

Module 8

Cloud-based data protection

About this module

This module focuses on enabling you to do the following:

- Describe the architecture, features, and use cases of NetApp Cloud Volumes ONTAP
- Describe the features and use cases of NetApp Cloud Backup service
- Describe the features and working of SnapMirror Cloud
- Describe the features and use cases of NetApp Cloud Sync service

Lesson 1

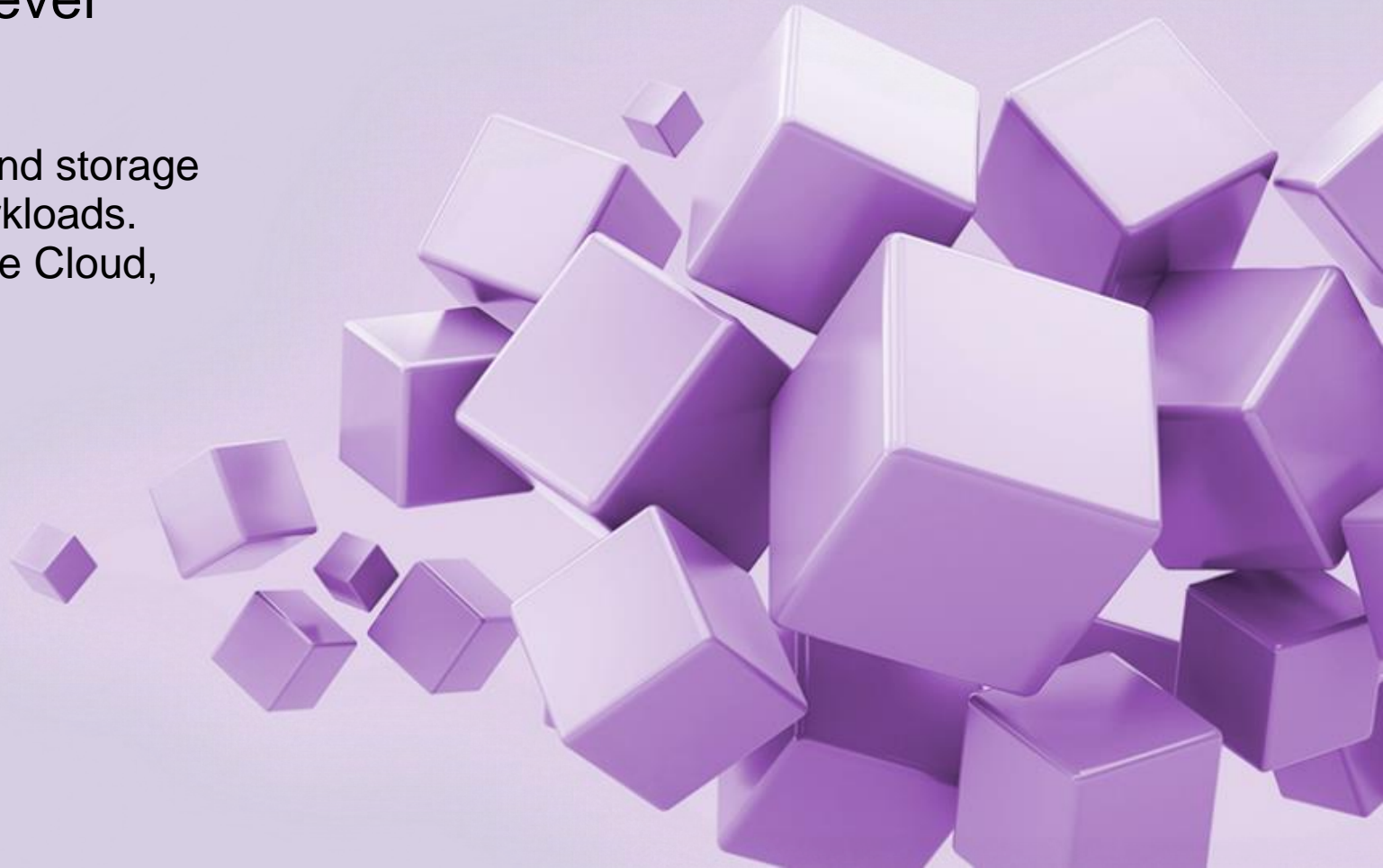
Cloud Volumes ONTAP



Cloud Volumes ONTAP

Enterprise-grade storage wherever your applications are

A powerful solution with data protection and storage efficiency features for your enterprise workloads. Available in AWS, Microsoft Azure, Google Cloud, and hybrid environments.



Cloud Volumes ONTAP

Features

Control and automation

- Enterprise-wide hybrid multicloud data management
- Consistent governance for application and user data
- API-driven workflows integrated with third-party automation tools

Security and compliance

- End-to-end encryption in transit and at rest
- Ransomware prevention
- AI-driven data privacy compliance tools

Optimized resources

- NetApp ONTAP storage efficiencies
- Intelligent cold-data tiering to object storage

Resilient architecture

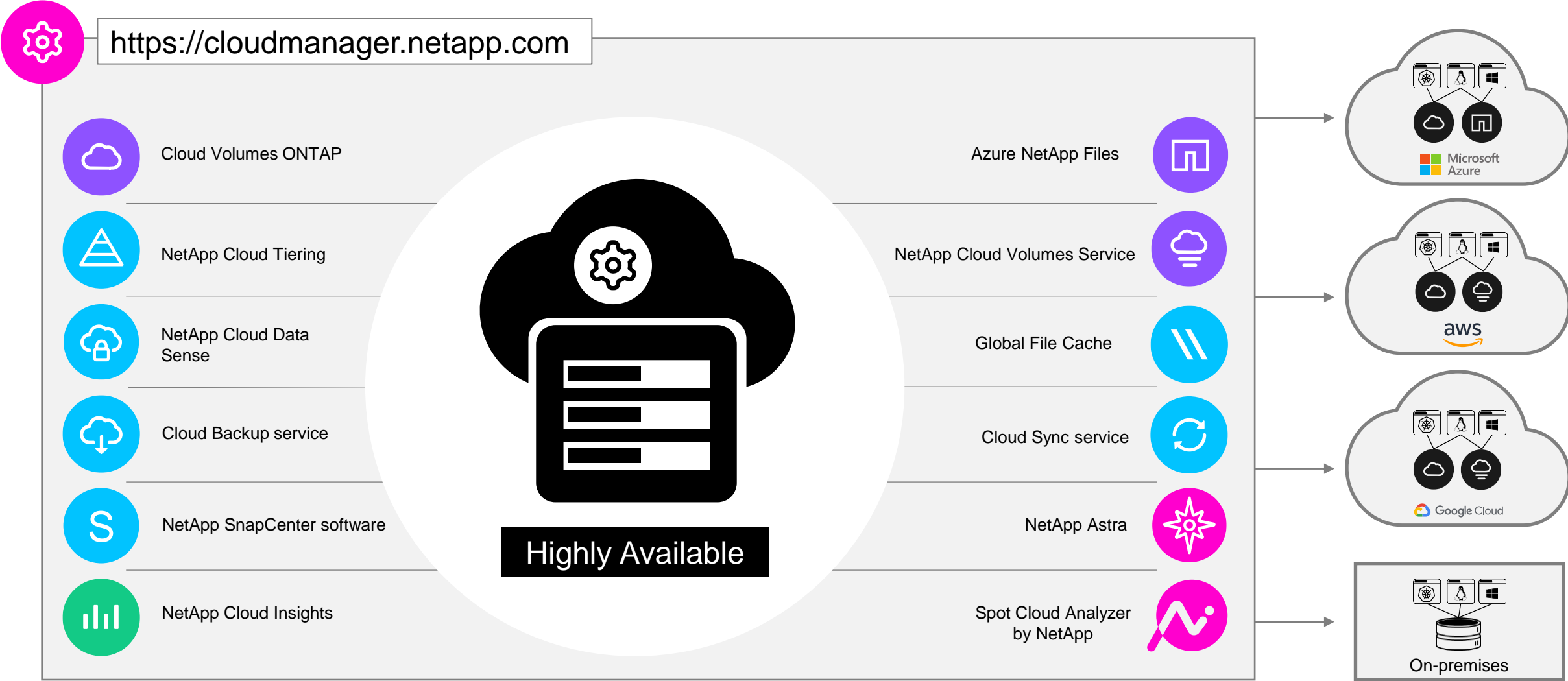
- Cross-region high availability
- Cross-region replication for disaster recovery
- Built-in backup to object storage
- Instant restore from point-in-time Snapshot copies

Unified storage

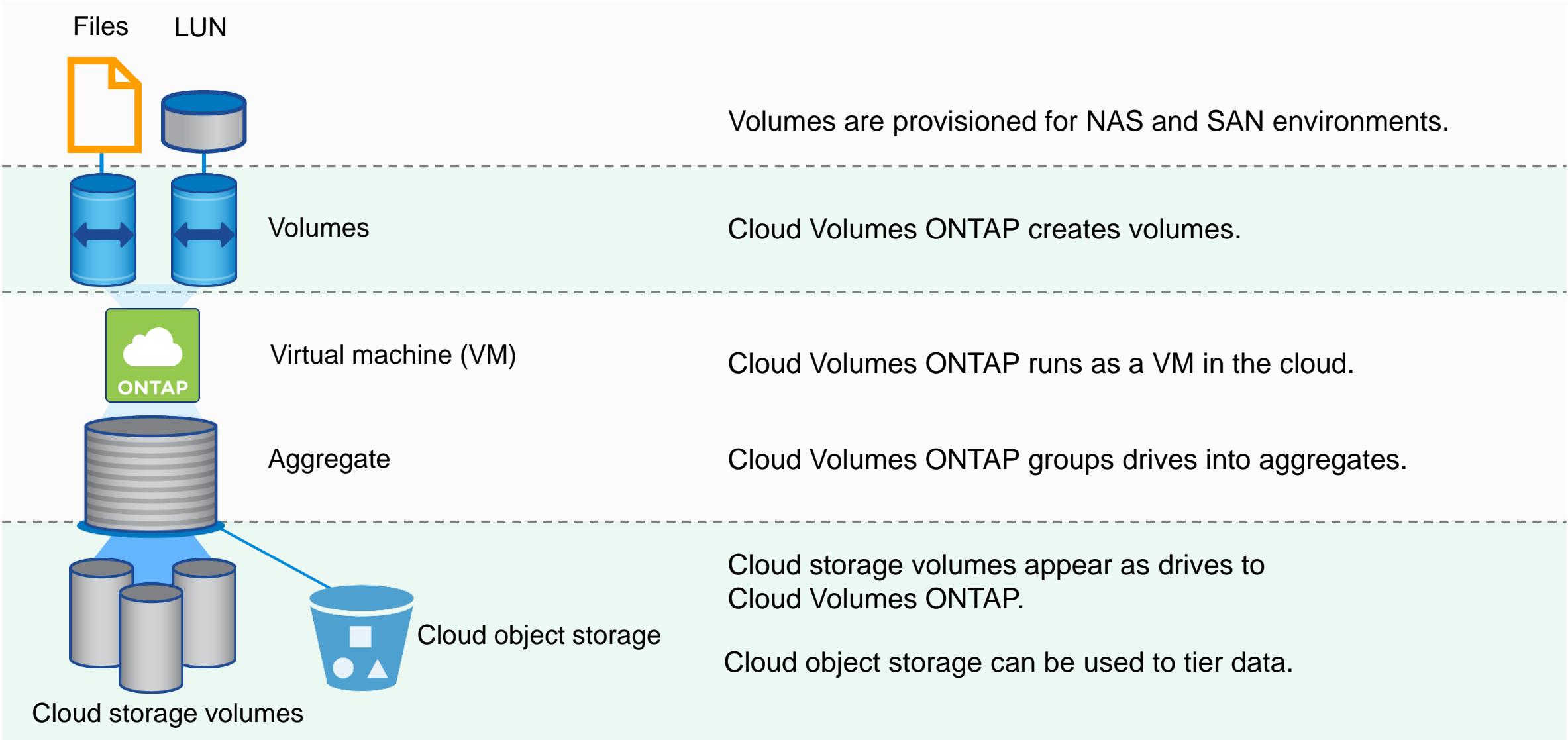
- Multiprotocol support: NFS, SMB, and iSCSI
- Same APIs in all supported clouds
- Same tools and features in all supported clouds

Cloud Manager

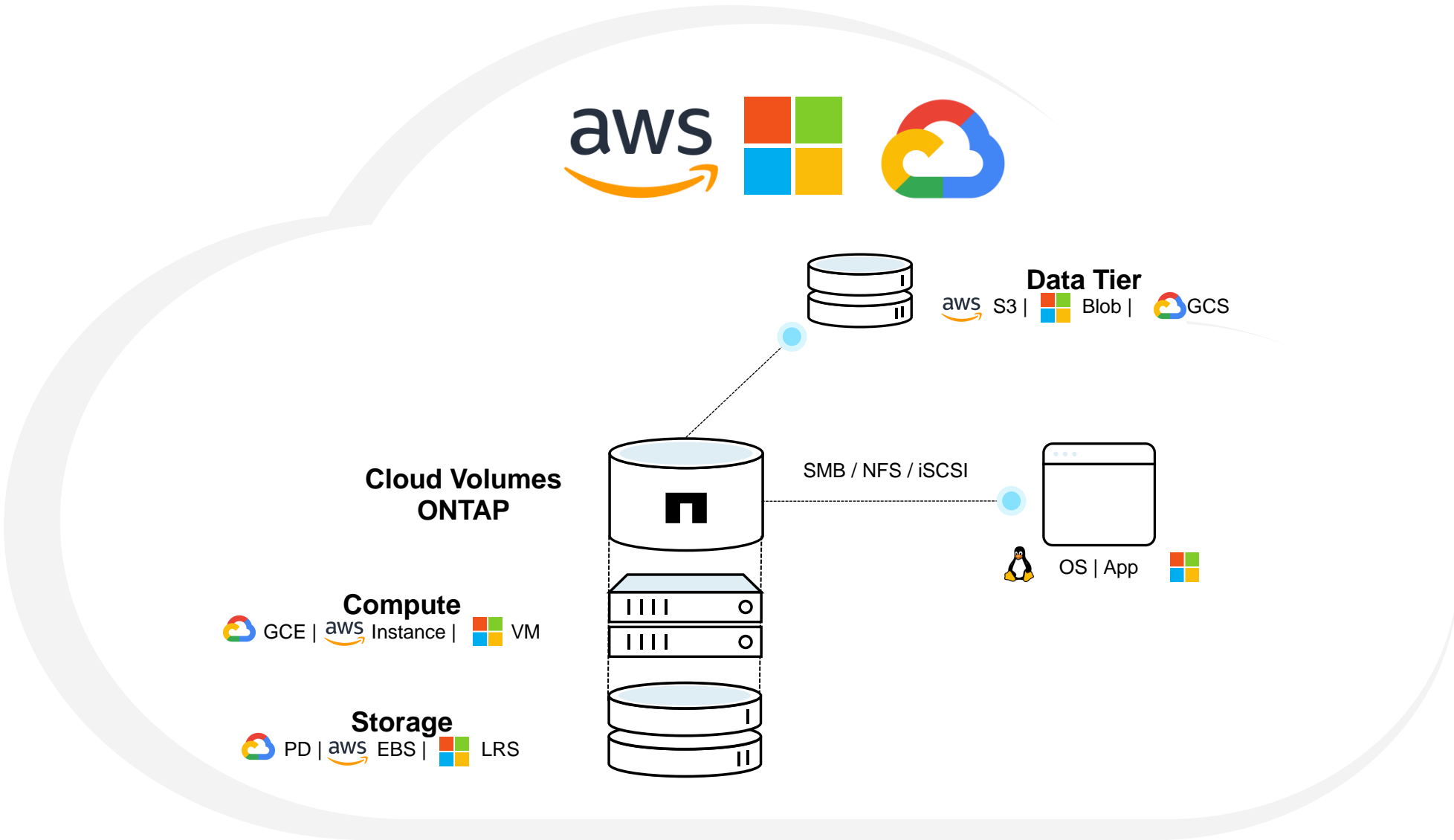
Overview



Storage configuration in Cloud Volumes ONTAP

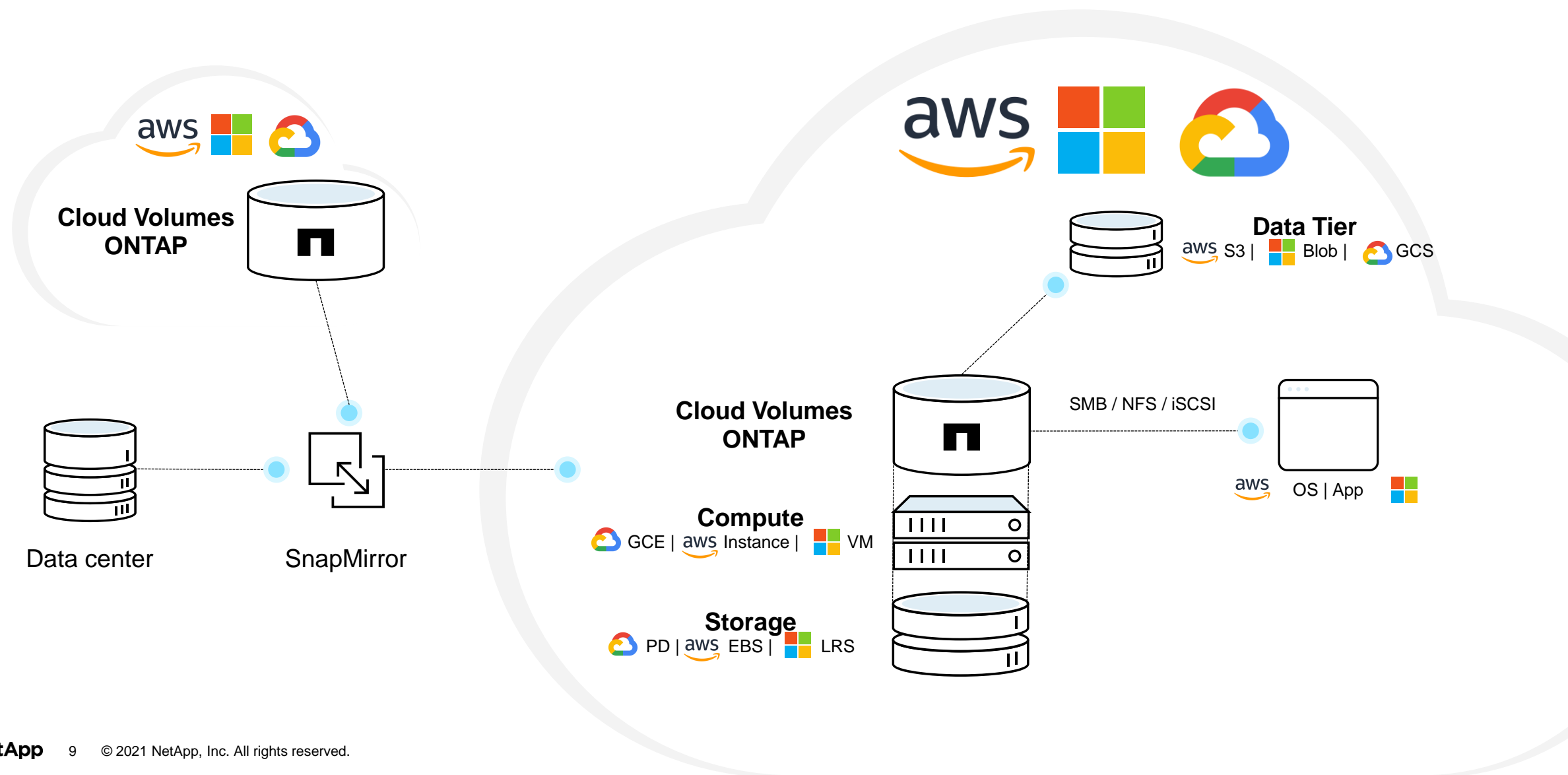


Cloud Volumes ONTAP architecture



Cloud Volumes ONTAP architecture

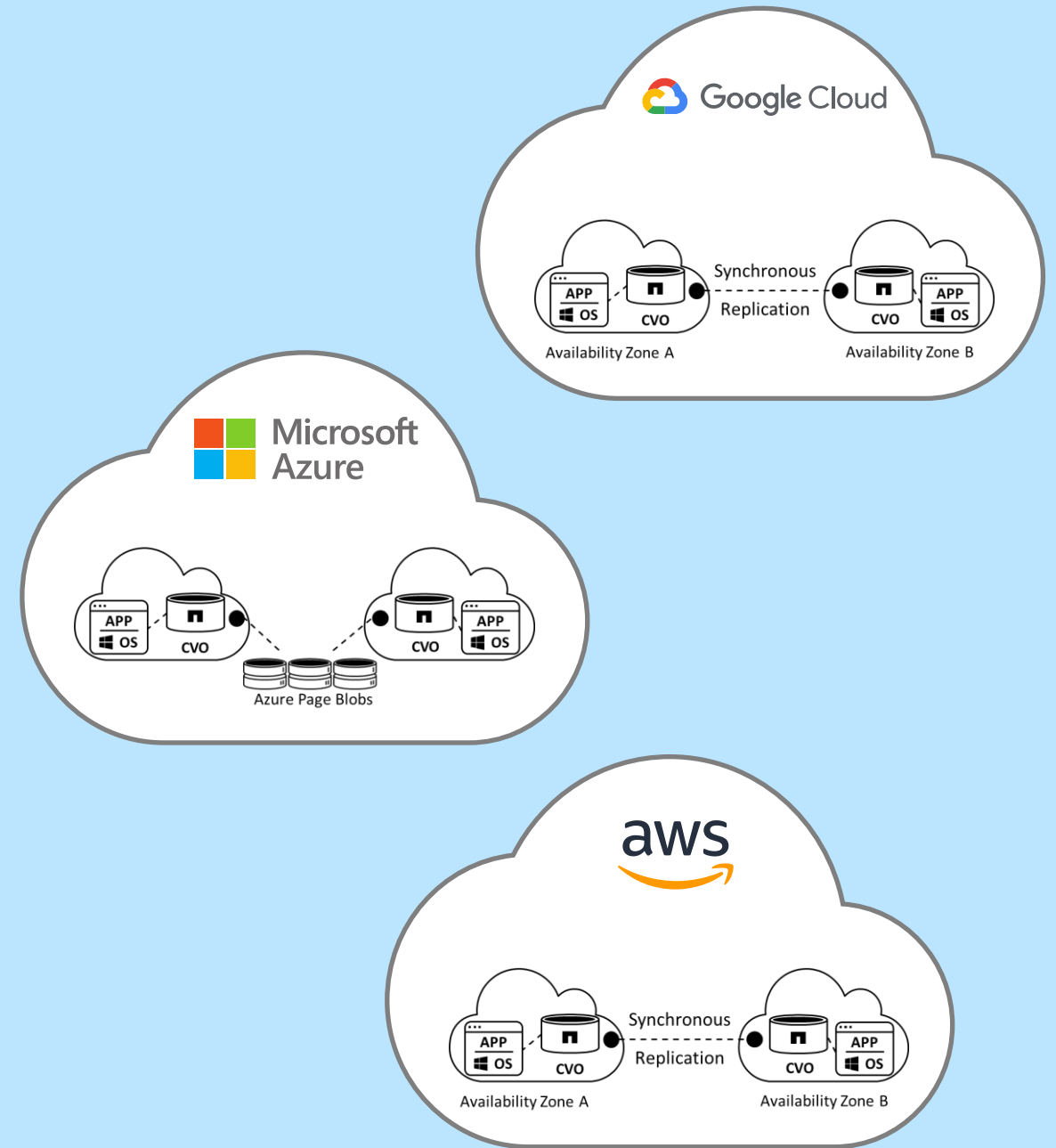
Hybrid



Cloud Volumes ONTAP high availability

- Synchronous data replication
- Multiple availability zones
- Automatic failover and failback
- Data loss prevention ($RPO^* = 0$)
- Quick failover ($RTO^{**} = 60$)
- Nondisruptive operations (NDO)

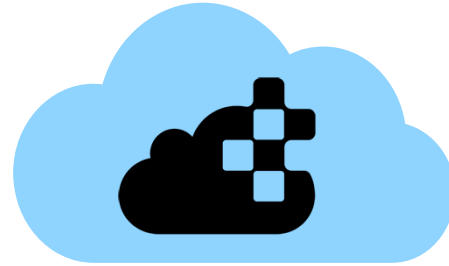
RPO = recovery point objective
RTO = recovery time objective



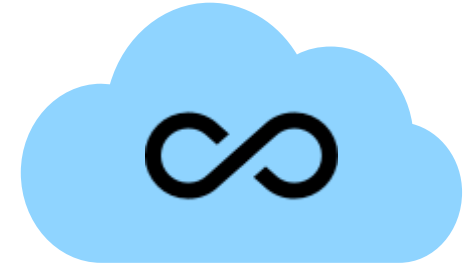
Cloud Volumes ONTAP use cases



Disaster recovery



Enterprise applications in
the cloud



DevOps

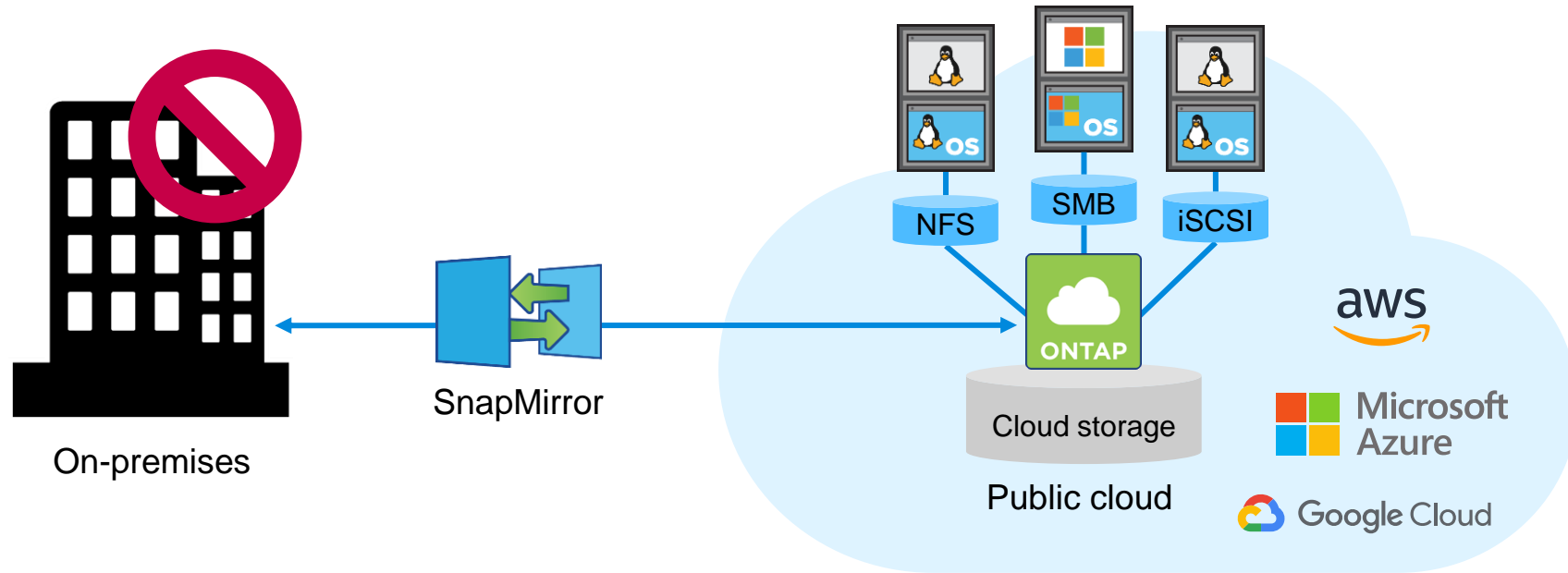


File sharing



Cloud migration

Disaster recovery with Cloud Volumes ONTAP



No physical disaster-recovery site needed

Automatic failover

Cost-effectiveness

Compliance with regulations

Lesson 2

Cloud Backup service



Cloud Backup service

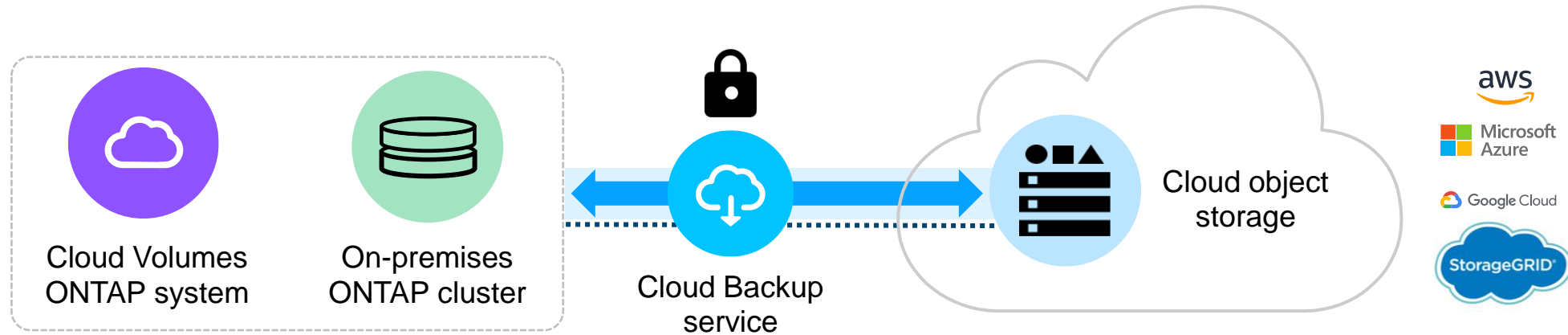
Fully integrated cloud backup and restore service

Delivers seamless and cost-effective backup and restore capabilities for protecting and archiving cloud and on-premises ONTAP data



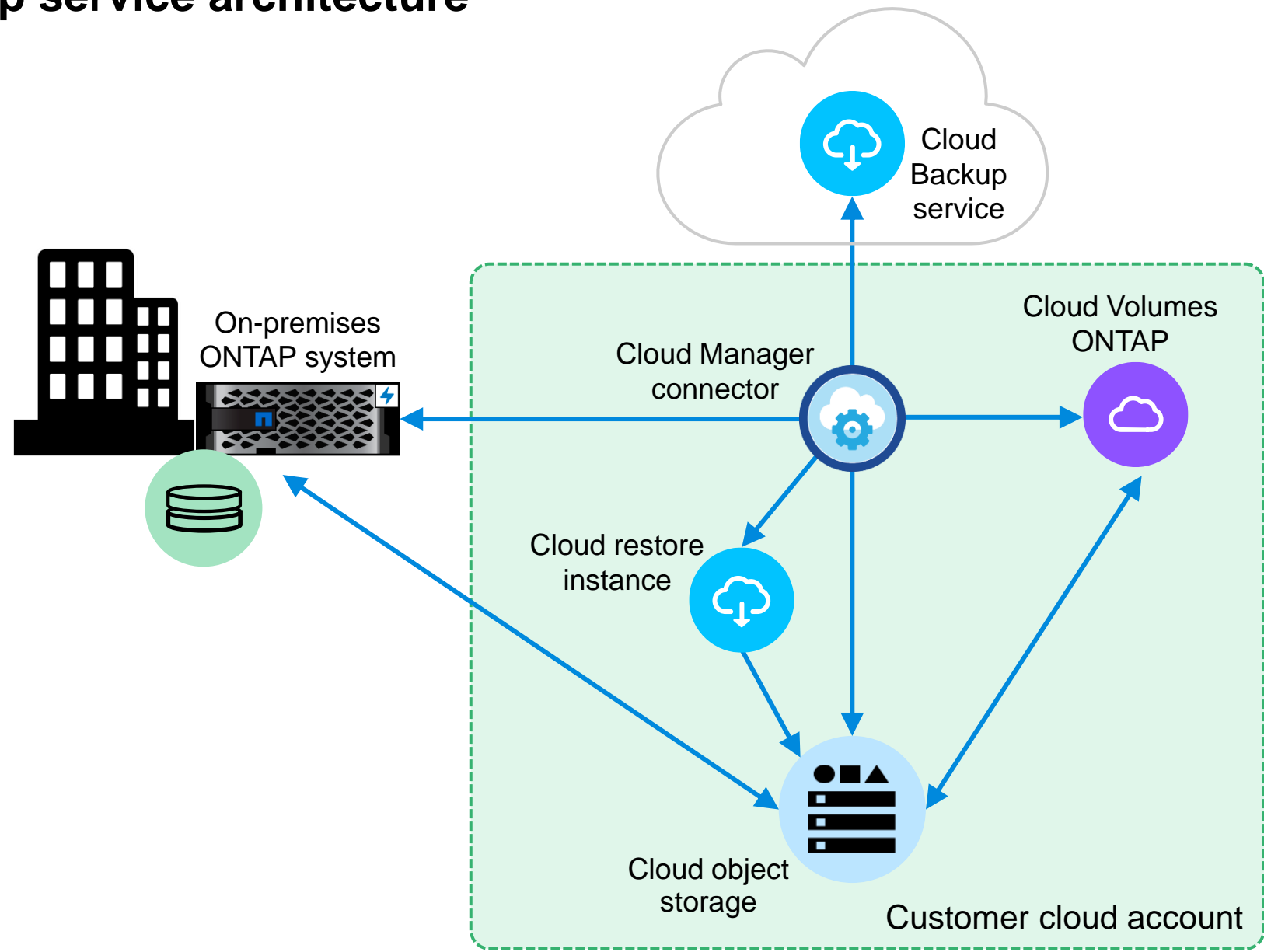
Cloud Backup service

Overview



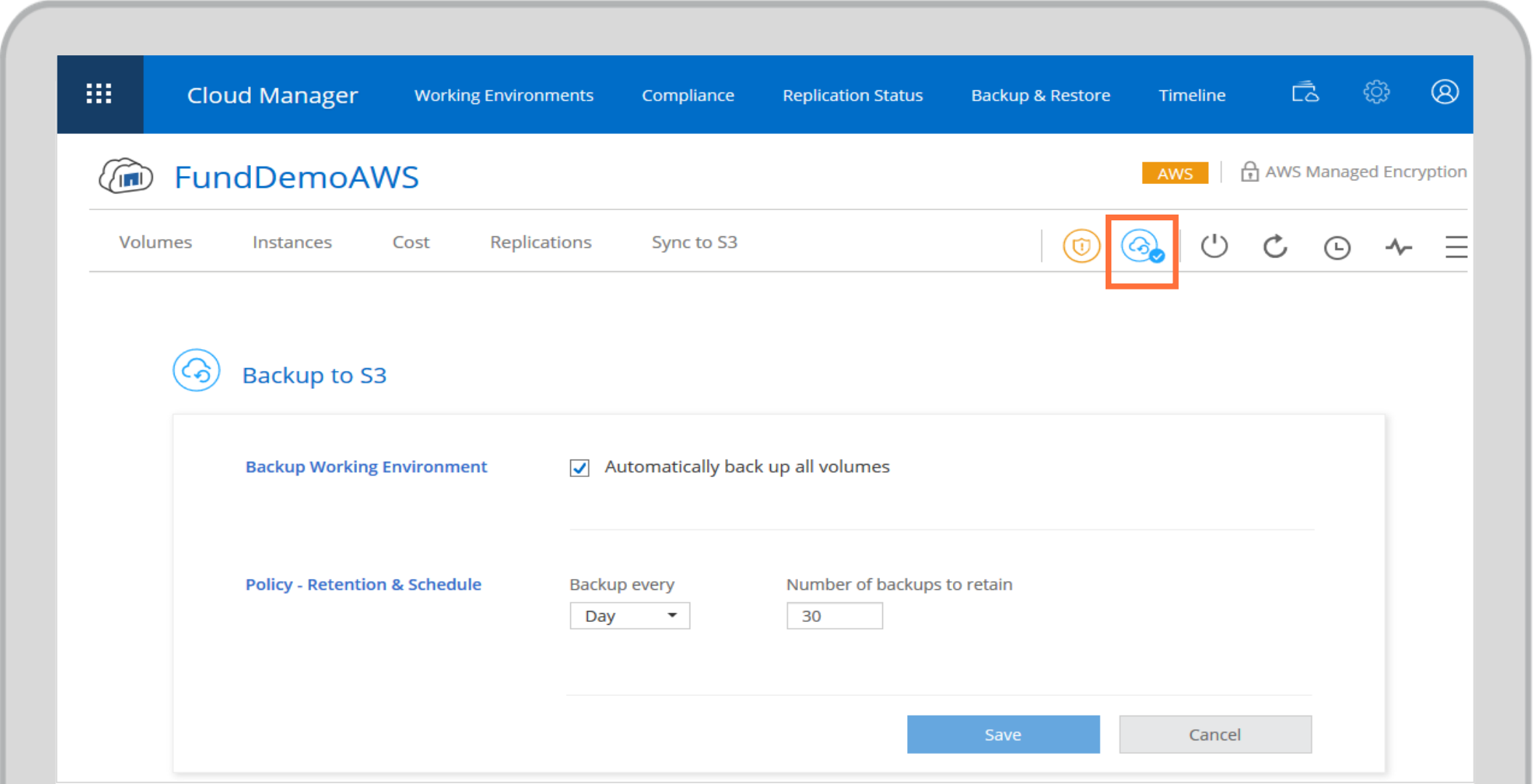
- Part of Cloud Manager
- Delivers backup and restore capabilities
 - Back up directly to customer-owned public cloud object storage, without a mediator or gateway.
 - Data is encrypted end to end and secured at rest and in flight.
- Enables you to back up to the cloud while meeting compliance regulations
 - Data is securely backed up to object storage.
 - Data is scanned for sensitive information.

Cloud Backup service architecture



Example: Cloud Backup service in AWS

Back up and restore data to Amazon S3



Cloud Backup service

Primary use cases



Cloud backup and archive

- Backups are true individual copies.
- Backups are off-site, satisfying 3-2-1 backup strategy.
- Backups provide long-term recovery when a volume is deleted or unavailable.



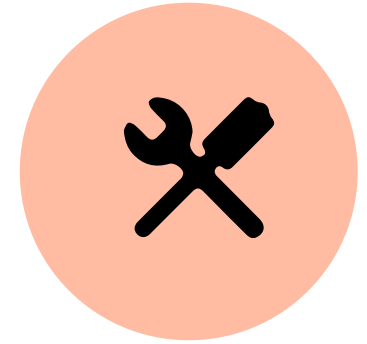
Disaster recovery

- Use a separate location from primary data on cloud object storage.
- Recover to Cloud Volumes ONTAP in a region.



Ransomware protection

- Backups are read-only and cannot be modified.
- Backups protect against insider threats or accidental deletion.

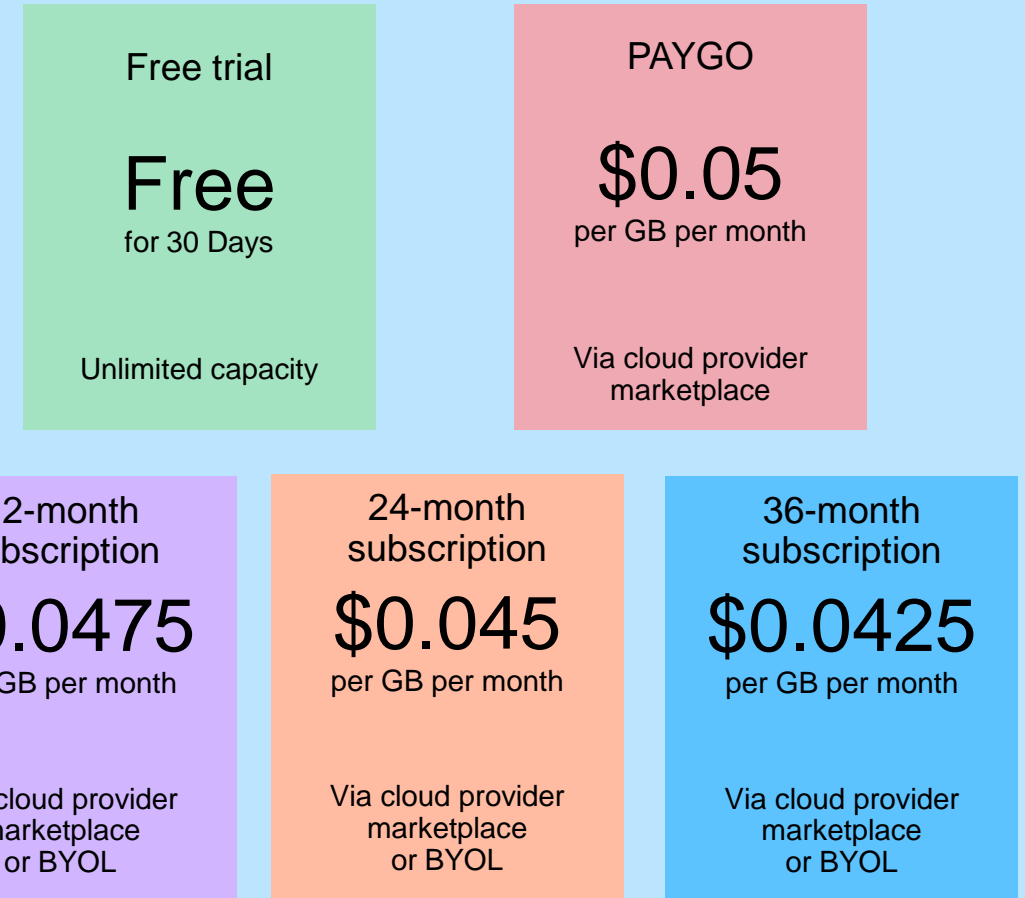


Modernization

Replace legacy tape solutions.

Pricing

- Pay only for what you protect, according to the target backup capacity before efficiencies.
- Object storage cost applies.
 - Source volume storage efficiencies are preserved.
 - Customer pays for deduplicated and compressed data.
- There is no charge on restore.
- Select PAYGO or BYOL.



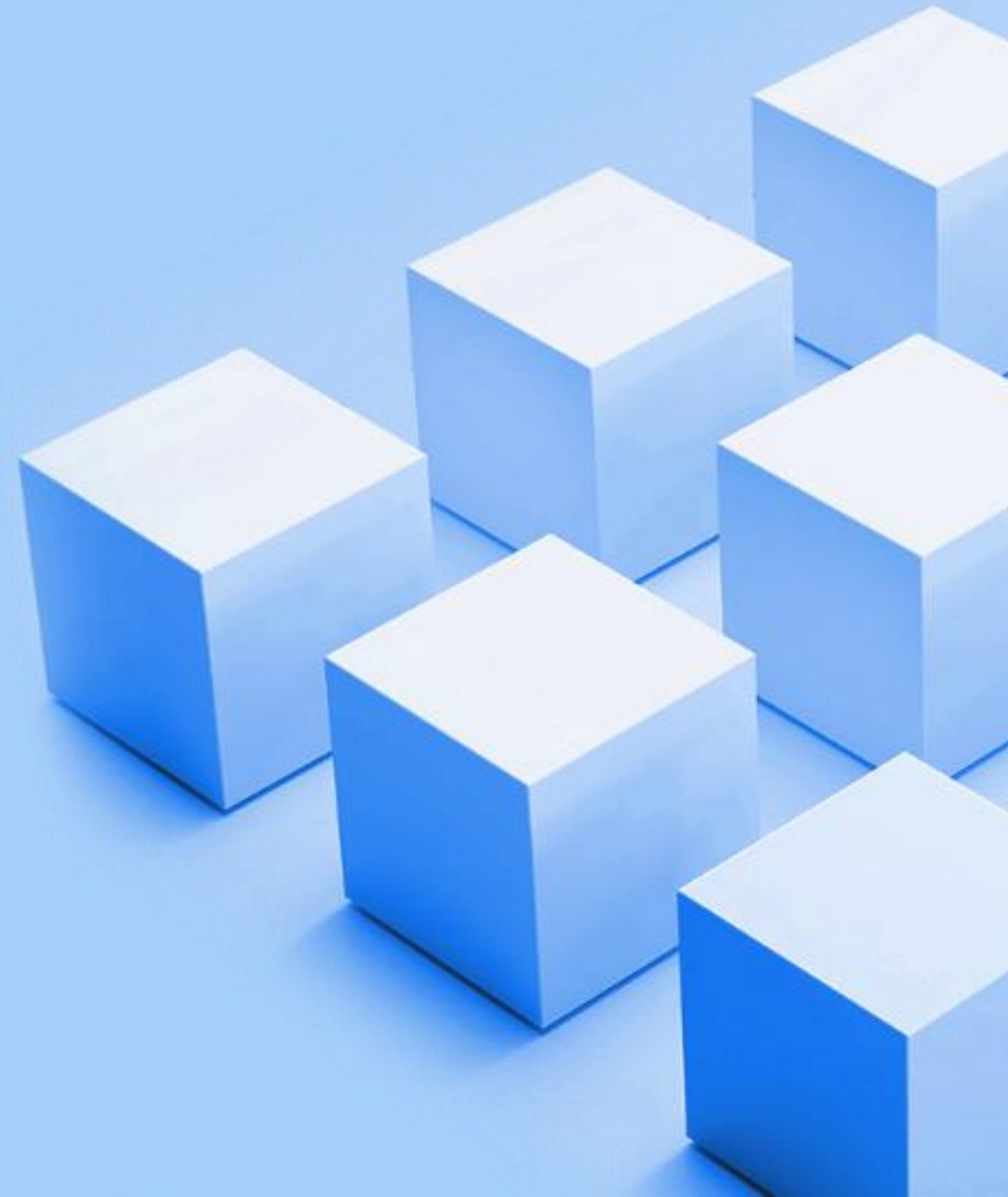
Lesson 3

SnapMirror Cloud

SnapMirror Cloud

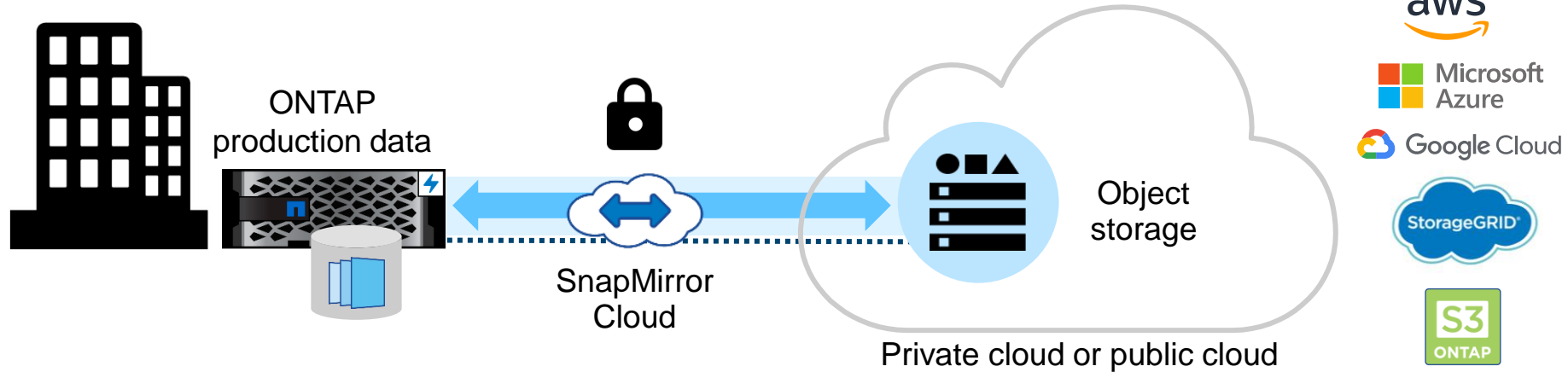
Hybrid cloud data mobility and data protection across the data fabric

A collection of RESTful APIs integrated in
ONTAP software (ONTAP 9.8 and later)
for asynchronous Snapshot replication to
object storage targets



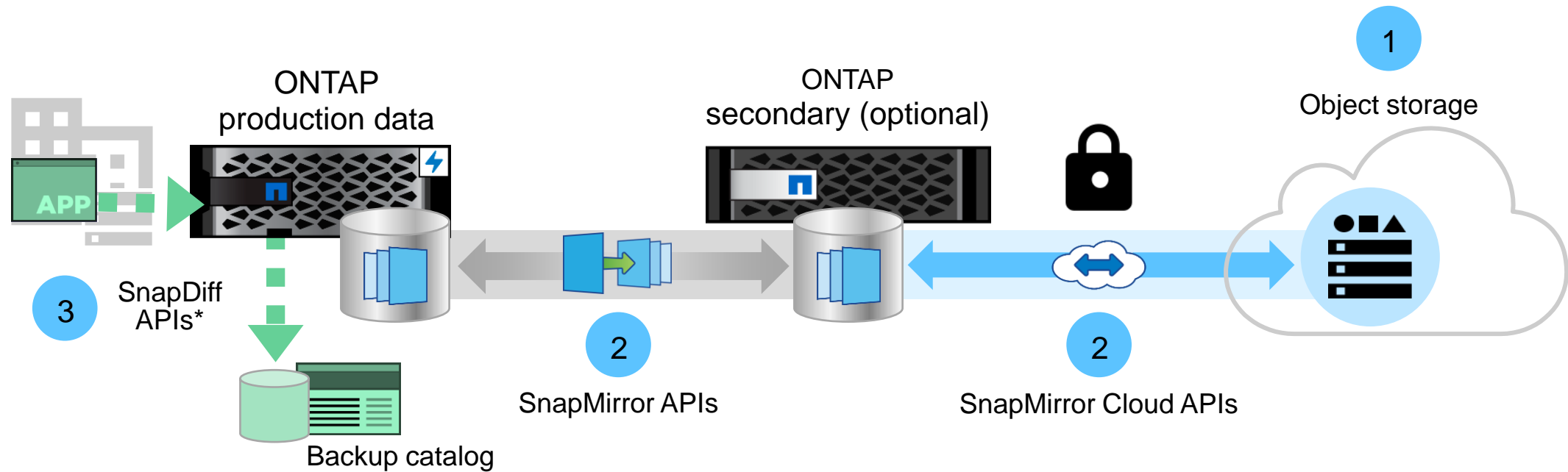
SnapMirror Cloud

Overview



- Copies ONTAP Snapshot copies to object storage, on-premises or in the public cloud
- Requires an authorized backup application for workflow orchestration
- Options for orchestrating SnapMirror Cloud workflows include:
 - Independent vendors of backup software: multiple partners to offer applications that integrate SnapMirror Cloud APIs
 - Cloud Backup service on NetApp Cloud Central, using NetApp Cloud Manager

SnapMirror Cloud workflow for third-party backup software

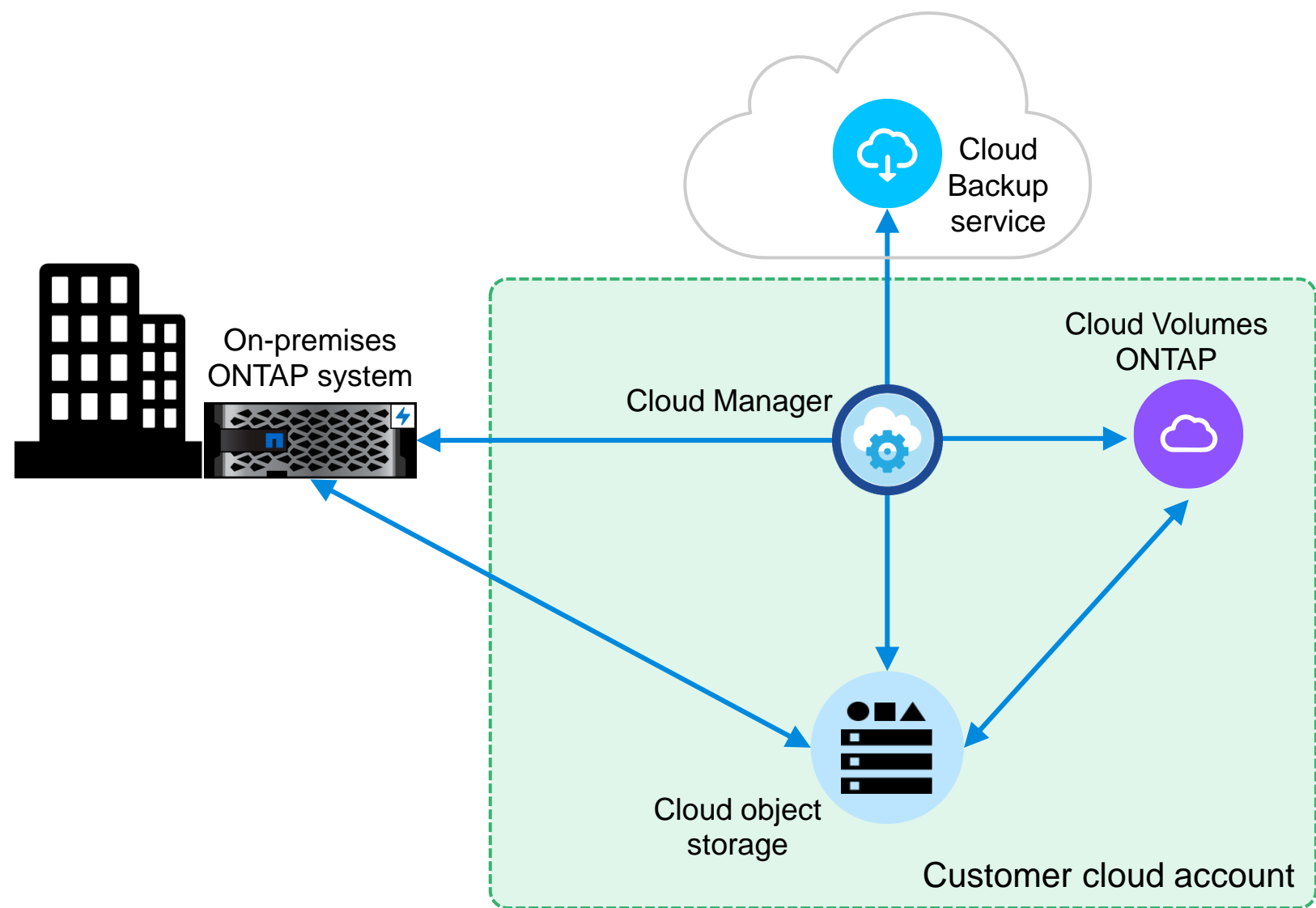


Available backup and restore options:

- Full volume backup
- Volume restore (to a different volume)
- Single file restore

*SnapDiff is an internal ONTAP engine that quickly identifies the file and directory differences between two Snapshot copies.

SnapMirror Cloud workflow for Cloud Backup service



SnapMirror Cloud

Supported object storage targets

On-premises

- NetApp StorageGRID appliance (v10.3 and later)
- StorageGRID software defined (v10.3 and later)
- ONTAP S3 (ONTAP 9.8 and later)

Public cloud

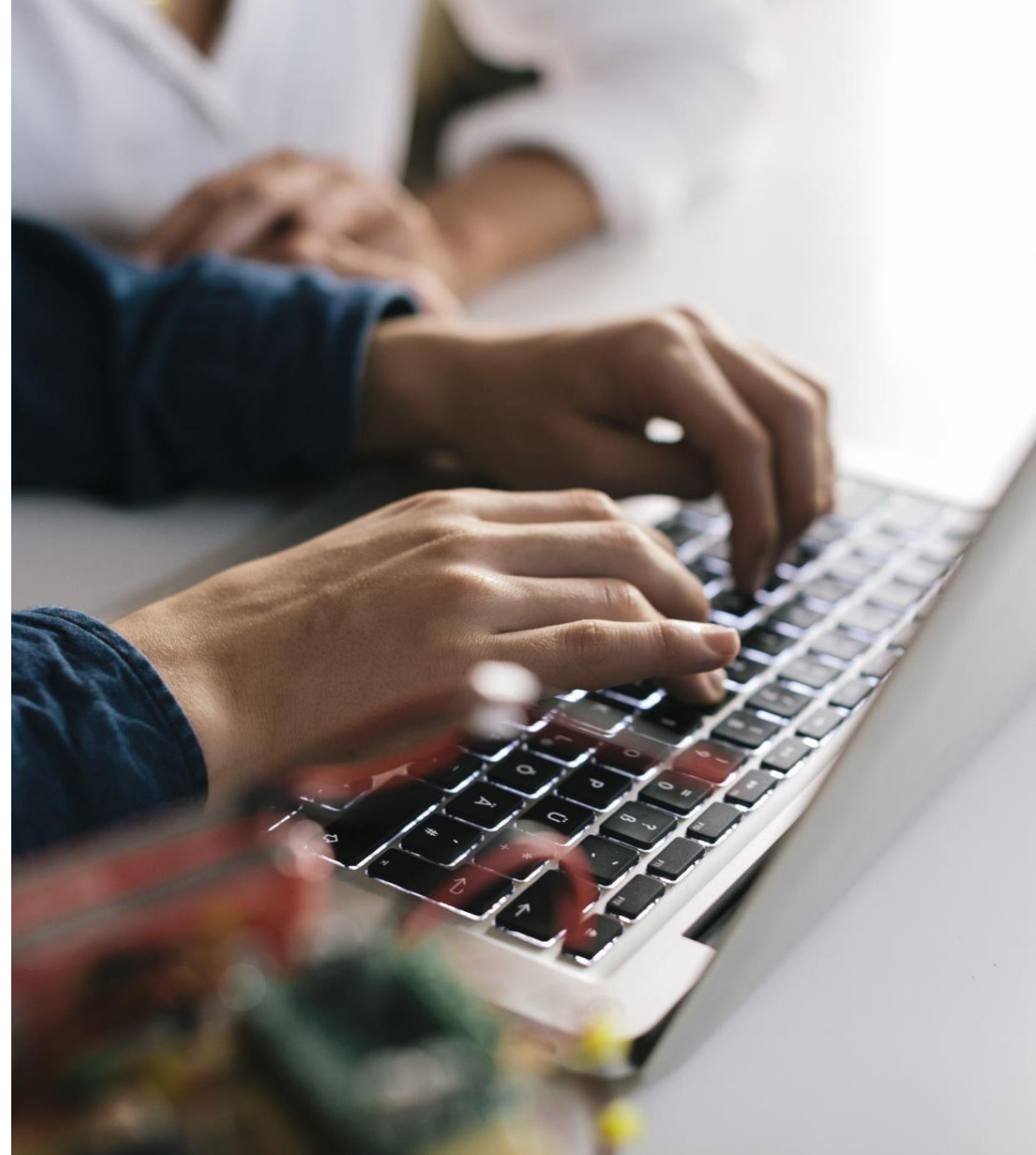
- Amazon S3
 - S3 Standard
 - S3 Standard – Infrequent Access
 - S3 One Zone – Infrequent Access
- Azure Blob Storage
 - Premium
 - Hot
 - Cool
- Google Cloud Storage
 - Standard Storage
 - Nearline Storage

SnapMirror Cloud known limitations

- Only ONTAP FlexVol volumes are supported as a source.
- ONTAP S3 can be used only as a target.
- Configuration occurs only through partner backup applications or Cloud Manager.
- AWS S3 Intelligent-Tiering is supported only between Standard and Standard – Infrequent Access storage classes.
- MetroCluster technology is supported only through an intermediate ONTAP system.
- The following systems and features are unsupported in SnapMirror Cloud:
 - AWS Glacier or similar lower-tier object storage
 - ONTAP System Manager (formerly OnCommand System Manager)
 - ONTAP FlexGroup volumes
 - SVM DR
 - SnapMirror Business Continuity
 - SnapCenter software
 - SnapLock compliance software volumes
 - WORM or compliance mode on object store
 - NetApp Element software

SnapMirror Cloud licensing

- Both SnapMirror and SnapMirror Cloud licenses are required on the ONTAP source cluster.
- SnapMirror Cloud licenses can be purchased only from NetApp and partner resellers. Licenses are not required if the Cloud Backup service is used to replicate ONTAP data to object storage.
- The license is available via purchase of Hybrid Cloud Bundle Part Numbers. A term-based license is available for 1 year or 1 years.
- The pricing model is based on the physical used capacity on the source ONTAP volume, in increments of 1 TB.



Lesson 4

Cloud Sync service



Cloud Sync service

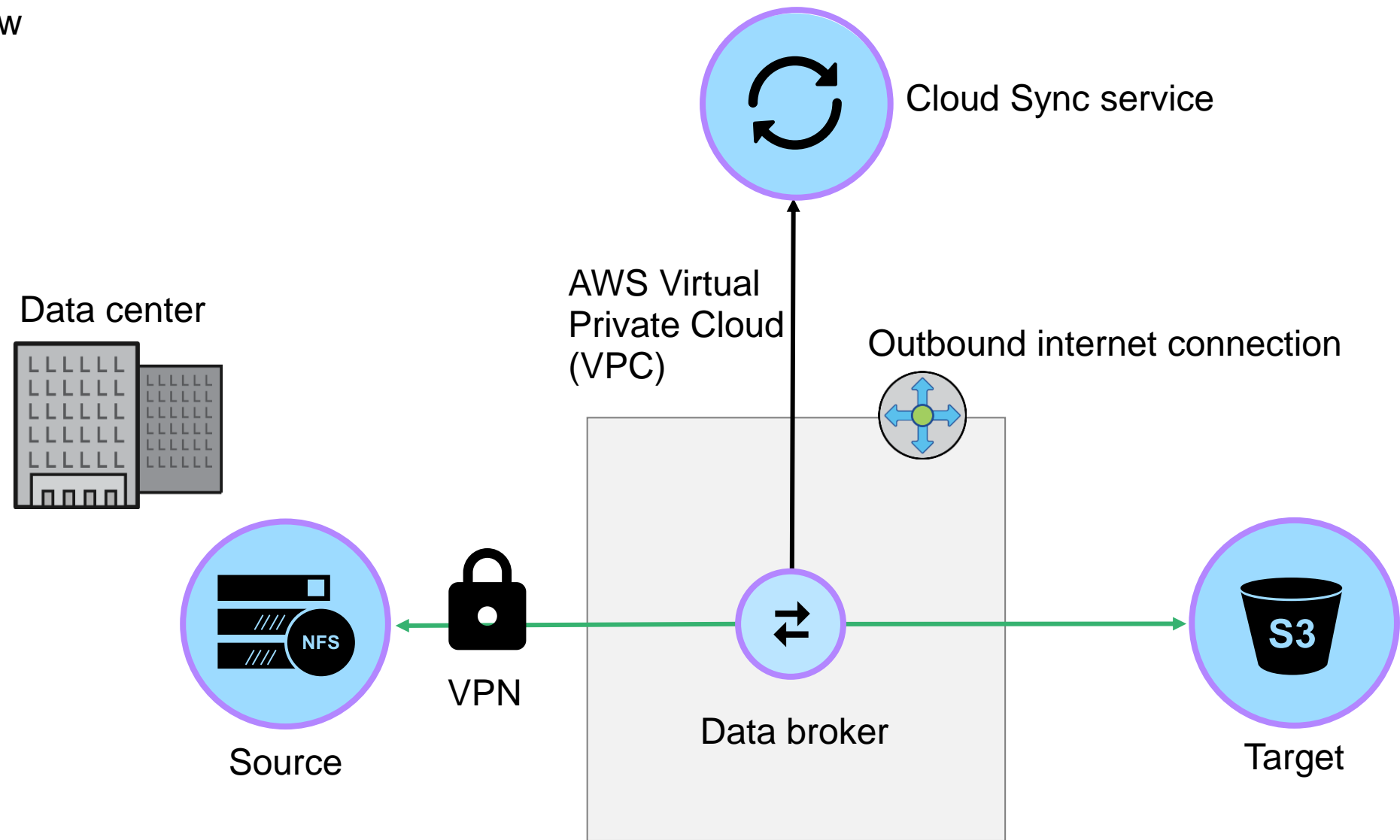
Secure, fast, automated data synchronization

An easy-to-use cloud replication and
synchronization service for transferring NAS data
between on-premises and cloud object stores



Cloud Sync service

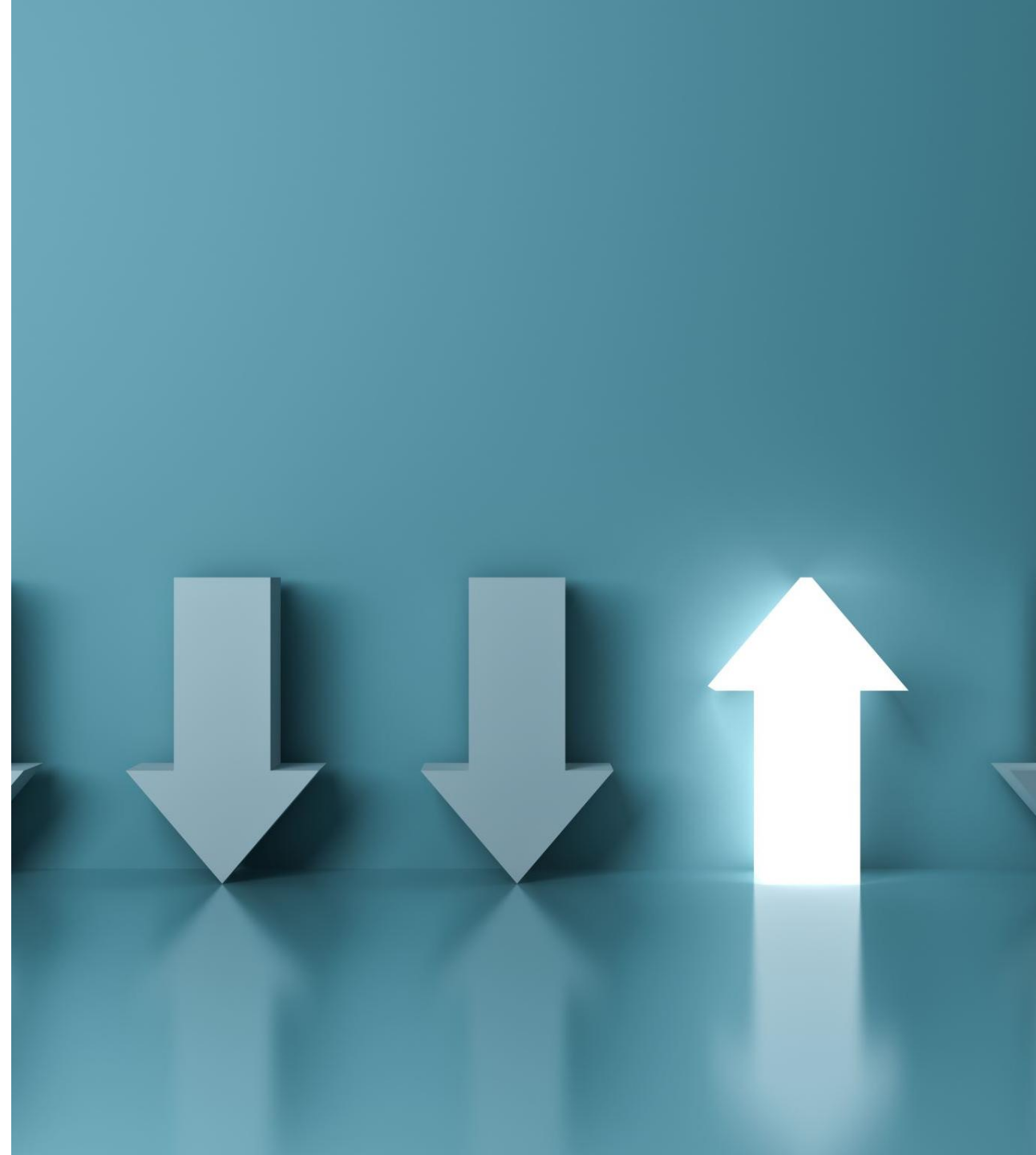
Overview



Cloud Sync service

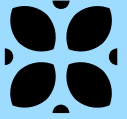
Use cases

- Data migration
- Big data analytics (using AWS services)
- Onboard cloud environments
- Data consolidation
- Data tiering
- Data archiving
- Data lakes
- Data protection



Cloud Sync service

Benefits



Seamless

Sync cycles that are based on the schedule that you set, moving only changes



Simple

Intuitive web-based GUI and API



Reliable

Enterprise-class monitoring, auditing, and reports



Secure

Data within your security boundaries



Fast

Continuous sync of large workloads and immediate data access



Cost effective

Simple, on-demand resources

Cloud Sync licensing model

Pay for relationships after the free trial ends

A license model that is designed for a cloud consumption mindset

PAYGO



Deploy by the hour through
your cloud provider

Pay for only what you use, by the hour



Online Sales

BYOL



Purchase a subscription from NetApp

Purchase annual subscription
20 sync relationships per license



Field Sales

Additional learning

- *NetApp Public Cloud Services Fundamentals*
- *Cloud Volumes ONTAP Fundamentals*
- *NetApp Cloud Manager Fundamentals*

Resources

- NetApp Cloud Central
<https://cloud.netapp.com>
- NetApp Cloud Documentation
<https://docs.netapp.com/us-en/cloud/>
- NetApp Cloud Solutions Blog
<https://cloud.netapp.com/blog>

Module summary

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An abstract graphic in the top right corner consisting of a grid of teal-colored cubes. The cubes are arranged in a way that creates a sense of depth and perspective, with some cubes appearing to be in front of others, casting soft shadows. The overall effect is a modern, architectural design element.

Knowledge check

Module 8: Cloud-based data protection

Knowledge check

Which three protocols does Cloud Volumes ONTAP support for accessing data from a client application? (Choose three.)

- a. NFS
- b. FC
- c. FCoE
- d. SMB
- e. iSCSI

Knowledge check

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- a. NFS
- b. FC
- c. FCoE
- d. SMB
- e. iSCSI

Knowledge check

Which NetApp tool do you use to deploy and update Cloud Volumes ONTAP?

- a. Cloud Manager
- b. ONTAP System Manager
- c. NetApp Active IQ Unified Manager (formerly OnCommand Unified Manager)
- d. NetApp Virtual Storage Console software client plug-in

Knowledge check

Which NetApp tool do you use to deploy and update Cloud Volumes ONTAP?

- a. Cloud Manager
- b. ONTAP System Manager
- c. NetApp Active IQ Unified Manager (formerly OnCommand Unified Manager)
- d. NetApp Virtual Storage Console software client plug-in

Knowledge check

Which three environments does Cloud Backup service support? (Choose three.)

- a. Cloud Volumes ONTAP for AWS
- b. Cloud Volumes Service for Google Cloud
- c. Cloud Volumes ONTAP for Azure
- d. on-premises StorageGRID systems
- e. on-premises ONTAP clusters

Knowledge check

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- d. on-premises StorageGRID systems
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Knowledge check

After the initial full backup of data, which type of backups does Cloud Backup service take?

- a. full
- b. differential
- c. incremental
- d. mirror

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