## Your goals

* Understand what AWS Elastic Block Storage is used for, know it’s volume types
* Explain EBS encryption, multi-attach, migration, monitoring and snapshotting, lifecycle manager
* Understand AWS EFS and its storage classes
* Know AWS EFS/EFx features and use-cases
* Know what AWS S3 is, its tiers, what bucket and object are
* Explain S3 replication, website hosting, ACL, versioning
* Understand S3 Security

Diagram

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We recommend Amazon EBS for data that must be quickly accessible and requires long-term persistence. EBS volumes are particularly well-suited for use as the primary storage for file systems, databases, or for any applications that require fine granular updates and access to raw, unformatted, block-level storage. Amazon EBS is well suited to both database-style applications that rely on random reads and writes, and to throughput-intensive applications that perform long, continuous reads and writes.

### Some of EFS’ key features include:

* **Shared Storage**  
  Files are accessible from AWS services as well as from on-premise. They can be simultaneously accessed by up to a thousand EC2 instances within the cloud or via VPN or AWS Direct Connect, making EFS good for hybrid solutions. File access is possible across multiple AWS Availability Zones (AZs) and Regions, for easier collaboration and global remote work.
* **Scalable Performance**  
  EFS is designed for low latency with IOPS and throughput that scale with usage and the number of attached instances, meaning that as storage size grows, performance increases. At peak performance, it offers 10 GB/sec throughput and 500k IOPS. EFS scales automatically as data is moved in or out, minimizing fears of running out of space or paying for storage you aren’t using. Learn more about how file sharing impacts cloud scalability and agility.
* **Secure and Compliant**  
  EFS allows multiple layers of security and relies on your existing security infrastructure. It can be used with Amazon's Identity and Access Management (IAM) roles as well as VPC security groups and allows you to define individual file permissions using POSIX. EFS has built-in compliance with common regulatory standards, including PCI DSS, HIPAA, and SOC with the ability to meet others if necessary. Learn more about best practices for secure cloud file sharing.

### 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. Amazon EFS volumes also cannot be used for 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.

**Don’t Run Applications from EFS**If you plan to run and host applications from EFS, Elastic Block Storage (EBS) is a better option for you. EFS is not meant for the large file read volumes or fast speed that tasks like managing codebases or application deployment require, so you should not try to use it for these tasks. Instead, stick to tools that deploy code to local filesystems or containers.

Graphical user interface, text, application

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Amazon FSx for Windows File Server provides fully managed Microsoft Windows file servers, backed by a fully native Windows file system. Amazon FSx for Windows File Server has the features, performance, and compatibility to easily lift and shift enterprise applications to the AWS Cloud.

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- Amazon FSx. It's a file system for the cloud. And what it does, is it allows you to implement different types of file systems that you might need such as Windows file systems and even the open file system called Lustre, which is a high performance file system. It's all about performance efficiency. So this file system is a solution to allow you to create things like Windows server shares without actually having to have a Windows server to put the share on. Or you can create folders that you store graphics files in that you're going to do intensive processing against so that you can get good performance. So those are just a couple of examples of what you can do with it, but the concept of FSx is really important to understand.

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Description automatically generatedso the AWS Storage Gateway is basically a software appliance that creates the gateway on the customer's location. Now, let me explain what this software appliance concept is. What we're really dealing with here is a virtual machine. So you can run it in either VMware ESX, or you can run it in Hyper-V, whichever virtualization solution you have locally. So if you have Windows servers, you have the ability to run Hyper-V. If you have a VMware architecture already in place, of course you have that. So you can run this virtual machine image, which is itself the actual storage gateway. So when we talk about a software appliance, that's what we're talking about. It's not a piece of hardware you get from AWS, it's just a virtual machine image that you download from them, and then you install it on your local network. You activate it to be able to connect to the Amazon cloud

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Since these tapes are virtual, they are objects and stored in an S3 bucket.

An ENI is a virtual network interface available for EC2 instances running inside a VPC.

Why is EFS unique among all the different file systems? EFS can have multiple instances accessing it at the same time because of its shareable nature.

You will give the vault a name only after you take another step first.

Which command used in Linux will install the Network File System (NFS) on your on-premises server? sudo yum install -y nfs-utils

Where are virtual tape libraries (VTLs) stored? Since these tapes are virtual, they are objects and stored in an S3 bucket.