AWS Elastic File System(EFS)

AWS offers a wide range of storage services that can be provisioned depending on your project requirements and use cases.

AWS storage services have different provisions for highly confidential data, frequently accessed data, and the not so frequently accessed data.

Amazon's Elastic File System (EFS) is a scalable storage solution that can be used for general purpose workloads. An EFS can be attached to multiple Amazon Web Services (AWS) compute instances and on-premises servers, providing a common resource for applications and data storage in many different environments.

Amazon states that a single EFS can be simultaneously connected to thousands of Elastic Compute Cloud (EC2) instances or on-premise resources, allowing you to share EFS data with as many resources as needed.

Different Storage Classes in AWS EFS:

Standard storage class:

- This is the default storage class for EFS.
- The user is only charged for the amount of storage used.
- This is recommended for storing frequently accessed files.

Infrequently Accessed storage class(One Zone):

- Cheaper storage space.
- Recommended for rarely accessed files.
- Increased latency when reading or writing files.
- The user is charged not only for the storage of files but also charged for read and write operations.

Different Performance Modes in EFS:

General-purpose:

- Offers low latency.
- Supports a maximum of 7000 IOPS.

- As a cloudwatch metric, you can view the amount of IOPS your architecture uses and can switch to Max IOPS if required.

Max I/O:

- This is recommended when EFS needs over 7000 IOPS
- Theoretically, this mode has an unlimited I/O speed.

Advantages to using an EFS:

- An Amazon EFS is elastic. That means its storage capacity can be automatically scaled up (add more storage) or scaled down (shrink storage capacity) as folders and files are added to or removed from the system.
- This is a major advantage over traditional storage solutions—you can add or remove capacity without disrupting users or applications.
- Importantly, EFS storage is permanent. When attached to an AWS compute instance, data will not disappear when that instance is relaunched.

Disadvantages to using an EFS:

Amazon EFSs do have a couple limitations:

- **No Windows instances.** Amazon EFSs are not supported on AWS Windows EC2 instances. EFS volumes can only be used with non-Windows instances, such as Linux, that support NFS volumes.
- **No system boot volumes.**
- AWS EC2 instances must use Elastic Block Store (EBS) volumes for booting their systems. EBS volumes are like EFS volumes with one exception. An EBS volume can only be connected to one EC2 instance or server, while EFS volumes can be connected to several EC2 instances and on-premises resources.

Use cases for EFS volumes:

An EFS is suitable for the following use cases:

- Web serving and content management
- Enterprise application usage
- Media and entertainment
- Shared and home directories
- Database backups

- Developer and application tools
- Container storage
- Big data analytics
- Other applications where you need to connect a common data source to a single server or multiple servers

Limitations to consider when using AWS Elastic File System (EFS):

1. EFS only supports the Network File System (NFS) protocol, so it can only be mounted and accessed by devices that support NFS.
2. EFS does not support file locking, so it is not suitable for applications that require file locking for concurrent access.
3. EFS does not support hard links or symbolic links.
4. EFS has a maximum file size of 47.9 TB.
5. EFS has a maximum throughput of 1000 MB/s per file system, and a maximum of 16,000 IOPS per file system.
6. EFS has a maximum number of files and directories that can be created within a single file system, which is determined by the size of the file system. For example, a 1 TB file system can support up to about 20 million files and directories.
7. EFS is only available in certain regions, and it is not possible to migrate data between regions.