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NetApp's mission is to empower our customers to change their worlds with data. At our annual INSIGHT conference, we celebrate this mission and the real people that inspire us to transform our own business and lead the charge in data-driven innovation.

As INSIGHT 2019 kicks off, I find myself reflecting on the evolution of the company since I took the position of CEO in 2015. I am proud of what we've achieved during our transformation journey, but also will be the first to say that the journey is not over. Today's business environment demands continuous change. As I shifted from managing our product portfolio to managing the entire company, I challenged myself and my colleagues to continuously reinvent NetApp in order to best serve our customers – and INSIGHT has been our opportunity to showcase the innovation we're delivering to the market as a result.



To help customers solve the challenges of operating in a hybrid multicloud world, we created the Data Fabric and have innovated technologically across a wide range of use cases. The Data Fabric is real, full of possibilities and use cases to help customers transform their business. And today we are reinventing the customer experience for the hybrid multicloud world with NetApp Keystone, It is a combination of programs, services, and products that will dramatically change how customers consume IT resources and give them one consistent experience on any cloud and in their data center.

Our innovation focus has always started with the real challenges customers are dealing with. In 2019, those challenges have been far-ranging, with particular focus on winning the war for customers using digital innovation, technology and data. Our customers continue to be challenged to meet everincreasing demands to harness data and deliver value to the business while balancing costs and complexity. While trends such as the maturation of hybrid multicloud, the rise of Kubernetes, evolution of public cloud experiences, etc. provide exciting new opportunities, the rapid pace of innovation has made it difficult for organizations to decide what they need to - and can - integrate into their IT environments today.

In other words, complexity reigns king. Addressing this complexity must be the industry's number one priority. We must re-think traditional approaches to infrastructure. The reality of 2019 is that organizations are shifting from on-premises to leverage public cloud services, moving away from traditional IT to private cloud, and moving from disk to flash to modernize and simplify IT to run their applications more efficiently – sometimes all at the same time.



Hybrid multicloud has emerged as the defacto IT architecture to support this evolving environment, where data is the lifeblood of business and digital transformation is at the top of the corporate agenda. Yet in a world where speed is the new scale, too many organizations are hampered by convoluted and complex infrastructures which make it impossible to achieve central visibility into and control over data.

NetApp is tackling these challenges head-on. In the coming pages you will learn how we are transforming our customers' experience to bring cloud-like benefits to any on-premises, cloud, and hybrid environment. You'll also see how our latest portfolio announcements reflect a focus on simplicity. We are making it dramatically easy for organizations to build data fabrics and run resource-intensive applications in any cloud, with one experience.

Our mission is to help customers change their world with data by enabling them to thrive with data in a hybrid multicloud world. Our vision is to redefine enterprise infrastructure for a new era of IT.

George Kurian

NetApp CEO





NETAPP REINVENTS THE CUSTOMER EXPERIENCE FOR THE HYBRID MULTICLOUD

Company introduces new simplified cloud experience for the enterprise, on and off the premises, with consumption models as easy as 1-2-3

SUNNYVALE, Calif. — **Oct. 29, 2019** — NetApp (NASDAQ: NTAP), the data authority for hybrid cloud, today announced its reinvention of the customer experience with NetApp® Keystone, a program that offers a range of flexible solutions for customers whether they choose to build or buy their cloud infrastructure.

Organizations are digitally transforming to drive competitive advantage. They need to accelerate innovation in today's real-time world while dealing with the complex reality that data and resources live anywhere and everywhere. In order to address this complexity, today's IT environments must transform. While the industry has been focused on addressing these needs from a technology standpoint, the incremental improvements to financial options and to the upgrade process haven't kept pace, until now.

"While the advent of hybrid multicloud brings incredible potential, it has also resulted in increasingly complex environments. At the same time, budgets have contracted this year, creating intense demand to optimize and streamline not only how infrastructures are orchestrated and managed, but also the economics around IT buying," said Ashish Nadkarni, vice president of IDC's Infrastructure Systems, Platforms and Technologies Group. "In introducing flexible consumption models and automation-focused products, NetApp is making it significantly simpler not only to use its own products and services, but for IT leaders to modernize, monitor and manage the entirety of their infrastructure."

"In today's environment, cloud sets the benchmark for customer experience," said NetApp CEO George Kurian. "We've built and delivered the data fabric strategy to simplify and modernize our customer's data centers and enable success in the hybrid cloud era. The solutions we are introducing today are an extension of that philosophy – what data fabric has done to simplify and integrate data infrastructure; our new flexible consumption models do at the business level."

NetApp's vision is to simplify the business of data services for customers from every perspective: from how they buy and consume products and services to how they run them in their environments and who services them. As a leader in storage systems and software and an innovator in cloud services, with a business that is growing by almost 200% year over year, only NetApp offers the full range of capabilities that customers need to build and manage their unique data fabric to solve the financial, operational, and technical barriers to adopting hybrid multicloud environments.



NetApp Keystone: The Customer Experience Reinvented

NetApp Keystone is a program that offers a range of flexible solutions for customers, whether they choose to build or buy their cloud infrastructure, on their premises or off. Keystone offers the agility, pay-per-use economics, dynamic scaling, and operational simplicity that customers need to be able to consume cloud on their own terms.

Keystone features:

- Flexibility to mix and match purchases and subscription payment methods
- Ability to run any NetApp service in any environment—on premises, cloud, and hybrid
- Freedom to choose how it's all managed—by NetApp, a partner, or internally
- Simplified ownership experience that makes it easier to buy, operate and grow starting with NetApp's new systems, the A400, FAS8300 and FAS8700

Keystone is designed to meet the reality of a hybrid multicloud world where IT teams need to have greater choice, flexibility, and freedom to run and pay for their data services however they want.

"NetApp's data fabric strategy has been a key element in how we help our customers modernize their infrastructures," said Ken Farber, President, ePlus Software. "With Keystone we can help our customers build their data fabric via a consumption model that simplifies the experience and complexity of navigating hybrid multi-cloud."

Featured Portfolio Updates

Along with the new program and simplified customer experience, NetApp announced a number of updates throughout its portfolio, with a range of new product launches, enhancements, and integrations.

- AIOps. New integrated solution with Active IQ® and Cloud Insights offer access to NetApp's
 exponentially growing data lake of IT infrastructure intelligence for real-time, one-click resolution of
 issues across an entire hybrid multicloud environment.
- Data security and protection purpose-built for hybrid multicloud. New data services provide security
 and compliance for key industries, including federal, defense, and critical infrastructure, in addition to
 enterprise-class protection and tiering of cloud data, regardless of the choice of cloud.
- New software and systems meet the demands of new and traditional enterprise applications. New flash storage systems and solutions and NetApp ONTAP® updates offer a wide range of performance options, simplicity to power enterprise and modern applications. Additionally, the AFF All SAN array delivers state-of-the-art resiliency and record-setting performance in the midrange.
- Cloud-agnostic DevOps. Leveraging Kubernetes, NetApp has created a redesigned model to allow true application portability and answer the economic factors and complexity concerns that have begun to plague modern DevOps. Based on NetApp's own transformation, which connected the dots between three disparate solutions being used internally, we are providing the template for anyone to avoid vendor lock-in, lift and shift entire infrastructures, with the flexibility around anywhere workloads live.



PRESS RELEASE CONT.

For more information, refer to the Spotlight Stories and Product Appendix sections of the NetApp INSIGHT 2019 Newsroom

Additional Resources

- Learn more about today's announcement <u>here</u>.
- Read more information about today's announcements, read the NetApp blog.
- For information about NetApp INSIGHT™ 2019, visit https://insight.netapp.com
- Follow us on Twitter, Linkedin, and Facebook.

About NetApp

NetApp is the data authority for hybrid cloud. We provide a full range of hybrid cloud data services that simplify management of applications and data across cloud and on-premises environments to accelerate digital transformation. Together with our partners, we empower global organizations to unleash the full potential of their data to expand customer touchpoints, foster greater innovation, and optimize their operations. For more information, visit www.netapp.com. #DataDriven

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Additional Resources:

Gartner Magic Quadrant for Primary Storage, September 17, 2019





AIOPS: THE ERA OF INTELLIGENT DATA MANAGEMENT

Whether you call it AlOps, ITOps, ITOA, or something else, one thing is clear: The era of intelligent data management has arrived.

As we head into the final months of 2019, it's an era that's coming just in time. The reality of hybrid multicloud is creating incredibly complex and fast-moving IT environments. Teams are challenged to "keep the lights on"—and also to deliver strategic value to the business by enabling rapid adaptation to shifting customer expectations and new competitors. They have to modernize infrastructure—and also to future-proof it against near-constant disruption. And they have to deal with an expanding array of stakeholders-not just executives in their organizations but also external stakeholders, such as regulators. The pressure is on and the heat is rising.

Given these competing priorities and stakeholders, it's obvious that a new approach is needed to equip teams to truly see, understand, and act with minimal friction across the entire infrastructure. Automation is the answer, but the stakes are high. Can a machine really be trusted to understand and safeguard the infrastructure that, in a world of digital transformation, supports almost every function of a business?

Although many organizations and vendors have made huge strides in automating IT analytics, progress has tended to be incremental, still requiring a human hand at the helm. Yet, in the era of hybrid multicloud where data and applications are dispersed far beyond the walls of any one data center, data management means accepting that it has become impossible for humans to intelligently monitor and manage IT environments at the scale and speed now required.

Enter AlOps. At a basic level, AlOps can be understood as the application of artificial intelligence and machine learning (Al and ML) to automate the identification and resolution of typical operational issues, such as emerging security and governance risks, unexpected errors, poor system performance, and so on. However, this is a deceptively simple definition. Automation is already happening in IT environments. The distinction with AlOps is that the automation is truly intelligent. It's not simply an algorithm acting on predefined rules to push out templated reports that a human operator must still analyze and act on.

The advent of AlOps and intelligent data management is not an incremental advancement but a true game changer for IT. It means significant cost savings, productivity gains, and dramatically reduced downtime, which add up to a meaningful impact on a business's bottom line. No wonder that Gartner predicts that by 2023, 30% of large enterprises will use AlOps and digital experience monitoring tools exclusively.



For more than two decades, NetApp has been cultivating our data lake, which aggregates and anonymizes metadata information from our entire hardware and software customer ecosystem. At first, this data was used for reactive customer support and diagnostics, but over time our process and data science intelligence have evolved. We are now using refined AI and ML capabilities to deliver predictive and prescriptive insights and guidance. The results are compelling. Over the last year alone, NetApp® Active IQ® monitoring saved customers more than 2 million hours of lost productivity due to avoided downtime.

As part of NetApp INSIGHT 2019 and our vision to dramatically simplify every aspect of IT, we are introducing these exciting new features:

- Active IQ uses AlOps to act as your Digital Advisor, identifying best next actions and automating
 fixes and optimizations with a single click of a button. These AlOps capabilities are included with the
 new SupportEdge Advisor and SupportEdge Expert offerings, enabling you to spend less time
 managing infrastructure and more time on strategic activities.
- Active IQ predictive guidance is included with Cloud Insights. Together, Active IQ and Cloud Insights span the entirety of any hybrid multicloud environment, no matter how complex, acting as the only solution to provide a single source of truth for the performance of an entire infrastructure (with Cloud Insights, not just for NetApp products) in real time.
- Finally, we are introducing Cloud Insights Premium, an advanced version of our popular cloud-monitoring SaaS-based tool, which adds Kubernetes monitoring with topology visualization and insider threat detection.

Combining the industry's largest, living set of IT analytics data, which can monitor and analyze any possible mix of cloud, on-premises, and hybrid environments, with increased flexibility to ingest and export insights across NetApp products and beyond, we're going all-in on AlOps as the future of our industry.

Our vision is an operations environment without friction, where teams are enabled and inspired to contribute to big-picture innovation. What will your organization achieve once you have the ability to identify an issue in about a second and fix it with a single click?





SAFEGUARDING DATA IN A HYBRID MULTICLOUD WORLD

Throughout the last decade of public cloud migration, the top-of-mind question has been "Can I really trust this vendor to keep my data safe?" In 2019, we can confidently say that this paradigm has shifted. Cloud providers such as AWS, Azure, and Google Cloud have responded to the concerns of the past decade and collaborated with enterprise customers to ensure that cloud workloads are as secure and resilient against external threats as those in on-premises data centers.

But that doesn't automatically make data "safe" in the public cloud.

Although data in public clouds is secure from external threats, true safety—knowing that all your data is in compliance with regulations, stored correctly to ensure business continuity, and secured against access from unapproved internal users—now comes down to what you're doing to see and control where data is going across your entire infrastructure. The onus has shifted from the cloud back to the organization itself.

NetApp has long been in a unique position to watch how this paradigm has shifted. Our partnerships with the world's biggest clouds, and our traditional leadership in storage and investment in a data fabric strategy, give us a window into the new questions that are being asked—and answered—about securing and protecting data in a world where hybrid multicloud has become the de facto IT architecture.

The question is no longer "Can I trust this cloud with my data?" but instead "Can I trust that my organization knows who is touching the data and where they are putting it?"

This evolution has been a long time coming, driven by both long-term and emerging industry trends. The most significant, albeit obvious, trend has been the rapid rise to dominance of the public cloud. Ten years ago organizations were slow to migrate; now everyone we talk to is using at least one public cloud. The advent of cloud has changed everything, and public clouds have established a new standard for IT experiences that all vendors must live up to.

Consider how public clouds have addressed the security concerns of the past decade, landing in the spotlight for hackers. They've espoused the shared responsibility model so that providers and customers can ensure a complete and consistent security posture. On their hardware and infrastructure responsibility, they've defended themselves admirably, hardening their systems to continually protect against new attacks, optimizing systems each time. Yet their biggest advantage is scale—the immense budgets that hyperscalers have access to help them attract the best security talent in the industry, and they upgrade their data centers at incredible rates.

To drive home how secure public cloud environments are, consider our partner Microsoft Azure. Following our Azure NetApp® Files collaboration, we're working closely with Microsoft to make the service available in Azure Government to meet the demands of the organizations that control the world's most sensitive information, and to ensure the most secure and compliant environment possible with FedRAMP certification for Azure NetApp Files in both Azure Government and the other dozen Azure regions that are available.



In addition to deepening our relationship with Azure with the efforts on Azure NetApp Files for Azure Government and FedRAMP certification, we have added **new security features such as external key management and FIPS 140-2 compliance to our NetApp HCI and SolidFire® solutions**, further showcasing our commitment to meeting the most stringent data requirements in highly regulated industries such as government, finance, and healthcare.

Public clouds have become extremely secure, but other trends have emerged that make safeguarding data as challenging as ever. IT environments today are incredibly complex and difficult to monitor—and they're only getting more so with the constant integration of new platforms and the resulting data silos. At the same time, more people in more places are trying to access data for disparate uses, resulting in well-documented cases of shadow IT and rogue DevOps where processes that prioritize speed to business value rather than security and compliance are the norm.

This is where NetApp Cloud Insights comes in. Our multivendor, multicloud monitoring and optimization service now extends to security and compliance, applying analytics and machine learning to the patterns of who is accessing files and data. Suspicious activity that might indicate an external hacker or data breach can be flagged, and it's also very important to look at insider threats, whether intentional or unintentional, that might violate internal rules or policy, across the hybrid cloud.

All this adds up to one truth: **Today it's far easier to accidently put data where it's not supposed to go than it is for a hacker to crack a cloud and access your data.** Organizations must focus first and foremost on putting controls in place to manage and monitor their data at all times.

That's why NetApp has announced another new service, NetApp Cloud Compliance, which monitors native cloud storage in the public cloud. Designed to integrate with Cloud Volumes ONTAP®, which provides data management and data protection for AWS, Azure, and Google Cloud block and object storage, Cloud Compliance applies artificial intelligence to identify and classify sensitive data such as payment card information (PCI), personal health information (PHI) like patient data, and personally identifiable information (PII) and to make sure that it is being stored and used only in the clouds that were intended. Cloud Compliance can help ensure that only the appropriate on-premises and cloud environments are storing data and that they are in compliance with industry regulations and the increasing number of governmental privacy mandates such as GDPR in Europe and CCPA in California.

If you can see your data, you can trust that it is secure, regardless of the environment you are operating in. If you have well-defined policies in place that specify what data can live where and who can touch it, and you have the tools in place to monitor that, you won't need to ask whether your data is secure in the cloud. You'll know that it is.

This new paradigm for securing and protecting data in a hybrid multicloud world requires a new approach. The industry must embrace a centralized, automated, real-time model that empowers IT leaders to be the single source of truth when it comes to data. IT teams must further be equipped with Al-driven insights to simplify situations that require immediate action, and be given the flexibility to immediately access their data and enrich it for threat detection and forensics.

With NetApp, organizations can trust that they've implemented a best-in-class set of solutions to meet the new mandate for data visibility and control, which is central to an effective overall security approach.

We've been preparing for the reality of hybrid multicloud. Our vision at NetApp INSIGHT® 2019 is to help organizations build their data fabrics, simplify how they manage IT systems, how they consume IT resources, and how they power real-time, always-on data visibility across any hybrid multicloud environment.

At NetApp INSIGHT 2019, we're doubling down on that vision and acknowledging the "new normal" for data security and protection for a hybrid multicloud world. We are introducing new and updated tools to build and safeguard your data fabric across the most demanding industries and regulations.

NetApp is the only provider of a complete set of solutions to monitor any mix of IT environments and automate threat detection and to monitor user behavior in real time. NetApp provides the safety net that organizations need to stop unauthorized data access or movement as it is happening.

In 2019, you can trust your public cloud—if you can trust yourself. This is a challenge for IT leaders, and also an opportunity. Safeguarding data necessitates achieving central control and a deeper understanding of how data moves through an enterprise. The visionaries who can make this happen are poised to determine their organizations' relationship with data for years to come.



CONNECTING THE DOTS FOR CLOUD-AGNOSTIC DEVOPS

Despite the innovations of the past decade, DevOps can still look radically different from one use case to another. The result is that no one in the industry knows what specific DevOps solution will work best for a given organization.

DevOps is a "choose your own adventure" situation. Organizations have to evaluate their own goals, skills, bottlenecks, and blockers and then iterate toward a modern application development and deployment process that works for them. And that's OK!

NetApp offers an innovative approach, built around a data fabric and an industry-leading portfolio of products and solutions that are already being leveraged for DevOps in organizations around the world. However, the reality of one-size-fits-all, plug-and-play DevOps is still far off.

Today we are excited to share a new approach, using Kubernetes, that we developed through much trial and error, which makes it possible for us to get the most out of our hybrid multicloud environment, faster and more easily. Kubernetes connected the dots between the disparate DevOps solutions we were using internally, and the results have been game changing.

We offer our own NetApp use case as the template, not as the only answer, for building a modern, simpler DevOps solution that can span any hybrid multicloud environment.

We believe that containers represent the evolution of DevOps out of "public cloud purgatory." That's not to denigrate public clouds. Without them it would be impossible to support the ever-more- demanding workloads that are essential for deriving business value from data. However, as customers recognize that in a hybrid multicloud world, vendor lock-in is a substantial barrier to innovation and true agility, they often struggle to absorb, adopt, and leverage innovation in a multicloud environment. "Cloud agnostic" means the ability to avoid vendor lock-in and to move from one cloud to another without negative consequences for IT and business process.

Flexibility and freedom should be the high priorities for DevOps teams today. With the "gravity" of data becoming heavier and heavier, realizing that it might be easier to move the entire infrastructure itself, rather than the data it contains, is an epiphany. Achieving true application portability is the answer to addressing the economic factors and complexity concerns that plague modern DevOps.

We're excited to give you a peek behind the curtain and show you what application portability looks like in action at NetApp.

NetApp's Internal DevOps: An End-to-End CI/CD Pipeline

This example is based on the evolution of our own internal engineering process, in this case the team that develops the NetApp® SolidFire® and NetApp HCl product lines. Last year we moved to the Scaled Agile Framework (SAFe) for our product development process. And we are revamping our internal DevOps mechanisms and patterns, building out a DevOps-ready automation platform to support continuous integration/continuous delivery (CI/CD), rapid prototyping, and hybrid-cloud scaling.

NetApp HCI, with the Hybrid Cloud Control manageability suite enabled, serves as the starting point for our solution, leveraging NetApp Kubernetes Services (NKS) as the microservice and application infrastructure orchestration mechanism. From there we're using a Jenkins and native build pipeline pulling from Git repositories, feeding into the binary management system. Kubernetes then orchestrates the deployment and state of our target applications, using the NetApp Trident storage orchestration layer for persistent volume claims for stateful datasets.

As we scale the deployment further, we can tell NKS to expand out to any one of the "big three" public clouds—Amazon EC2, Google Cloud Platform, and Azure—and we use an Istio service mesh to create a federated hybrid multicloud application that spans disparate cloud infrastructures.

By implementing this approach internally, NetApp has dramatically shortened the lead times for creating CI/CD software pipelines for internal development, in some cases by more than two orders of magnitude. In addition, we are able to adapt and create new functionality for our developers in ways we've never been able to before.

What Can Cloud-Agnostic DevOps Do for You?

The NetApp family of products, integrations, and services can be woven together with standard opensource DevOps tools to create an end-to-end pipeline that is multicloud-enabled by default, capable of scaling to any organizational size, from a single team of developers with a site reliability engineer, all the way up to the global enterprise tier with thousands of contributors. Can your environment do that?

Only NetApp offers a true data center-to-multicloud abstraction layer that is generally available today, with nearly 20,000 clusters deployed in customer production environments.

Build a Data Fabric with NetApp, Solve Key Challenges

- Develop on your premises, then scale production deployment globally via multiple public clouds.
- Or prototype rapidly in the cloud, then deploy to local or regional data centers for an enterprise wide application release.
- Or keep a large part of your data systems in guarded secure private data centers while still taking advantage of public cloud offerings.

Creating a hybrid-cloud application or a hybrid IT platform has never been easier. You can get started today with NetApp hybrid cloud solutions for cloud native development.

We're excited to share more as we continue to experiment. In the coming weeks, we plan to publish a series of blogs and videos on NetApp's technical ecosystem site, Tepui, and to release a GitHub code repository where you can download, test, and try out our approach in your own environment.





FlexPod® is a converged infrastructure solution from NetApp and Cisco that powers modern AI and enterprise applications with the latest platform innovations. FlexPod is trusted worldwide and enables customers to embrace private and hybrid cloud with confidence for unmatched versatility.



Supporting materials:

 FlexPod Equals Cloud-Connected Converged Infrastructure In addition to connecting to the cloud with the data fabric powered by NetApp, FlexPod customers can now:

- Connect to the cloud with their data fabric and use the new FlexPod software solution for disaster recovery tiering and backup to the cloud
- Get the latest SAP HANA validation on the most up-todate AFF A320 with NVMe and Cisco UCS Servers.
- Use a "blueprint" for FlexPod hardening and best practices against ransomware.
- Have a vSphere solution tailored for cloud-connected, midsize workloads. This new FlexPod solution enables an affordable entry point into the FlexPod family while keeping all the FlexPod advantages like cloudconnectedness, single-vendor support, end-to-end testing, expertise in the FlexPod partner network.
- Use the continually evolving NetApp Converged Systems Advisor (CSA) cloud-based portal to detect and remediate FlexPod configuration issues. CSA configuration assurance and lifecycle management now includes support of Cisco Application Centric Infrastructure (ACI) networking, end-to-end NVMe and, NetApp® MetroCluster™ awareness.
- Evolve and modernize, adding new Cisco Validated Designs (CVDs) and NetApp Validated Architectures (NVAs) like the latest midsize and datacenter FlexPod vSphere updates to its family of more than 170 standard solutions, ensuring the performance of modern enterprise applications that run the largest and most complex enterprises.

FlexPod with SAP HANA

Cisco and NetApp have partnered to deliver FlexPod Datacenter as a platform for a variety of SAP workloads, including fully virtualized workloads. FlexPod uses best-inclass server and network components integrated with Cisco Unified Computing System (Cisco UCS) programmability features and backed by high-performance all-flash storage from NetApp.

The next version of FlexPod for SAP HANA offers the latest SAP HANA validation of the fastest, NVM-e-based AFF storage arrays and the fastest UCS servers.





FlexPod Workload and Infrastructure Updates

FlexPod is constantly evolving and modernizing, adding new Cisco Validated Designs (CVDs) and NetApp Validated Architectures (NVAs) like the latest midsize and datacenter FlexPod vSphere updates to its family of more than 170 standard solutions.

These updates include:

- A new FlexPod infrastructure midsize solution that is tailored for cloud-connected mid-size workloads. The solution is an affordable entry point into the FlexPod family retains all of the FlexPod advantages like cloud-connectedness, single-vendor support, endto-end testing, and diversified, enormous expertise in the FlexPod partner network.
- FlexPod Datacenter solution that includes the latest technology, hardware and software updates including NetApp AFF storage, Cisco Nexus networking, Cisco MDS storage networking, the Cisco Unified Computing Systems *Cisco UCS), and VMware vSphere software. The FlexPod Datacenter solution meets the business requirements of the most scalable, available, and reliable vSphere solution with comprehensive data services, seamless scalability, new levels of performance, and cloud integration.

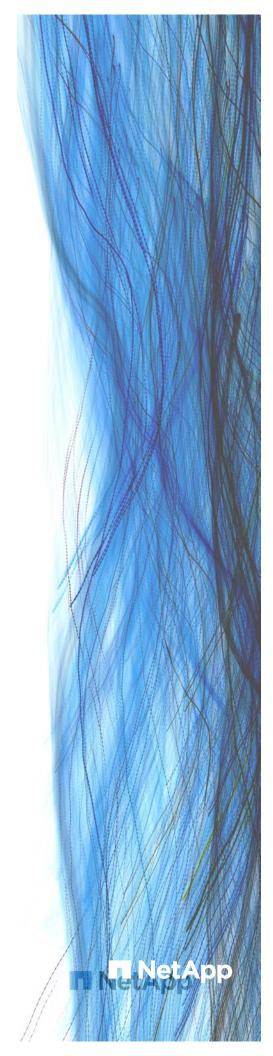
FlexPod Leverages NetApp FabricPool Software

FlexPod now delivers NetApp FabricPool to leverage cloud economies by moving infrequently use data from on-premises flash storage to a storage tier in a private or public cloud. Moving infrequently accessed data to the cloud frees up valuable flash storage space on AFF and FAS systems to deliver more capacity for business-critical workloads to the high-performance flash tier.

FlexPod Best Practices and Hardening Against Ransomware

This solution uses NetApp and Cisco features and innovations to protect against and recover from ransomware attacks. This solution also uses features from NetApp ONTAP® software, Cisco NetFlow and other parts of the Cisco security software portfolio to provide end-to-end hardware and software protection against ransomware.





NetApp Converged Systems Advisor (CSA) for FlexPod

NetApp Converged Systems Advisor (CSA), a software-as-aservice (SaaS) platform, consists of an on-premises agent and a cloud-based portal. CSA validates the deployment of the FlexPod infrastructure and provides continuous monitoring and notifications to ensure business continuity.

CSA configuration assurance and lifecycle management now includes support for Cisco ACI networking, end-to-end NVMe, and MetroCluster awareness.

Artificial Intelligence (AI) Reference Architecture for Automotive and Healthcare

Automotive – In collaboration with NVIDIA, NetApp is developing an end-to-end reference architecture (RA) for all aspects of autonomous vehicle (AV) development—from training, to validation, to archiving and compliance. The first RA release will offer directional guidance for building an Artificial Intelligence (AI) infrastructure that uses ONTAP AI incorporating NVIDIA DGX-1 systems and NetApp AFF storage. The automotive reference architecture:

- Offers data fabric technologies to satisfy the needs of complex, high-performance data pipelines with solutions that reach from our customer's core data centers to the edge and to the cloud.
- Supports seamless, cost-effective data movement across the hybrid multicloud environment.
- Supports use cases from vehicle safety to advanced driverassistance systems all the way to fully autonomous vehicles.

Healthcare – In collaboration with NVIDIA, NetApp is developing an end-to-end reference architecture (RA) for healthcare that unlocks the potential of AI in healthcare by breaking down data silos and connecting disparate datasets to generate deeper insights. The first RA release will offer directional guidance for building an AI infrastructure that uses ONTAP AI incorporating NVIDA DGX-1 systems and NetApp AFF storage systems for healthcare use cases, in particular medial imaging. The healthcare architecture:

- Makes is possible to review thousands and millions of records or images in less time and apply cognition to unlock vast amounts of data.
- Supports improved diagnostics through training with deep learning to detect the earliest changes in cell structure that typically develop into cancerous cells.
- Supports radiologists and prevents burnout by "triaging" overwhelming numbers of images, quickly sorting out normal images and flagging exceptions.

Supporting materials:

- Webpage: <u>FlexPod Converged</u> Infrastructure
- Solution brief: FlexPod All-Flash Solutions for SAP
- Solution brief: Modernize your Data Center with a Platform Built for Innovation
- Blogpost: FlexPod Equals Cloud-Connected Converged Infrastructure
- Blogpost: <u>Cloud-Based Automation</u> for <u>FlexPod with Configuration</u> <u>Healing Powered by Ansible</u>

Supporting materials:

- eBook: Al in Automotive
- Solution brief: <u>NetApp AI Solutions</u> for Automotive
- Infographic: <u>Driving Transformation</u> in <u>Automotive with AI and Deep</u> Learning
- Reference architecture: <u>TR-4799</u>: <u>NetApp ONTAP AI for Autonomous</u> <u>Driving Workloads</u>: Solution Design
- Webpage: <u>Al for Automotive</u>
- Blog: Artificial Intelligence in the Automotive Industry
- Blog: <u>How to Build a Pipeline for</u> <u>Autonomous Driving</u>
- Blog: Infrastructure Design for Autonomous Vehicle Development
- Pre Show Blog: <u>Your Guide to</u>
 <u>Everything AI at NetApp INSIGHT®</u>

- E-book: Al in Healthcare
- Solution Brief: <u>NetApp AI Solutions</u> <u>for Healthcare</u>
- Solution Brief: Accelerate Genome Sequencing with ONTAP Al and Parabricks
- Infographic: How Al and Deep
 Learning are Improving Healthcare
- Contributed Article: <u>Two Steps for Al</u> <u>Readiness for Healthcare</u> Organizations
- · Webpage: Al for Healthcare
- Blog: <u>How NetApp Partners Are</u> <u>Improving Patient Care with Artificial</u> <u>Intelligence</u>
- Blog: <u>How to Improve Healthcare</u> with AI and Deep Learning
- Blog: <u>Accelerate Genome</u>
 <u>Sequencing with NetApp ONTAP AI</u>
 and Parabricks
- Blog: How Al is Changing Medical Imaging

Virtual Desktop Infrastructure (VDI) for Citrix

NetApp HCI for Virtual Desktop Infrastructure (VDI) with Citrix Virtual Apps and Desktops is a hybrid cloud infrastructure that lets organizations run virtual desktops and other user applications side by side with guaranteed performance, simplifying management and enabling independent scaling of both compute and storage resources. With the latest release, available October 28, 2019, customers have access to:

- NetApp HCI best practices for the deployment of graphic-intensive desktop applications for knowledge and business users with Citrix Virtual Apps and Desktops 7
- A NetApp Validated Architecture that they can use to deploy virtual desktops with Citrix on NetApp HCI

StorageGRID All Flash

StorageGRID offers improved data management intelligence on a simplified platform for object data. Because StorageGRID leverages S3, it painlessly bridges hybrid cloud workflows and enables data to be fluid to meet business demands. SGF6024 introduces an all-flash appliance for small, high-performance object workloads. SGF6024 delivers:

- · Speed at enormous scale
- 3X performance for small object versus SG6060

StorageGRID Tiering to Azure Blob Storage

StorageGRID now offers tiering to Azure Blob Storage, supporting up to 10 Cloud Storage Pools per grid.

SG6060 Expansion Nodes

StorageGRID expansion nodes provide a simple and costeffective way to grow a StorageGRID environment. SG6060 expansion nodes now offer:

- 400PB in a single namespace.
- High density, high-capacity large object workloads.
- Ample compute, making the SG6060 the best option for on-premises FabricPool.

Supporting materials:

- NetApp HCl for Citrix Virtual Apps and Desktops
- NetApp HCl End User Computing Solutions
- What is VDI?
- What is EUC?



- NetApp StorageGRID Datasheet
- StorageGRID: Take control of your unstructured data at scale
- Blog: Speed, Scale, & Simplicity:
 You Can Now Have It All with
 StorageGRID



Cloud Manager

Cloud Manager enables you to deploy and manage NetApp Cloud Volumes ONTAP (CVO), which is a data management solution that provides protection, visibility, and control for your cloud-based workloads.

With version 3.7.5, NetApp Cloud Manager customers can get more out of their data with new features and tighter integration with the NetApp cloud portfolio. Cloud Manager now allows customers to manage more of their NetApp product portfolio, including Cloud Volumes Service for AWS and Azure NetApp Files. New capabilities include:

- Protection of data on Cloud Volumes ONTAP in AWS with a new Cloud Backup Service that is fully integrated and easy to manage via the Cloud Manager interface.
- Discovery of existing Kubernetes clusters with NetApp Kubernetes Service integration.
- New Cloud Compliance feature for Cloud Volumes ONTAP that offers improved data governance and control.
- Additional enhancements in Azure, AWS and Google Cloud.

Enhancement to Cloud Volumes ONTAP for Amazon Web Services

NetApp Cloud Volumes ONTAP (CVO) enables migration of applications to the cloud to achieve the precise performance, scale, and security that each application demands. The Cloud Volumes ONTAP for AWS now offers:

- Data protection with a new Cloud Backup Service that is fully integrated and simple to manage via the Cloud Manager interface.
- New Cloud Compliance feature that offers improved data governance and control.
- Released in ONTAP 9.5, NVMe Caching allows Cloud Volumes ONTAP instances to leverage NVMe flash available on virtual compute instances. Currently available only in AWS.



- Cloud Volumes ONTAP
- Blog: NetApp Cloud Insights
 Enhances Monitoring and
 Security for All Your IT
 Infrastructure



Cloud Backup Service

Cloud Backup Service, a fully managed data protection offering with new support for Cloud Volumes ONTAP for AWS, offers efficient backup of user data to cloud object storage with easy recovery in the event of data loss or to be used as a long-term data archive.

- Protection settings are available via NetApp Cloud Manager, and the service is supported on Cloud Volumes ONTAP 9.4 and later.
- Requires little to no management. The service is enabled by default with new installations of Cloud Volumes ONTAP, making it ideal for IT generalists and application owners.
- Cloud Backup Service is cost effective, storing Snapshot copies of data volumes to low-cost cloud object storage.
- · Recovering a data volume is easy with only a few clicks.
- Cloud Backup Service for Cloud Volumes ONTAP is available now with simple pay-as-you-go pricing and billing through an AWS account.

Supporting materials:

- Fully managed data protection for cloud volumes ONTAP made easy
- Blog: ONTAP 9.7: Do More with Less Time and Effort

Network File System v4.1 for Azure and Amazon Web Services

Network File System is a type of file system mechanism that enables the storage and retrieval of data from multiple disks and directories across a shared network.

NetApp is committed to making it easier for its customers to move more enterprise workloads to the cloud without rearchitecting or refactoring. That's why NetApp has expanded its multiprotocol file services to encompass NFS v4.1, NFS v3, and SMB for both Azure NetApp Files and Cloud Volumes Service for AWS, delivering the widest range of support for Windows and Linux workloads. These services pave the way for NetApp customers to continue their migration to the cloud and to gain increased scale, performance, and availability

- Azure NetApp Files Powerful Enterprise File Shares
- Extreme Performance for File Services



NetApp SaaS Backup Enhancements

NetApp SaaS Backup is a secure, web-based, software-as-a-service (SaaS) offering that backs up essential data across popular platform to ensure business continuity. NetApp SaaS Backup features daily automated backup and point-in-time, granular restore of your critical data with a simple interface and streamlined user management. New updates include:

- Partner Central Edition of SaaS Backup is being previewed for cloud solution providers (CSPs) and managed service providers (MSPs). With the Partner Central edition, CSPs and MSPs can provide backup for Office 365 to their end customers via a true multi-tier, multi-tenant service.
- SaaS Backup for Salesforce is now generally available (GA) worldwide and via Salesforce AppExchange marketplace. The service, offered on a license per seat, per year basis, requires no installation and is easy for any business to use.
- SaaS Backup for Office 365 support for backup and restore of Microsoft OneNote is available for customer preview. SaaS Backup performs full and incremental backup, and restores data at the OneNote, Section, and Section Group levels of OneNote notebooks stored in OneDrive and SharePoint.
- SaaS Backup now provides PowerShell cmdlets that help automate typical workflows such as onboarding
 of users and grouping them into tiers with specific grouping criteria that are based on Azure Active
 Directory attributes. Includes managing backup schedules and retention periods for different groups of
 users.

NetApp Data Protection and Security Assessment

The NetApp Data Protection and Security Assessment enables customers to simplify and improve the security and stability of their NetApp ONTAP and Cloud Volumes environments. By uncovering gaps and vulnerabilities and defining and documenting security risks that could leave the storage estate exposed, this new professional service helps customers:

- Proactively plan for minimizing the potential of security threats by quickly determining security readiness and establishing the ability to effectively respond before a cyberattack happens.
- Recover faster when an attack occurs by defining data restoration requirements, determining appropriate
 data protection policies and strategy, and identifying recovery processes to demonstrate compliance.
- Stay up to date with changing security requirements to avoid future risks.

Supporting materials:

ONTAP Data Security - Ensure company and customer data is secure across your hybrid cloud

NetApp FAS Hybrid-Flash Arrays

NetApp FAS hybrid flash arrays are simple, smart, trusted storage shared NAS and SAN environments that require rich data management and easy cloud integration. Powered by ONTAP data management software, they are ideal for back-up and retention, consolidation of general business applications, and distributed content. The new storage systems include:

- FAS8700 is a new high-end system that is optimized for high capacity and performance to consolidate multiple business workloads.
- FAS8300 is a next-generation midrange system designed for a wide range of deployments that need a balance of capacity and performance.

Supporting materials:

FAS Datasheet



NetApp AFF All Flash Arrays

Powered by NetApp ONTAP data management software, AFF systems deliver the industry's highest performance, superior flexibility, and best-in-class data services and cloud integration to help you accelerate, manage, and protect your business-critical data in the hybrid cloud. New products and offerings include:

- AFF A400: This new end-to-end NVMe allflash system that offers extremely low latency at a mid-range price point for enterprise applications, data analytics, and artificial intelligence workloads. With new data acceleration technology, it delivers up to 50% higher performance than its predecessor. especially for workloads with large I/Os, such as SAP HANA with reducible data sets. It offers best-in-class network connectivity including NVMe/FC, 100GbE and 32Gb FC making it versatile enough to support a wide variety of deployment options, such s scale out and scale up. It also supports both NVMe SSDs and SAS SSDs for a seamless transition path.
- Simplified data management and software offering: The new ONTAP System Manager makes it quick and easy to install and manage the system. The simplified software package allows customers to choose exactly the capability they need, such as data protection, cloud integration and security.
- New services and support offering: Includes a new digital advisor with predictive capabilities and a high0touch support tier, setting a new standard to help customer manage and optimize their storage

Supporting Material:

- · AFF Family Datasheet
- Blog: Reinvent Your Modern IT with the Newest AFF NVMe All-Flash Storage

NetApp ONTAP Data Management Software

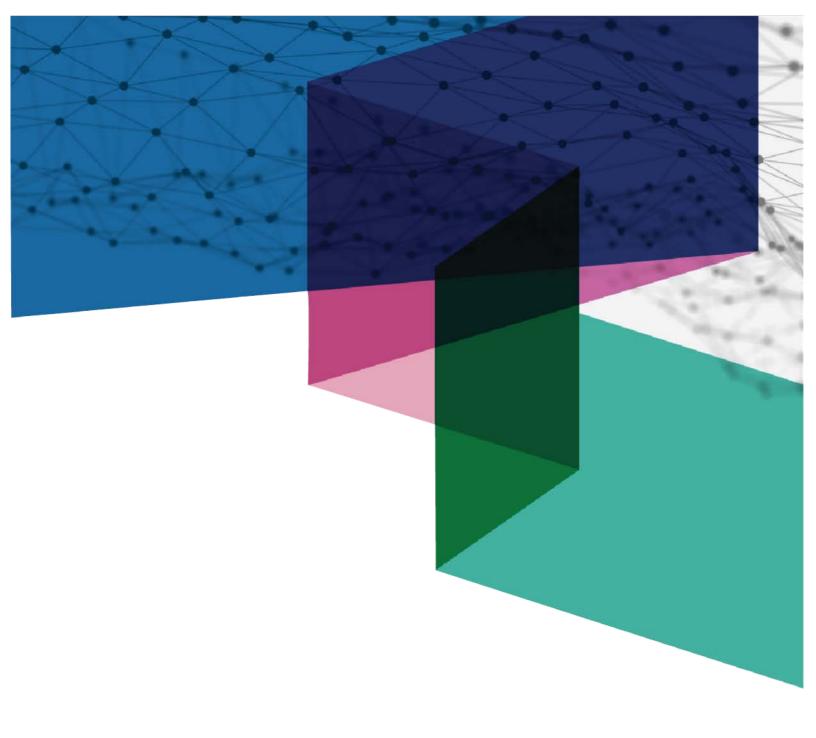
NetApp ONTAP 9 combines simplicity, flexibility, and security with powerful data management capabilities, proven storage efficiencies, and leading cloud integration. With ONTAP 9, you can build a storage infrastructure that is smart. powerful, and trusted – the foundation of an intelligent hybrid cloud that spans flash, disk, and cloud. Flexibly deploy storage on your choice of architectures—hardware storage systems, software-defined storage (SDS), and the cloud—while unifying data management across all of them. Accelerate enterprise applications with flash, without compromising on the essential data services. And seamlessly manage data as it flows to wherever it's needed most to help make the best possible decisions for your organization.

New capabilities with ONTAP 9.7 enable you to do more with less time and effort:

- Even simpler management, with redesigned dashboards for ONTAP System Manager and Active IQ Unified Manager that provide a clear and comprehensive status of your ONTAP clusters and enable proactive management of performance, capacity, data protection, and security.
- Expanded integration of hybrid cloud, with seamless and efficient migration of tiered data between private and public clouds using FabricPool.
- For business applications where continuous data availability is the top priority, AFF systems for all-SAN deployments are now available with symmetric active-active hostto-LUN access.
- Reduce the time and cost to deploy MetroCluster for business continuity by using your existing networking infrastructure for enterprise applications.
- Extended scale-out NAS deployments to workloads that use NFS 4.x protocols and storage-efficient data caching.

- ONTAP Data Sheet
- Blog: ONTAP 9.7: Do More with Less Time and Effort





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