

SOLUTION BRIEF

NetApp Cloud Volumes ONTAP for AWS Outposts

On-premises hybrid AWS
cloud experience



Advanced
Technology
Partner

AWS Outposts

Partnership Strength

AWS, the industry-leading public cloud provider, and NetApp, the industry leader in enterprise-grade storage, have partnered to deliver application-driven storage for business-critical workloads. NetApp is positioned to harness AWS's advanced features and deliver a safer, faster way to migrate, deploy, and manage production-level applications, while gaining cloud scalability, agility, and cost efficiencies.

As the cloud storage specialists, NetApp has hundreds of AWS success stories in delivering Windows (SMB/CIFS) and Linux (NFS) file shares, and block-level iSCSI storage that serves NAS and SAN protocols, for cloud-native workloads and hybrid cloud-ready applications.

The Challenge

Every company is at a different stage on its journey to the cloud. However, some workloads need to remain on premises because of low latency, data processing, or local data storage needs, and the need to regional compliance and data privacy requirements.

In today's world of AI, big data, and analytics, enterprises need all the data-crunching capacity they can get. When you deploy new services or run applications with varying usage needs, the cloud provides a level of flexibility that allows you to pay for what you need, when you need it. However, even though the cloud has become synonymous with flexibility and efficiency, some applications still can't be moved to the cloud today for various reasons.

As enterprises adopt the cloud for agility and lower costs, they also want robust AWS-native features on premises, so that IT can build and run modern, secure, application-driven cloud workloads. Many compute- and storage-intensive workloads or graphics-intensive programs with fixed usage patterns continue to be deployed in a more traditional fashion: in the on-premises data center.

Industry Use Cases

NetApp® Cloud Volumes ONTAP® for AWS Outposts can address low latency application needs and local data processing requirements across a broad range of workloads.

Databases

- Requiring minimal delay in writing and retrieving data

Financial Services

- Executing banking, payments processing, and risk management services at low latency

Windows File Shares

- Achieving highly scalable, highly available, and high-performing SMB shares

High Performance Computing

- Processing, storing, and analyzing data with lightning-fast file services

Manufacturing Automation

- Running manufacturing such as manufacturing execution systems (MES) and supervisory control and data acquisition (SCADA) systems close to the factory floor

Media & Entertainment

- Accessing GPU innovations on premises for graphics processing, rendering, and real-time streaming

Retail

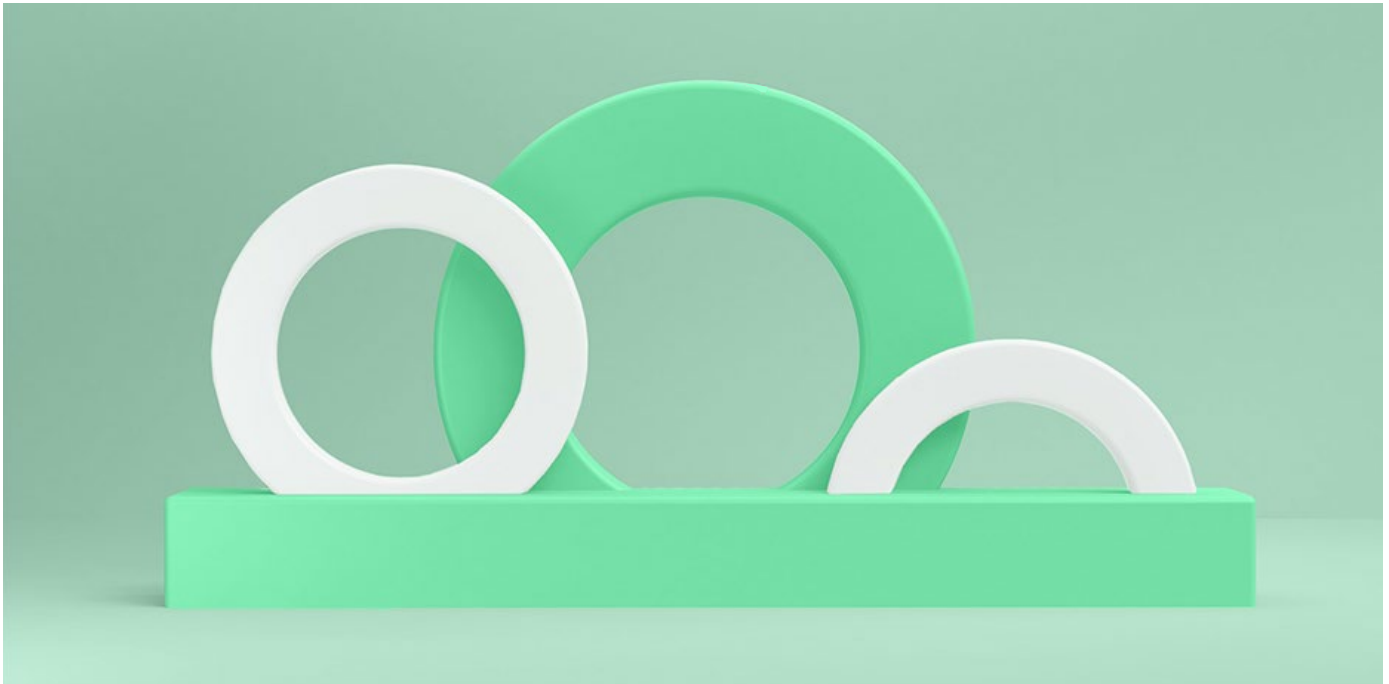
- Enabling retail innovations, in-store experiences, and local point-of-sale systems

Telecommunications

- Updating and orchestrating at scale to manage virtual network function (VNF) lifecycles

Healthcare

- Retrieving medical information rapidly while applying low-latency analytics and machine learning



This situation creates disparate development and operating models that miss out on the benefits of the AWS cloud.

Instead of using siloed models, what if developers could use the same services and APIs that they use in the cloud to develop applications on premises? What if IT could use the same tools to manage and operate IT resources across on-premises environments and cloud? What if your organization could get a truly consistent hybrid experience?

Truly Consistent Hybrid Cloud Experience

Customers need to control what happens to their data no matter where it is. Enterprises must exploit the benefits of public cloud infrastructure and services in models that best fit their applications' needs, where data storage is at the center and deliver business value.

AWS Outposts is a fully managed service that brings the public cloud on site. It offers the same AWS hardware infrastructure, services, APIs, and tools to run your applications on premises and in the cloud. AWS compute, storage, database, and other services run locally on Outposts, and you can scale your on-premises applications by using familiar AWS services and tools.

Outposts are connected to the nearest AWS Region. Thus, they provide the same management and control plane services on premises for a consistent operational experience across your local and cloud environments. Your Outposts infrastructure and AWS services are managed, monitored, and updated by AWS just as in the cloud.

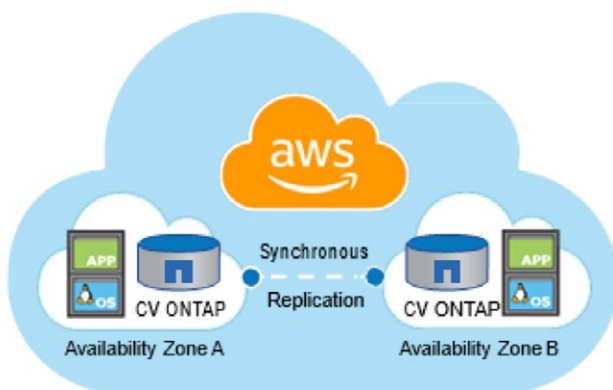


Figure 1) NetApp Cloud Volumes ONTAP for AWS.

Cloud Volumes ONTAP for AWS Outposts

AWS Outposts has qualified NetApp Cloud Volumes ONTAP. AWS Outposts are tuned to use enterprise-grade file storage services with industry-leading NetApp ONTAP technology. Cloud Volumes ONTAP can extend the AWS infrastructure to virtually any data center, colocation space, or on-premises facility for a ubiquitous hybrid cloud experience.

NetApp has the only qualified storage service deployed on AWS Outposts to run file shares and block-level storage serving NAS and SAN protocols (NFS, SMB, iSCSI).

Cloud Volumes ONTAP integrates with AWS Outposts to unlock the best of cloud, addressing low-latency application needs and local data processing requirements across a broad range of workloads.

Cloud Volumes ONTAP for AWS

NetApp Cloud Volumes ONTAP for AWS is a well architected cloud-native storage and data management software, providing the most efficient, robust file and block storage infrastructure that matches your application's needs.

Cloud Volumes ONTAP is well-architected cloud-native storage and data management software that is built on NetApp ONTAP technology. It offers a universal storage platform to address your cloud data needs for control, protection, and efficiency. With the same storage system in the cloud and on your premises, you get the value of a data fabric without having to train your IT staff in all-new methods of data management.

Cloud Volumes ONTAP provides a data storage solution that fits many different customer requirements. These requirements range from disaster recovery, development, and test environments to critical applications that require highly available nondisruptive operation, such as production business applications and file services using NFS and SMB. Cloud Volumes ONTAP is deployed and managed from NetApp Cloud Manager as a software-only solution; it runs on Amazon Elastic Compute Cloud (Amazon EC2)

compute instances managing Amazon EBS storage. This capability enables you to build a virtual storage solution directly on Amazon resources.

Building your cloud storage environment on Cloud Volumes ONTAP provides advanced data management features. ONTAP allows you to provision both NAS and SAN storage for your application environment with SMB, NFS, and iSCSI support. You also get zero-impact NetApp Snapshot™ technology that provides near-instantaneous point-in-time backup and recovery copies of your data without consuming additional storage resources or affecting your application performance.

In addition, you minimize your storage footprint and cloud resources spending with storage efficiency features such as data deduplication and data compression that act on your primary and secondary data. With the NetApp SnapManager® tool suite, you get application-consistent Snapshot copies. On top of all the local storage features, ONTAP provides NetApp SnapMirror®, the #1 storage replication technology. SnapMirror brings your hybrid cloud together by tying your on-premises NetApp AFF and FAS to your Cloud Volumes ONTAP environment.

In AWS Outposts, your data physically sits on third-party storage. To address security concerns, Cloud Volumes ONTAP supports multiple methods for protecting your data. You can use AWS storage encryption and take advantage of Amazon key management services. If you're want a more secure option, Cloud Volumes ONTAP provides an additional protection with NetApp native encryption technologies: NetApp Volume Encryption (NVE) and NetApp Aggregate Encryption (NAE). With these native technologies, you can own and manage the encryption keys outside the cloud.



NetApp Cloud Manager

For many enterprises, the cloud is a new environment. As you find ways to simplify your cloud resource usage, it's important to have tools to streamline the experience.

Cloud Manager software is a centralized management environment for all your ONTAP software-based storage systems across the hybrid cloud, including Cloud Volumes ONTAP, AFF, and FAS. Through automation and orchestration, Cloud Manager streamlines the deployment of Cloud Volumes ONTAP on top of AWS infrastructure.

Cloud Manager performs daily management activities for your data fabric endpoints and can automate your data movement to and from AWS. Cloud Manager integrates seamlessly with your cloud environment, so it can gather the resources you need to meet your storage requirements. With visibility into the resources consumed by each instance, Cloud Manager provides valuable feedback to administrators about the cost and utilization of resources over time. This information helps you decide when and where to move a workload if a change of resources is required to cost-optimize your environments.

Cloud Manager Key Features

Cloud Manager offers the following benefits:

- Simplifies configuration and deployment of Cloud Volumes ONTAP
- Provides a central point of control for all Cloud Volumes ONTAP instances
- Automates data movement between your premises and AWS
- Provides cost monitoring of your AWS cloud storage resources
- Eases license and entitlement management
- Facilitates hybrid environments that include Cloud Volumes ONTAP, AFF, and FAS systems



Figure 2) NetApp Cloud Manager.

Consumption Models

Cloud Volumes ONTAP offers two consumption methods: pay as you go and subscription. Pay as you go is purchased directly from your AWS account and is charged either hourly or annually. The subscription model is a license purchased from NetApp that follows the Amazon bring-your-own-license (BYOL) model and is installed in your Cloud Volumes ONTAP instance. You can purchase BYOL subscriptions in 6-month or annual increments.

For short-term application needs or for environments that must spin up or down on demand, the hourly pay-as-you-go consumption model is appropriate. If your application is more deterministic or will be used for longer periods of time, the 6-month or annual subscription might be better.

In each consumption model, there are multiple solutions that start at a single instance with 2TB capacity and range up to two-node high-availability environments with up to 368TB of capacity. For the pay-as-you-go offerings, the capacity and features of Cloud Volumes ONTAP depend on the Amazon EC2 server instance chosen. Small server instances are matched with small capacity, and the largest instances support the maximum capacity.

A Truly Consistent Hybrid Cloud

To help you determine the infrastructure that best fits your application and economic needs, NetApp offers a wide variety of options. These options range from on-premises storage systems and near-the-cloud NetApp Private Storage (NPS) systems to in-the-cloud Cloud Volumes ONTAP storage software service.

About NetApp

In a world full of generalists, NetApp is a specialist. We're focused on one thing, helping your business get the most out of your data. NetApp brings the enterprise-grade data services you rely on into the cloud, and the simple flexibility of cloud into the data center. Our industry-leading solutions work across diverse customer environments and the world's biggest public clouds.

As a cloud-led, data-centric software company, only NetApp can help build your unique data fabric, simplify and connect your cloud, and securely deliver the right data, services, and applications to the right people—anytime, anywhere.

To help you choose which environment best fits your applications, Tables 1 and 2 organize workload characteristics, application locations, and application properties alongside solutions and features.

Table 1) Application environments and workload characteristics.

	CLOUD VOLUMES ONTAP FOR AWS (SINGLE NODE)		CLOUD VOLUMES ONTAP FOR AWS HIGH AVAILABILITY	
Licensing	Pay as you go	BYOL	Pay as you go	BYOL
High availability	No	No	Yes	Yes
Multiprotocol	NFS, SMB, iSCSI	NFS, SMB, iSCSI	NFS, SMB, iSCSI	NFS, SMB, iSCSI
Data protection	Snapshot, SnapMirror, SnapVault®	Snapshot, SnapMirror, SnapVault	Snapshot, SnapMirror, SnapVault	Snapshot, SnapMirror, SnapVault
NetApp FlexClone® volumes	Yes	Yes	Yes	Yes
Tiering to S3	Yes	Yes	Yes	Yes
Encryption	<ul style="list-style-type: none">ONTAP encryptionAWS encryption with default key or external keys	<ul style="list-style-type: none">ONTAP encryptionAWS encryption with default key or external keys	<ul style="list-style-type: none">ONTAP encryptionAWS encryption with default key or external keys	<ul style="list-style-type: none">ONTAP encryptionAWS encryption with default key or external keys
VMware Cloud support	Yes	Yes	Yes	Yes
AWS regions	All	All plus GovCloud	All	All plus GovCloud
EBS volume types	GP2, ST1, SC1, and IO1	GP2, ST1, SC1, and IO1	GP2, ST1, SC1, and IO1	GP2, ST1, SC1, and IO1
Procurement (license)	AWS Marketplace	NetApp	AWS Marketplace	NetApp
Solution capabilities	M4.XL: <ul style="list-style-type: none">Up to 2TB M4.2XL, R4.XL: <ul style="list-style-type: none">Up to 10TB M4.4XL, C4.4XL, C4.8XL, R4.2XL <ul style="list-style-type: none">Up to 368TB	M4.4XL, C4.4XL, C4.8XL, R4.2XL: <ul style="list-style-type: none">Up to 360TB	M4.XL: <ul style="list-style-type: none">Up to 2TB M4.2XL, R4.XL: <ul style="list-style-type: none">Up to 10TB M4.4XL, C4.4XL, C4.8XL, R4.2XL <ul style="list-style-type: none">Up to 368TB	M4.4XL, C4.4XL, C4.8XL, R4.2XL: <ul style="list-style-type: none">Up to 360TB
Support	Software support plan	Software support plan	Software support plan	Software support plan

Table 2) NetApp solutions for different application locations and properties.

APP LOCATION	NETAPP SOLUTION	APPLICATION PROPERTIES
On premises	AFF/FAS/E-Series	Application usage pattern and resource requirements are well known, with long-term steady-state usage.
Near the cloud	NPS for Cloud	Application has high governance and/or high performance requirements but with variable usage patterns.
In the cloud	Cloud Volumes ONTAP	Applications have variable usage and variable storage patterns, or applications can benefit from rapid spin-up and/or rapid spin-down of storage.



1 Source: IDC Worldwide Quarterly Enterprise Storage Systems Tracker 2018 Q1, June 2018 (Open Networked Enterprise Storage Systems revenue).