different types





Amazon EBS: Volumes, IOPS, and pricing

1. **Volumes –**
   - Amazon EBS volumes persist independently from the instance.
   - All volume types are charged by the amount that is provisioned per month.
2. **IOPS –**
   - General Purpose SSD:
     - Charged by the amount that you provision in GB per month until storage is released.
   - Magnetic:
     - Charged by the number of requests to the volume.
   - Provisioned IOPS SSD:
     - Charged by the amount that you provision in IOPS (multiplied by the percentage of days that you provision for the month).

Amazon EBS: Snapshots and data transfer

3. **Snapshots –**
   - Added cost of Amazon EBS snapshots to Amazon S3 is per GB-month of data stored.

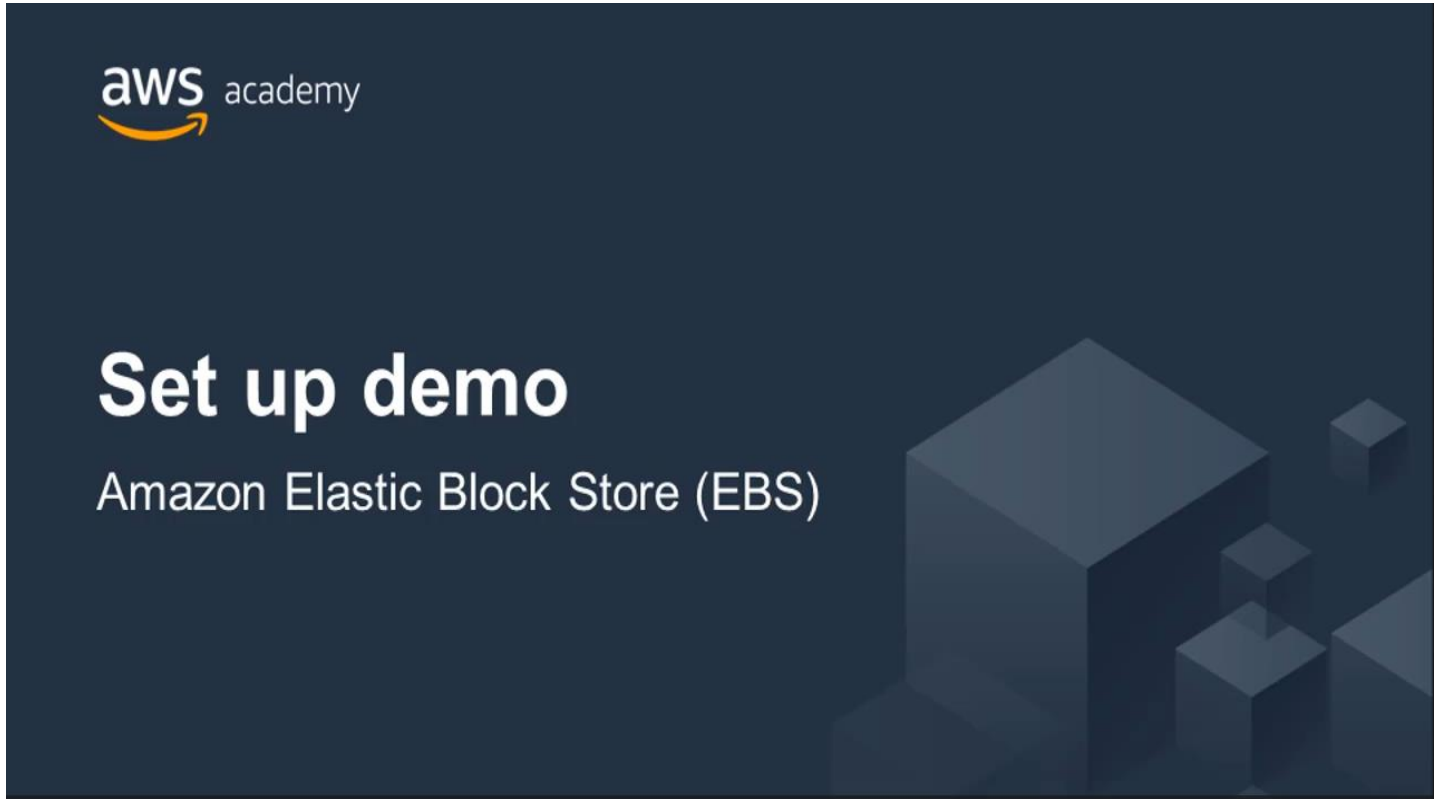
4. **Data transfer –**
   - Inbound data transfer is free.
   - Outbound data transfer across Regions incurs charges.

Section 1 key takeaways

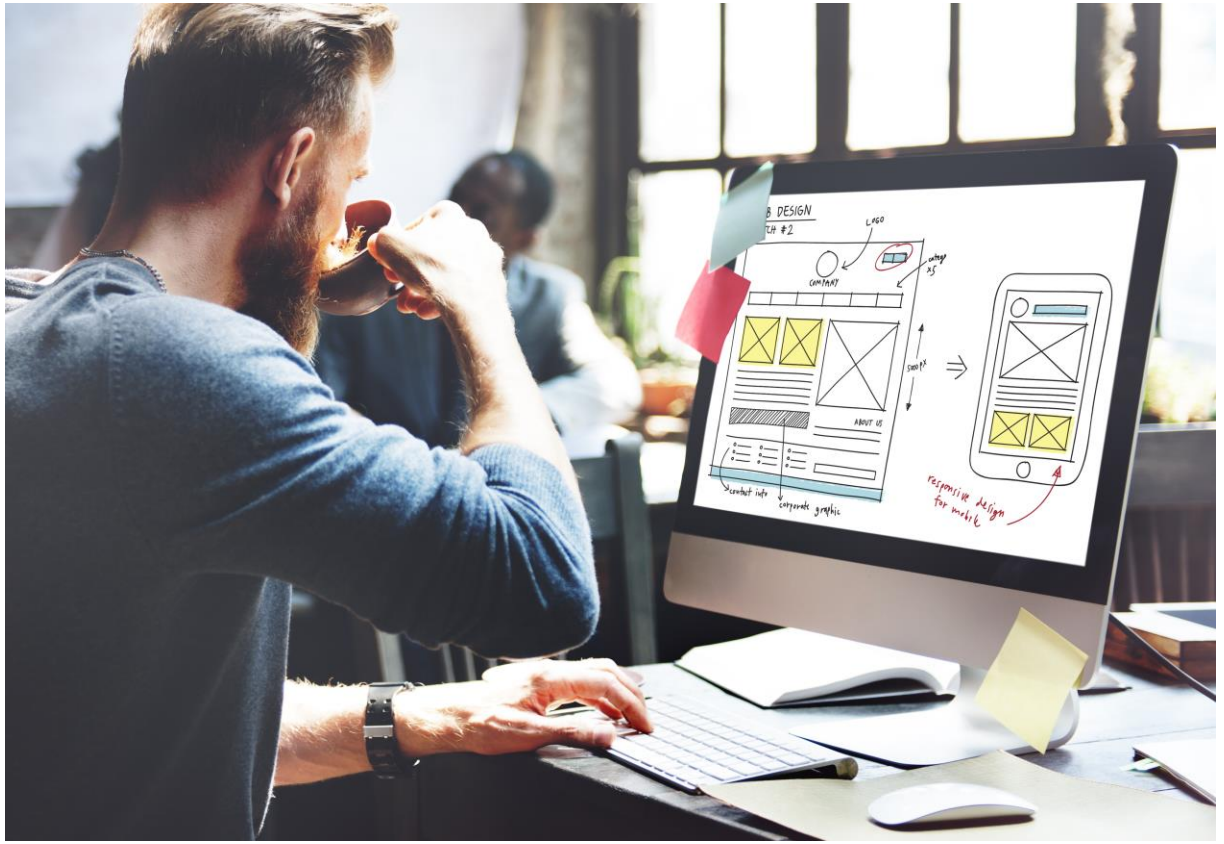
Amazon EBS features:

- Persistent and customizable block storage for Amazon EC2
- HDD and SSD types
- Replicated in the same Availability Zone
- Easy and transparent encryption
- Elastic volumes
- Back up by using snapshots

Recorded demo: Amazon Elastic Block Store



Lab 4: Working with Amazon EBS



Lab 4: Scenario

This lab is designed to show you how to create an Amazon EBS volume. After you create the volume, you will attach the volume to an Amazon EC2 instance, configure the instance to use a virtual disk, create a snapshot and then restore from the snapshot.

Lab 4: Final product

Lab debrief: Key takeaways