Track 5|Session 5

AWS 檔案儲存服務概觀

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Agenda

- Introduction to AWS file storage
- What are Amazon Elastic File System (Amazon EFS) and Amazon FSx for Windows File Server?
- Key features of Amazon EFS and Amazon FSx
- Deep dive on Amazon EFS and Amazon FSx

Your digital transformation is a journey

Infrastructure

Improve fundamentals: security, availability, performance, and cost

Architecture

Increase agility and ability to innovate

Business

Maximize your business results

Security	Availability	Modernization	Data lake	Analytics	Real time
Performance	Cost optimization	Data services	Edge	AI/ML	Vertical solutions

AWS meets you where you are today—and tomorrow

Fully managed cloud file systems

AWS provides file system options that help you easily address the diverse needs of your file-based applications and workloads

File systems for business workloads

Amazon
EFS

Fully managed cloud-native file system for Linux-based applications

Linux-based workloads

Amazon FSx for
Windows File Server

FSx

Fully managed file storage for Windows

Windows-based workloads

File system for compute-intensive workloads

Amazon FSx
for Lustre

FSx

Fully managed Lustre file system for compute-intensive workloads

Compute-intensive workloads

What “fully managed” means

What you no longer need to do

Manage hardware

Plan capacity

Procure and purchase hardware

Set up storage servers and volumes

Detect and address hardware failures

Invest capital expenditure (capex)

Manage software

Install and configure server software

Set up and configure file systems

Apply Windows updates

Manage software licenses

Manage backups

Monitor security

Amazon EFS: Network file system (NFS) evolved

Amazon EFS is a fully managed file system that is…

Cloud native

Highly reliable

Cost optimized


Cloud native


Highly reliable

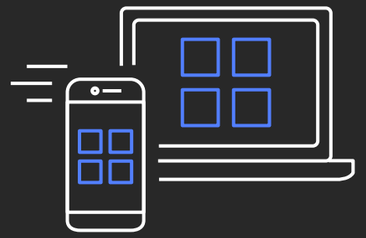

Cost optimized

Use cases for Amazon EFS

Home directories

Container storage

Application test and development



Lift-and-shift enterprise applications

Web serving

Content management

Database backups

Analytics

Media workflows

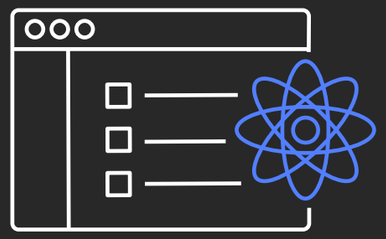
Metadata-intensive jobs

Scale-out jobs

Low-latency and serial I/O

High-throughput and parallel I/O

What is Amazon FSx for Windows File Server?



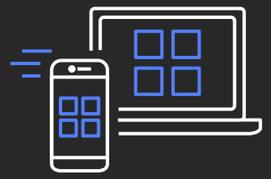
Fully managed
Windows file storage

Broadly
accessible

Amazon FSx for Windows File Server use cases

NAS lift-and-shift

Home directories



Line-of-business applications

Web serving and content management

Software development environments

Backup and disaster recovery

High availability SQL Server databases

Key features

New: Amazon ECS and AWS Fargate support for Amazon EFS

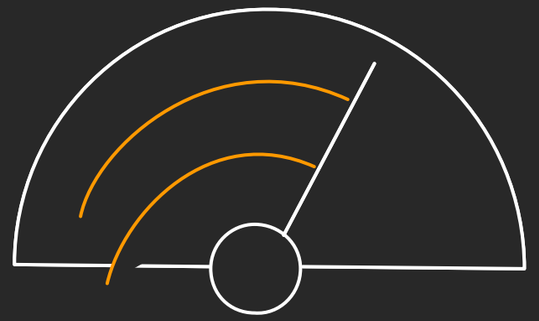
Simple: All Amazon EFS configuration is inside the Amazon ECS task definition, and connectivity is handled behind the scenes

Serverless: AWS Fargate tasks can now leverage shared persistent storage

Secure: Access to file systems can be authorized by IAM, and access to data can be controlled by Amazon EFS access points

Amazon EFS performance increase

General purpose (GP) mode file systems



400% increase – 35,000 read operations per second

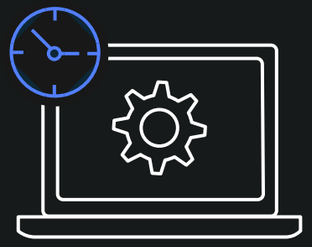
Ideal for ERP, CI/CD, and EDI workloads

Amazon EFS Infrequent Access (IA)

Amazon EFS IA: Storage class for infrequently accessed files for an effective price as low as **$0.08/GB per month***

No changes to existing applications using Amazon EFS

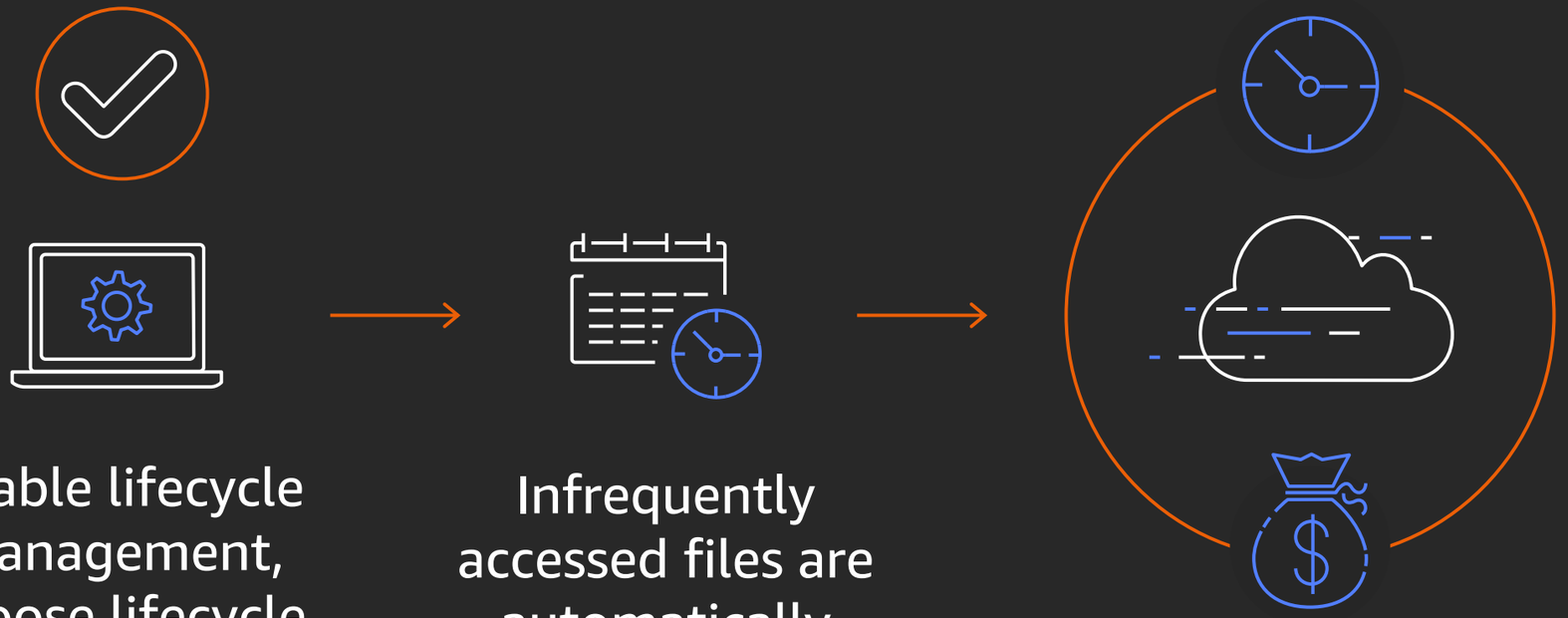
Cost savings up to 92%



Automated lifecycle management

*Pricing in the US East (N. Virginia) Region

Enabling Amazon EFS lifecycle management



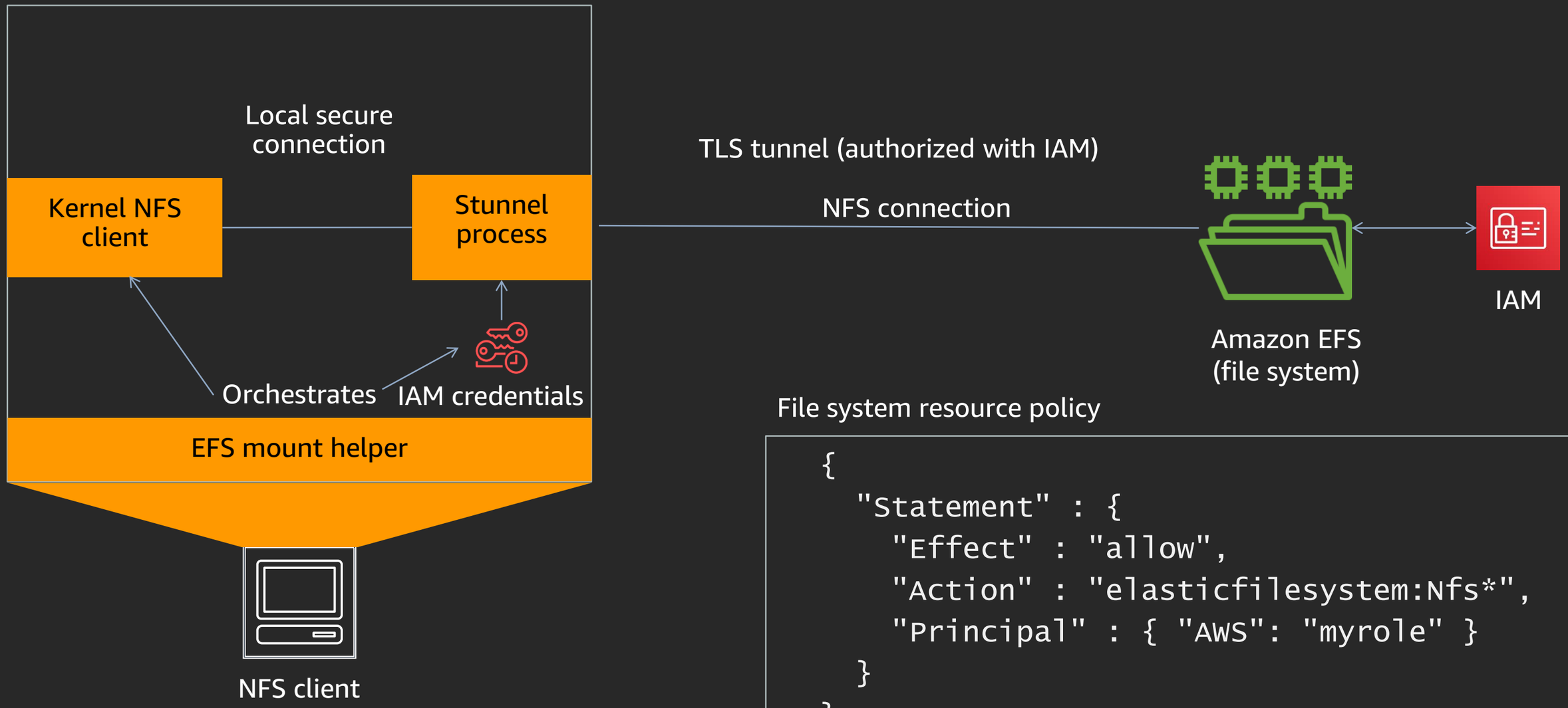
Enable lifecycle management, choose lifecycle policy

Infrequently accessed files are automatically moved to Amazon EFS IA

All Amazon EFS features are supported with Amazon EFS IA

Lifecycle policies can be configured to 7, 14, 30, 60, or 90 days since last access

Restricting EFS access using an IAM resource policy



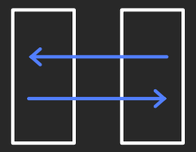
File system resource policy

```
{
  "Statement" : {
    "Effect" : "allow",
    "Action" : "elasticfilesystem:Nfs*",
    "Principal" : { "AWS": "myrole" }
  }
}
```

FSx for Windows File Server deployment options

Single-AZ

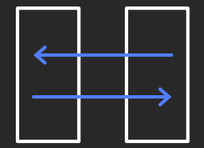
Continually monitors and addresses hardware failures



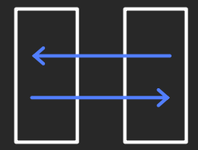
Replicates data within an Availability Zone

Multi-AZ

Continually monitors and addresses hardware failures



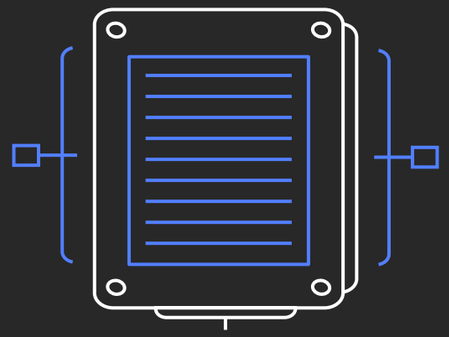
Replicates data within an Availability Zone



Replicates data across Availability Zones

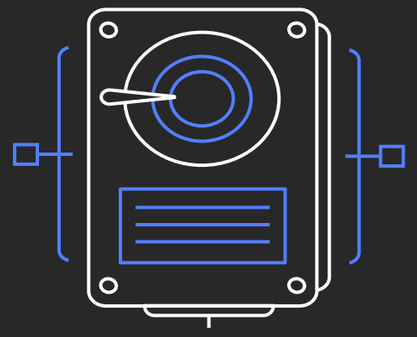
Automatically fails over across Availability Zones

FSx for Windows File Server storage options



SSD

Highest performance



HDD

Lowest cost

Flexibility to choose throughput independent of file system size

Effective storage cost with data deduplication

Per GB-month

	Single-AZ	Multi-AZ
SSD-based storage	6.5 cents	11.5 cents
HDD-based storage	0.65 cents	1.25 cents

Typical savings from deduplication for general file shares is 50%–60%

Example TCO

Storage requirements

- 10 TB of storage
- With deduplication, 50% of storage needed
- Deployment type: Multi-AZ
- Storage type: HDD

Throughput requirements

16 MB/s sustained, 100 MB/s burst

Backup requirements

Expected backup storage usage:
1x storage capacity

File system component	Total cost
Storage (Multi-AZ, HDD, 5 TB at $0.025/GB-mo)	$128
Throughput capacity (16 MB/s at $4.50/MBps-mo)	$72
Total cost (excluding backups)	$200/month (or $0.02/GB-mo)
Backups (5 TB at $0.05/GB-mo)	$256
Total cost (including backups)	$456/month (or $0.04/GB-mo)

Data deduplication

Large Windows-based datasets often contain significant duplication, which increases storage costs

User shares (home directories)
Multiple users have many copies or versions of a file

Software development shares
Most portions of binaries remain unchanged from build to build

Use data deduplication to reduce costs associated with duplicated data

Scenario	Content	Typical space savings
User documents	Office documents, photos, music, and videos	30%–50%
Software development shares	Software binaries, build files, and program symbols	70%–80%
General file shares	Mix of the above	50%–60%

Deep dive on AWS file solutions

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Amazon EFS: High availability for containers

Examples

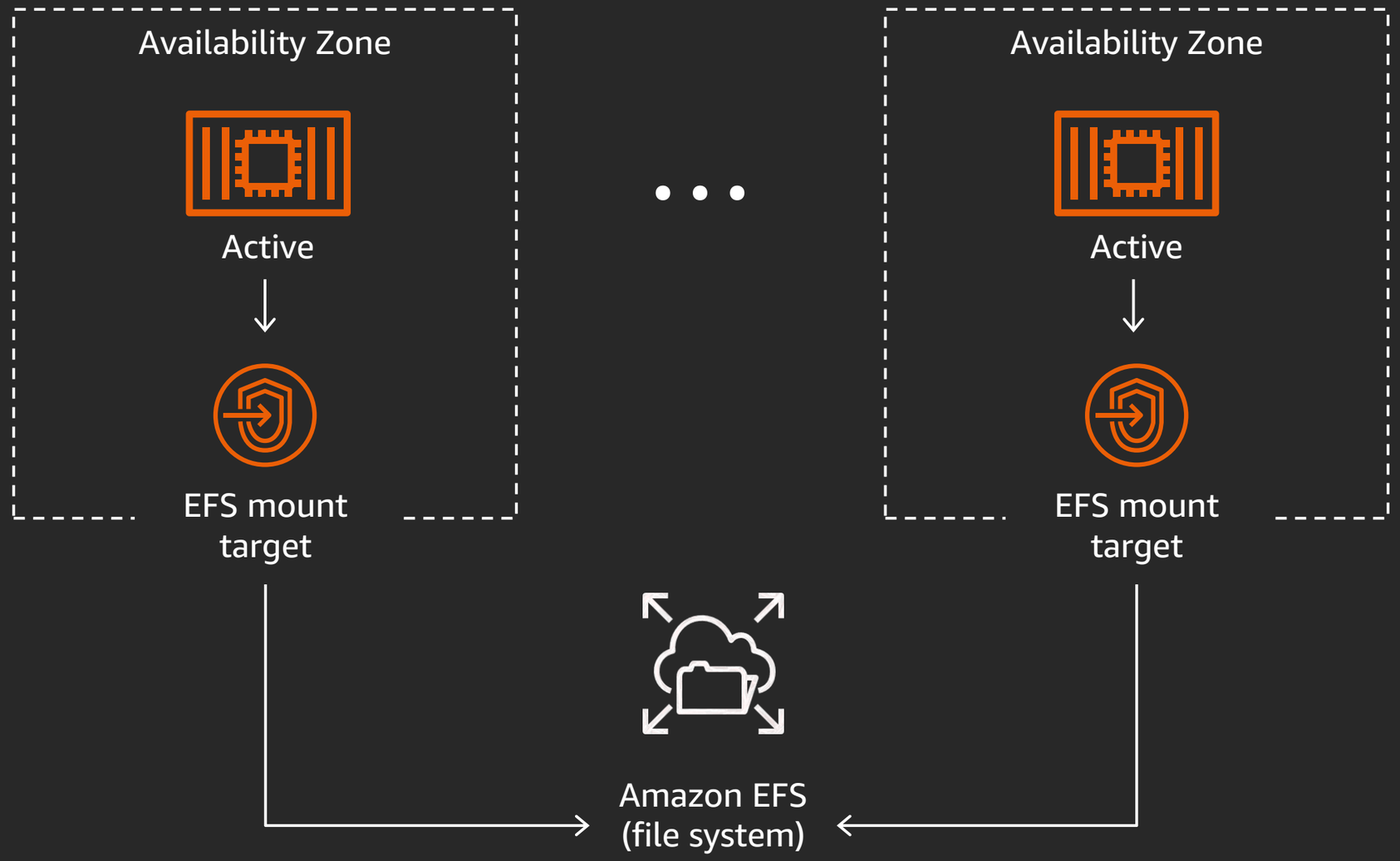
Jira

Artifactory

Git

Jupyter

JupyterHub



https://aws.amazon.com/blogs/storage/best-practices-for-using-amazon-efs-for-container-storage/

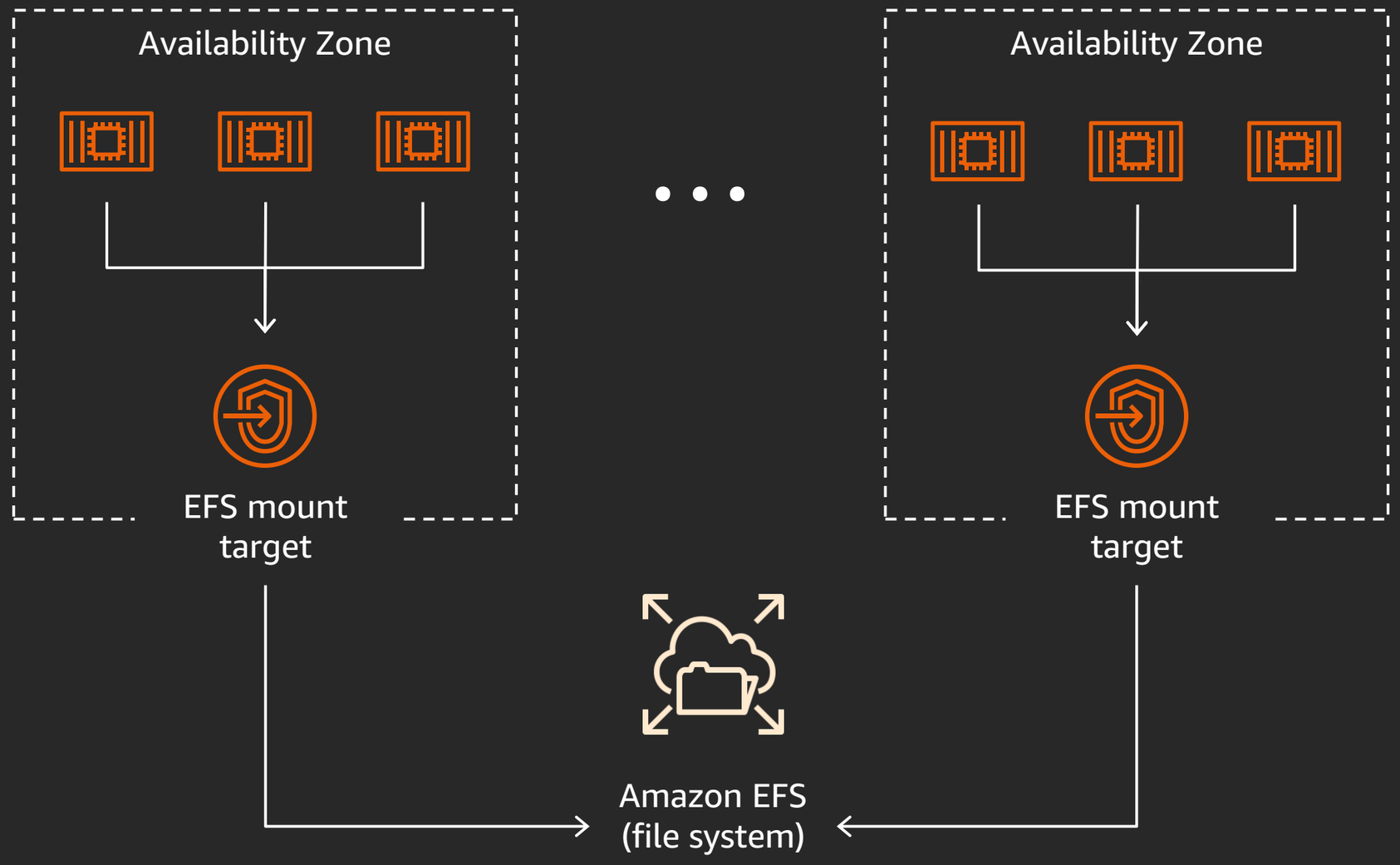
Shared storage for NFS-based scale-out applications

Examples

Machine learning training (MXNet, TensorFlow)

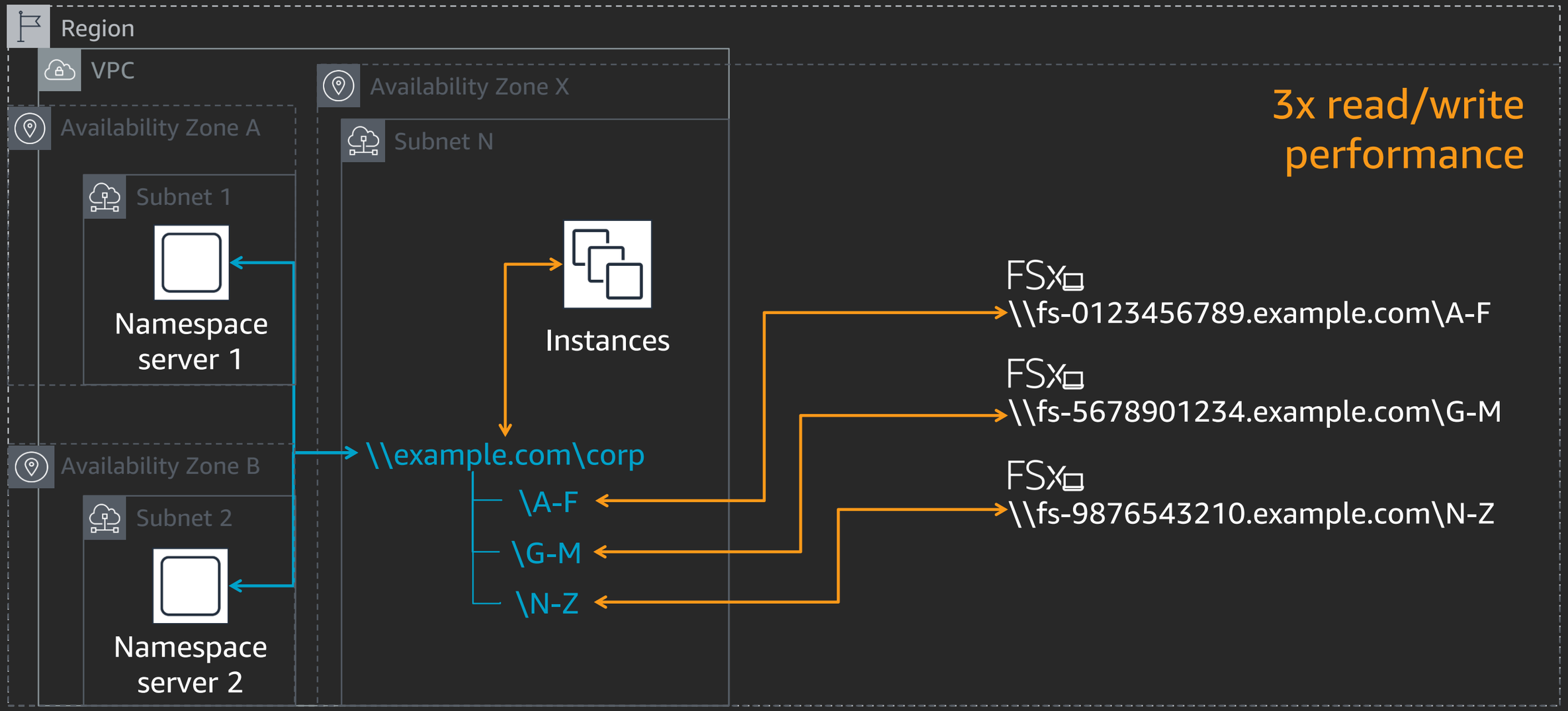
Analytics

Containerized applications



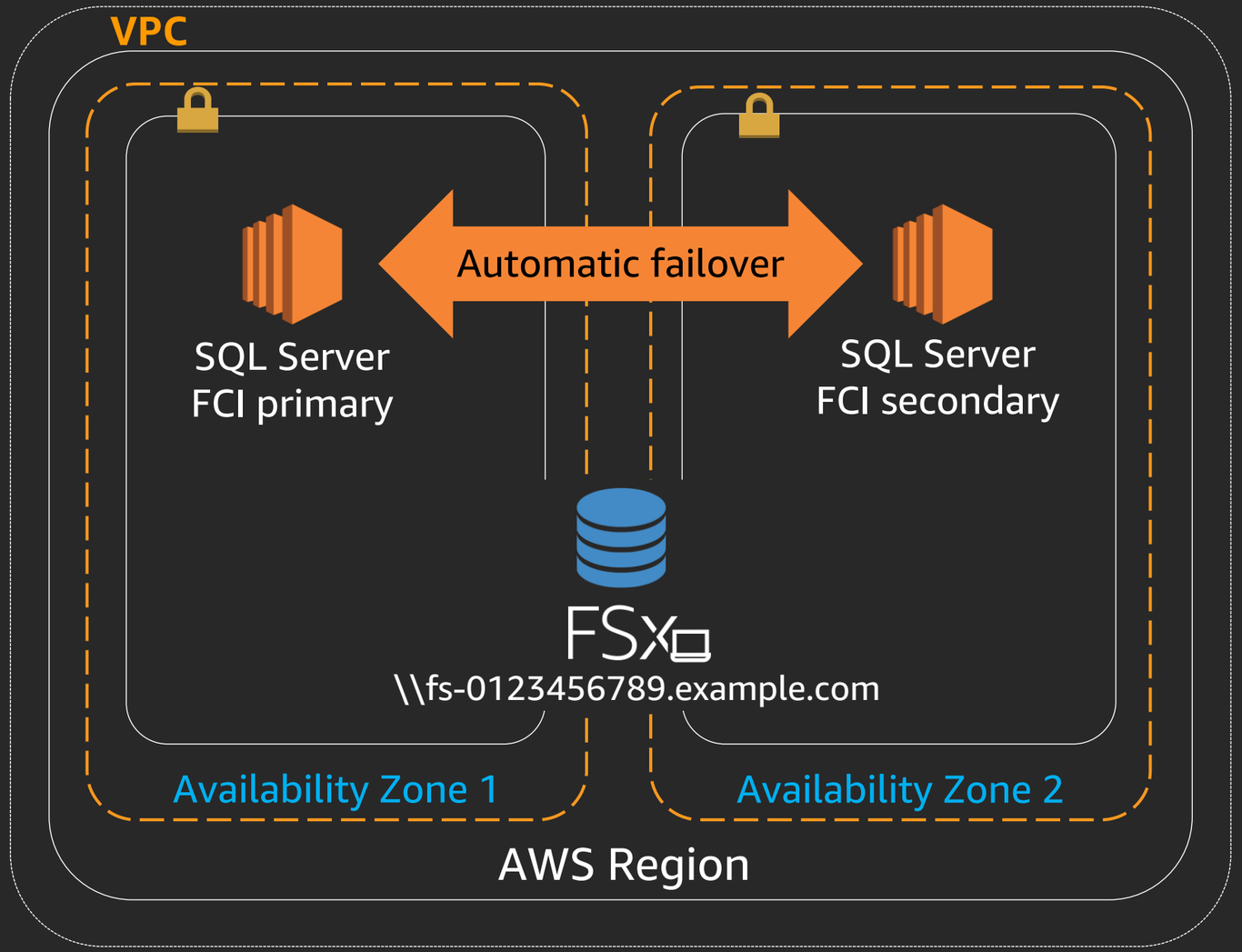
Scaling out storage & performance with DFSN for Windows workloads

Demo: https://www.youtube.com/watch?v=s482kj_xMeE



Amazon FSx: Support for SQL Server HA deployments

- Supports SMB transparent failover (aka continuously available shares)
- Use Amazon FSx to store databases and logs for SQL Server Always On Failover Cluster Instance (FCI) deployments
- No need to deploy, manage, and pay license fees for storage replication software solutions



https://docs.aws.amazon.com/fsx/latest/WindowsGuide/sql-server.html

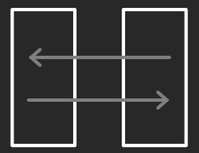
AWS DataSync

Easily and efficiently transfer hundreds of terabytes and millions of files

Fast
Parallelized transfer, 10 Gbps per agent, scale-out with multiple agents

Automated
No scripts; does validation, filtering, throttling, scheduling

One-time migrations or ongoing transfers



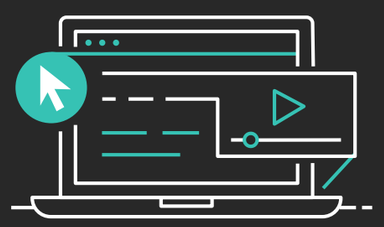
Flexible
Multiple protocols (NFS, SMB) and destinations (FSx for Windows File Server, Amazon EFS, Amazon S3)

AWS integrated

Secure and compliant

Learn storage with AWS Training and Certification

Resources created by the experts at AWS to help you build cloud storage skills



45+ free digital courses cover topics related to cloud storage, including

- Amazon S3
- AWS Storage Gateway
- Amazon S3 Glacier
- Amazon EFS
- Amazon EBS

Classroom offerings, such as **Architecting on AWS**, feature AWS expert instructors and hands-on activities

Visit the storage learning path at https://aws.training/storage

Thank you!

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