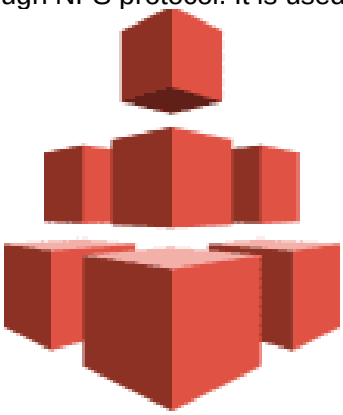
AWS EFS, EBS and S3: Best AWS Storage Option

Elastic File Storage (EFS), Elastic Block Storage (EBS), and **Simple Storage Service (S3)** are AWS's three different storage types that can be used for different types of workload needs.
we will discuss EFS, EBS, and S3, and on the basis of that, we will compare these three storage types offered by AWS.

What is Elastic File Storage (EFS)

Amazon EFS is an NFS file system service offered by AWS. An Amazon EFS file system is excellent as a managed network file system that can be shared across different Amazon EC2 instances. Amazon EFS works like NAS devices and performs well for big data analytics, media processing workflows, and content management. EFS can be accessed by multiple instances at a time through NFS protocol. It is used as a clustered database and document sharing.



Benefits of EFS

- With EFS you need not worry about managing file servers or storage, updating hardware, configuring software, or performing backups as EFS is a fully managed service
- The distributed architecture of Amazon EFS provides data protection from an AZ outage, system and component failures, and network connection errors.
- Network Access to the files can be controlled using Virtual Private Cloud security group rules and with Identity Access Management policies and EFS access points you can control the access to your files
- Amazon EFS is designed to provide the throughput, IOPS, and low latency needed for a broad range of workloads
- With Amazon EFS, storage capacity is elastic, growing and shrinking automatically as you add and remove files, dynamically providing the storage capacity to applications as they need it.
- AWS EFS provides encryption of data both at rest and in transit so that your data is secure.

What is Elastic Block Storage (EBS)

Amazon Elastic Block Store (EBS) is an easy-to-use, high-performance block storage service designed for use with Amazon Elastic Compute Cloud (EC2) for both throughput and transaction-intensive workloads at any scale. A broad range of workloads, such as relational and non-relational

databases, enterprise applications, containerized applications, big data analytics engines, file systems, and media workflows are widely deployed on Amazon EBS.

Benefits Of EBS

- EBS volumes function well even if the load is very high. SSD backed options include a volume designed for high-performance applications and a general-purpose volume that offers strong price performance for most workloads.
- EBS volumes are designed to protect against failures by replicating within the Availability Zone (AZ), offering 99.999% availability.
- EBS provides six different volumes at different price points enabling you to optimize cost and choose volumes according to your needs.
- Elastic Volumes capability allows you to increase storage, tune performance up and down, and change volume types without any disruption to your workloads
- EBS volumes can be encrypted by default with a single setting in your account. EBS volumes support encryption of data at-rest, data in-transit, and all volume backups.
- EBS enables you to increase storage without any disruption to your critical workloads.

AWS S3 (Simple Storage Service)

AWS S3 stands for **AWS Simple Storage Service.** It is secure, durable, and highly scalable object storage which can store different types of files. It's a static storage service useful for static website hosting, media distribution, version management, big data analytics, and archiving. It is easy to use with a simple web interface to store and retrieve any amount of data from anywhere on the web. Files are stored in **Buckets** (similar to folders) and bucket names must be unique. Files can be from **0 bytes to 5TB.**

Benefits Of S3

- It is the most supported cloud storage service. Amazon S3 stores and protects your data by working with a partner from the AWS Partner Network (APN) the largest community of technology and consulting cloud services providers.
- Save costs without sacrificing performance by storing data across the S3 Storage Classes, thus a wide range of cost-effective storage classes.
- S3 is a highly scalable secure and durable (99.999999999% data durability) storage type offered by AWS.
- S3 is the only object storage service that allows you to block public access to all of your objects at the bucket or the account level with S3 Block Public Access.
- S3 Access Points make it easy to manage data access with specific permissions for your applications using a shared data set
- Improves query performance by using S3 Select to retrieve subsets of object data, instead of the entire object.

Difference Between EFS, EBS, and S3

Now let's take a look into the differences between Elastic File System, Elastic Block Storage, and Simple Storage Service

- **Accessibility:** S3 is publically accessible and you do not need a server to access it while EBS can only be accessed via EC2 machine and EFS can be accessed via several EC2 machines and AWS Services.
- **Interface:** S3 provides you a web interface while EBS provides a file system interface and EFS provides a web and file system interface.
- **Storage Type:** AWS S3 is object storage while Amazon EBS is block storage and Amazon EFS is file storage.
- **Scalability:** Amazon S3 and EFS are highly scalable while EBS is hardly scalable.
- **Speed:** Amazon S3 is slowest among the three and comes under tier 3 while Amazon EBS is fastest among the all and comes under tier 0 and Amazon EFS is faster than S3 and slower than EBS and comes under tier 1. So based on the performance hardware will be used in the backend of the storage services

- **Backup:** Amazon S3 is good for storing backups while EBS is meant to be an EC2 drive and since EFS is accessible over multiple servers so it's good for shareable applications and workloads.

	Performance	Availability and Accessibility	Access Control	Storage and File Size Limits	Cost
Amazon S3	- Supports 3500 PUT / LIST / DELETE requests per second - Scalable to 5500 GET requests per second	- Usually 99.9% available - If lower, returns 10-100% of cost as service credits - Accessible via Internet using APIs	- Access is based on IAM - Uses bucket policies and user policies - Public access via Block Public Access	- No limit on quantity of objects - Individual objects up to 5TB	- **Free tier:** 5GB - **First 50 TB/month:** $0.023 per GB - **Next 450 TB/month:** $0.022 per GB - **Over 500 TB/month:** $0.021 per GB
AWS EBS	- HDD volumes: 250-500 IOPS/volume depending on volume type - SSD volumes: 16-64K IOPS/volume	- 99.99% available - Accessible via single EC2 instance	- Security groups - User-based authentication (IAM)	- Max storage size of 16TB - No file size limit on disk	- **Free tier:** 30GB - **General Purpose:** $0.045 per GB/month - **Provisioned SSD:** $0.125 per GB/month, $0.065 per IOPS/month
AWS EFS	- 3GB/s baseline performance - Up to 10GB/s - Up to 7K IOPS	- No publicly available SLA - Up to 1,000 concurrent EC2 instances - Accessible from any AZ or region	- IAM user-based authentication - Security groups	- 16TB per volume - 52TB maximum for individual files	- **Standard storage:** $0.30-$0.39 per GB-month depending on region - **Infrequent storage:** $0.025-$0.03 per GB-month - **Provisioned throughput:** $6 per MB/s-month

If you need help deciding which technology is the best fit for your unique business challenges and goals, I would suggest you to take our training program for **AWS Solutions Architect.**