Inspire Innovation with the Cloud

Transform Your Data
into a Strategic Asset

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Data Driven

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Data-Driven Organizations Will Thrive

Data is the lifeblood of modern business, and companies that succeed in their digital transformation can achieve a sustainable competitive advantage. A recent article in *The Economist* noted that in today's economy, "the world's most valuable resource is no longer oil, but data."[1] Data-driven companies operate more efficiently and outperform the competition. Enterprises that are positioned to gain the greatest insights from data will decide the future.

> **"The world's most valuable resource is no longer oil, but data."**
> —The Economist[1]

Becoming a data-driven organization starts with your company's culture. You need visionaries who recognize and evangelize the importance of data-driven decision making at all levels of the organization. You also need partners who can help you build a unified data infrastructure to turn your vision into reality. Success hinges on treating data as your company's primary source of value and equipping your entire organization with the tools, training, and culture to change the world with data.

Data-driven organizations seek to thrive, not just survive, in the face of digital disruption. You can start on the path to success by driving three key initiatives:

• Transform your organization to become data driven.

• Control and secure your data in a hybrid cloud.

• Accelerate IT innovation to drive business growth.

Transform into a Data-Driven Organization

According to a recent IDC survey[2], leading digital organizations have discovered that the cloud—with its power to deliver agility and flexibility—is indispensable for achieving their digital transformation business objectives. This realization leads most organizations to hybrid IT, in which data is generated and stored across a combination of on-premises, private cloud, and public cloud resources.

85%

"By 2018, more than 85% of enterprise IT organizations will be committed to a multi-cloud architecture."
—IDC[3]

However, this approach creates numerous challenges for IT teams, such as knowing what data is where, protecting and integrating data, securing data and ensuring compliance, figuring out how to optimize data placement, and seamlessly moving data into and out of the cloud as needed. To address these challenges, organizations must invest in cloud services while developing new data services that are tailored to a hybrid cloud environment.

Deploying data services across a hybrid cloud can help you to respond faster and stay ahead of the competition. However, all the data in the world won't do your company any good if the people who need it can't access it. Employees at every level, not just executive teams, must be able to make data-driven decisions. This approach means making informed decisions about where to place data so that it can provide the greatest value, with the ability to move data easily as requirements change. That might mean placing the data at a corporate data center, a production facility, a public cloud, or a cloud service provider.

The key to success in the digital era is maximizing the value of data. That might mean improving the customer experience, making information more accessible to stakeholders, or identifying opportunities that lead to new markets and new customers.

Control and Secure Your Data

Becoming a data-driven company requires a rigorous approach to all aspects of your data: where and how it's stored, maintaining compliance, and making sure that it's protected at all times. Attention to these details can make the difference between survival and extinction.

It's impossible to gain value from data that you don't know you have. Over the last decade, keeping track of data resources across a large enterprise has become exponentially more difficult. And today, data is moving at an increasing rate to hyperscale public clouds, such as Microsoft Azure, Google Cloud Platform (GPC), and Amazon Web Services (AWS), to software-as-a-service (SaaS) providers, and elsewhere. New challenges are emerging, based on the sheer amount of data that must be man-aged and the proliferation of new types, such as social data and data created by the Internet of Things.

"In 2017, 31% of enterprises reported an increase in monetary loss due to targeted attacks."
—IDC, U.S. State of Cybercrime Survey[4]

Not only do you need to establish full data visibility across multiple clouds, but your governance and data protection policies must also extend beyond your data center boundaries. In its Data Protection Cloud Strategies report, Enterprise Strategy Group notes that "corporate data needs to be protected to a corporate standard, regardless of whether that data resides on servers or within cloud services."[5]

IT leaders must maintain full control over enterprise data, no matter where it lives, and keep it secure against attacks, accidents, and disasters. According to the IDG U.S. State of Cybercrime Survey, 31% of enterprises reported an increase in monetary loss due to targeted attacks in 2017.[6] Data protection is no longer just a question of protecting your company against lost productivity. It's now an essential element of protecting your company's brand and balance sheet.

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Accelerate Innovation

When data is siloed across functional groups such as finance, marketing, engineering, manufacturing, and other teams, it's difficult or impossible to identify deeper correlations. As eBay CIO Dan Morales notes, "Data is becoming more and more disparate every day. You have on-premises systems; you have cloud systems. So, now it becomes important to be able to pull those all together so that you can get insights."[7]

By transforming into a data-driven company, you're strategically positioned to harness your data and grow your business. After you identify and map your data assets—both on the premises and in the cloud—and make them accessible, your employees can discover new ways of looking at data to improve operations, gain new business insights, and spot new opportunities. Your company can move quickly to advance new ideas from concept to production while reacting faster to market changes.

40%

"By 2019, 40% of IT projects will create new digital services and revenue streams that monetize data."
—IDC[8]

As your business evolves, your approach to IT purchasing must also evolve to take advantage of cloud economics. Otherwise, you risk leaving your business dangerously over, or underprovisioned. Smart IT teams complement their on-premises infrastructure with cloud services so that they are never caught flatfooted in the face of unexpected infrastructure demands.

INDUSTRY LEADER ACCELERATES INNOVATION WITH CLOUD

One of the largest property and casualty insurance companies in the United States was seeking to innovate and launch new digital revenue streams. To meet those business goals, the IT team needed to provide the company's data scientists with on-demand access to powerful analytics tools. The analytics workloads are compute intensive but highly variable, which made a cloud-based solution financially attractive. However, as a regulated industry, it was also crucial to maintain control of data security and privacy.

The IT team selected a hybrid solution that enables the company's data to be stored in a secure colocation facility with high-speed access to multiple cloud services. The solution enables the data scientists to use powerful and elastic compute services and analytics programs from a variety of hyperscale cloud providers, while the data itself remains under tight control.

The following benefits have been documented during the first year of operation:

- Data is now analyzed in days instead of weeks.
- A $1 million expense has been avoided by buying cloud compute resources on demand instead of purchasing new infrastructure.
- The ability to connect to multiple cloud services has reduced the risk of lock-in.
- The productivity of data scientists has increased.

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Master Your Cloud Strategy

It's rapidly becoming a multicloud world. As IDC notes, "The proliferation of application deployment models and data formats across hybrid IT has resulted in organizational data being widely and unpredictably spread across multiple repositories."[9] To become a data-driven company in this hybrid cloud world, you need to completely rethink your cloud strategy and your approach to data services.

50%

"By 2020, over 50% of all corporate data will reside outside of the corporate data center."
—Gartner[10]

Your cloud environment is probably the result of organic growth and stopgap efforts to respond to changing business demands, and your hybrid cloud "strategy" at this point might be more tactical than strategic. Different lines of business in your organization are probably using whatever tools they need to get their jobs done. It's time to assess all of the elements that make up your hybrid cloud: Decide what to keep, what to add, and what to discontinue, and start formulating a data services plan that encompasses everything.

The starting point is to establish data insight and control. This approach means finding out not only where all of your data is stored, but also how much performance, capacity, and availability it requires and what your storage costs are. Then you can begin to integrate cloud data services that extend your capabilities, such as backup and recovery, disaster recovery, DevOps, production workloads, cloud-based analytics, machine learning, and artificial intelligence

Deliver Data Insight and Control

It's crucial to understand where all of your data is located across multiple clouds, and also how it's being stored and managed, how much it's costing your company, and whether or not it's meeting service-level requirements.

A recent IDC Executive Brief[11] offers a prescription for effective data services in a hybrid cloud. In particular, IDC emphasized the importance of:

• In-depth monitoring and analytics
• A single data management tier

These capabilities must encompass both on-premises and cloud environments, allowing you to assess the performance and availability of all of the services in your portfolio to make better-informed decisions about data placement. Today, infrastructure analytics and machine learning can be used across hybrid cloud environments to understand the performance, capacity, and availability of each dataset.

Visibility into your IT infrastructure is crucial to making informed decisions that impact your business. You need a monitoring tool that can ensure that your hybrid cloud environment is operating at peak efficiency. You must have visibility into all of your infrastructure from on-premises multivendor systems to cloud-based IaaS. An infrastructure monitoring tool must address these important use cases:

• **Monitor** to prevent infrastructure issues from impacting your users and your business.
• **Troubleshoot** to identify and fix problems quickly.
• **Optimize** to reduce costs.

NetApp offers two infrastructure monitoring products, OnCommand Insight® and Cloud Insights. Both products can monitor, troubleshoot, and optimize all of your cloud and on-premises infrastructure.

Cloud Insights is designed to monitor modern cloud infrastructures such as microservices, Kubernetes, and containers. It is offered as a SaaS product and is intended for customers who are executing a "cloud-first" strategy. Read more about cloud monitoring for critical storage.

OnCommand Insight is offered as on-premises software and is best for enterprise IT organizations that have large on-premises, multivendor data centers. Read more about OnCommand Insight IT infrastructure monitoring.

With both Cloud Insights and OnCommand Insight you can expect the following benefits:

• Monitor and prevent up to 80% of cloud-infrastructure issues from ever impacting your end users.
• Reduce mean time to resolution (MTTR) by up to 90%.
• Reduce cloud infrastructure costs by an average of 33%.

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Integrate Cloud Data Services

Hybrid cloud data services act as a toolkit for mastering your data management objectives, retaining full control over your data, and getting the most business value and velocity from the resources and data at your disposal.

Data Protection and Security

Data protection and security are essential to the success of data-driven organizations. Many IT teams struggle to meet recovery time and recovery point objectives. Traditional backup and restore methods are not designed for hybrid cloud and might not meet the stringent service-level objectives that your business demands.

> **"[Disaster recovery] is often the first step that organizations take when going to the cloud."**
> —IDC[12]

Emerging cloud data services help you to address all of your backup and recovery and disaster recovery needs, whether that means protecting on-premises data in the cloud to reduce complexity and cut costs, or protecting data that's already in the cloud.

NetApp offers several services and solutions to address data protection and security needs, including:

- Backup and restore services for SaaS data
- Cloud-integrated backup for on-premises data
- End-to-end protection services for hybrid clouds

Cloud-Based File Services

According to IDC, nearly 80% of firms are using file-based storage for unstructured data associated with mission-critical workloads[14]. As organizations seek to harness the full value of corporate data, they are looking to move more data and file workloads to public clouds. However, they are finding a lack of robust, performant data options in the cloud to enable large-scale migration of their file-based data and applications.

NetApp Cloud Volumes Service offers consistent, reliable storage and data management with multi-protocol support for AWS and Google Cloud Platform, enabling existing file-based applications to be migrated at scale and new applications to consume data and extract value quickly.

Azure NetApp Files offers consistent, reliable storage and data management with multi-protocol support for AWS and Google Cloud Platform, enabling existing file-based applications to be migrated at scale and new applications to consume data and extract value quickly.

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DevOps

Embracing digital transformation means accelerating the delivery of new data-driven applications and services to increase customer engagement and satisfy the needs of employees and business partners.

Many enterprises are turning to DevOps as the best way to deliver new software features, services, and applications more quickly and with higher quality. By bringing developer and operations teams together, DevOps can reduce friction and put your company on the path to continuous integration and continuous delivery.

According to the 2017 State of DevOps Report,[16] published by DevOps Research and Assessment, organizations that effectively use DevOps principles can achieve massive benefits, such as:

- 46× more frequent software deployments
- 96× faster recovery from failures

By simplifying data services with features such as space-efficient cloning, NetApp hybrid cloud solutions can facilitate DevOps practices both on–premises and in the cloud.

NetApp Cloud Volumes Service enables you to scale development activities in AWS and Google Cloud Platform, including building out developer workspaces in seconds rather than hours, and feeding pipelines to build jobs in a fraction of the time. Container-based workloads and microservices can also achieve better resiliency with persistent storage provided by Cloud Volumes Service.

Azure NetApp Files similarly enables you to scale development and DevOps activities in Microsoft Azure–all in a fully managed native Azure service.

NetApp Cloud Volumes ONTAP® services enable developers and IT operators to use the same capabilities in the cloud as on-premises, allowing DevOps to easily span multiple environments.

Databases and ERP

Organizations are looking to optimize their business data that is currently stored with database applications and enterprise resource planning systems, by migrating the data to public clouds and building out new applications with speed and agility. At the same time, they are looking for consistent performance, durability, and high availability, to ensure that existing databases and ERP systems can be moved with less risk of disruption and downtime.

NetApp Cloud Volumes Service offers reliable and consistent enterprise-grade performance and file-based architecture for existing databases and ERP applications, so that they can be moved to AWS or Google Cloud Platform without replatforming and with minimal migration complexity.

Azure NetApp Files offers reliable and consistent enterprise-grade performance and file-based architecture for existing databases and ERP applications, so that they can be moved to Microsoft Azure without replatforming and with minimal migration complexity.

Cloud Analytics

A variety of data analytics services are now available in the public cloud. Public cloud providers offer these services as a way to differentiate themselves and attract customers. Organizations can also move their own analytics workloads into public clouds, along with consolidating their data into large cloud-based data lakes.

60% of enterprises are relying on hybrid and public clouds as the platforms to enable big data analytics.
—The State of Cloud Analytics, 2016[17]

Many enterprises want to apply cloud-based analytics services to their existing datasets. However, moving large volumes of data into the cloud can be time-consuming and costly. After data has been moved, it can rapidly get out of sync with the parent copy. Once analytics and data are in

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the cloud, it can be challenging to feed data pipelines with the right level of performance, scale, and cost.

NetApp offers the following services that simplify use of cloud analytics:

- NetApp Cloud Volumes Service enables you to store and manage large datasets in AWS and Google Cloud Platform, while feeding data pipelines to analytics jobs with strong performance and unconstrained capacity—all in a fully managed no-ops service that lets data scientists focus on their results.
- Azure NetApp Files enables you to store and manage large datasets in Microsoft Azure, while feeding data pipelines to analytics jobs with strong performance and unconstrained capacity—all in a fully managed native Azure service.
- NetApp Cloud Volumes ONTAP streamlines the process of moving data to and from AWS and Azure.
- Cloud Sync lets you safely and efficiently move datasets to the cloud while making sure that the cloud versions re-main in sync with the original.
- NetApp Private Storage lets you place data near the cloud with high-speed access to multiple hyperscale cloud providers. This approach eliminates the risk that your data will be locked in and facilitates the use of multiple analytics services.

SYNCING ON-PREMISES BIG DATA TO THE CLOUD

The IT team at an online real estate listing service was under pressure to use the cloud to increase agility and reduce costs. To meet the cloud mandate, they needed to quickly move nearly 2 billion files—more than 85 terabytes of data—from on-premises systems to AWS S3 storage.

By using NetApp Cloud Sync, the company was able to transfer the data without impacting its customer-facing services, and within the time constraints of the cloud project.

Industry-First Cloud Data Services

NetApp is committed to connecting companies to more clouds in more ways to achieve their transformation goals. This commitment includes helping companies move on-premises applications that rely on file services to hybrid cloud and cloud-only models. Working with industry-leading hyperscale cloud providers, we have pioneered the delivery of enterprise NFS services in the cloud.

Available through Microsoft Azure, Google Cloud Platform, and the AWS Marketplace these new services offer high levels of performance and availability to speed enterprise applications including file services, analytics, databases, and DevOps. Cloud architects, developers, and storage administrators can provision, automate, and scale NFS services by using RESTful APIs. Support for NFSv3, NFSv4, and fully featured NetApp Snapshot™ copies enables integration with on-premises systems and seamless data migration and synchronization between on-premises systems and the cloud.

Azure NetApp Files and Cloud Volumes Services for GCP and AWS can:

- Support hybrid cloud and cloud-only environments
- Integrate with on-premises systems for seamless data migration and synchronization
- Integrate with cloud-based analytics, databases, and other cloud-native services

"Working together, we will deliver new solutions that give customers using NetApp and Microsoft Azure even more freedom to build and deploy applications however they want."
—Scott Guthrie, Executive Vice President, Cloud and Enterprise Group, Microsoft Corp.[18]

Inspire Innovation with the Cloud

NetApp Strategic Partnerships

At NetApp, we have recognized the power and potential of the cloud since its inception. We work tirelessly to forge partnerships that offer greater insight and reach, enabling us to create cloud data services to meet demanding customer needs both on–premises and in the cloud.

Our growing portfolio of partners includes cloud industry leaders Microsoft, Google Cloud Platform, and AWS.

In addition, the NetApp Cloud First Partner Initiative supports cloud services partners that help implement architectures in public cloud environments. Cloud First includes both consulting and technology partnerships, with NetApp working behind the scenes to ensure your success.

The NetApp Data Fabric

NetApp Data Fabric enabled solutions empower organizations to use data to make intelligent decisions about how to optimize their business and get the most out of their IT infrastructure. They provide essential data visibility and insight, data access and control, and data protection and security. With the Data Fabric, you can simplify the deployment of data services across cloud and on-premises environments to accelerate digital transformation and gain a competitive advantage.

NetApp hybrid cloud data services enable you to put your data-driven vision into practice so that you can respond faster to market changes and rapidly advance new ideas from concept to production. We can help you transform your data into a strategic asset so that you can advance your business and change the world with data.

Learn more about NetApp cloud data services
and how they can help your business at:

netapp.com/hybridcloud

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Endnotes

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