

WHITE PAPER
Master the Cloud
and Become a
Data Thriver
Be the difference!



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IT Change Is Necessary—and Inevitable

Why change? Why now?

As enterprises embrace the digital era, they are turning to IT to deliver new services that engage customers, optimize business processes, and enable new market opportunities. Companies increasingly recognize the strategic importance of data and are pushing IT to make data-centric business a reality and become data thrivers.

But your IT team is still operating with traditional infrastructure and relying heavily on manual procedures. When your day is sideways by 8:15 a.m. because something broke during the night—and your IT team is handling hundreds or thousands of tickets a day—how do you find the time to catalyze the revolution in IT that is so clearly required? It's time to stop being a ticket agent and become a change agent.

New Challenges, New Opportunities

The technology landscape has shifted dramatically over the span of just a few years (see Figure 1), leaving IT teams to sort out the challenges and opportunities created by cloud technology, new application paradigms, mountains of data, and the need for teams with new and different skill sets.

Though enterprises believe that public cloud is the key to solving digital transformation challenges, IT teams are learning the hard way that despite its agility and ease-of-consumption, public cloud alone is not enough. You may have moved workloads to the cloud only to bring them back on-premises because of unexpectedly high costs or poor performance.

New applications have different developer requirements, different resiliency needs, and less dependency on the underlying hardware than traditional software. NoSQL databases are replacing Oracle. Hadoop, Spark, and other big data platforms are taking on critical importance, and you're probably also coming to terms with the infrastructure and data management needs of artificial intelligence (AI).

Any Time, Any Place, Any Device

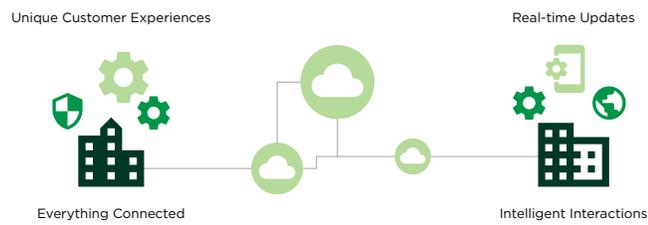


Figure 1) The world is fundamentally and rapidly changing. IT must evolve with it.

Your IT clients want to consume services, not architect solutions. Traditional IT organizations with separate teams for storage, virtualization, networking and other functions may be ill-prepared—in both agility and skills—to leverage the latest cloud and application technologies to deliver on customer needs. To prevent your customers from going around IT to the public cloud, it may be necessary to re-think your organization and re-skill your team.

Embrace Disruption on Your Terms

IT transformation is both necessary and achievable. By embracing change and making smart choices now, you can minimize the risks and maximize the rewards. How do you plot a course from where your organization is today to where you need to be in the future? IT success hinges on the following critical factors.

- **Recognize the critical importance of data.** The key to your company's future lies in recognizing the critical importance of data. A recent article in The Economist noted that in today's economy, "The world's most valuable resource is no longer oil, but data." Data-centric companies operate more efficiently and outperform the competition. Data has become the key for businesses to **transform, innovate, expand, and thrive**.
- **Modernize infrastructure.** A recent survey of 650 IT decision makers around the globe found that increasing IT operational efficiency was the number-one digital transformation goal, followed closely by improving the customer's experience. Modernizing infrastructure was seen as the most important initiative for achieving these goals. Modernizing infrastructure can enable you to:
 - Reduce complexity and streamline management
 - Automate routine tasks
 - Take control of your data assets
 - Build a private cloud with the agility and features of public cloud
 - Master your data and leverage the public cloud to achieve hybrid cloud infrastructure success
- **Prepare for scale.** You need to prepare your organization for a future in which you operate at far larger scale. Your IT budget has never increased at a rate commensurate with growth in services, and it probably never will. Success hinges on simplicity, automation, and—something that all IT organizations understand—iteration. All IT processes from procurement to deployment to provisioning to management to scaling have to be simple, well-defined, and repeatable.

This white paper will help you understand how to achieve lasting success by becoming an advocate for data-centric technology, modernizing your IT environment, and focusing on the things that matter most. For many fast-moving IT teams, hyperconverged infrastructure (HCI) is a key tool to modernize their environments. HCI can help you create a private cloud that incorporates the same capabilities as the public cloud, facilitate your ability to leverage a hybrid cloud infrastructure model, and enable your company to become a Data Thriver.

Create a Sustainable Legacy in IT

Revolutionize with less risk

In IT, the term “legacy” is often used in a derogatory fashion to refer to technology that’s a holdover from the past and no longer of value. But the word can also mean something of value handed down from a predecessor.

As an IT professional today, you may wonder which type of legacy you’ll leave behind. Your legacy may depend on the actions you take in the next few years. The IT leaders who will leave a lasting imprint on their organizations are pushing their teams and their companies to recognize the crucial importance of data in the digital era, helping redefine the scope and breadth of IT, and building multicloud infrastructure solutions capable of operating at unprecedented scale.

Become a Data Thriver

Businesses that rely on traditional means of sustaining competitive differentiation are being disrupted by more agile, innovative companies that are leveraging the huge amounts of data generated by connected systems and devices to improve business processes and enhance the customer experience. (See Figure 2.)

Intelligent, data-driven applications transform your business and bring customers closer. These applications incorporate the new data they generate to continuously enrich the user experience.

The organizations that are best-positioned to capitalize on this wealth of data can be classified as **Data Thrivers**. In Data Thriver organizations:

- Data is considered a strategic asset
- IT and business work in unison
- Data quality is priority one
- Data is disseminated uniformly throughout the organization
- Data maps provide visibility and control
- Insights span a range of systems, including development, test, QA, and production

To thrive, your entire company has to recognize the critical importance of data, and your team has to create an IT environment in which data is securely stored, reliably managed, and accessible across your data centers and the cloud.

Lead the Charge

An effective cloud strategy is crucial for data-centric companies. You may have already learned the hard way that traditional IT plus public cloud does not add up to a fully functioning cloud environment. Because traditional infrastructure is plagued by complex architecture with silos dedicated to individual applications, it lacks both agility and integration. Mixing public cloud resources and traditional IT can make your situation worse, not better.

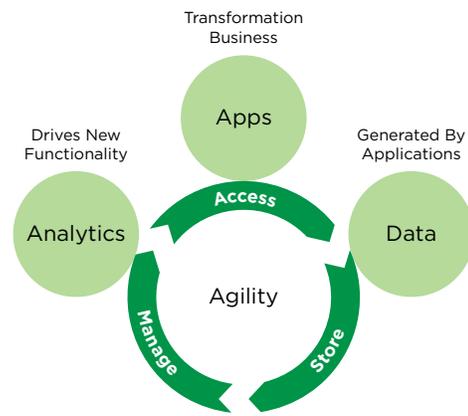


Figure 2) Agile enterprises are turning to data as the source of future innovation and differentiation.

As Figure 3 illustrates, a successful hybrid cloud infrastructure goes beyond on-premises consolidation and virtualization, adding deep automation and integrating private cloud and public cloud resources that enable data to flow where it is needed. This more flexible environment meets the demands of business stakeholders, end users, and developers and enables your company to rapidly develop, deploy, execute, and protect next-generation, data-centric applications. Your IT team becomes a broker of services that can be hosted in a private cloud or sourced through external cloud providers.

The foundation for this hybrid cloud infrastructure success is an effective private cloud platform built on modern infrastructure that reduces data center complexity and technical debt, facilitates automation, simplifies data management, and offers the agility of the public cloud.

There may be considerable resistance to the changes required to build the necessary private cloud as part of a successful hybrid cloud strategy. Business leaders need to be persuaded that public cloud by itself is not the answer. Financial teams may view IT as a cost center and balk at new investments. Even members of your own team will resist changing the status quo. Be prepared to lead the charge with a clear vision of the destination and a clear plan for how to get there.

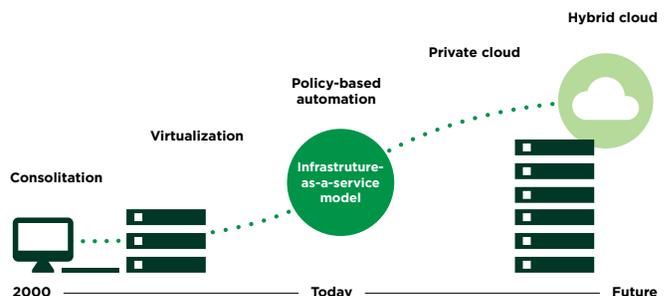


Figure 3) The path to a digital future leads from virtualization to automation to cloud.

Keep Things Simple at Scale

If the traditional IT architecture is an impediment to cloud success, you need an IT environment that will enable you to:

- Build an effective private cloud
- Implement your hybrid cloud infrastructure strategy
- Protect and manage more data in more locations
- Operate efficiently at scale

Enterprises are turning to hyper converged infrastructure (HCI) solutions as an alternative to traditional IT infrastructure, addressing many of the operational challenges of private cloud, and acting as a stepping stone to an effective, no-compromise hybrid cloud.

Designed to be easy to consume and manage, HCI combines all elements of the infrastructure stack in a single shared resource pool built on virtualization technology. Everything is managed from one centralized interface. Resources scale incrementally, so you pay as you grow with lower upfront costs, deployment is fast and simple, and the whole stack is supported by a single vendor.

What does this mean in practice for operations at scale? With HCI, you can start small and grow compute and storage resources quickly as needed in increments that make sense for your needs and budget. Existing silos of specialized and dedicated infrastructure disappear over time as they reach end of life. If you need to deploy additional private cloud environments, the deployment process is fast and repeatable.

Because everything is integrated and managed centrally, IT generalists handle most day-to-day monitoring and management functions without relying on teams of server, storage, networking, and virtualization admins. As your private cloud matures, your IT clients increasingly satisfy their needs through self-service, freeing staff from the demands created by a constant stream of service requests and trouble tickets and allowing them to dedicate time to innovation that delivers greater business value.

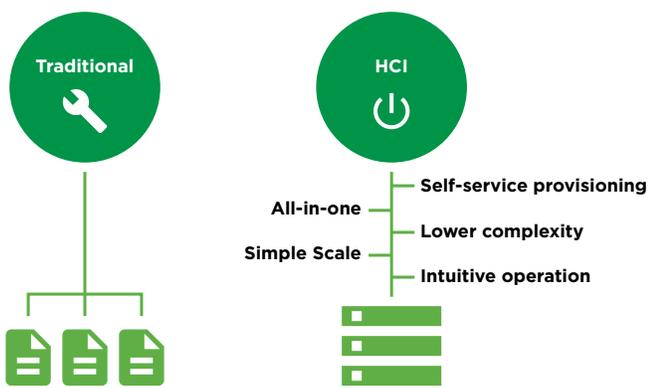


Figure 4) Hyper converged infrastructure overcomes the complexity that results from traditional infrastructure in cloud environments.

NetApp HCI Enables Private Cloud at Scale

Infrastructure for a hybrid cloud world from a supplier you know and trust

Although almost all HCI solutions can address some of your cloud requirements, they are not all equally well suited to meet the needs of a private cloud operating at scale. NetApp HCI is an enterprise-scale hyper converged infrastructure solution that reduces IT complexity and also enables meaningful automation and facilitates cloud integration.

NetApp HCI (see Figure 5) is designed for superior performance, scalability, and availability, simplifying and accelerating your journey to private cloud. Flexible compute options and proven all-flash storage are combined in a turnkey scale-out solution that's simple to manage and easy to automate. Your private cloud environment expands with no disruptions and no costly surprises.

With NetApp HCI you can:

- **Become a Data Thriver.** NetApp Data Fabric enables NetApp HCI to act as the foundation of a more effective hybrid cloud infrastructure strategy in which your data flows easily where it's needed.
- **Deliver predictable storage performance for each application.** Allocate capacity and performance independently for every workload and application and easily adjust allocations.
- **Scale compute and storage independently.** Each application has a growth path that is unique in how it consumes compute and storage resources. NetApp HCI uniquely grows and shrinks its compute and storage resources independently to match the exact needs of your applications.
- **Automate data distribution and load balancing.** Performance for each volume is defined in terms of minimum, maximum, and burst characteristics. Changes take effect immediately without the need to move data to address performance problems.
- **Confidently mix workloads.** A single private cloud platform can support a mix of workloads, including databases, virtual desktops, and cloud-native apps.
- **Provision storage the same way you provision virtual compute.** Storage resources are allocated to each individual volume from available capacity and IOPS with no storage expertise required.
- **Minimize the impact of failures.** NetApp HCI can absorb multiple concurrent faults without affecting application performance. Recovery is fully automatic, requiring no operator intervention and eliminating fire drills.

These capabilities are essential for enterprise operations at scale.

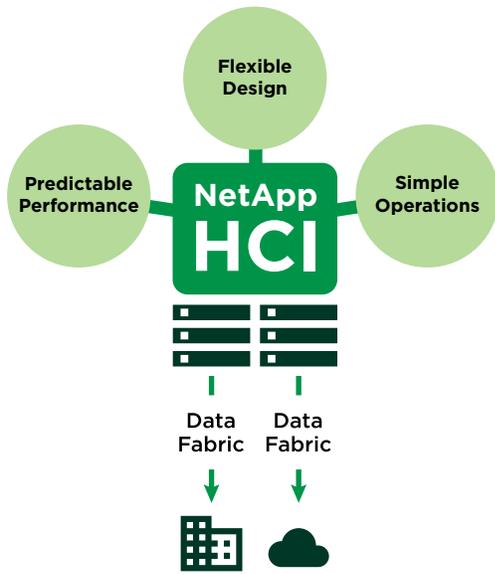


Figure 5) NetApp HCI addresses the business and technical challenges of private cloud with an innovative platform that is scalable, predictable, automated, and integrated.

Data Fabric Integration

Connect with everything in your hybrid cloud infrastructure

NetApp Data Fabric is built for a data-centric world, allowing you to unleash the power of data to achieve a new competitive advantage and become a Data Thriver. With Data Fabric, you can simplify and integrate data services across cloud and on-premises environments. Hybrid cloud data services enable you to put your data-centric vision into practice, so you can respond faster to market changes and rapidly advance new ideas.

Because NetApp HCI is Data Fabric ready out of the box, you gain access to all your data across any cloud—private, public, or hybrid—for a level of cloud integration that other HCI solutions don't offer. Data Fabric integration enables a variety of advanced data services, including file services, object services, replication, data visibility, and backup and recovery. (See Figure 6.) These services increase the power and flexibility of your hybrid cloud infrastructure.

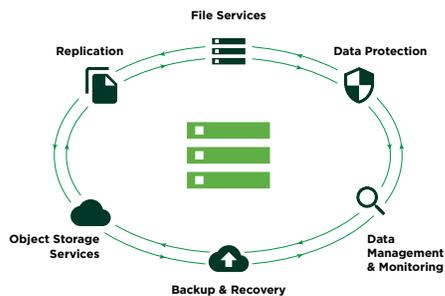


Figure 6) NetApp HCI offers full cloud integration, providing advanced data services to your private cloud and full connectivity to other data center and cloud environments via NetApp Data Fabric.

Scale Without Disruption

Take the pain out of private cloud scaling

The agile, scale-out NetApp HCI architecture future-proofs your investments. Integrate the latest node technology with an existing cluster to eliminate painful forklift upgrades. As Figure 7 shows, an elastic design allows NetApp HCI to scale compute and storage resources up or down independently for cloudlike agility, avoiding the inefficiencies of HCI solutions with tightly coupled compute and storage.



Figure 7) NetApp HCI scales compute and storage independently, allowing you to grow resources to match needs without overprovisioning or purchasing resources you don't need.

Complete System Automation

Meet diverse business needs with simple, fast automation

Automating tasks and allowing users to initiate them directly is essential to cloud success. Because NetApp HCI is simple to provision and manage, it's also simple to automate customized provisioning as part of a self-service portal. Users can provision and modify resources to address their workload needs without having to understand the complexities of LUNs and storage tiers

NetApp HCI was designed from the ground up to be 100% programmable. Developers can rapidly create and deploy applications and services that incorporate HCI functions to address business needs. With comprehensive, well-documented APIs and deep integration with management and orchestration platforms, NetApp HCI interoperates with everything in your environment. (See Figure 8.)

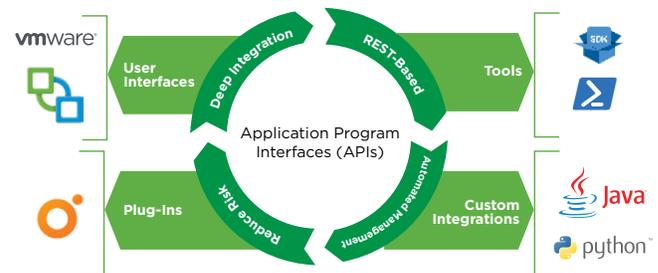


Figure 8) NetApp HCI was designed from the ground up to provide compatibility and programmability

- Manage NetApp HCI entirely from the VMware vSphere web client.
- Provision storage resources based on application requirements by using the VMware Storage Policy Based Management (SPBM) model.
- Design and deploy scalable custom vRealize Orchestrator workflows that use the full power of NetApp HCI.
- Integrate with other automation tools such as PowerShell, Puppet, and Ansible to support agile development practices and DevOps.
- Drive software-defined storage management from any codebase, including Java, Python, and .NET.
- A simple, scale-out architecture combined with superior automation capabilities that are designed in rather than bolted on helps guarantee that cloud needs can be met.

HCI at Enterprise Scale

Simplify and automate your cloud

No matter where you are on your cloud journey, NetApp can help you succeed, delivering solutions and services you can trust to reduce risk and accelerate transformation. Break free from the limits of infrastructure solutions that are too complex, can't consolidate all of your workloads, force you to scale in ways that strand resources, or throttle the performance required by next-generation applications.

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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NetApp HCI delivers on the promise of enterprise scale. Now you can run multiple applications with predictable performance in the same environment and confidently deploy cloud infrastructure across your data centers. Unleash the true power of your enterprise by simplifying operations and flexibly scaling both compute and storage resources. With NetApp Data Fabric built into NetApp HCI, you can provide data services across any cloud—public, private, or hybrid.

Transform and empower your organization so you can move faster, drive operational efficiency, and reduce costs. Realize the true promise of an enterprise-scale hyper converged infrastructure solution with NetApp HCI.

Learn More

If you're ready to build a simpler, smarter IT environment that operates at scale, NetApp is ready to help you. To learn more about NetApp HCI, visit www.netapp.com/hci.

- [NetApp HCI 360° Demo](#)
- [A Hyper Converged Future for Digital Transformation](#)
- [Gartner Report: Competitive Landscape for Hyperconverged Integrated Systems](#)