
AWS
re:Invent
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STG213-R

Choosing the right AWS storage service for the job

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Agenda

AWS Cloud storage portfolio

Common misconceptions

Decision criteria

Customer scenarios – Interactive discussion

Q & A

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A complete cloud storage portfolio

Object



Amazon S3

Block



Amazon EBS

File



Amazon EFS



Amazon FSx for Lustre



Amazon FSx for NetApp ONTAP



Amazon FSx for OpenZFS



Amazon FSx for Windows File Server

Backup



AWS Backup

Data transfer and migration



AWS Storage Gateway



AWS DataSync



AWS Transfer Family



AWS Snowball



AWS Snowcone

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AWS Cloud storage learning badges



Core knowledge





Transformation skills

Get started: Object

Get started: Block

Read more: Blog

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Common misconceptions

“I absolutely need multi-protocol access to my file shares.”

“Mission-critical applications require a SAN on-premises.”

“AWS doesn’t offer data-reduction capability for storage.”

“My application is latency-sensitive and won’t work in the cloud.”

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Decision criteria

Protocol	Client type	IOPS/access patterns	Latency	Throughput or bandwidth
Geographic scale/data sovereignty	Migration strategy and risks	Backup/protection requirements	Disaster recovery	Security
Applications (including certifications)	Workflow	Cost-optimization strategies	Cloud-native layered services?	

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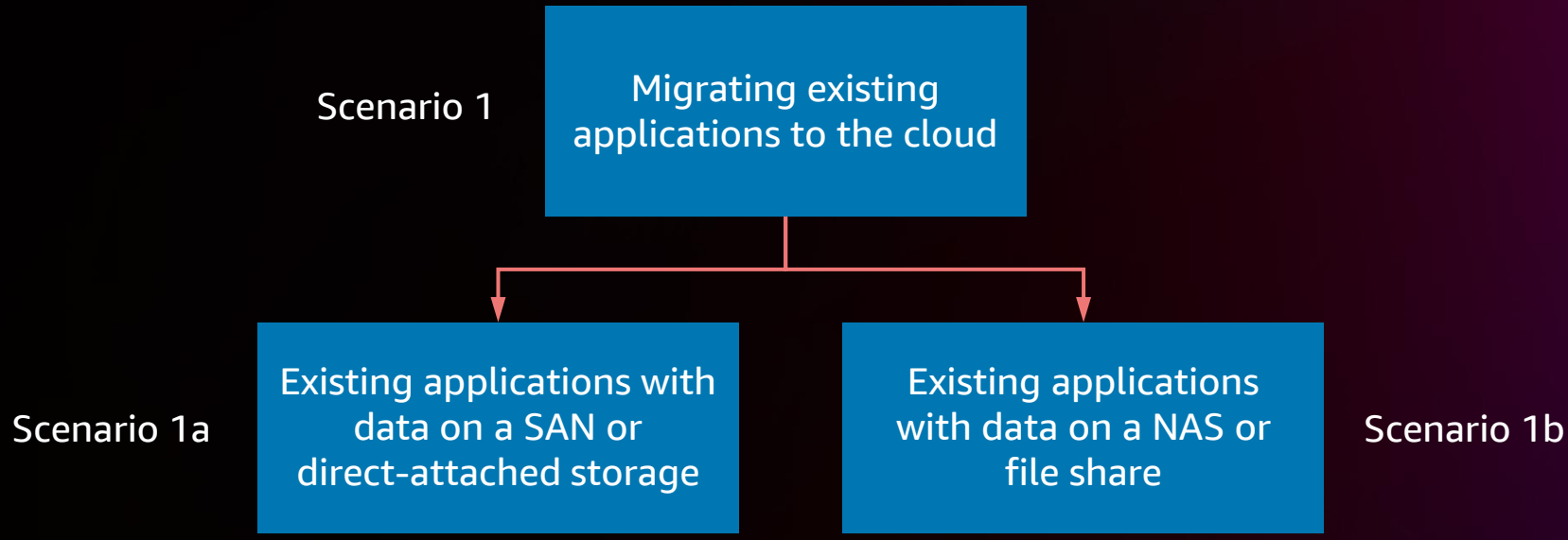
Common customer scenarios

Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Migrating existing applications to the cloud	Backing up data to the cloud	Hybrid – using cloud storage with on-premises applications	Building a data lake	Building a new application

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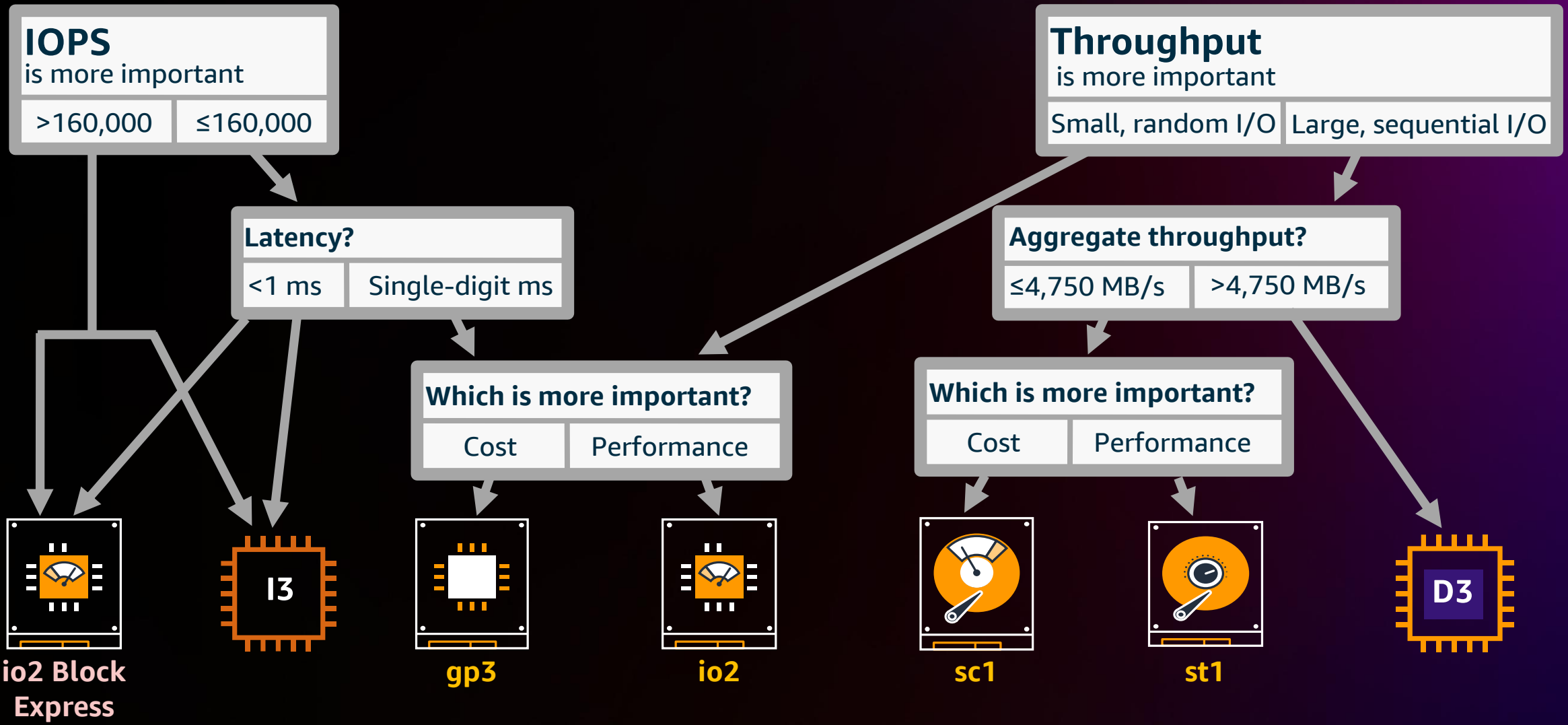
Scenario 1: Migrating existing applications to the cloud

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Scenario 1a: Choosing an Amazon EBS volume type



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Scenario 1b: Choosing the right file system

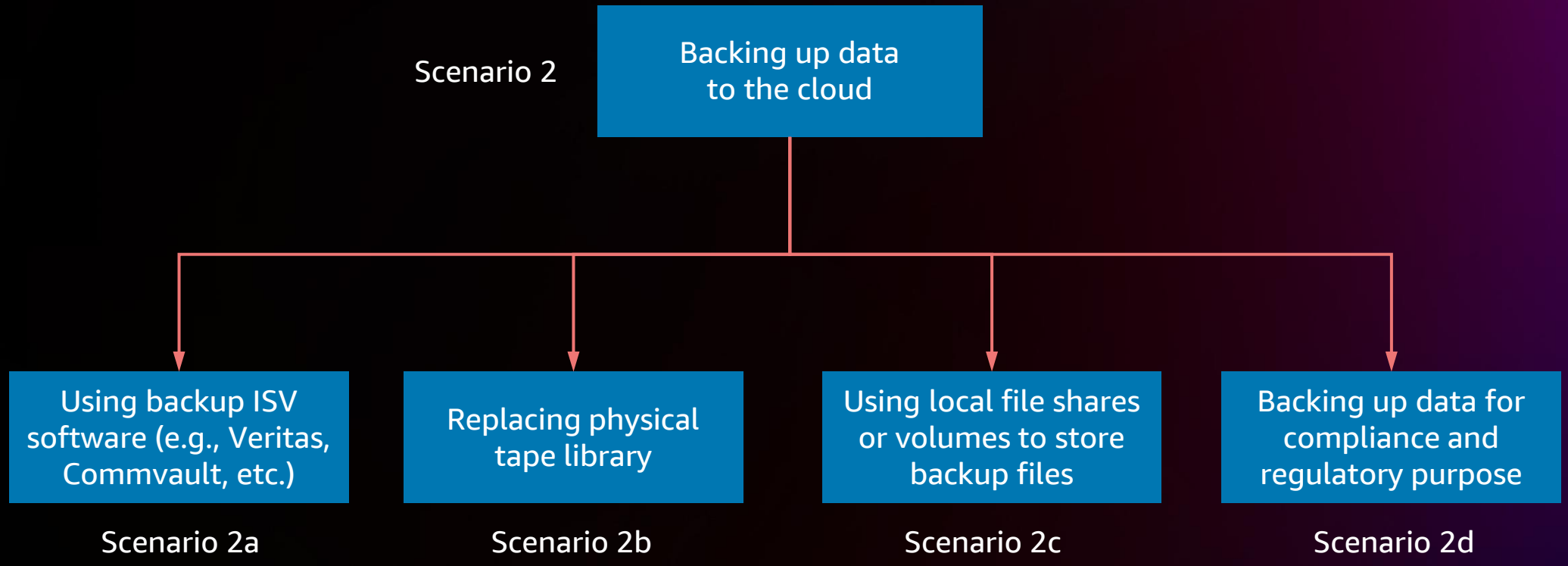
	Amazon EFS	Amazon FSx for NetApp ONTAP	Amazon FSx for Windows File Server	Amazon FSx for OpenZFS	Amazon FSx for Lustre
On-premises comparison	General file systems	NetApp, commodity NAS	Windows file servers	Commodity Linux servers, ZFS	Scale-out file storage (Lustre, GPFS, Dell EMC Isilon)
Unique features	Cloud-native NFS v4, fully elastic, no provisioning required, dynamically grow and shrink, file-level restore, AWS Identity and Access Management (IAM) for file system access control	Multi-protocol, replication, cloning, intelligent tiering, Varonis, and anti-virus integration	Native Windows features, file access auditing, Amazon FSx File Gateway for on-premises caching	Low-cost, high-performance (Graviton-based), cloning, snapshots, unlimited capacity	Scale-out performance, Amazon S3 data processing capabilities
Use cases	Serverless, containers, modern apps, CMS, test/dev, backup, and DR	Enterprise IT, databases, line-of-business apps, test/dev, backup and DR (NetApp)	Windows-based user and group shares, Windows applications, SQL Server with HA	Enterprise IT (Linux), databases, software build, HPC, ML, media rendering, big data analytics	Machine learning, HPC, media processing, data analytics, compute-intensive applications

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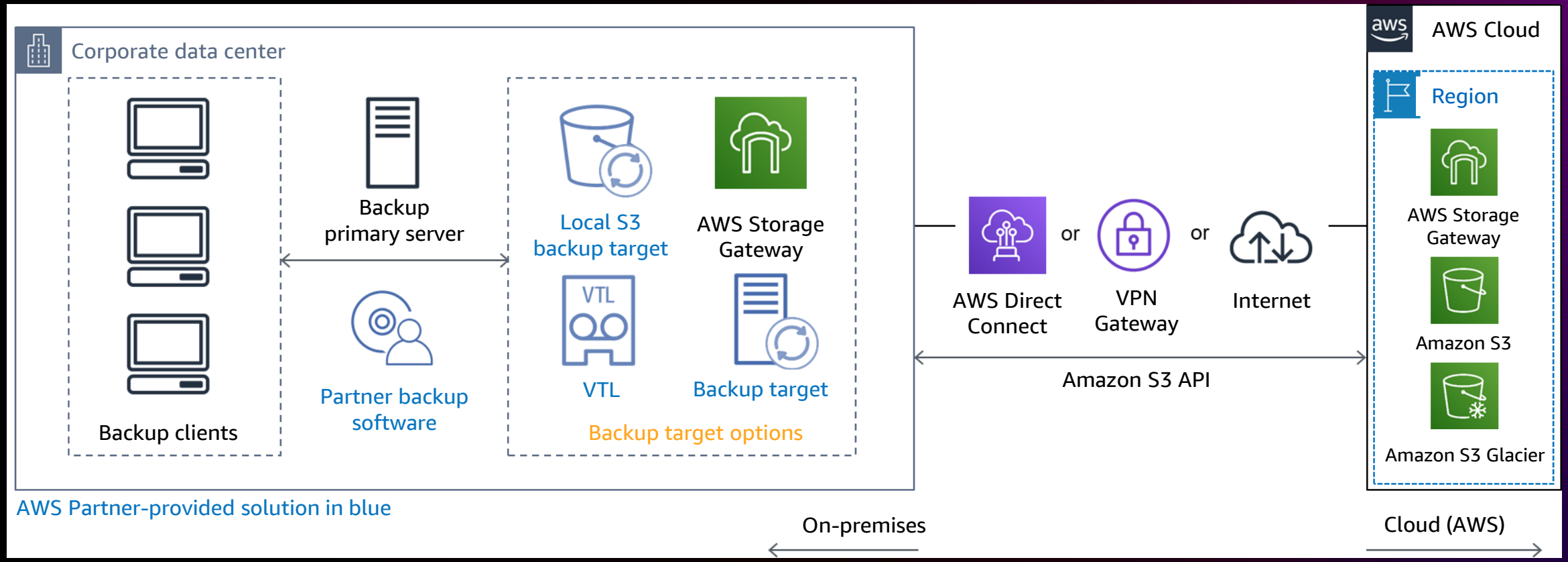
Scenario 2: Backing up data to the cloud

Go back



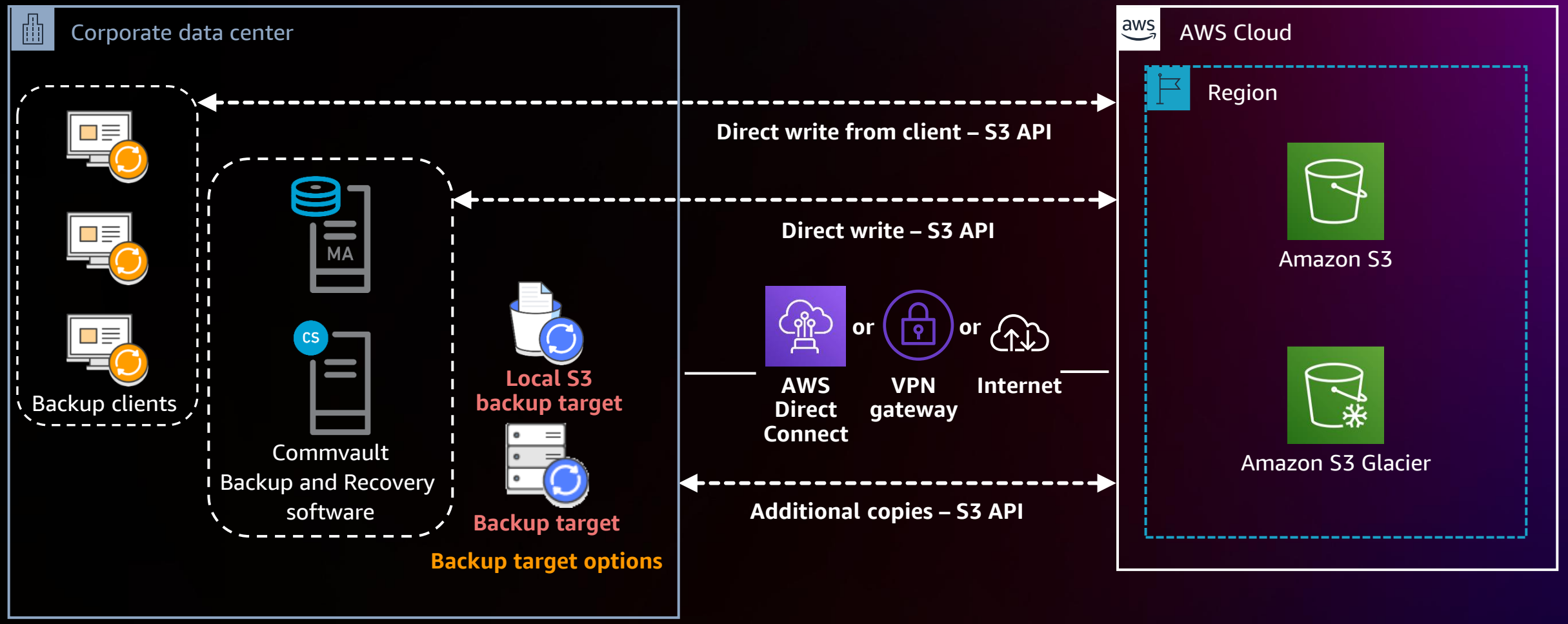
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Scenario 2a/b/c: Backup from on-premises to AWS



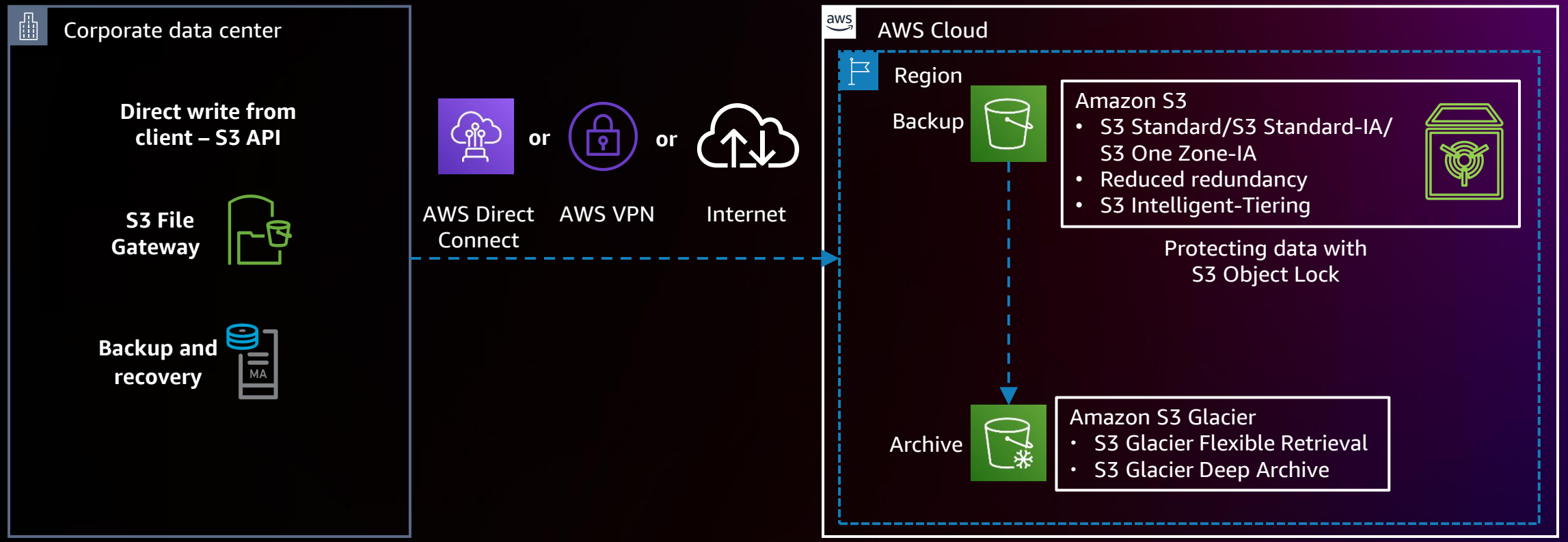
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Scenario 2a: Commvault architecture



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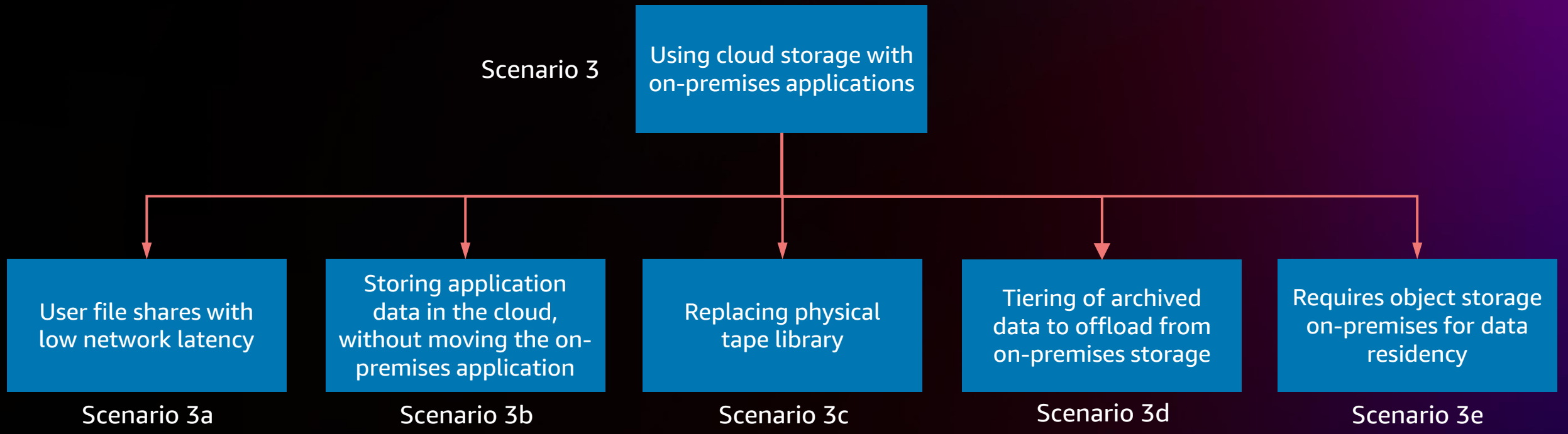
Scenario 2d: Backing up data for compliance and regulatory purposes



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Scenario 3: Hybrid – Using cloud storage with on-premises applications

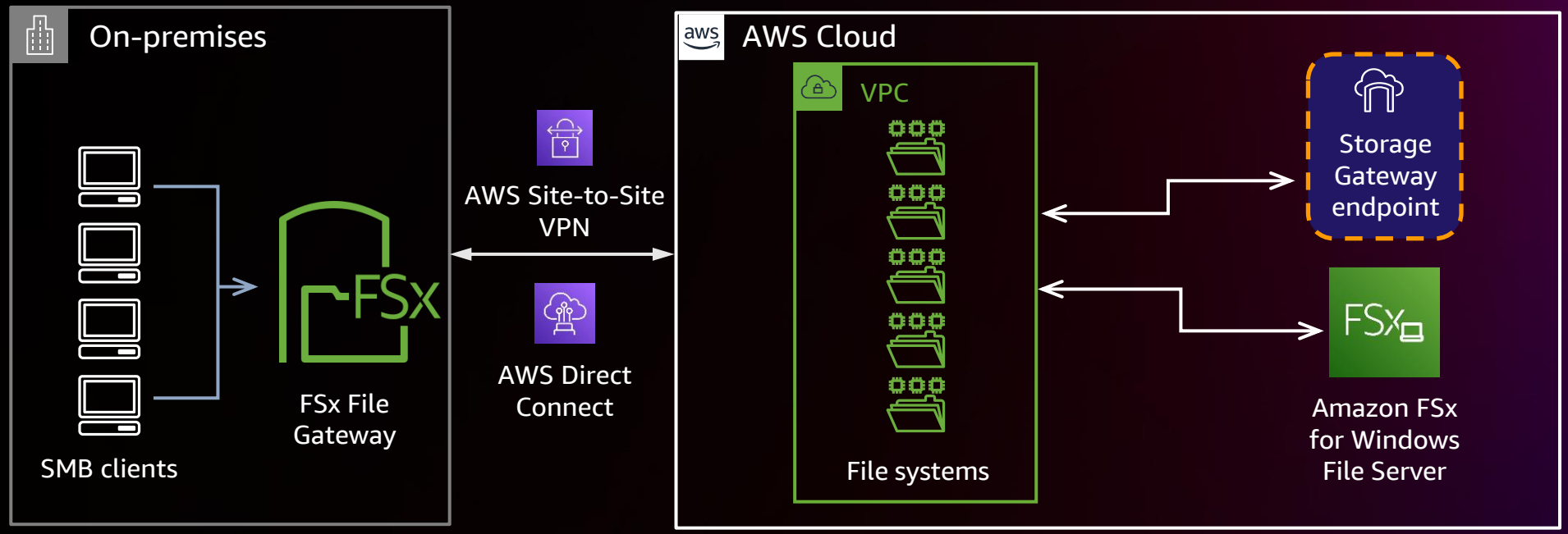
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Scenario 3a/b: Amazon FSx File Gateway architecture

LOW-LATENCY ACCESS TO AMAZON FSX FILE SHARES WITHOUT MOVING ON-PREMISES APPLICATION



Use cases: Multi-user interactive file sharing, such as group shares, project shares, home directories, media editing, and CAD/CAM

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Scenario 3b: S3 File Gateway

STORE AND ACCESS OBJECTS IN AMAZON S3 FROM FILE-BASED APPLICATIONS WITH LOCAL CACHING



Use cases:

Repository for machine-generated data, such as

- Backups
- Archives
- Data lakes

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S3 File Gateway vs FSx File Gateway



S3 File Gateway

Repository for machine-generated data, such as backups, archives, and data lakes

- Designed for users who want **native access to S3 objects**
- Local cache optimized for **large files,** such as large database backups, images, etc.
- Supports up to **10** file shares and **100** active users per gateway
- Developed to **support all S3 Lifecycle policies** (transition and expiration actions) and S3 data-protection capabilities (e.g., S3 Versioning, S3 Object Lock)
- Provides **workload-centric WAN optimization** (e.g., byte-range gets, multi-part uploads)



FSx File Gateway

Multi-user interactive file sharing, such as group shares and home directories

- Designed for users that need a **file system**
- Local cache is optimized for **small and mixed file workloads** like office documents, Adobe suite, etc.
- Supports unlimited file shares, 500 active users per gateway, and up to 5 Amazon FSx for Windows File Server file systems
- Developed with a **high degree of Windows features parity** (e.g., permissions, application-consistent backup, data deduplication, shadow copies, DFS Namespaces support)
- Provides **workload-centric WAN optimization** (e.g., byte-level reads, byte-level writes)

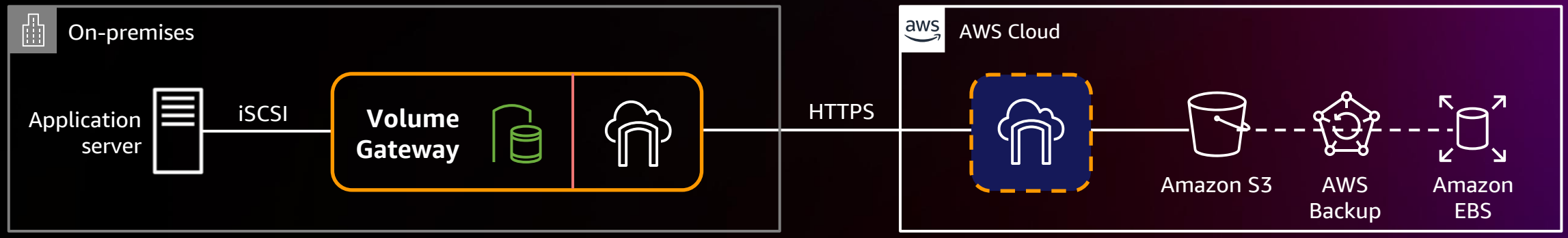
Different needs = Different features, benefits, and roadmaps

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Scenario 3b: Volume Gateway

BLOCK STORAGE ON-PREMISES BACKED BY CLOUD STORAGE



Use cases

- Backup on-premises data to the cloud
- Migration of volumes to the cloud
- DR to the cloud

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Scenario 3c: Tape Gateway

VIRTUAL TAPES PRESENTED TO ON-PREMISES BACKUP APPLICATIONS



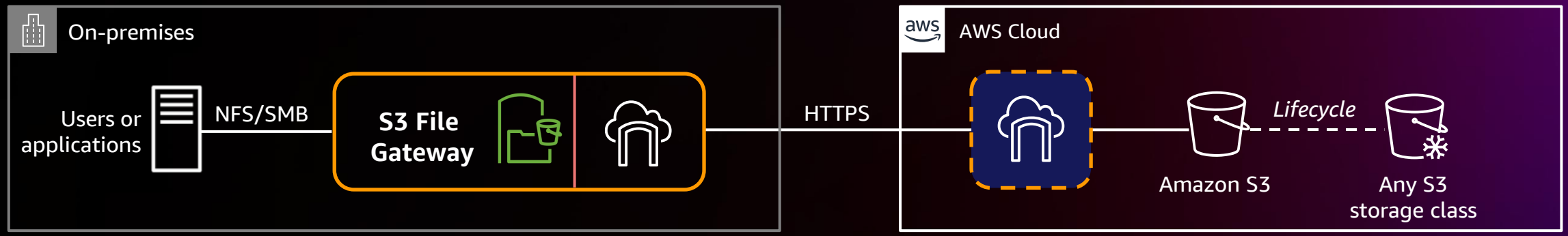
Use cases

- On-premises backup to cloud
- Drop-in replacement for physical tape libraries
- Archive to S3 Glacier Flexible Retrieval or S3 Glacier Deep Archive

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Scenario 3d: Amazon S3 File Gateway for archive

MOVE ARCHIVES INTO THE CLOUD AND FREE UP ON-PREMISES STORAGE CAPACITY



Features

- NFS/SMB protocol support, mount shares directly on client systems
- Files stored durably in Amazon S3, lifecycle to any S3 storage class
- Local cache for recently accessed files
- Windows ACL support to control access to archive files
- Bandwidth-optimized, only changes are transferred

Benefits

- Cost optimization
- Reducing on-premises capacity
- Data protection with S3 Versioning, S3 Object Lock, and S3 Replication

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Scenario 3e: The AWS Snow Family evolution

Data movement

Edge computing



Customer sites

Edge sites

- Set of services and functionality on the partially to fully disconnected and secure edge
- Activates data collection, data processing, and data movement from the edge to AWS

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Scenario 3e: Amazon S3 on Outposts helps users with ...



Data residency requirements



High-throughput local data processing



Staging and validation for on-premises migrations

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Scenario 3e: Use cases for S3 on Outposts



Data residency requirements

Keep data within a country, state/province, or other location where there is not an AWS Region today

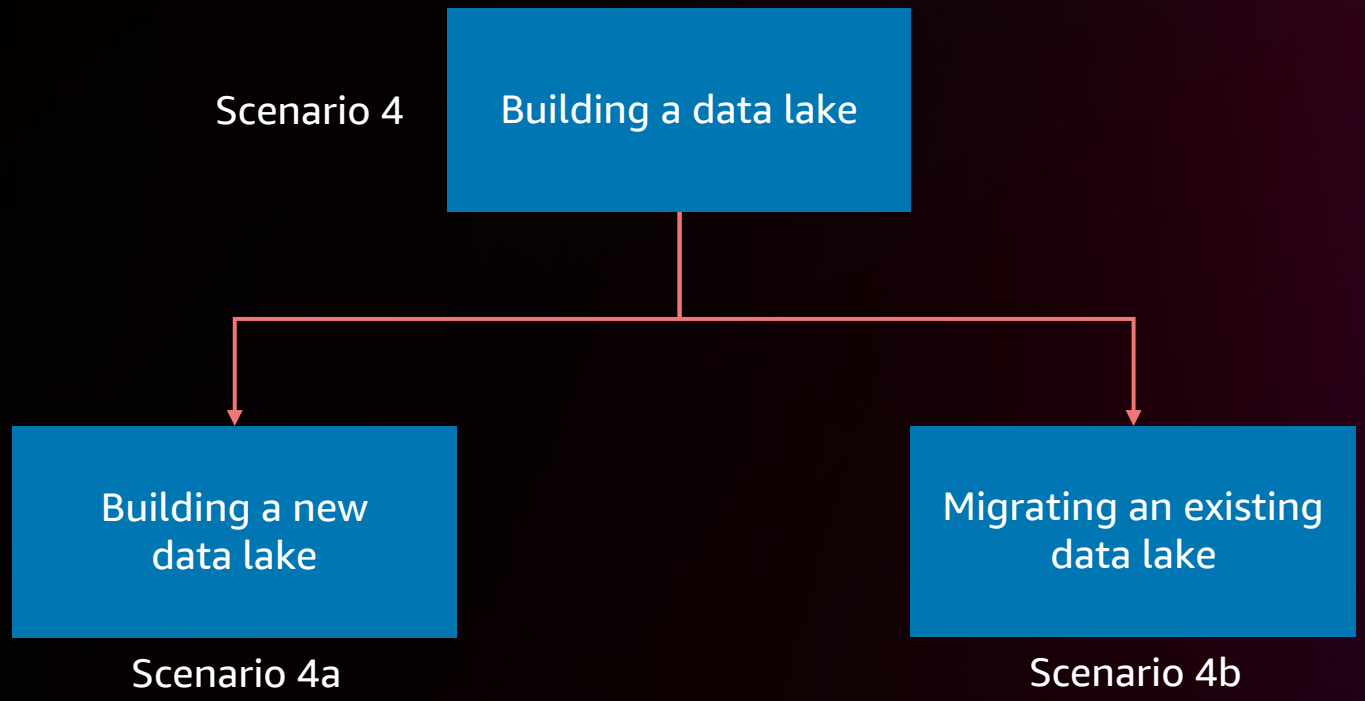
Build applications locally on Outposts that use the S3 API, and meet local data residency or regulatory requirements

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Scenario 4: Building a data lake

Go back



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Scenario 4a: Amazon S3 is a popular choice for cloud data lakes

Many ways to get data in

Broad portfolio of analytics tools

Many ways to optimize costs, easy to automate:
S3 Intelligent-Tiering,
S3 Batch Operations



Easy to **manage access at scale**:
Access points

Many **object-level** controls

Unmatched **durability**, **availability**, and **scalability**

Excellent **security**, **compliance**, and **audit** capabilities:
S3 Block Public Access,
AWS Identity and Access Management Access Analyzer for S3,
S3 Inventory reports

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Broad and deep portfolio, purpose-built for builders

Analytics

Amazon Redshift
Data warehousing

Amazon EMR
Hadoop and Spark

Amazon Athena
Interactive analytics

Amazon Kinesis
Data Analytics
Real-time

Amazon OpenSearch Service
Operational analytics

Business intelligence and machine learning

AWS Data Exchange

Amazon QuickSight

Amazon SageMaker
ML

Amazon Comprehend

Amazon Transcribe

Amazon Textract

Amazon Personalize

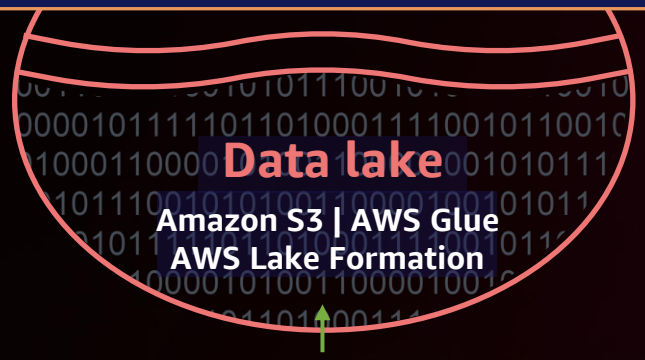
Amazon Forecast

Amazon Translate

Kibana in OpenSearch Service
Operational dashboarding

Third-party
BI tools

Analytics-optimized storage
Support for Apache Parquet, ORC
Amazon S3 Select



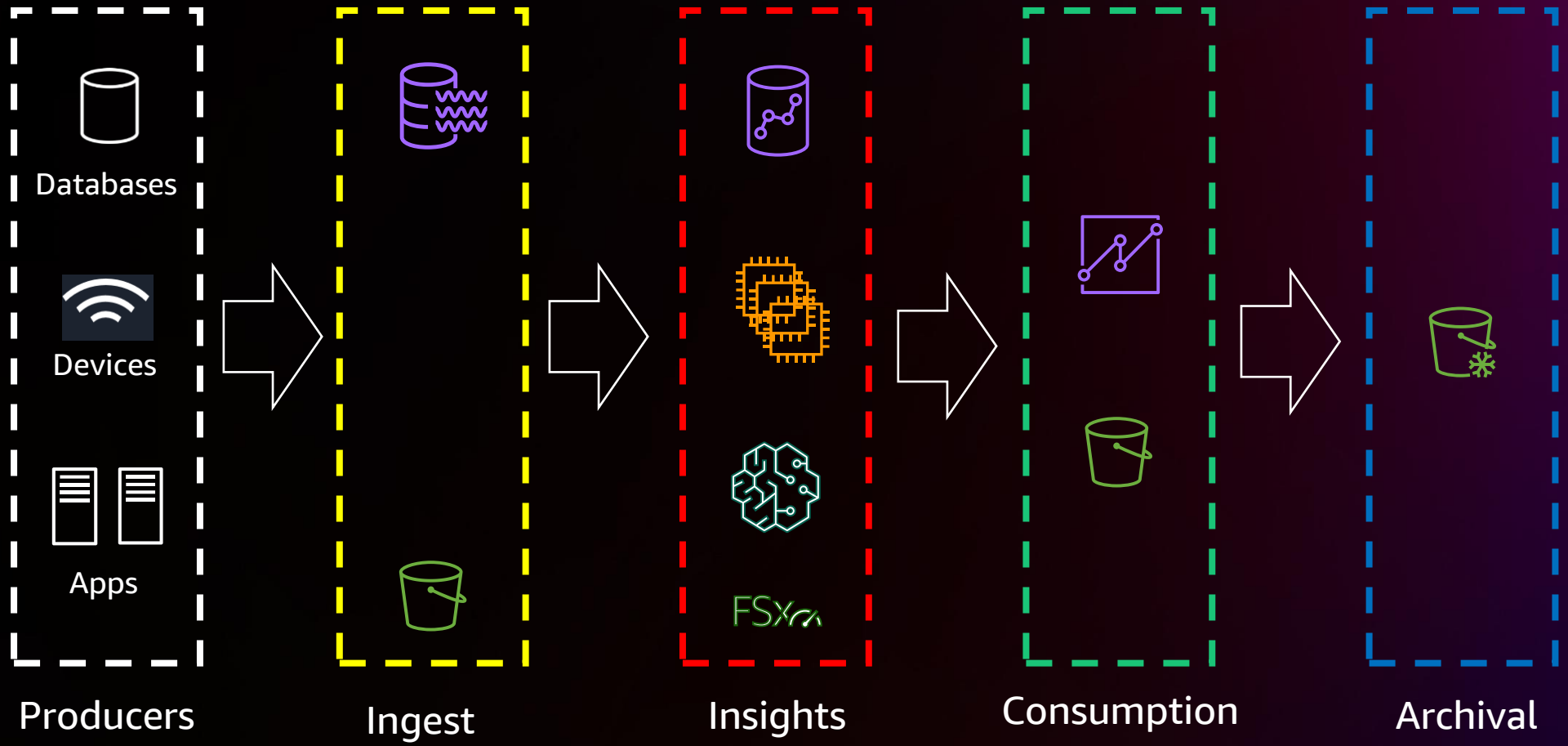
Data movement

AWS DataSync | AWS Storage Gateway | AWS Database Migration Service (AWS DMS) | AWS Snowball | AWS Snowmobile | Amazon Kinesis Data Firehose | Amazon Kinesis Data Streams | Amazon Managed Streaming for Apache Kafka (Amazon MSK)

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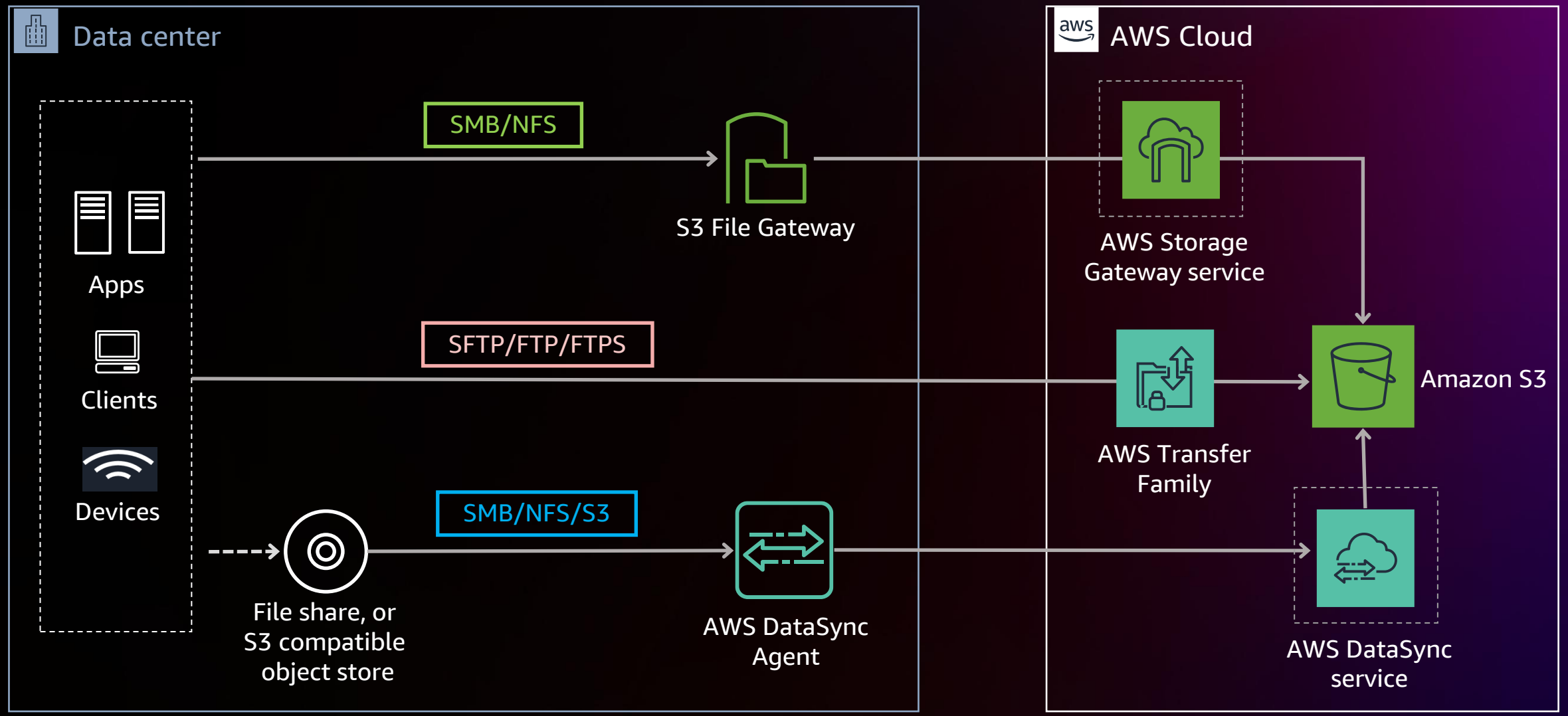
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A simplified journey of data in analytics



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Data ingest patterns



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Your choice of Amazon S3 storage classes



S3 Standard

- Active, frequently accessed data
- Milliseconds access
- ≥3 AZs



S3 Intelligent-Tiering

- Data with changing access patterns
- Milliseconds access
- ≥3 AZs
- No retrieval fees
- Monitoring fee per object
- Minimum storage duration
- Minimum object size



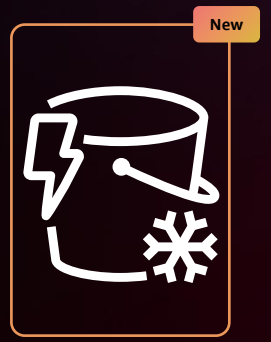
S3 Standard-IA

- Infrequently accessed data
- Milliseconds access
- ≥3 AZs
- Retrieval fee per GB
- Minimum storage duration
- Minimum object size



S3 One Zone-IA

- Recreatable, less-accessed data
- Milliseconds access
- 1 AZ
- Retrieval fee per GB
- Minimum storage duration
- Minimum object size



S3 Glacier Instant Retrieval

- Rarely accessed data
- Milliseconds access
- Minimum storage duration
- Minimum object size



S3 Glacier Flexible Retrieval

- Archive data
- Select minutes or hours
- ≥3 AZs
- Retrieval fee per GB
- Minimum storage duration
- Minimum object size



S3 Glacier Deep Archive

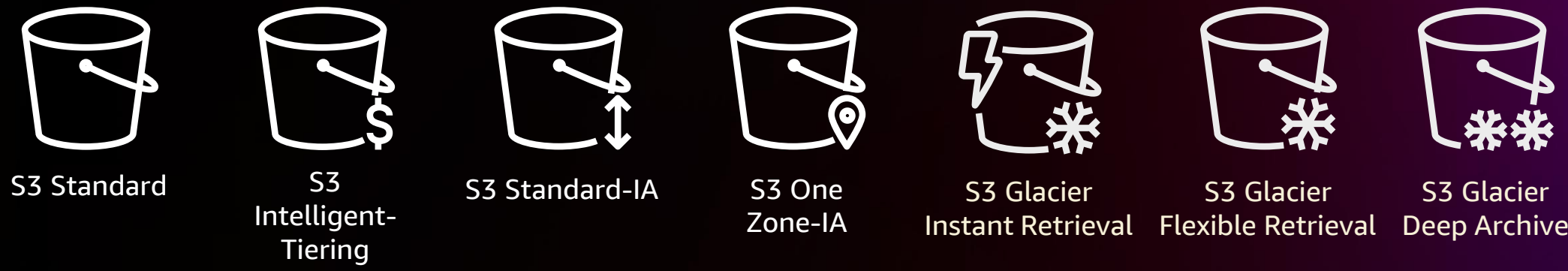
- Archive data
- Select 12 or 48 hours
- ≥3 AZs
- Retrieval fee per GB
- Minimum storage duration
- Minimum object size

Frequent ← **Access frequency** → **Infrequent**

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Amazon S3 Lifecycle tiers data to optimize storage costs



S3 Lifecycle policy

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Scenario 4b: Journey to your data lake on S3

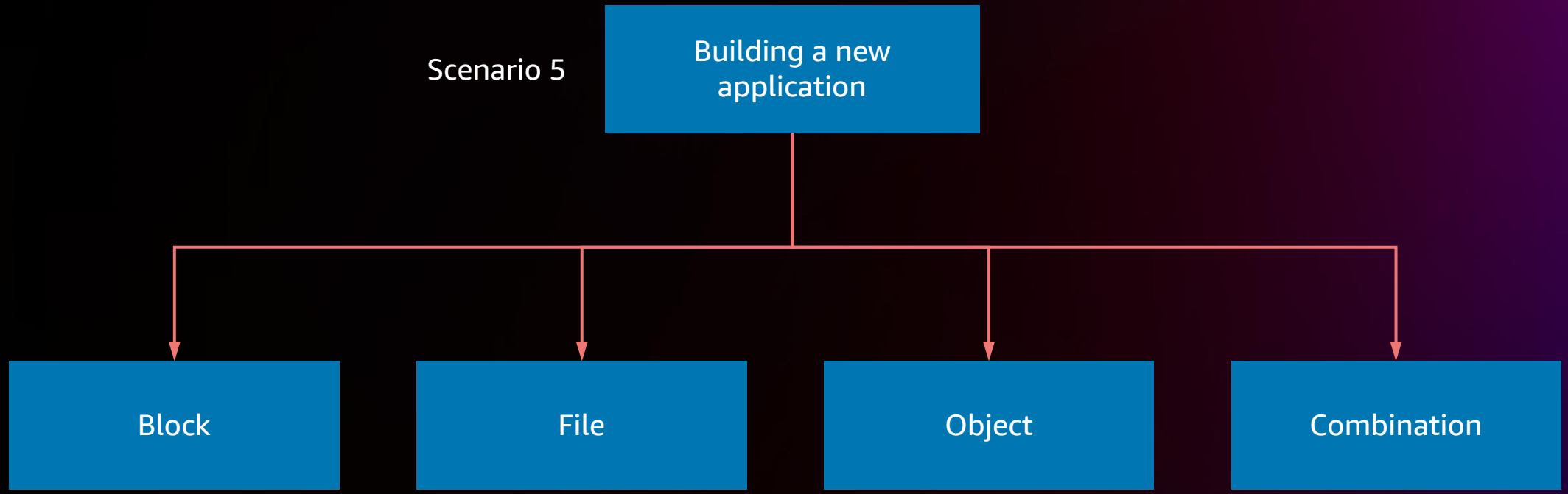
	Lift & shift	AWS managed services
	cloudera, databricks	Amazon Redshift, AWS Glue, Amazon EMR, Amazon Athena
What	Run third-party analytics tools on Amazon EC2 Use Amazon EBS and S3 as data stores Self-managed environments	AWS managed & serverless platforms AWS Glue, Athena, Amazon EMR and Amazon Redshift More options to process data in place
Why	Simplify on-premises migrations Use existing tools, code, and customizations Minimize application changes	Focus on data outcomes, not infrastructure Speed adoption of new capabilities More tightly integrated with AWS security
Consider	You provision, manage, and scale You monitor and manage availability You own upgrades and versioning	Utilizing AWS Lake Formation Flexibility and choice with open data formats Leverage AWS pace of innovation

Amazon S3 is the storage foundation for both approaches

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Scenario 5: Building a new application for storage

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Basic decision criteria

Protocol	Client type	IOPS/access patterns	Latency	Throughput or bandwidth
Geographic scale/data sovereignty	Migration strategy and risks	Backup/protection requirements	Disaster recovery	Security
Applications (including certifications)	Workflow	Cost-optimization strategies	Cloud-native layered services?	

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