

**WHITE PAPER**  
Creating the  
Cloud Foundation  
for Tomorrow's  
IT Services

#DataDriven



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## Creating the Cloud Foundation for Tomorrow's IT Services

**Enterprises in transformation are challenging IT to operate “like a service provider” as public cloud and hosting services gain momentum**

The demand for enterprise IT departments to deliver infrastructure services like public cloud and hosting providers' models is increasing rapidly. A [recent survey](#) of CIOs and IT executives across a range of companies found that “the shift to the cloud is accelerating, with large enterprises becoming a major driver of growth for cloud environments.” Cloud computing services of all types are dominating the headlines as enterprise IT organizations search for an infrastructure delivery model that can enable—and ideally, accelerate—their corporate journeys toward operating as internal enterprise cloud infrastructure providers.

Enterprises face a series of tough decisions as they make the necessary technology investments to allow them to assemble the building blocks of a next-generation data center infrastructure.

## The right technology decisions today can lay the foundation for future success.

Cloud services enable unprecedented business agility and flexibility, but as enterprises are placed under greater pressure to act like service providers to deliver infrastructure as a service, many find it difficult to keep pace with technical innovation.

Even the largest and most agile enterprise IT organizations struggle to innovate at the rate of cloud providers such as Amazon Web Services and Microsoft Azure. An enterprise's ability to efficiently deploy and scale cloud infrastructure services that support all kinds of workloads is the benchmark from which its IT department is plotting its future enterprise cloud vision.

As your enterprise IT organization analyzes its ability to build and deploy infrastructure services like a service provider, take these few key business considerations into account:

- What core infrastructure services and solutions should you productize first to have the biggest impact on business scale and agility?

- How will you increase investment flexibility and make it easier to procure the right IT resources at the right time for the right workloads?
- How can you deliver better infrastructure services more cost effectively to your internal consumers?
- How will a service provider model reduce shadow IT?
- How can you streamline your operations to reduce operating costs and enhance your company's bottom line?
- How will your new infrastructure model allow you reduce time to market and offer an edge over your competition?

## It takes constant attention to remain true to your core values and stay on course.

The right technology decisions today can lay the foundation for future success. This paper will help you understand how to address current enterprise customer challenges while architecting your systems to create a next-generation data center platform that meets your rapidly changing cloud technology demands .

## Reinvent Your IT Infrastructure Strategy

Cloud infrastructure dynamics that impact enterprise IT strategy are changing rapidly. Your competitors are quickly evolving their corporate IT services delivery, and hyperscale providers are disrupting how infrastructure is being offered. All of this affects how internal customers perceive the value of IT in a cloudy world. It takes constant attention to remain true to your core values and stay on course. Your ability to satisfy IT customers, and to contribute positively to the business bottom line, is a constant struggle and between financial efficiency and customer satisfaction.

There are five key elements that drive day-to-day operations for cloud and hosting providers. As you reinvent your enterprise infrastructure strategy, these five pillars will help you determine the underlying technology building blocks that you need to build enterprise IT infrastructure just “like a service provider.”



### **Reduce Infrastructure Storage Costs**

Enterprise IT is once again considered to be a business enablement organization rather than a cost center. Successful enterprise IT organizations listen closely to their customers to understand both today's and tomorrow's application needs so that they can build the right set of solutions to help deliver more efficiencies to

the business.. IT leadership must continue to expand its services portfolio, accelerate service development, and deploy automation-driven services rapidly and on demand to support continuous improvement and progress and make a bottom-line contribution to the stated business objectives. Cloud and hosting providers are in business to sell technology-based services for a reasonable profit.



### Expand Markets and Capabilities

Traditional storage systems are complex to deploy and operate, especially at service-provider scale, whether you are a service provider or an enterprise IT organization.

As you create your next-generation data center strategy to support the anticipated future demands of your enterprise customers, legacy storage systems are simply not up to the task. Data storage systems are the lifeblood of any cloud and hosting infrastructure platform. Understanding how to price, position, and productize your storage solutions to appeal to next-generation data center enterprise customers is a critical requirement in the productization of storage platforms. The ability to offer new solutions in ways that weren't previously possible gives your constituents a new level of go-to-market agility.



### Reduce Business Risk

Risk in the infrastructure services world comes in many forms: the need for an unplanned storage purchase, a system-wide outage, or unexpected demand for large volumes of infrastructure. Any of these risks can turn a normal day into a disaster and create significant financial exposure for an enterprise IT organization. As you reinvent your cloud strategy, the ability to minimize risk and exposure is key to building a long-term and predictable enterprise cloud deployment.



### Streamline Operations

A strong operations team is often the key differentiator in a cloud experience, solving customer issues and driving up your internal customer satisfaction scores. These non-revenue-generating but highly valuable teams are among the most significant costs in any IT organizations. Unfortunately, they negatively affect the cost of service delivery to the end customer. Finding the right balance between a hands-on approach and API-driven systems automation at all levels of the infrastructure stack is critical as you build your data center strategy.

Streamlining operations and service deployment while maintaining a hands-on feeling and personal touch with customers is one of the most complicated challenges you face in designing your next-generation data center



### Accelerate IT Scale and Agility

Given the ubiquitous nature of cloud deployments, enterprise IT organizations need to adopt similar infrastructure deployment models as public cloud and hosting providers. The ability to scale on demand and support the random or unexpected infrastructure needs of internal customers is key to building and operating a real enterprise cloud infrastructure.

### Netapp Helps Enterprises Understand How Service Providers Build Successful Cloud Infrastructures

NetApp helps you achieve better business outcomes, both today and tomorrow, with software-defined, scale-out, next-generation storage architectures that allow you to expand and contract granularly and overcome technical limitations. When you employ NetApp® storage as part of your cloud architecture, your data centers immediately take on next-generation qualities such as guaranteed quality of service (QoS), unprecedented scalability, support for S3 and S3 as a service, and total infrastructure automation.

With NetApp as a partner, you are able to focus on the mission of your business rather than the technology on which it runs.

NetApp's next-generation storage architectures can be deployed in the form of:

- NetApp SolidFire® all-flash storage, optimized for the performance and capacity needs of structured data and high-performance applications
- NetApp StorageGRID® object storage, ideal for repositories of rich unstructured content
- NetApp HCI for small-scale IaaS and dedicated managed private cloud.

With NetApp as a trusted cloud partner, you are able to focus on the mission of your business rather than the technology it runs on. The NetApp next-generation storage architectures deliver more value from your storage, better satisfy customers old and new, streamline your operations, and reduce financial risk.



## Reduce Infrastructure Storage Costs

Create new and innovative IT cloud services while improving the bottom line.

### Limitations of Traditional Storage

If you use a traditional storage architecture, there's a good chance that you're finding it difficult to fully consume and depreciate those investments. You'd like to see more efficient deployments, but cumbersome management, limited automation, and complicated scaling get in your way, while public cloud companies are offering services that you can't deliver.

NetApp's next-generation storage architectures enable you to:

- Fuel new revenue streams
- Accommodate data growth
- Offer new cloud consumption models

### Fuel New Revenue Streams from Your Storage

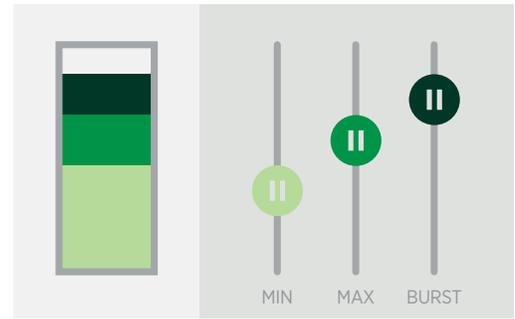
NetApp's storage architectures enable you to increase the pace of service delivery and create new revenue opportunities without adding to capital costs or data center complexity.

For example, with SolidFire all-flash storage you can offer storage and performance tiering without resorting to different storage architectures. You can set minimum and maximum performance thresholds to create both capacity-oriented and performance-oriented tiers and move customer data from one tier to another instantly with a few clicks—no migration necessary.

### Accommodate Data Growth with a Scalable Cloud Platform

Most storage architectures scale up only within modest limits. When one storage system reaches its limit, you need to add another, and then another, increasing complexity and management overhead. NetApp's next-generation storage architectures eliminate these challenges, allowing you to scale out storage performance and capacity one node or appliance at a time. This approach more closely aligns to your strategic business growth plans.

If you have internal customers who need object storage for rich unstructured content, Internet of Things (IoT), or large data lakes, NetApp's flexible, software-defined storage scales out to support billions of objects across diverse locations and media types. And the NetApp dynamic policy engine simplifies data management throughout its lifecycle.



### Deliver new cloud consumption offerings on demand

The types of services your internal customers want to consume, and where and how they want to consume them, can change rapidly. Your storage infrastructure needs to be flexible enough to allow you to bring new services online quickly without having to rearchitect or deploy a lot of new hardware up front.

NetApp gives you more ways to increase the service delivery potential of your storage through superior scaling and new consumption models. As the examples throughout this paper illustrate, service providers rely on NetApp's next-generation storage architectures as the foundation for diverse private, public, and hybrid cloud services, and enterprises can benefit from understanding their real-world experience

### University of Giessen

The University of Giessen turned to NetApp® SolidFire® technology to support its analytic software services, enabling researchers worldwide to solve pressing challenges in medicine and biotechnology.

- 300 research projects supported globally
- 2,500 global researchers served

### Premier Eye Care

To overcome the productivity-draining drawbacks of its previous storage solution and deliver exemplary performance to customers, Premier Eye Care implemented NetApp SolidFire all-flash storage.

### Business Benefits

- Reduced Latency
- Improved application performance
- Fast backup and recovery
- Fast report generation
- Linear scalability
- Guaranteed performance
- Global efficiencies



## Expand Markets and Capabilities

### Expand Your Services Portfolio to Drive New Cloud Infrastructure Deployment Models.

#### Limitations of Traditional Storage

Traditional storage architectures have a profound effect on your ability to keep internal customers satisfied. The limitations of legacy storage make it difficult to differentiate services in ways that are meaningful to your customers' vision of the future. This lack of differentiation makes it even harder to retain those customers and avoid shadow IT deployments in the public cloud.

Your current storage systems may not be able to meet customers' expectations when it comes to hosting performance-sensitive enterprise applications or next-generation workloads. NetApp's next-generation storage architectures help you provide greater differentiation and win more customers by:

- Expanding your available services portfolio
- Accelerating the delivery of new services
- Offering services that can be consumed on demand

### Expand Your Services Portfolio to Diversify Your Business and Grow Profits

NetApp's storage architectures enable you to quickly expand your services portfolio to attract more workloads, tailor services for particular customer types, or both.

You can deliver exactly the resources needed from a performance or capacity perspective for specific workloads like ecommerce, VDI, ERP/CRM, collaboration, and big data, creating the foundation of services tailored to particular applications. For example, NetApp all-flash storage supports the demanding performance requirements of desktop as a service (DaaS), an increasingly popular offering

NetApp StorageGRID object storage is ideal for delivering services for customers with analytics, IoT, or other applications that need large-scale object storage services spanning multiple regions. Many enterprises are also deploying their own S3-as-a-service offerings, targeting development, backup, and other use cases that have unique requirements for data durability, availability, performance, scale, or location

### Get the Blueprint for Productization and Service Development

You know that adding new services is essential to help your business grow, but making the time to architect, plan, and deploy them can be challenging. By providing blueprints for productization and service development, NetApp makes this job much easier. Why start from scratch when NetApp can get you most of the way there?



NetApp's next-generation storage architectures are designed with automation in mind, so your team can easily automate storage functions and make them accessible to your customers through a self-service portal. In addition, our Fueled by NetApp consulting team is available to assist with the development, productization, and promotion of new solutions that you can take to market. Our experienced service provider industry advisors can help you:

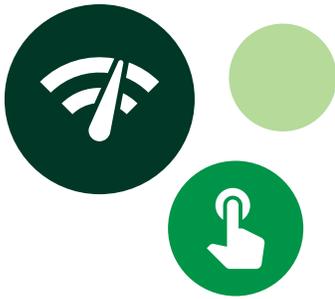
- Better understand market opportunities
- Build accurate financial models
- Accelerate time to market
- Create market differentiation through messaging, positioning, and SLA creation
- Make ongoing service improvements for maximum return on investment
- Understand how cloud and hosting providers deploy their infrastructure to help harden your enterprise cloud architecture.

### Deploy New Services on Demand

On traditional storage architectures, deploying new services can be a slow and demanding process. For example, suppose that a customer with 50TB of data stored in a Silver tiered storage service decides to change to Gold . It may take hours or days to migrate the data from Silver to Gold storage, tying up infrastructure and staff resources.

With NetApp SolidFire storage, the process is entirely software defined. Change the QoS settings on the customer's data, and the process is complete. The new service level takes effect immediately, with no migration required.

With NetApp object storage, any policy change takes effect immediately. Suppose that a customer has a policy that data is stored with one copy in the United States, one in Germany, and one in Japan. But then the law changes and that data type can no longer be stored in Japan. Change the policy, and data is automatically moved as needed to achieve compliance, turning what might otherwise be a monumental data management task into a task that is resolved in only a matter of a few clicks.



### 1&1 Delivers a Better Cloud Experience

NetApp gave 1&1 a single storage solution that better supports the performance needs of its customers, provides them with more choice, and delivers a better experience. These capabilities help 1&1 retain existing customers and attract new ones.

“1&1 can now offer its customers two million server configurations delivered in 55 seconds, which is clearly a massive improvement for us and our users. And with state-of-the-art, solid-state storage, they never need to worry about performance, availability, or reliability.”

—Javier Salcedo Gadea,  
Head of Product Management Cloud, 1&1

[Read the full story.](#)

NetApp’s next-generation storage architectures eliminate this risk through granular, node-based, scale-out design.



## Reduce Business Risk

### Buy As You Grow, Reduce Overprovisioning, and Effectively Deploy Next-Generation Storage Automation

#### Limitations of Traditional Storage

The traditional storage model adds significant financial risk because it forces you to make significant storage capital outlays up front.

In addition, there’s no easy way to move capacity once it’s installed. No matter how carefully you plan, you’re going to end up with too much capacity in some data centers and too little in others, stranding assets and adding costs.

Traditional storage also adds business risk in other ways. System renewals add to your capital costs, while disruptive and complex system upgrades and other sources of downtime reduce revenue-generating potential. Because overprovisioning has been the only way to protect against noisy neighbor issues, you must either overprovision at added capital expense or add to the risk of customer churn to a public cloud provider.

NetApp’s next-generation storage architectures help you provide greater differentiation and win more customers by:

- Allowing you to pay as you grow your infrastructure
- Eliminating stranded assets
- Simplifying updates and reducing downtime

#### Stop Overprovisioning: Pay as You Grow Instead

Most traditional storage architectures require heavy up-front investments and overprovisioning in an attempt to ensure that customer SLAs can be met. NetApp’s next-generation storage architectures are based on a scale-out model in which one node or appliance can be added at a time as needed, allowing your cost curve to more closely follow infrastructure demand. With the guaranteed performance of NetApp all-flash storage, all customer performance SLAs are met without overprovisioning.

NetApp object storage accommodates different types of media, including tape, across different locations, enabling it to optimize data placement for performance or to minimize storage costs for archived data.



## Eliminate Stranded Assets to Reduce the Risk of Capacity Planning

For large enterprises managing multiple data centers, the financial consequences of mistakes in capacity planning can be significant. NetApp's next-generation storage architectures eliminate this risk through granular, node-based, scale-out design.

For example, suppose that you have too much capacity deployed in Virginia and not enough in Texas. The architecture allows you to simply remove nodes from your system in Virginia and send them to Texas, where the extra capacity can be added seamlessly and transparently. Automatic redistribution of the data remaining in Virginia is transparent to the customer and has no impact on system performance.

## Simplify Updates and Eliminate Downtime

NetApp's next-generation storage architectures support non-disruptive operations, upgrades, and infrastructure refreshes, so your storage is online and supporting customer workloads more of the time and not offline for maintenance, planned or unplanned. The architecture is also intrinsically highly available and self-healing, which further protects your operations from disruption and downtime.

### Solidfire Customer Fact

**Enterprise customers are realizing significantly reduced risk with SolidFire.**

A Global 500 retail company realized 50-75% of savings benefits from reduced risk after using NetApp compared to previous data storage platforms.

Source: Director of Technical Architecture, Global 500 Retail Company

### Solidfire Customer Fact

PayPal, Inc. realized 75-100% savings benefits with the agility/flexibility of NetApp compared to previous data storage platforms.

Source: Valued Customer, Storage Admin, PayPal, Inc.



## Streamline Operations

Transform Your Team from Tactical to Strategic

### Limitations of Traditional Storage

Operational expenses make up a large portion of your budget. Streamlining operations and controlling expenses not only has an immediate impact on your company's profitability, it frees up your operations team to focus on more value-added and strategic tasks.

Traditional storage infrastructure creates a number of operational challenges. In particular, with most storage architectures it's difficult or impossible to achieve the level of automation and integration needed without a huge investment in professional services.

Long, disruptive, and complex system upgrades not only have a big operational impact, they also impact budgets. The more infrastructure that is down for maintenance at any given time, the more infrastructure you must deploy to meet customers' needs.

Finally, the more time your team spends on troubleshooting tasks, the less attention strategic tasks receive. By enabling you to increase your level of automation while simplifying or eliminating upgrade and troubleshooting tasks, NetApp storage not only streamlines your operations, it enables you to manage more infrastructure and serve more customers and workloads with a smaller staff and frees up staff time to focus on tasks that add business value.



### **Integrate and Automate Seamlessly**

NetApp's next-generation storage architectures make your infrastructure and your team much more agile. Easy automation via open REST APIs simplifies provisioning, management, and other tasks, and allows your team to automate storage capabilities as services available to your customers without expensive consulting engagements.

NetApp next-generation storage architectures were designed with API automation in mind, making NetApp APIs simpler and easier to use relative to traditional storage, where APIs are often bolted on as a sad after-thought.

Multiplatform integration, including VMware, OpenStack, and Docker, streamlines integration tasks and allows traditional enterprise and cloud-native applications to share the same infrastructure, simplifying planning and further reducing infrastructure and management costs.

## Automation reduces the chance of user error and minimizes troubleshooting, giving you back countless hours .

### **Transform Your Team**

Because cloud infrastructure is complex, your team most likely dedicates too much time to just keeping the lights on: managing compute resources, virtualization, storage provisioning across multiple storage arrays, and a seemingly never-ending stream of software and firmware patches and updates. NetApp's next-generation storage architectures are designed to change all that. Using the simple, robust, and extensive REST-based APIs, many traditionally manual storage tasks are eliminated.

If you perform a manual task five or more times per month, it should be automated. Automation reduces the chance of user error and minimizes troubleshooting, giving you back countless hours that can be put to use creating additional services and moving the business forward.



## Accelerate IT Scale and Agility

### **Offer Predictable Enterprise Infrastructure Performance in a Service-Provider-Like Model**

#### **Limitations of Traditional Storage**

With public cloud consumption on the rise, it's more important than ever that enterprise IT build, deploy, and support a service provider like infrastructure.

Unpredictable performance and downtime are the leading causes of end-user complaints. Unfortunately, with traditional storage architectures the only way to address these challenges is to overprovision. As you probably know all too well, the impact that overprovisioning has on your infrastructure and your team is significant. Hardware utilization goes down, your infrastructure sprawls, and capital costs all go up. As the complexity of your environment rises, team productivity falls, increasing operating costs.

And even with all that, the results are mixed, leaving your end users often dissatisfied. NetApp's next-generation storage offers a better and easier path to customer satisfaction with

- Guaranteed performance
- Self-service control
- Self-healing architecture

#### **Guaranteed Performance**

By delivering right-sized performance according to end user needs with guaranteed SLAs, you ensure that each user has the best possible application experience.

NetApp guaranteed performance reduces the number of trouble tickets and minimizes the time spent resolving trouble tickets that do arise.

#### **Self-Service Control**

Because NetApp's next-generation storage architectures are easily automated, you can extend self-service control to your end users, so they can take action when needed. For example, if an application is experiencing a spike in activity that exceeds the customer's performance SLA during the holiday season, that user can take immediate action to identify the problem and raise the SLA, without needing to file a trouble ticket or customer service request to resolve the issue.

The more visibility and control your customers have, the more satisfied they will be.

## Self-Healing Architecture

NetApp next-generation storage isn't just designed to be resilient and highly available, it's designed to be self-healing. When a failure occurs, there is no impact on quality of service, and the system works in the background to automatically restore full resiliency. NetApp storage can survive more serious failures than traditional storage architectures. Your storage actually becomes more resilient as it scales out.

The benefit for your users is that their data, as well as application performance and uptime, are better protected and even the most stringent SLAs can be met. The benefit for your operations team is that a failure is no longer an emergency requiring an immediate response. Hardware replacement becomes a task that can be scheduled and performed when it's most convenient.

### DARZ Builds Hybrid Cloud Service with NetApp StorageGRID

For German IT provider DARZ, a service offering built on StorageGRID Webscale object-based storage goes where traditional storage architectures cannot follow, providing a massively scalable, globally managed, and robust object storage solution.

"With StorageGRID Webscale, we can give our customers—especially those in verticals such as banking, energy, and pharmaceuticals—an innovative hybrid cloud approach for preserving and leveraging the value of their vast data repositories and archives, especially across a global enterprise."

—Lars Göbel, Director of Sales and IT Services, DARZ

[Read the full story.](#)

### Advanced UniByte Chooses NetApp for Backup and DR Services

A combination of NetApp Cloud Backup and StorageGRID Webscale enabled this service provider to offer a new cloud service that optimizes data retention, availability, and performance.

"We have been able to expand our cloud service considerably thanks to the new NetApp solution. We can now serve the entire market, regardless of whether customers use NetApp solutions or not."

—Michael Maier, Director of the AU Service Center, Advanced Unibyte

[Read the full story.](#)

## The Best Partner to Help You Create Tomorrow's Cloud Services

If you're ready to create the foundation for tomorrow's IT services, NetApp is ready to help. NetApp's next-generation storage architectures will enable you to:

- Monetize/chargeback/show-back your infrastructure more fully to create new a stronger business model
- Win more internal workloads through expanded service offerings
- Reduce business risk by eliminating overprovisioning
- Streamline operations with advanced automation
- Improve end-user satisfaction to increase workload contract retention life

NetApp proves every day that it has both the technology and the expertise to take your business further.

Enterprises will increase their adoption of cloud services over the next three to five years. To prepare yourself to take advantage of new opportunities, you need a business partner that can help you transform and deploy infrastructure resources like today's successful cloud and hosting providers.

NetApp proves every day that it has both the technology and the expertise to take your business further. NetApp is the smart choice for you, your team, and your business.



Refer to the [Interoperability Matrix Tool \(IMT\)](#) on the NetApp Support site to validate that the exact product and feature versions described in this document are supported for your specific environment. The NetApp IMT defines the product components and versions that can be used to construct configurations that are supported by NetApp. Specific results depend on each customer's installation in accordance with published specifications.

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