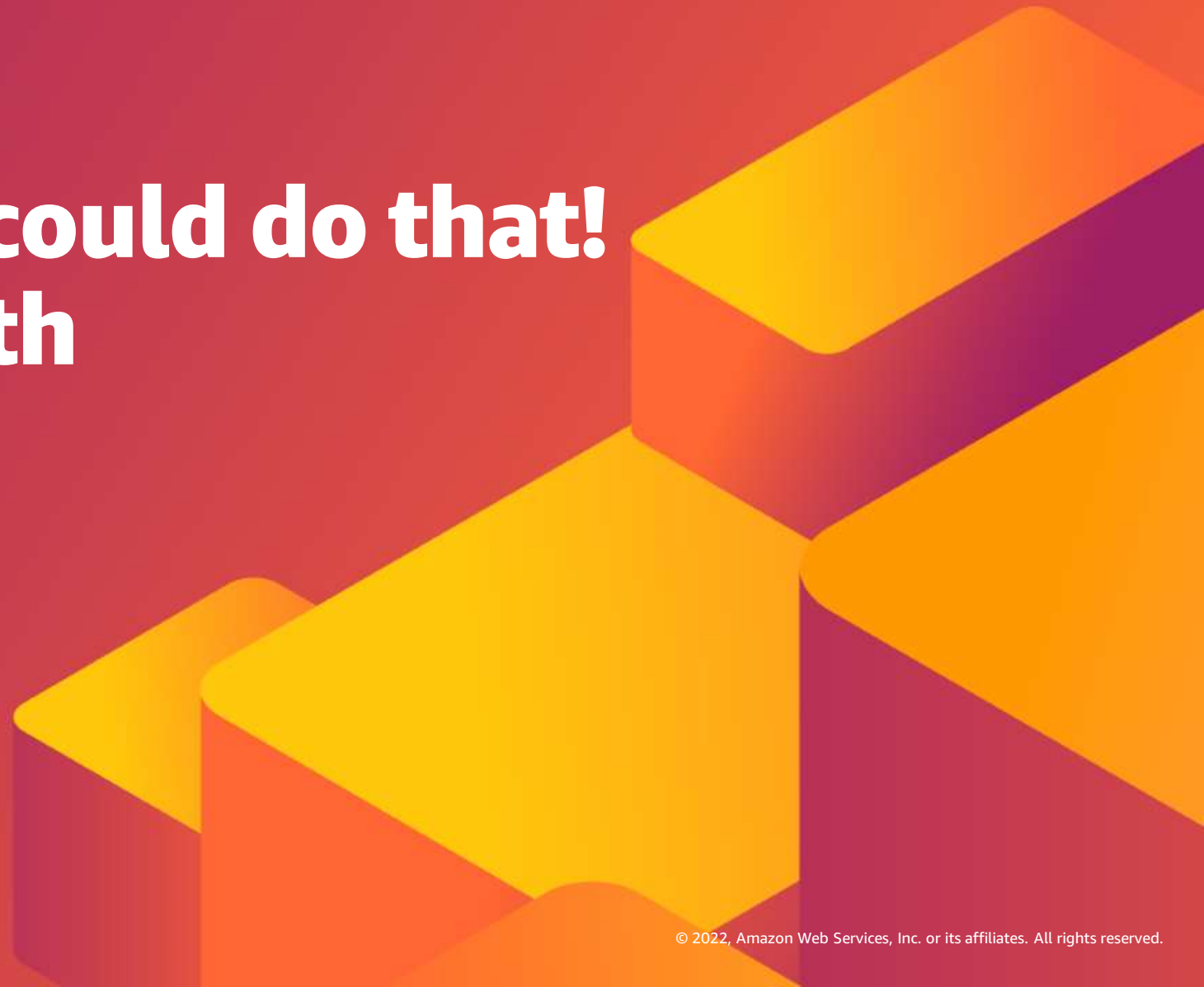
AWS Builders Online Series

I didn't know you could do that! Getting started with AWS Storage

Naim Mucaj
Senior Solutions Architect
Amazon Web Services



What are customers building?

Backup & Restore

Non-disruptive

Easy place to start

Integrated with all major vendors

Archive & Compliance

Media workflows

Tape replacement

Public Sector, FinServ, Healthcare/Life Sciences

Home Directories

Simple to move

Less latency sensitive

Significant cost savings

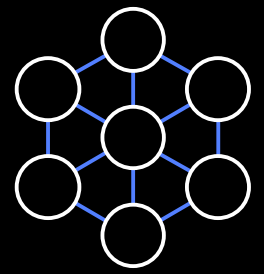
Data Lakes

Variety of analytics tools

Foundation for AI/ML

Built for streaming data

Data visualization



Modern Apps

Persistent storage for

Containers

Serverless

Business-Critical Applications

Integrated with major vendors

Fully managed infrastructure

Lift-and-shift migrations

Source: IDC Market Spotlight, Sponsored by AWS,
"Organizations Rely on Cloud Storage to Optimize Cost, Increase Agility, and Drive Innovation ," Doc. #USUS48291421, October 2021

Moderna delivers mRNA drugs faster and at lower cost using AWS

Challenge

To maximize the potential of mRNA-based drugs, Moderna needed IT infrastructure that supports powerful, scalable computing as well as automation and enterprise-wide data integration.

Solution

Moderna hosts its proprietary Drug Design Studio in the AWS Cloud and uses Amazon Elastic Compute Cloud (Amazon EC2), Amazon Relational Database Service (Amazon RDS), and Amazon Redshift for computing, storage, and simple, cost-effective data warehousing.

Benefits

Achieved uncommon speed and volume of preclinical drug development

Avoided millions in on-premises data-center costs

Satisfied complex regulatory requirements

> "With AWS computational and integration capabilities, combined with our proprietary Drug Design Studio, our scientists can have an idea for a unique protein, order it online that day, and be running preclinical experiments on it in less than a month."

Marcello Damiani, Chief Digital Officer, Moderna Therapeutics

https://aws.amazon.com/solutions/case-studies/moderna-therapeutics/

moderna

Company:	Moderna Therapeutics
Industry:	Biotechnology
Country:	United States
Employees:	1,800+ (As of June 2021)
Website:	www.modernatx.com

About Moderna Therapeutics

Moderna Therapeutics, which is based in Cambridge, Massachusetts and employs about 1,800+ people, was founded to deliver on the promise of messenger RNA (mRNA) science to create novel medicines for unmet patient needs.

aws

Data Services

AWS Backup

AWS Transfer Family

Core services

Object

Amazon Simple Storage Service (Amazon S3) and S3 Glacier

Block

Amazon Elastic Block Store (Amazon EBS)

File

FSx

Amazon FSx Family

Amazon Elastic File System (Amazon EFS)

Hybrid/Edge Storage

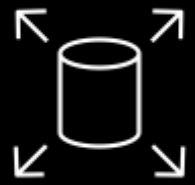
AWS DataSync

AWS Storage Gateway

Data Movement Services

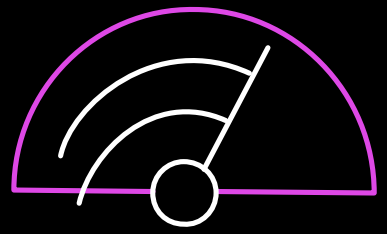
AWS Snow Family

Block



Amazon Elastic Block Store (Amazon EBS)

Why do customers use Amazon EBS?

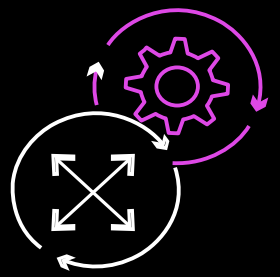


High performance

Up to 64,000 IOPS and 1,000 MiB/s throughput with single-digit millisecond latency

Reliability

99.999% availability and between 0.001% and 0.02% AFR



Scalability

Use a single gigabyte or scale up to petabytes of data for dynamic workloads such as stateful containers

Easy to use

Easily increase capacity, performance, switch volume types, and manage backups

Security

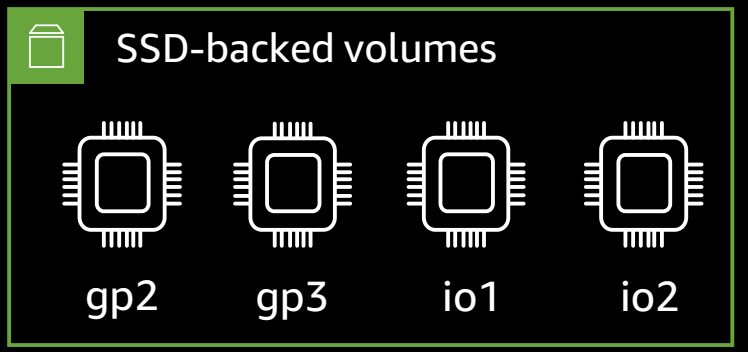
Encrypt all volumes using default encryption keys or custom managed keys

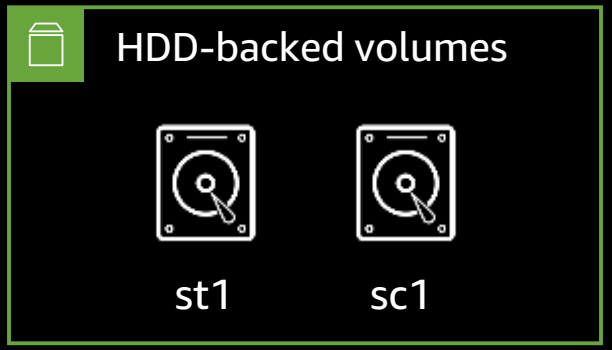
Cost-effective

Pay as low as $0.025/GB-month for HDD and $0.08/GB-month for SSD

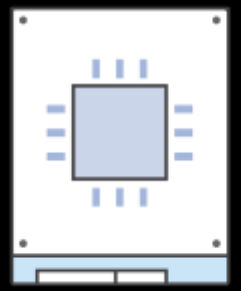
What is Amazon Elastic Block Store (EBS)?

- Block storage **volumes** as a service attached to Amazon EC2 instances
- **Flexible** storage and performance for dynamic workloads such as stateful containers
- Create, attach, and manage volumes through **API**, **SDK**, or **AWS console**
- Point-in-time **snapshots** and tools to automate backup and retention via policies

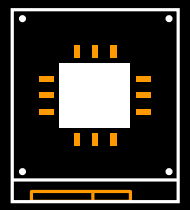




Select the right volume for your workload

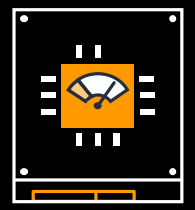


SSD

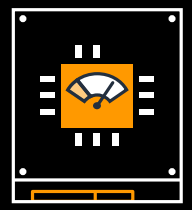


gp3

General-purpose SSD

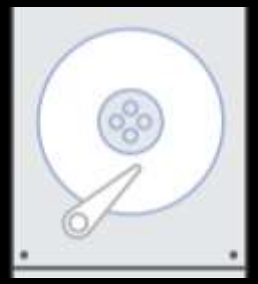


io2



Io2 Block Express

Provisioned IOPS SSD



HDD

st1

Throughput-optimized HDD

sc1

Cold HDD

Protecting Amazon EBS volumes

Amazon EBS snapshots

What are Amazon EBS snapshots

Point-in-time copy of Amazon EBS volumes

Incremental copies
Only changed blocks are copied

Stored in Amazon S3
11x9's durability

Crash consistent

Contains all data necessary to recover a volume

Snapshot use-cases

Backup data on Amazon EBS volumes

Meet RPO and RTO SLA objectives

Copy volumes within or across Availability Zones for redundancy

Copy volumes to another region for Disaster Recovery

Re-deploy production data for test/dev

aws

Did you know ?

low-cost
tier for archiving
EBS snapshots

You can cost optimize by tiering your EBS Snapshots into a low cost tier (EBS Snapshots Archive)

Reduce risk of data loss
from accidental
deletions

Automatically keep accidentally deleted snapshots for a retention period that you specify (Snapshots Recycle Bin)

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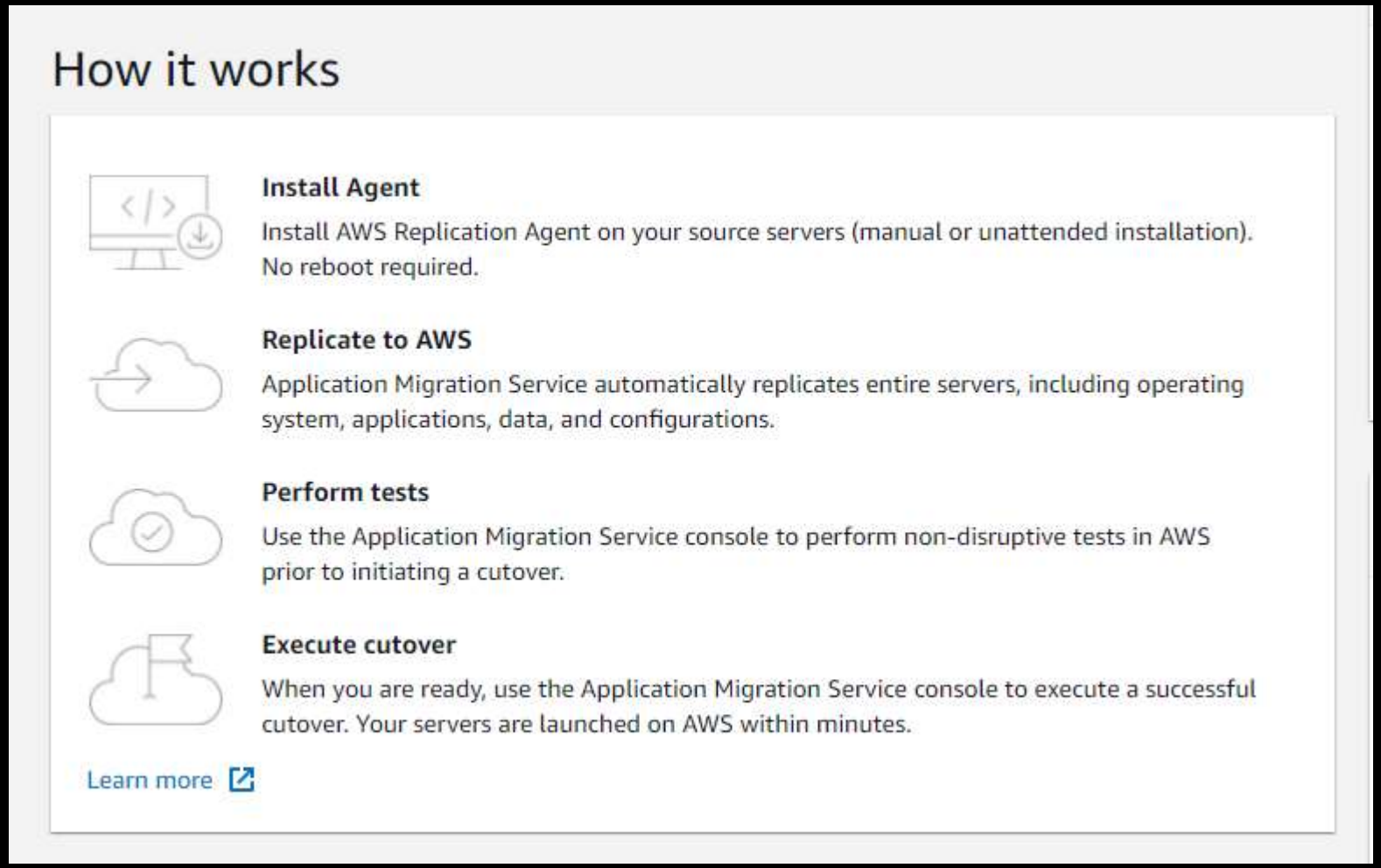
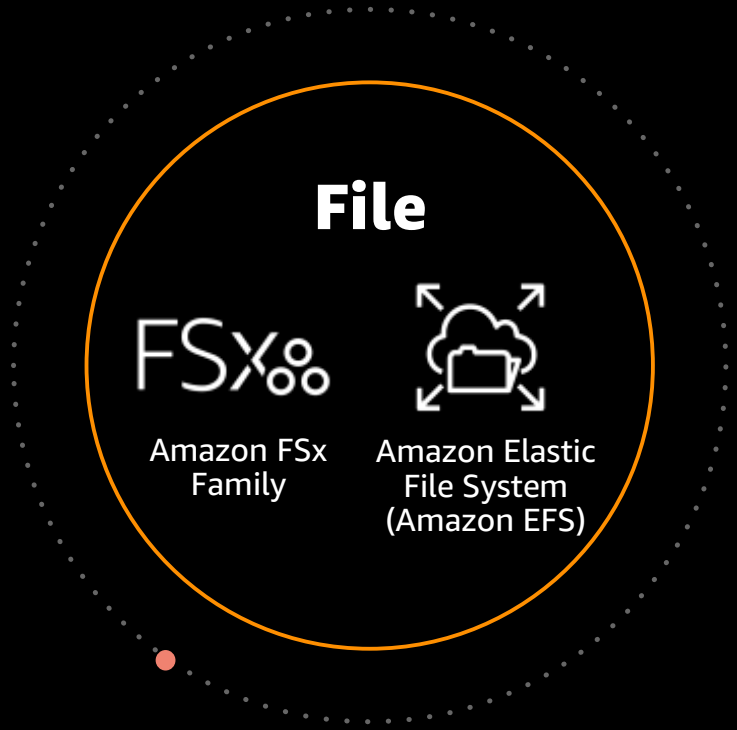
Migrate your on-premises machines to Amazon EC2 with AWS Application Migration Service (AWS MGN)



- Automate and orchestrate
- Lift-and-shift your machines
- Agent based (no reboot)
- Test cutovers

(formerly known as CloudEndure)

AWS Application Migration Service (AWS MGN)

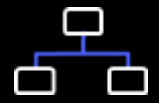

File
FSx
Amazon FSx Family
Amazon Elastic File System (Amazon EFS)

Why do customers use file storage?

File storage provides . . .

Simple experience

Shared access



High performance

Rich data capabilities

File storage is commonly used with **existing applications**…

…and to support **net-new workloads**

File Systems for your workloads…

Amazon FSx for
Windows File Server

Amazon FSx for
NetApp ONTAP

Amazon FSx for
Lustre

Amazon FSx for
OpenZFS

Amazon EFS

Amazon FSx for NetApp ONTAP

The only complete, fully managed NetApp file system in the cloud

Amazon FSx for
NetApp ONTAP

Migrate or extend NetApp ONTAP workloads to AWS

Leverage ONTAP's data management capabilities and multi-protocol support

Optimize cost with automatic tiering and built-in data compression and deduplication

aws

Move to the cloud application by application: Network Attached Storage (NAS) migration

Moving 1.3 PB NetApp on-premises medical imaging repository to **FSx for ONTAP**, reducing overhead

Moving patient administration applications to **FSx for Windows** for simplified management

NSW GOVERNMENT | eHealth

https://aws.amazon.com/fsx/netapp-ontap/customers/

aws

Amazon FSx for Windows File Server

Fully managed, highly reliable, and scalable SMB-accessible file storage built on Windows Server

Home directory

Content management

Virtual desktops

HA SQL Server databases

Fully managed, built on Windows Server

- No need to manage hardware infrastructure
- Feature parity with on-premises NAS

Flexible price and performance options

- SSD or HDD
- Single-AZ or Multi-AZ
- Data deduplication and compression
- Effective rates under 1 cent per GB-Mo

Easy migration to AWS

- SMB to SMB with AWS DataSync
- No need to re-platform or re-architect

aws

JOHN HOLLAND

John Holland Group actively migrated more than **90 key applications** to FSx for Windows File Server **within 48 hours**.

"Amazon FSx for Windows File Server **hasn't missed a beat**. The speed, the stability, and the ability to tune throughput speed and availability to our environment are quite positive for us."

Kier Morrison
GM of IT Operations

https://aws.amazon.com/solutions/case-studies/jhg-case-study/

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Amazon Elastic File System (Amazon EFS)

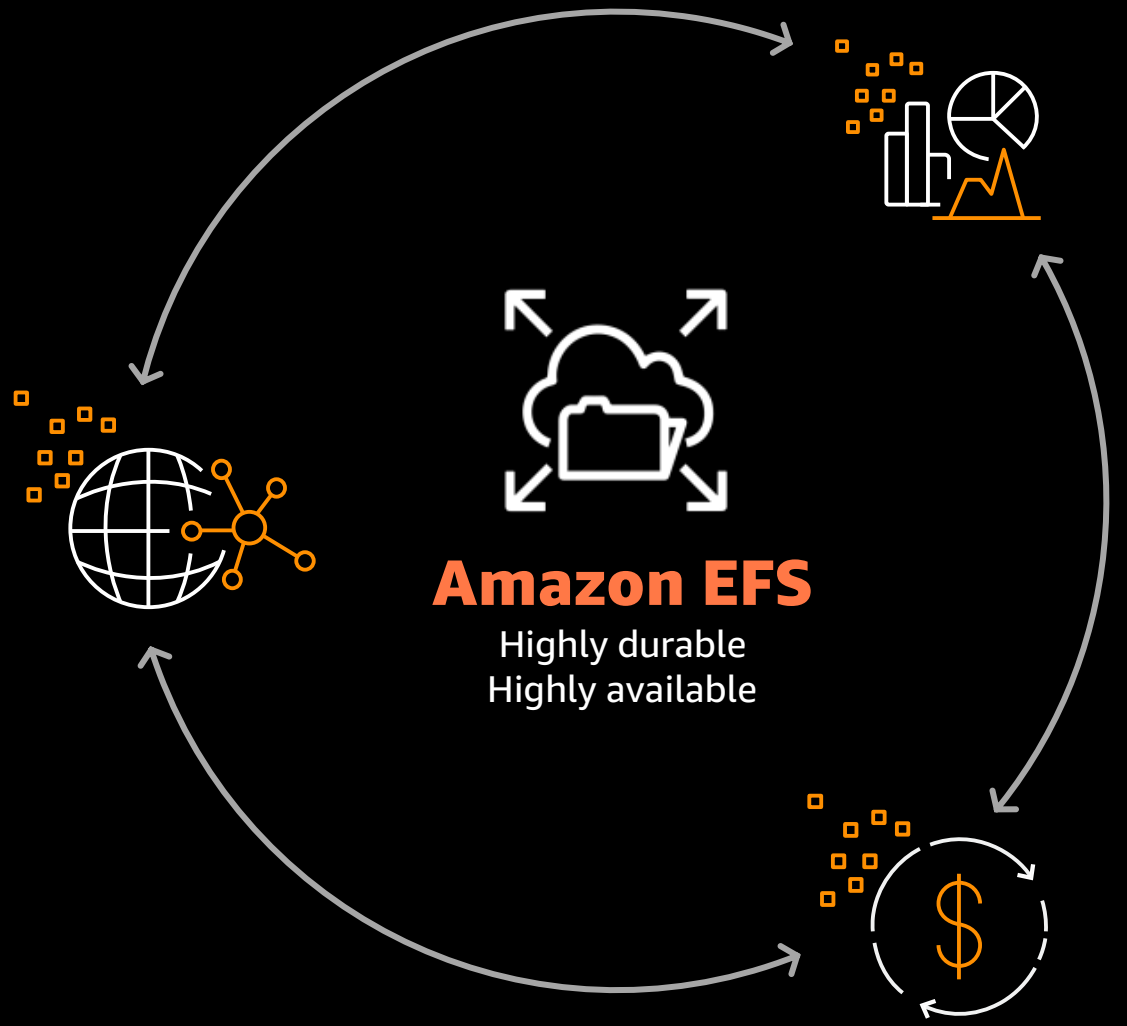
Simple, serverless, set-and-forget, CLOUD native, elastic file system for AWS compute

Cloud native

Built from ground up in the cloud to be simple at cloud-scale and be fully elastic and serverless

Secured and protected using cloud constructs like AWS IAM and AWS Backup

Consumable from any AWS computing model, supports tens of thousands of concurrent connections



Amazon EFS

Highly durable
Highly available

Performant

Latencies as low as 1 ms

Up to 500 K IOPS

Up to 10+ GB/s of throughput

Cost Optimized

Four storage classes with automatic lifecycle-based cost optimization

Blended storage cost:
$0.043 GB/month

aws

Some of the use cases of Amazon EFS

Designed to serve a vast majority of file-based workloads

Simplify and centralize DevOps

Web serving and content management

Data science & analytics

Media processing

Backup storage

Modern application development

Did you know ?

AWS
DataSync

easily lift and shift your data to FSx-Windows, FSx-Lustre and EFS with AWS DataSync Service

NetApp®

you can migrate your data with SnapMirror to FSx-NetApp ONTAP..

FSx N

aws


Object
Amazon Simple Storage Service
(Amazon S3) and S3 Glacier

How are customers using Amazon S3?

Compliance records

Analytics

Geospatial or lunar imagery

IoT sensor data

Medical images and records

Data lakes

Customer call-center records

Media master files

Digital record preservation

Home-recording video

Mobile sync and storage

Origin storage for CDN

Seismic and reservoir simulation data

Durable backups

Pharmaceutical study data

DNA sequences

Surveillance video/closed-circuit television

ML training data

Media assets

Financial transaction records

Website hosting

Log files

Meteorological and environmental research

User-generated content

Autonomous vehicle data

Oil and gas topography

TV TOKYO Corporation

Migrated 13PB TV video archive, largest archive size as a commercial broadcasting key station, to Amazon S3/S3 Glacier. Achieved a reduction of tens of millions of yen per year in direct costs and speedy utilization of existing content.

Challenge

- Increased procurement costs for archive media
- Reuse of video material becomes complicated
- Further promotion of content utilization

Solution

- Secure video data robustly and inexpensively
- Securely acquire data on a high-speed dedicated network
- Advanced technology for utilizing images such as AI

Benefits

- Media procurement costs can be reduced by tens of millions of yen / year
- Ensure line security and redundancy with Direct Connect
- Verify AI video analysis and consider in-house data linkage

> "For broadcasters dealing with high-volume video data, the cloud is a crucial technology and service that cannot be ignored. You might say the cloud was made for video. We have great expectations for AWS as a partner in creating new businesses amid a dramatically changing broadcasting environment."

Suguru Niinomi

Senior Managing Director CIO, Engineering, News, and Media Strategy, TV TOKYO Holdings Corporation

https://aws.amazon.com/solutions/case-studies/tv-tokyo-case-study/

Company:	TV TOKYO Corporation
Industry:	Media & Entertainment
Country:	Japan
Website:	www.tv-tokyo.co.jp

About TV TOKYO Corporation

TV TOKYO Corporation is the TV TOKYO Holdings' terrestrial television broadcaster. As a key station in the TXN network broadcasting in major metropolitan areas, TV TOKYO Corporation provides unique content with a focus on the economy, anime, and variety (and secondary rights to broadcast programming and other derived rights for broadcast).

Your choice of Amazon S3 storage classes


S3 Intelligent-Tiering


S3 Standard


S3 Standard-IA

New


S3 Glacier Instant Retrieval


S3 Glacier Flexible Retrieval (formerly S3 Glacier)


S3 Glacier Deep Archive


S3 One Zone-IA


S3 Outposts

AWS Region ≥ 3 Availability Zones

Changing access patterns	Frequently accessed data	Infrequently accessed data	Rarely accessed data	Archive data	Long term archive data
• Milliseconds access • No retrieval charge • **Archive Instant Access tier** New	• Milliseconds access • No retrieval charge	• Milliseconds access • Per-GB retrieval charge	• Milliseconds access • Per-GB retrieval charge	• Retrieval options from minutes to hours • **Free bulk retrievals** New	• Retrieval in hours

AWS AZ

Re-creatable, infrequently accessed data

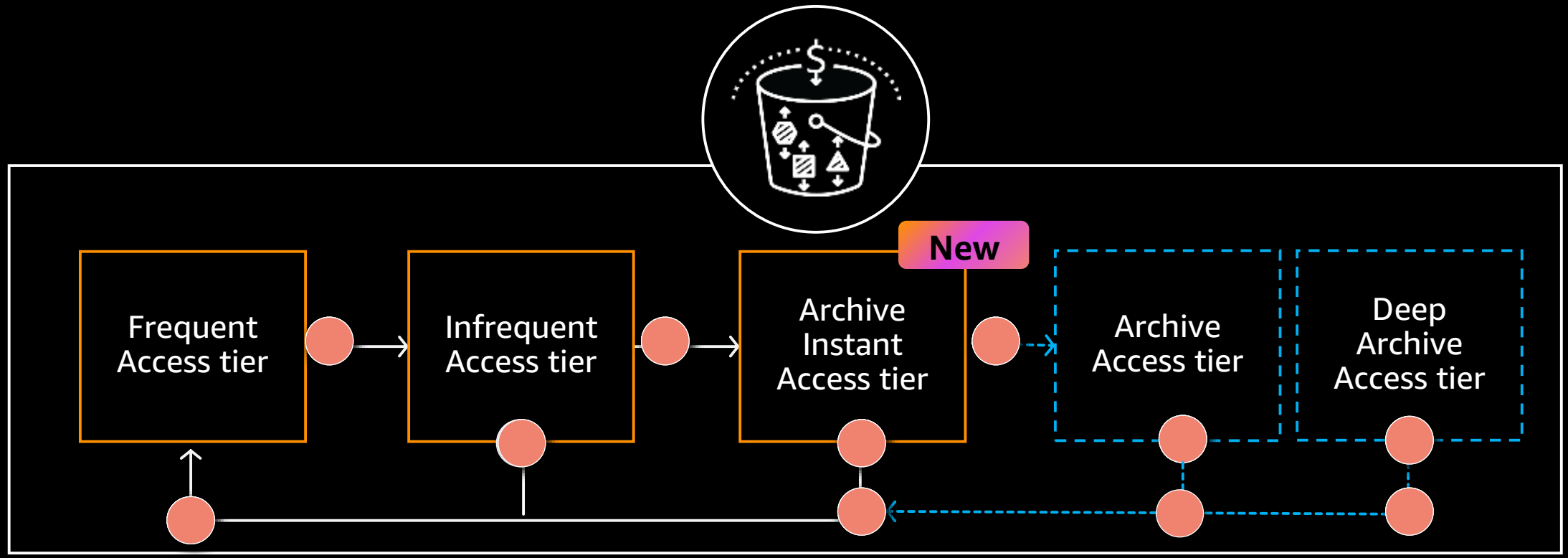
- Milliseconds access
- Per-GB retrieval charge

AWS Outposts

On-premises data

- Milliseconds access

Use S3 Intelligent-Tiering for data with unknown or changing access patterns



Milliseconds access (automatic)

Minutes to hours (Optional)

Lifecycle data with predictable access patterns

Amazon S3 Storage Lens

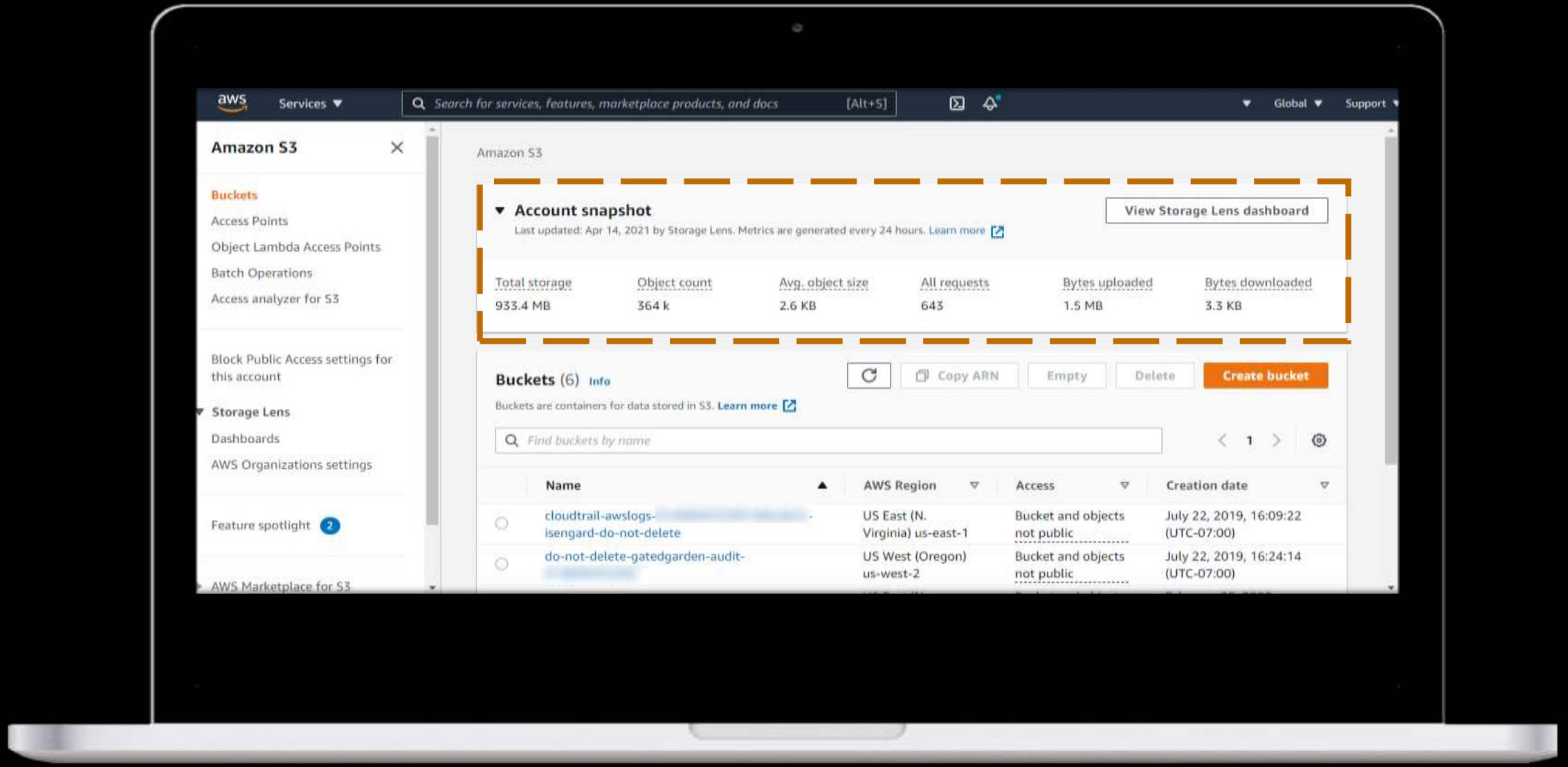
Metrics – 15 usage metrics, 14 activity metrics (29 total)

Aggregation levels – organization, account, Region, storage class, bucket, and prefix

Visualization – interactive dashboard in the Amazon S3 console (export to Amazon S3 bucket also available)

Recommendations – metrics-driven contextual recommendations to highlight best practices

Amazon S3 Storage Lens



Did you know ?

AWS Snow Family

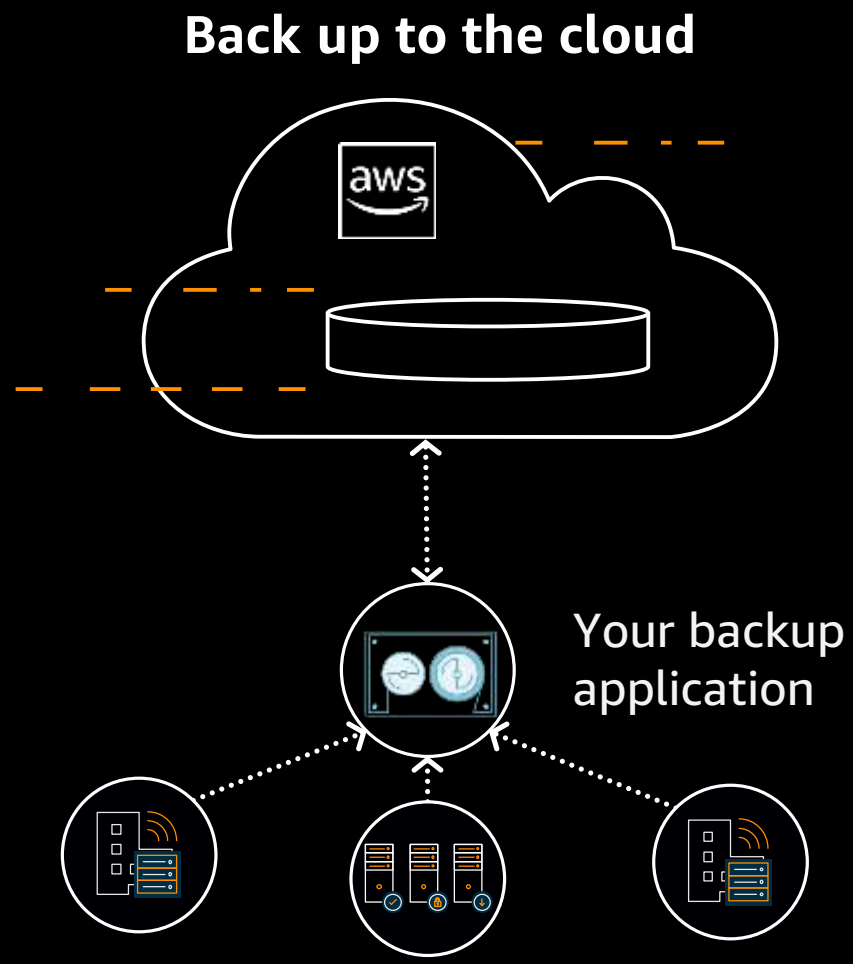
Move your data to S3 via an offline method – with the Snow Family

AWS Storage Gateway

You can implement an AWS S3 File Gateway on-premises presenting NFS or SMB share locally, and the gateway will transfer the files to S3.

Data Protection with AWS

Data protection with AWS



You have on-premises data and applications to protect

AWS Partners for backup

CLUMIO COHESITY ctera

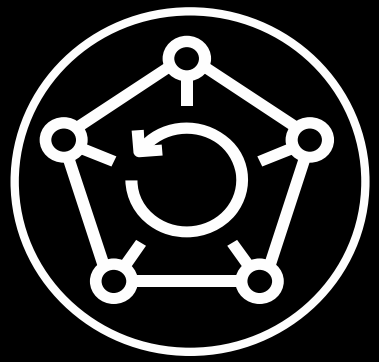
DELL EMC druva IBM MSP360 #1 MSP BACKUP N2WS

NetApp rubrik VEEAM VERITAS

www.aws.amazon.com/backup-recovery/partner-solutions/

aws

AWS Backup



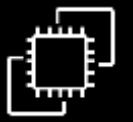
AWS Backup

A fully managed, policy-based backup service that makes it easy to centrally manage and automate the backup of data across AWS services

Amazon RDS

Amazon EBS

Amazon EFS



Amazon EC2

Amazon FSx for Lustre

AWS Storage Gateway

Amazon DynamoDB

Amazon FSx for Windows

Amazon DocumentDB

Amazon Neptune

Amazon Aurora

Amazon S3 *(Preview)*

AWS Backup for VMware

Three main pillars of AWS Backup for VMware

Single, centralized data protection solution for hybrid VMware workloads

Flexible restore options – on premises and VMware Cloud on AWS

Ability to use same backup policy across AWS-native services and VMware

Demo

AWS Backup for VMware – Demo Steps

AWS Backup

1. Download Backup Gateway, and Connect to AWS Backup
2. Connect to the VMWare vSphere and Discover VMs
3. Govern your backups and maintain compliance of your policies
4. Backup VMs and do a Restore

Recap

- Complete Set of Cloud Storage – Cost and Performance Optimized
- How you can migrate your on-premises machines with AWS Application Migration Services (MGN)
- Various migration and hybrid services with AWS DataSync, Snow Family and AWS Storage Gateway
- Data Protection with AWS
- Demo – AWS Backup for VMware (on-premises)

Resources

AWS Storage: https://aws.amazon.com/products/storage/

AWS FSx: https://aws.amazon.com/fsx/?nc=sn&loc=0

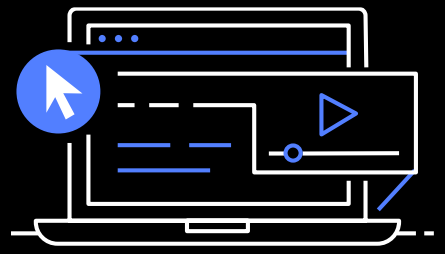
Help me choose an FSx File System: https://aws.amazon.com/fsx/when-to-choose-fsx/AWS

AWS Migration Service (CloudEndure) : https://aws.amazon.com/application-migration-service/

DataSync: https://aws.amazon.com/datasync

AWS Storage Gateway: https://aws.amazon.com/storagegateway

AWS Digital Training



Flexibility to learn your way

Build cloud skills with 550+ free digital training courses, or dive deep with classroom training

Featured courses

- AWS Cloud Practitioner Essentials
  Learn the fundamentals of the AWS Cloud and prepare for the AWS Certified Cloud Practitioner exam.

- Amazon DynamoDB for Serverless Architectures
  An introduction to Amazon DynamoDB and how it's leveraged in building a serverless architecture.

- AWS Security Learning Plan
  This Learning Plan is designed to help AWS Cloud security, governance, and compliance professionals learn the processes and best practices for securing the AWS platform.

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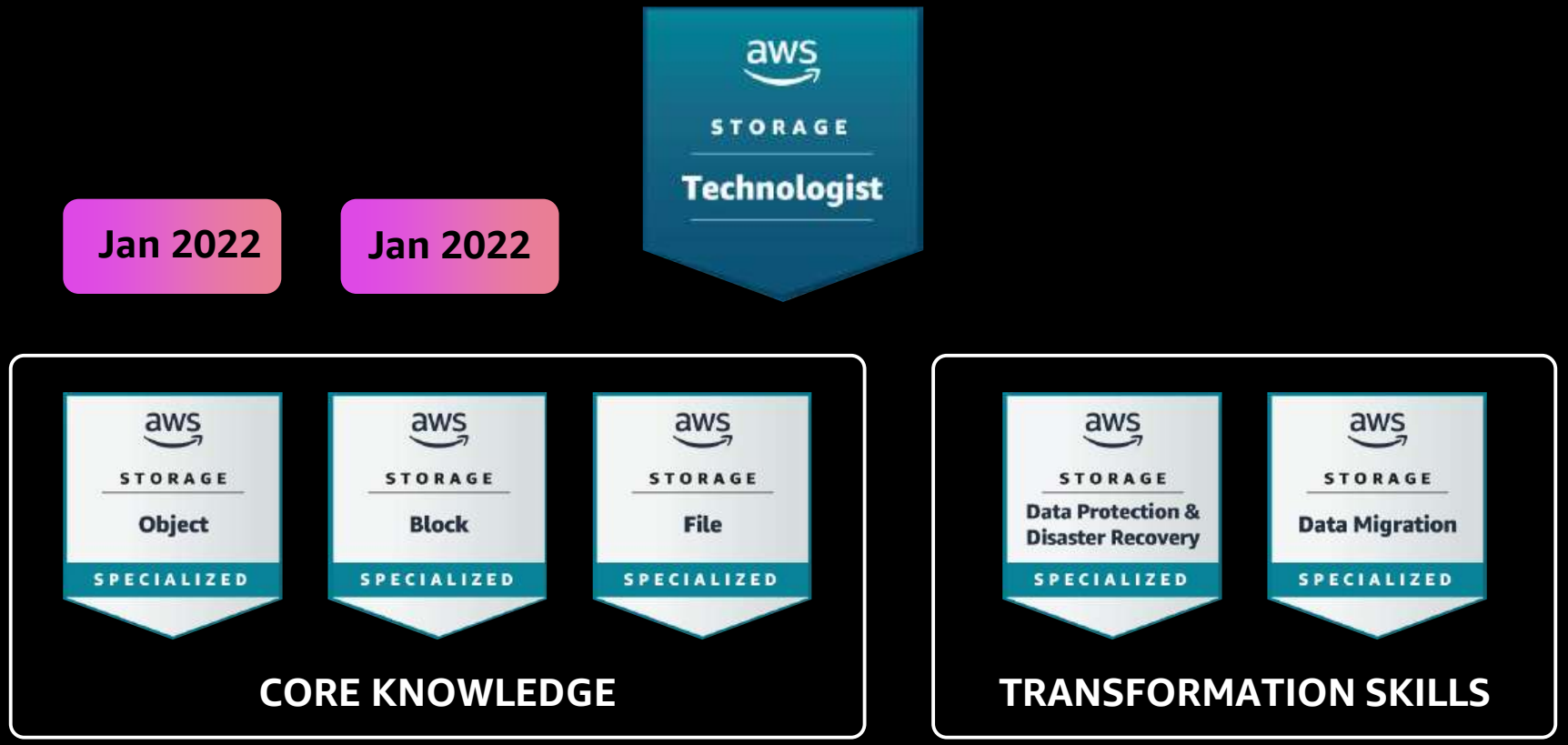
aws.amazon.com/training

AWS Cloud storage learning badges



Thank you for attending AWS Builders Online Series

We hope you found it interesting! A kind reminder to **complete the survey.**
Let us know what you thought of today's event and how we can improve the event experience for you in the future.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Thank you!