E-BOOK

Practical advice for moving to AWS

Learn the benefits of migrating to the cloud—a journey made easier with data services from NetApp

NetApp

Contents

Executive summary

Migrating to the cloud doesn’t have to be difficult.

This e-book explores the benefits of moving data, applications, and workloads to AWS. To be sure, there can be challenges, but the benefits outweigh the risks for companies that need to transform their operations. Today’s most successful companies are reaping the rewards of cloud because it helps drive exponential value, effortlessly scaling at speed to respond to changing business needs.

But to get there, companies are often faced with one or more of the following challenges. This e-book examines each challenge and shows you how to overcome them:

- Cost and complexity
- Deployment and data efficiency
- Poor performance
- Risky data protection
- Challenging compliance
- Complicated optimization

We’ll review important use cases, solutions, and benefits that are specific to AWS flexibility, performance, and cost.

Cloud challenges for business-critical apps

When organizations move their business-critical apps to the cloud, they expect smooth migration, reduced cost and complexity, and cloud-based agility. However, there are no such guarantees with many self-managed storage solutions.

For example, many organizations assume that the cloud provides common file shares for Windows and Linux workloads. But many clouds don’t—and the ones that do have self-managed or NAS-based file services that tend to be siloed, complex, and slow.

Let’s break down major challenges that organizations encounter when business-critical apps and data are poised to move to the cloud.

Cost and complexity

Example:

Your company expects a high return from its cloud investment, but getting high value at lower cost is challenging, with no guarantee of success.

The challenge:
Experienced administrators are accustomed to managing data center storage. But they're less familiar with managing storage in the cloud, and most clouds lack the tools that data center administrators take for granted—like tools for deduplication and compression, automatic tiering, immutable data protection, and simplified data management. These features automatically reduce the storage consumption on your file system storage and your file system backups—typically by 65% for general-purpose workloads[1]. Without these effective and sustainable management tools, overhead costs rise.

The solution:
NetApp solutions help you simplify cloud storage management without hiring specialized cloud architects. You can do enterprise-level file management, access cloud-native configuration tools, and use APIs from a central management console. For example, any volume you create should be thin provisioned—the storage for the volume is allocated as it's needed. With our technology, you can limit the amount of data that a volume stores, and you can also increase or decrease a volume's size at any time.

[1] Cost optimization features of Amazon FSx for NetApp ONTAP.

Deployment and data efficiency

Example:

Hybrid cloud management is rarely unified—it's often segmented and narrowly focused. Cloud teams need a way to discover and deploy cloud infrastructure with point-and-click simplicity, and they need centralized access across the entire data fabric. Teams frequently ask for zero-touch management of cached data at the edge and low-latency cloud bursting services.

The challenge:
It can be difficult to manage workloads in the cloud and at the edge while balancing performance and cost. Automated controls and orchestration are common in the data center, but not so common or well developed in the public cloud. This makes it hard to meet the pressure to cut the risks of a globally distributed workforce and to burst on-premises workloads to the cloud.

The solution:
To manage operations for your entire data estate and simplify data environments, you need the single point of control that the NetApp portfolio provides. Our solutions also provide an innovative, integrated digital wallet, so you get flexible consumption while optimizing cloud costs—satisfying both operational and FinOps (cloud financial operations) needs. With extra data efficiency muscle, we help you centralize data by caching "active datasets" in distributed offices. You can also configure an in-cloud cache for low-latency access to on-premises datasets.

Poor performance

Example:

If you use VMware Cloud on AWS, you have unique storage requirements like capacity growth and high performance. Often these requirements don't scale in tandem, leaving resources overprovisioned or underprovisioned. Your administrators and developers need enterprise storage features and also want to run them in the cloud without the pain, time, and cost of refactoring data or applications.

The challenge:
Businesses are deploying enterprise workloads in the cloud. These workloads include Oracle, SQL, and SAP HANA databases; enterprise resource planning (ERP); customer relationship management (CRM); analytics; and VMware Cloud. But migrating often requires rearchitecting. Enterprise workloads in the cloud need low latency, and high performance has always meant higher costs.

The solution:
The native datastore functionality in NetApp solutions helps you meet VMware workload storage challenges head-on by scaling capacity independently from compute. You get on-premises-like features for VMware hypervisors with NetApp ONTAP storage volumes mounted as datastores in the public cloud.

Risky data protection

Example:

Cybersecurity involves the highest levels of your organization—IT directors, chief information security officers, chief legal counsel, and chief financial officers. Moving data to the cloud doesn't shift this responsibility to the provider.

The challenge:
The public cloud provider is responsible for securing its digital and physical infrastructure and hypervisor, and for its SLAs. But as a cloud customer, you are solely responsible for your own data protection, including creating backups and fighting ransomware.

The solution:
Organizations must protect their apps and data against loss, corruption, or theft, just as they do with on-premises storage. Our solutions help you control access, automate cloud-native backup and replication, and integrate disaster recovery approaches that work for a hybrid cloud.

Challenging compliance

Example:

Your cloud provider offers a software tool that locates personally identifiable information (PII). However, the tool only works directly on the cloud's object storage.

The challenge:
Achieving consistent compliance on premises can be difficult enough. Adding compliance in the cloud increases the challenge of identifying sensitive information, observing regulations from different bodies, and safely modifying and deleting protected files.

The solution:
NetApp technology helps you reduce compliance risks in the hybrid cloud. We offer cloud-native tools that map and classify data in on-premises environments and in the cloud, but not just on object storage—on file and block, too.

Complicated optimization

Example:

Unplanned data growth and failure to balance workloads for performance and cost tiers cause cloud costs to keep rising. The IT team knows what's happening, but not how to efficiently fix it.

The challenge:
Even a successful migration to the cloud isn't one-and-done. Organizations find that they need to optimize their infrastructure for performance, cost, and compliance. But when they're managing clouds and on-premises resources, optimizing can be complicated.

The solution:
The NetApp portfolio includes tools for visibility and automation across the entire technology stack. You can optimize workload performance and tier settings. And our machine learning tools help you identify stubborn errors before they affect your users.

Use cases for cloud services

Common use cases

Business need	Challenge	Solution
Managing unstructured data	80% or more of enterprise data is unstructured. In the cloud, burgeoning data volumes push up subscription costs and overage fees.	Cloud-native file protocols and enterprise-level file management toolsets manage and control unstructured data in the cloud.
Data protection	Cloud security is growing stronger, but cybercriminals are getting smarter. Cloud customers are responsible for fully protecting their data.	Cloud-native data protection solutions offer efficient replication, granular backup, and rapid recovery of user and application data.
Data-led migrations	Migrations are often dreaded, difficult processes that need to be improved—because movement will continue to be more common.	Data generates value and should guide the cloud journey. NetApp supports data-led migrations that let you quickly harness value and gain actionable insights.
Managed clouds	Enterprises rely on managed services like VMware Cloud to concentrate on their business-critical applications, not on building an entire infrastructure.	VMware Cloud uses AWS and cloud services to support applications and NFS file and block storage for VMware Cloud.

Industry use cases

Sector	Challenge	Solution
Financial services	The financial services industry is a prime target for hackers. It must prove physical and digital compliance with strict regulations and develop extremely secure and well-designed online apps to serve customers.	Cloud compliance services and resilient infrastructure help fight fraud. Cloud-based agile applications meet online customer needs. Financial services firms can trust NetApp, an AWS Financial Services Competency Partner.[1]
Automotive	Pandemic shutdowns severely affected the automotive industry's manufacturing, in-person sales model, and supply chain. Some new companies took advantage of the challenge and moved sales online, but much of the industry is still reeling.	End-to-end cloud services offer storage cost efficiencies and innovative, data-driven software apps for manufacturing, design, and analytics.
Public sector	The public sector is a broad category that includes courts, utilities, emergency services, transportation, and education. Digitizing services helps meet public expectations but can be an expensive burden for budget-conscious public sector organizations.	Scalable cloud services let organizations with limited resources develop efficient public-facing digital services.
Healthcare	Like financial services, healthcare has a heavy burden of regulatory compliance. The pandemic has also presented unprecedented challenges for patient care and public health reporting.	Customized cloud-based solutions for healthcare meet requirements for compliance, public health reporting, patient care, and resource management.
Media and entertainment (M&E)	"Fast-growing" hardly begins to describe M&E's data challenge. Analysts expect overall storage for M&E to grow at 420% per year until it reaches 264EB by 2024.[2] About half of this data growth will consist of converting analog film and tape into digital archives on the cloud.	AWS scales to massive sizes for M&E's growing data. Intelligent cloud services expand to create hybrid clouds and simplify media asset management, protection, and reuse.

[1] AWS just gave the financial services industry even more reason to bank on NetApp. June 6, 2022.

[2] Digital Storage for Media and Entertainment Report, Coughlin Associates, 2019.

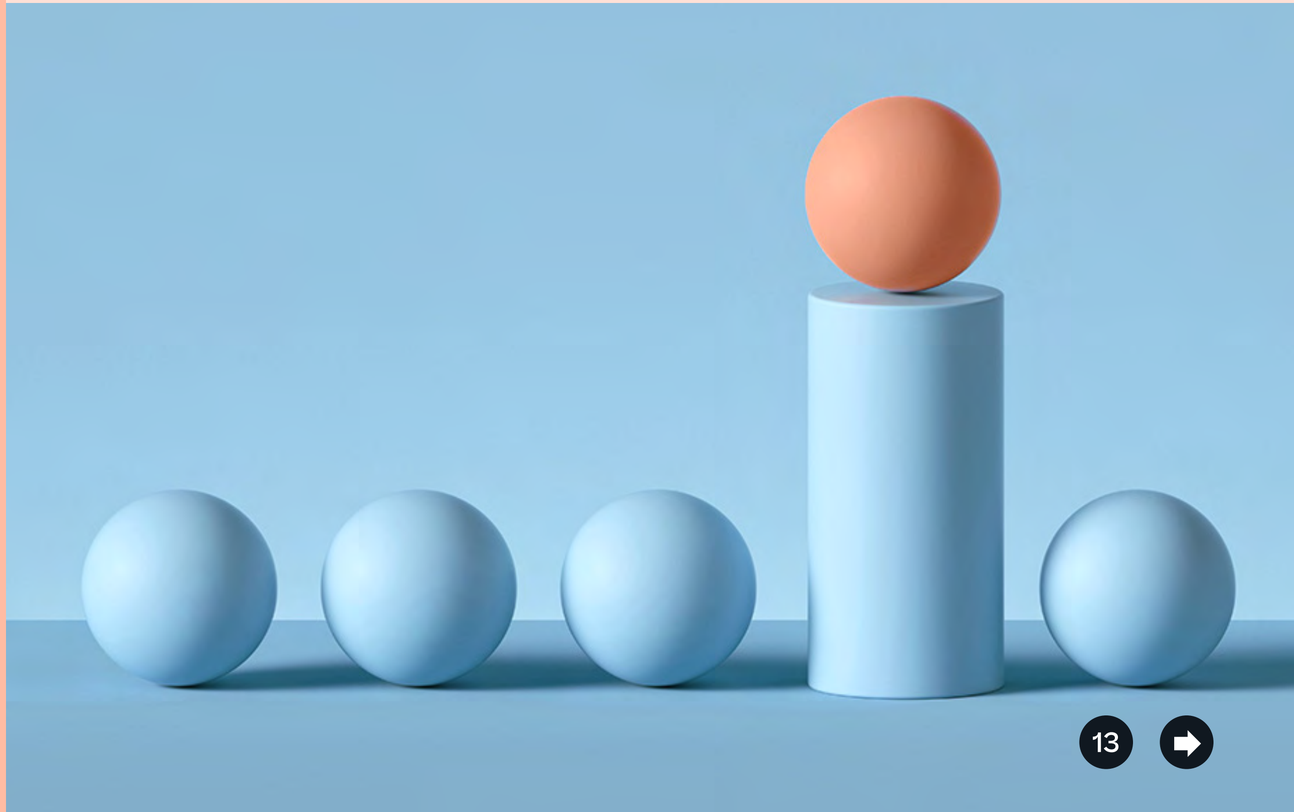
How enterprise-grade services work seamlessly in AWS

If organizations are going to evolve from treating the cloud as data repository, they need technologies that extract value from their data and support new applications in the cloud. Enterprise-level file and block data management is front and center for corporate users and should be in the cloud.

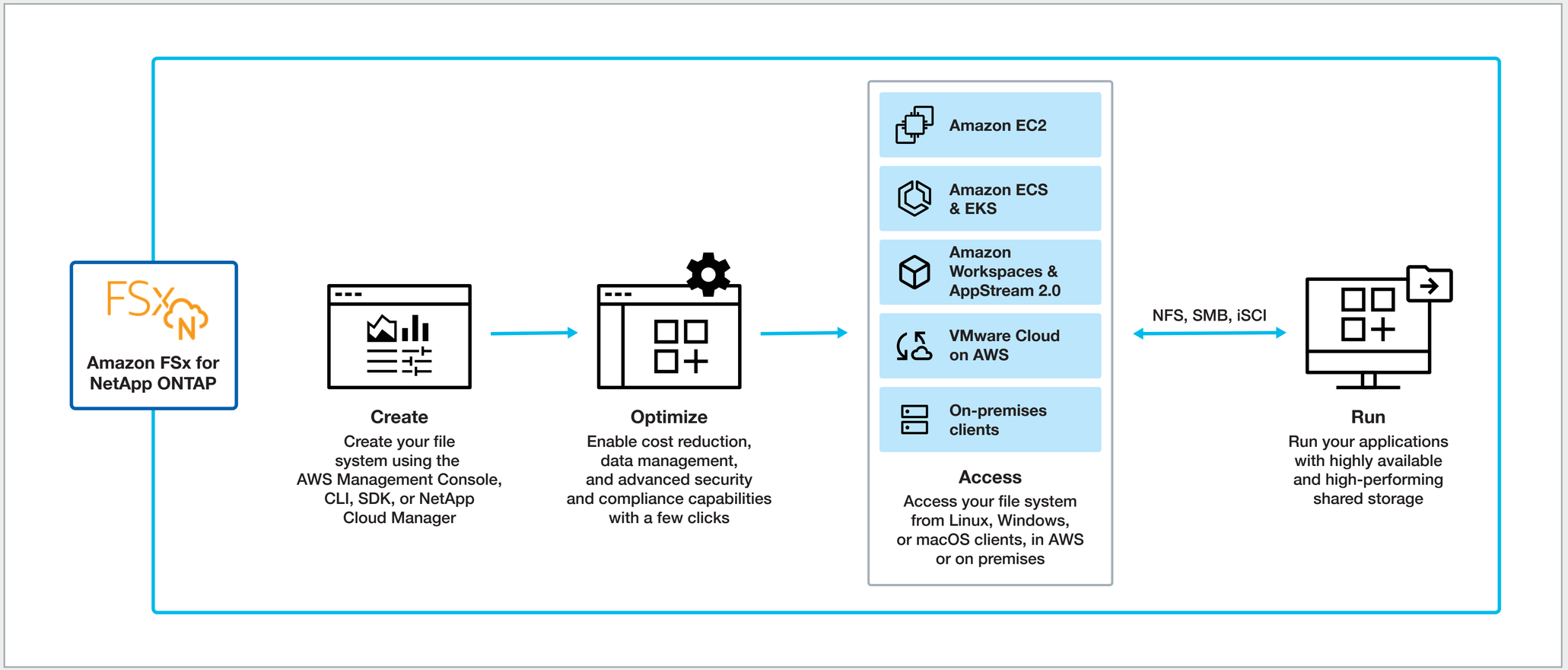
Amazon FSx for NetApp ONTAP expands cloud services for file and block management. With this solution, AWS can provide on-premises capabilities within the infrastructure of the world's biggest public cloud. FSx for ONTAP is designed to deliver highly available, predictable, and consistent performance with simplified migration, storage efficiencies, and cost optimizations for mission-critical workloads.

FSx for ONTAP is a storage service that allows you to launch and run fully managed ONTAP file systems in the AWS cloud. It combines the familiar support for shared file and block features, performance, capabilities, and APIs of NetApp file systems with the simplicity of a fully managed AWS service through both the AWS Management Console and NetApp Cloud Manager.

This native AWS service allows you to move high-performance apps and large datastores into the cloud to simplify, optimize, accelerate, and protect. These capabilities create the foundation for immediate and lasting business value.

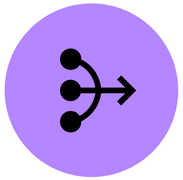


Amazon FSx for NetApp ONTAP



1. Amazon FSx for NetApp ONTAP offers the AWS compute, security, monitoring, and data services you need—integrated with the complete NetApp portfolio.

The hybrid cloud value chain



Simplify

- Confidently migrate data
- Simplify management

Accelerate

- Accelerate performance
- Speed up workflows for DevOps, pipelines, analytics, and AI/ML

Optimize

- Continuously optimize infrastructure
- Raise performance and lower cost

Protect

- Support backup and data protection requirements
- Keep SaaS data backups indefinitely

Enterprise size not required
Although the ONTAP service supports the largest enterprises, its integration into the AWS infrastructure also supports any customer that needs enterprise-grade capabilities in a pay-as-you-go model.

Companies of all sizes, departments or divisions, integrators or independent software vendors (ISVs): All can easily implement this technology. They'll enjoy our powerful portfolio of refined NetApp data management services combined with AWS-native APIs and services for launching—and scaling—applications and workloads.

Simplify:

Less complexity and more productivity

- Simplify the cloud environment for DevOps and DataOps teams with cloud-native features like file cache layers, fast file transfers, and continuous analytics.
- Manage the cloud without hiring specialized cloud architects. Protect visibility, access cloud-native configuration tools, and use APIs from a central management console.
- Use NetApp Cloud Manager's single-pane-of-glass interface to eliminate needless complexity.
- Meet audit and compliance requirements with NetApp Cloud Data Sense, and use the NetApp Cloud Secure feature of NetApp Cloud Insights to defeat ransomware. Consolidate distributed file servers into a single AWS footprint with NetApp Global File Cache and multiprotocol support.

Optimize:

Manage workloads for performance and cost savings

- High-performance, low-latency shared storage meets the operational requirements of enterprise applications like SAP HANA, Oracle RAC, and Microsoft SQL Server. Amazon FSx for NetApp ONTAP is SAP-certified for workloads including S/4HANA.[1]
- Customers report storage cost savings of up to 90% thanks to ONTAP thin provisioning, deduplication, compression, compaction, and policy-based storage tiering.[2]
- Global File Cache and NetApp FlexCache® software provide seamless read and write activity for file sharing in the hybrid cloud.
- Cloud-based file services enable you to mirror production environments and clone writable volumes. With these services, you can shorten the infrastructure-provisioning phase of projects.

[1] Amazon FSx for NetApp ONTAP is now SAP HANA certified. May 17, 2022.
[2] Quick guide: Amazon FSx for ONTAP pricing. November 24, 2021.

Accelerate:

Speed up migrations and applications

- Easily migrate enterprise-scale workloads and mission-critical applications to AWS without rearchitecting.
- Get fast shared storage that spans latency-sensitive Windows and Linux applications.
- Take advantage of multiprotocol support for complex workloads with the flexibility to burst on-premises data to AWS.

Protect:

Real-time data protection with analytics

- Protect and replicate data on premises and across regions. Centralized, policy-based NetApp Snapshot™ technology protects on-premises workloads.
- With FSx for ONTAP, get centralized, policy-based NetApp Snapshot, SnapVault®, and SnapMirror® features, and automated data synchronization from NetApp Cloud Sync.
- Automate replication across AWS Availability Zones and gain control with cost-effective, incremental-forever, block-based backups.

Cloud flexibility and cost efficiencies

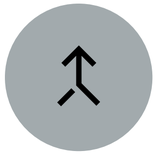
NetApp lets you take full advantage of the hybrid cloud by helping you migrate, deploy, and manage applications flexibly and efficiently.

Multiprotocol support.
Support any workload or user with NFS, SMB, and iSCSI protocols.

High performance.
Leverage the enterprise-level performance of ONTAP for data access and data management.

Scalability.
Benefit from storage capacity that can grow and shrink automatically.

Price/performance.
Reach SSD performance at one-tenth the cost with built-in storage-efficiency technologies.



Integration.
Take advantage of integrated NetApp data services, including Cloud Data Sense, Global File Cache, SnapMirror, automated incremental-forever, block-based backups.

Accessibility.
Work with all native AWS cloud services, such as Amazon CloudWatch, AWS Key Management Service, Amazon SageMaker, Amazon RDS Custom, and Amazon Elastic Container Service (Amazon ECS).

Moving forward with mission-critical apps in the cloud

Pillars of industry like Arc’teryx, D2L, and Dow Jones trust NetApp to modernize workloads and help them become data-driven enterprises. They deploy a robust hybrid cloud from NetApp that lets them integrate the best of their on-premises data center with the best of the AWS cloud and NetApp ONTAP.

The hybrid architecture allows them to enjoy the agility, scalability, and simplicity of AWS without giving up the ONTAP capabilities they’ve already built into their processes.

This same powerful cloud workflow is available to companies of all sizes. No forklift replacements, no expensive cloud administrators, no rearchitecting required. Just extend your ONTAP investment into the AWS cloud for unrivaled optimization, scalability, simplified management, and data protection.

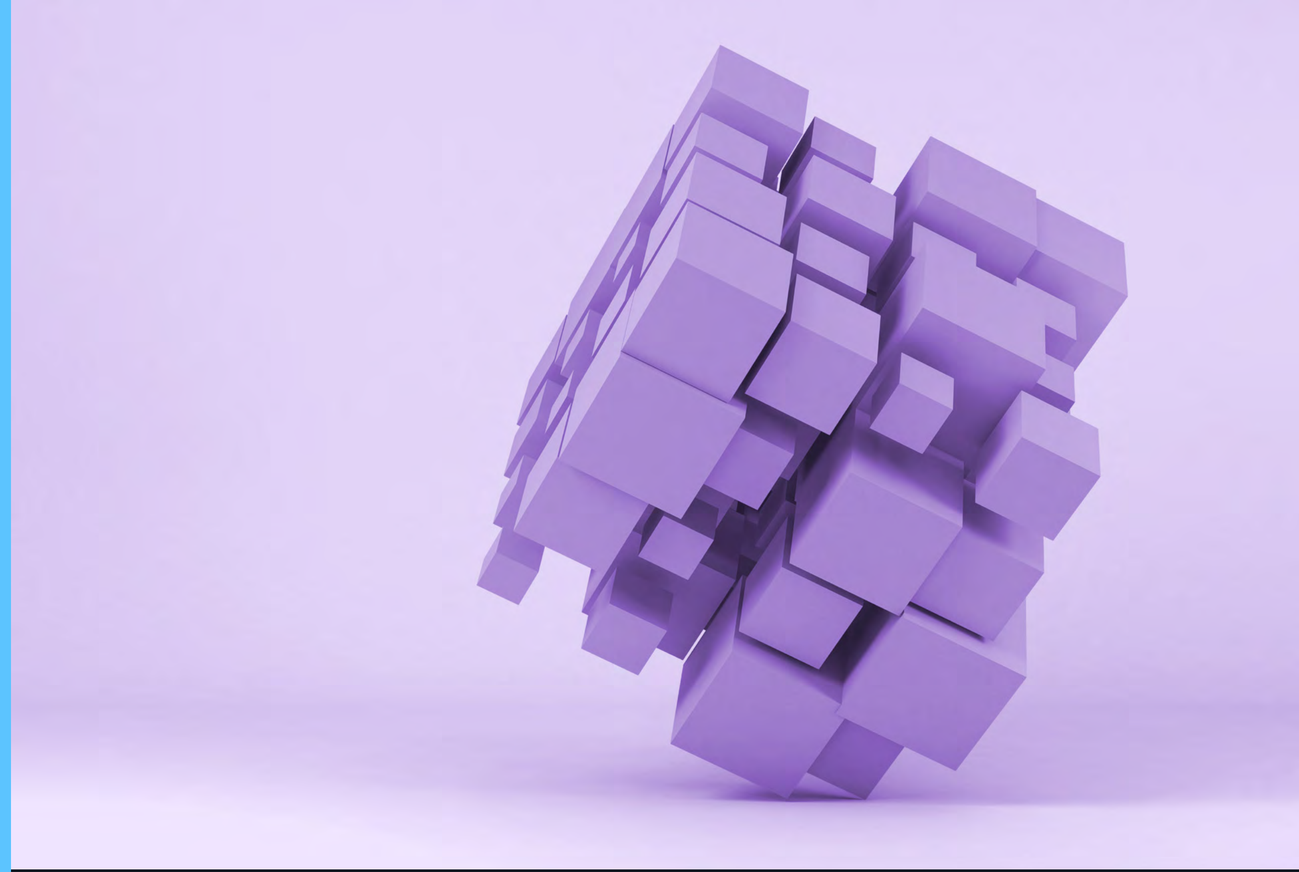
Take data beyond file storage with AWS and the comprehensive suite of NetApp cloud data services.

> “Amazon FSx for NetApp ONTAP makes it easy for organizations to extend the power of ONTAP into AWS, enabling teams to easily use the NAS features and capabilities in AWS that they’ve come to love on premises.”

Wayne Duso, Vice President of File, Edge, and Data Services, AWS

About NetApp

Learn more at netapp.com/aws



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.

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