EBS

Elastic Block Storage

A CLOUD GURU

EXAM TIPS

Learning EBS: SSD Volumes

Highly available and scalable storage volumes **you can attach to an EC2 instance.**

gp2

General Purpose SSD

- Suitable for boot disks and general applications
- Up to 16,000 IOPS per volume
- Up to 99.9% durability

gp3

General Purpose SSD

- Suitable for high performance applications
- Predictable 3,000 IOPS baseline performance and 125 MiB/s regardless of volume size
- Up to 99.9% durability

io1

Provisioned IOPS SSD

- Suitable for OLTP and latency-sensitive applications
- 50 IOPS/GiB
- Up to 64,000 IOPS per volume
- High performance and most expensive
- Up to 99.9% durability

io2

Provisioned IOPS SSD

- Suitable for OLTP and latency-sensitive applications
- 500 IOPS/GiB
- Up to 64,000 IOPS per volume
- 99.999% durability
- Latest generation Provisioned IOPS volume

EXAM TIPS

EBS: HDD Volumes

Highly available and scalable storage volumes **you can attach to an EC2 instance**.

st1

Throughput Optimized HDD

- Suitable for big data, data warehouses, and ETL
- Max throughput is 500 MB/s per volume
- Cannot be a boot volume
- Up to 99.9% durability

sc1

Cold HDD

- Max throughput of 250 MB/s per volume
- Less frequently accessed data
- Cannot be a boot volume
- Lowest cost

Next lesson
Volumes and Snapshots

5 Tips for EBS Volumes and Snapshots

- Volumes exist on EBS, whereas snapshots exist on S3.
- Snapshots are point-in-time photographs of volumes and are incremental in nature.
- The first snapshot will take some time to create. For consistent snapshots, stop the instance and detach the volume.
- You can share snapshots between AWS accounts as well as between regions, but first you need to copy that snapshot to the target region.
- You can resize EBS volumes on the fly as well as changing the volume types.

Amazon Machine Images: EBS vs. Instance Store

AMIs: EBS vs. Instance Store

- **Instance store volumes** are sometimes called **ephemeral storage.**
- Instance store volumes **cannot be stopped**. If the underlying host fails, you will lose your data.
- **EBS-backed instances can be stopped.** You will not lose the data on this instance if it is stopped.
- **You can reboot** both EBS and instance store volumes and you will **not lose your data.**
- By default, both root volumes will be **deleted on termination**. However, with EBS volumes, you can tell AWS to **keep the root device volume**.

BONUS TIP

An AMI is just a blueprint for an EC2 instance.

What You Need to Know about E2C 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.

What to Remember about EFS

- **Supports** the Network File System version 4 (NFSv4) protocol
- **Only pay** for the storage you use (no pre-provisioning required)
- **Can scale up** to petabytes
- **Can support** thousands of concurrent NFS connections
- **Data is stored** across multiple AZs within a region
- **Read-after-write consistency**

BONUS TIP

If you have a scenario-based question around **highly scalable shared storage using NFS, think EFS.**

FSx Overview

In the exam, you'll be given different scenarios and asked to choose whether you should use EFS, FSx for Windows, or FSx for Lustre.

1. **EFS:** When you need distributed, highly resilient storage for Linux instances and Linux-based applications.

2. **Amazon FSx for Windows:** When you need centralized storage for Windows-based applications, such as SharePoint, Microsoft SQL Server, Workspaces, IIS Web Server, or any other native Microsoft application.

3. **Amazon FSx for Lustre:** When you need high-speed, high-capacity distributed storage. This will be for applications that do high performance computing (HPC), financial modeling, etc. Remember that FSx for Lustre can store data directly on S3.

Storage Options Use Cases

S3
Used for serverless object storage

Glacier
Used for archiving objects

EFS
Network File System (NFS) for Linux instances. Centralized storage solution across multiple AZs.

FSx for Lustre
File storage for high performance computing Linux file systems

EBS Volumes
Persistent storage for EC2 instances

Instance Store
Ephemeral storage for EC2 instances

FSx for Windows
File storage for Windows instances. Centralized storage solution across multiple AZs.

BONUS TIP

Knowing the different use cases for storage will gain you valuable points in the exam.

AWS Backup

- **Consolidation:** Use AWS Backup to back up AWS services, such as EC2, EBS, EFS, Amazon FSx for Lustre, Amazon FSx for Windows File Server, and AWS Storage Gateway.
- **Organizations:** You can use AWS Organizations in conjunction with AWS Backup to back up your different AWS services across multiple AWS accounts.
- **Benefits:** Backup gives you centralized control, letting you automate your backups and define lifecycle policies for your data. You get better compliance, as you can enforce your backup policies, ensure your backups are encrypted, and audit them once complete.

Next lesson
Reducing Storage Costs with EFS