White Paper

Microsoft and Nutanix: Building a Scalable Hybrid Cloud

Adaptable Infrastructure Foundation for Cloud Transformation

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Contents

Introduction

Cloud computing has been available for a number of years, and IT organizations are benefitting from having the ability to enable their users to spin up workloads on demand. Now, we are seeing IT travelling down the path to transform internal resources to mirror public cloud resources—i.e., building a private cloud that can be extended to a public cloud and creating a hybrid operating environment. These private cloud deployments are growing. Organizations are looking to the private cloud for the same reasons they're looking to the public cloud—for the elasticity it can provide (adding or removing resources as required); for independence from the physical infrastructure; and to receive a more flexible, fluid software-based experience, and self-service provisioning.

Once internal private cloud resources start operating more like the public cloud, IT can start creating enterprise hybrid cloud environments, allowing them to take advantage of not just their own on-premises resources, but cloud-based resources as well—producing a true, seamless, flexible experience that spans both on-premises and the cloud.

Enabling the Enterprise Hybrid Cloud: Microsoft and Nutanix

Two of the key players in the hybrid cloud movement are Microsoft and Nutanix. As one of the initial leaders of the public cloud movement, Microsoft has vast experience, expertise, and engineering resources dedicated to creating scalable cloud computing environments with Microsoft Azure, and it is bringing that experience to the private and hybrid worlds. It's doing this with solutions like Cloud Platform System (CPS) Standard.

Designed for simplicity and ease of use for IT administrators, CPS Standard provides the same management experience for on-premises resources as Microsoft does with Microsoft Systems Center, giving IT a common tool set for managing hybrid cloud environments. This reduces not only training costs, but also risk in the environment because training focuses on just one set of tools (whether applications are on-premises or in the cloud), ultimately speeding time to complete tasks.

Nutanix has been in the forefront of delivering hybrid cloud infrastructure and management from the hyper-converged infrastructure side. As a leader in this space, Nutanix provides a scalable distributed architecture that supports a wide variety of workloads and is easily managed, bringing the simplicity of the public cloud experience to enterprise data centers.

Nutanix solves a long standing problem for IT. It's no secret that managing discrete infrastructure resources has always been a challenge for IT and cloud deployments. The complexity of separate storage, networking, and compute has put IT in the hot seat: Managing islands of functionality, each requiring expertise, training, and certifications, and then ensuring that everything works together can be a daunting task. And doing this while tackling the higher levels of managing hundreds or thousands of virtual machines and service catalogs can be a nightmare. IT can't enable a cloud-like, self-service experience when simply adding storage can be a multi-day task requiring subject matter experts to configure LUNS, RAID groups, and SAN zones, and then try to map this physical construct into the virtual server world.

With Microsoft CPS Standard on Nutanix's hyper-converged infrastructure platform, much of the complexity is removed from virtualized environments. Together, these solutions provide self-service provisioning, VM lifecycle management, performance monitoring, capacity planning, and modeling. It's all about managing resources from a top-down virtualized system experience, and creating the agile cloud environment that is required to stay competitive in today's technology-intensive world.

This isn't the first set of products for which these two companies have teamed up. Microsoft and Nutanix have a long history of working together to drive successful business outcomes for their joint customers, and they are continuing to build on that history to deliver robust private and hybrid cloud environments. The rest of the paper will go into detail on just how.

The Enterprise Hybrid Cloud Movement

Cloud computing has changed the rules of how business is done, and where. Nobody knows this better than the countless organizations taking the trip to the cloud—as well as the countless service providers. But with change comes challenges, and not just for enterprises. What do service providers need to do differently today in order to attract and keep customers? The answer is obvious: Give existing and prospective customers what they want—a single solution with multi-tenant, self-service cloud capabilities that's highly automated, easy to deploy, has usage-based billing, and sits on existing software and hardware investments. Actually, enterprises are looking for the same things. But is this easier said than done?

To the Cloud(s)!

Deploying a public cloud yields numerous benefits—elasticity, flexibility, and reduction of CapEx and OpEx are but a few. With the public cloud, organizations are more agile, can bring up applications more quickly, and can respond swiftly to changing business needs. Today, organizations are looking to do this in-house as well, and expand to the cloud as needed. According to ESG research, a majority of organizations are looking to deploy private cloud infrastructure to receive the same benefits they would garner from a public cloud deployment.[1] More than one-third of survey respondents (35%) reported that rapid elasticity is the most important capability of a private cloud infrastructure, while one in four (25%) cited measured service. Additionally, one in five (19%) answered that resource pooling is the most important, while the same amount identified on-demand self-service capabilities (see Figure 1).

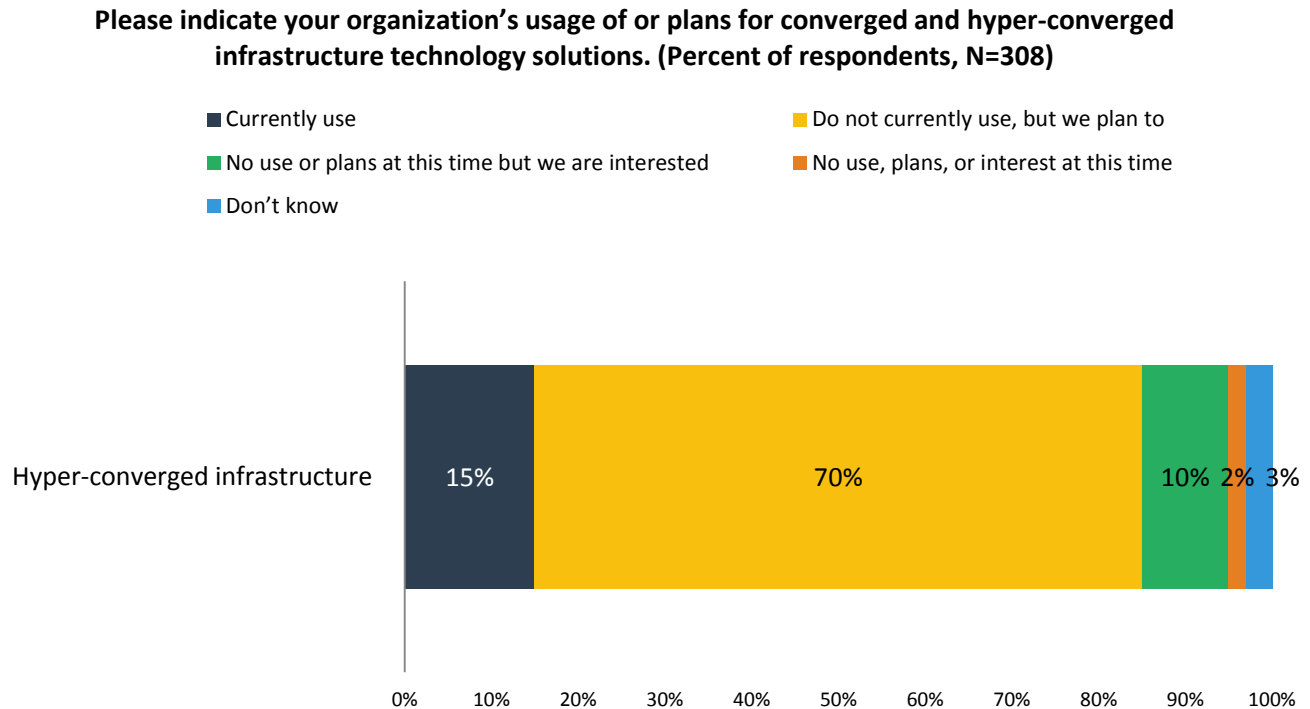**Figure 1. Most Important Capability of a Private Cloud Infrastructure**

Which of the following do you believe is the most important capability of a private cloud infrastructure? (Percent of respondents, N=308)
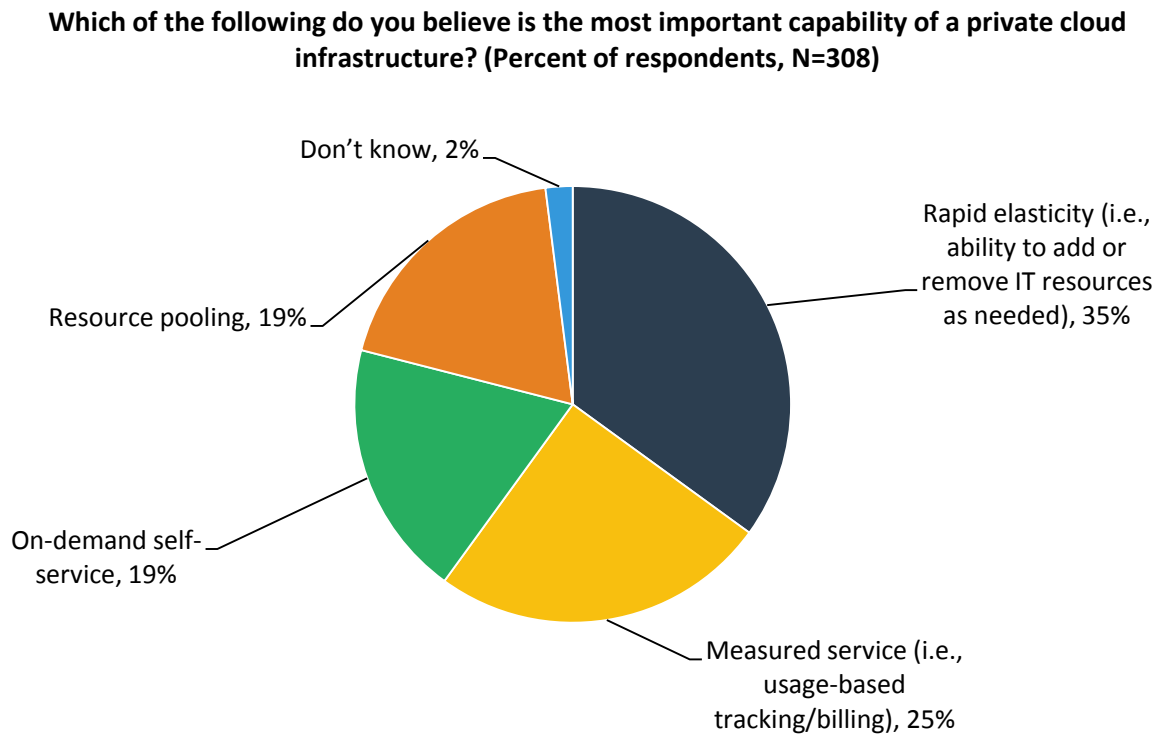
Source: Enterprise Strategy Group, 2016

[1] Source: ESG Research Report, *The Cloud Computing Spectrum: From Private to Hybrid,* March 2016. All ESG research references and charts in this white paper have been taken from this research report.

Building a Cloud: Why a Hyper-converged Platform Makes Sense

In cloud environments, hyper-converged platforms just make sense. In fact, 85% of IT organizations surveyed by ESG have deployed or are planning to deploy hyper-converged systems (see Figure 2).

Figure 2. Hyper-converged Infrastructure Adoption Trends

Please indicate your organization's usage of or plans for converged and hyper-converged infrastructure technology solutions. (Percent of respondents, N=308)

- ■ Currently use
- ■ Do not currently use, but we plan to
- ■ No use or plans at this time but we are interested
- ■ No use, plans, or interest at this time
- ■ Don't know

Hyper-converged infrastructure: 15% | 70% | 10% | 2% | 3%

Source: Enterprise Strategy Group, 2016

Why Hyper-converged Solutions

Hyper-converged solutions collapse the management stack for IT. They take all of those sub-specialties out of managing the IT infrastructure. There's no need to hire storage or fibre channel networking specialists, set up RAID groups, LUNs, or volumes. Hyper-converged solutions remove all those challenges. Much like server virtualization, everything in a hyper-converged environment is based on a logical, top-down management structure that starts with the virtual machine and virtual volumes. There is no mapping of physical to logical because it's all based on software—you're no longer managing hardware. And since you're using a software-based schema for managing resources, the benefits received from hyper-converged solutions are numerous. They include:

- Quicker deployment.

- Faster provisioning and seamless self-service.

- Ease of use.

- Elasticity and fast scalability.

- Simplified management.

- Improved Total Cost of Ownership.

In fact, based on ESG research, when asked about the most significant benefits their organization has realized by deploying a converged or hyper-converged solution, 26% of respondents cited faster deployment time, while 24% indicated improved service and support. Additionally, 24% indicated improved scalability has been a most significant benefit while 23% cited simplified management, and 22% indicated improved total cost of ownership (see Figure 3).

Figure 3. Top Five Benefits Realized by Deploying a Converged or Hyper-converged Technology Solution

What have been the most significant benefits your organization has realized by deploying a converged or hyper-converged technology solution(s)? (Percent of respondents, N=145, three responses accepted)

Benefit	Percent
Faster deployment time	26%
Improved service and support	24%
Improved scalability	24%
Simplified management	23%
Improved total cost of ownership (TCO)	22%
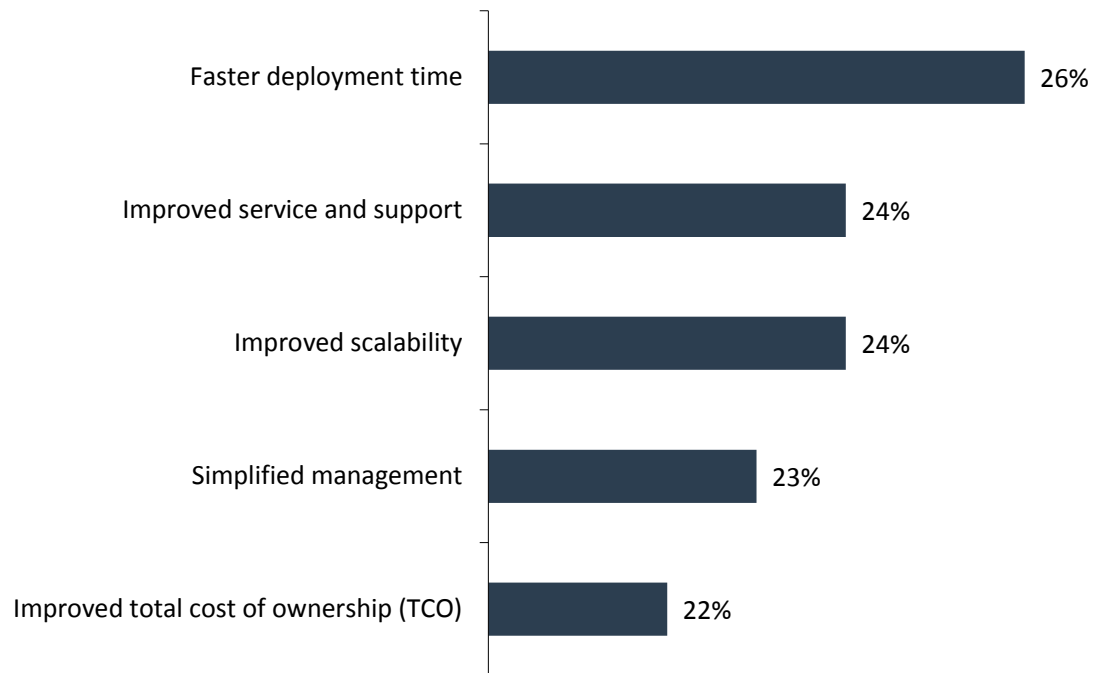
Source: Enterprise Strategy Group, 2016

Hybrid Cloud: A Part of Everyday Life

The hybrid cloud is inevitable. The speed of business demands it. Organizations demand that internal infrastructure be as flexible as the public cloud. The hybrid cloud gives organizations an additional level of elasticity and flexibility, with cost savings that can't be realized when keeping everything on-premises.

Organizations are turning to the cloud for data protection, and to quickly flex application capacity and processing. ESG research shows that more than half (60%) of organizations surveyed are moving data between on-premises and the cloud, while 39% are using the cloud for disaster recovery (DR) of on-premises workloads.

What this means is that hybrid cloud is no longer theoretical. It has become a part of everyday life.

Management Tools Are Key to Success

The hybrid cloud is all about the management tools. ESG surveyed organizations regarding the type of management tools important to them. In order to make operations simple, and incorporate on-premises and cloud-based resources, ESG found that 91% of adopters are looking for common software tools to manage the hybrid cloud environment in order to have the same seamless experience they have in the cloud as they do on-premises.

Nutanix, Engineered from the Top Down for the Cloud

Nutanix systems are engineered from the top down to support private cloud environments. The company delivers on its "invisible infrastructure" enterprise cloud vision through its Distributed Storage Fabric, and Application Mobility Fabric.

The Nutanix Distributed Storage Fabric provides a unified storage framework to deliver high performance, block-based storage for enterprise applications, as well as end-user file services from the same Nutanix platform. This enables data center infrastructure consolidation, improved resource utilization, and simpler ongoing storage management. The Application Mobility Fabric allows applications and data to move freely between runtime environments and drive functionality, including cross hypervisor backup and recovery including backup, to Microsoft Azure.

Nutanix Prism offers IT a simple, intuitive way to manage Nutanix enterprise clouds. Powered by advanced data analytics and heuristics, Prism simplifies and streamlines common workflows within a data center, eliminating the need for disparate management solutions.

Nutanix is tightly integrated into Microsoft Systems Center Operations Manager (SCOM). SCOM delivers simplicity and integration into the Azure-like workspace. Data center operators can easily monitor Nutanix enterprise cloud platforms from a familiar Operations Manager interface. Custom workflows, using System Center Orchestrator and Windows Azure Pack, help simplify administration. Nutanix customers have the capability to write orchestration logic using simple REST APIs or equivalent PowerShell cmdlets with these workflows, invoking them through Orchestrator or Windows Azure Pack. In addition, system administrators and architects may create their own workflows using a growing number of Nutanix scripts.

Nutanix is engineered to work in Microsoft hybrid cloud environments. Technologies such as Microsoft Hyper-V, System Center, and Windows Azure Pack allow organizations to automate deployment of virtual machines, enabling true IT-as-a-service (ITaaS). Nutanix has conducted extensive functional testing using Windows Azure Pack, Windows PowerShell, and System Center Orchestrator to simulate real-world workloads and conditions of an Azure Pack environment.

Nutanix integration and testing with Windows Azure Pack and overall with CPS Standard is really the key to enabling seamless hybrid enterprise cloud environments. Windows Azure Pack is the real link between public and hybrid clouds, bridging one architecture to the other and providing a consistent, self-service experience between the two. The same console and API technology are used in Azure, offering a familiar Azure-like platform between private and public clouds. Windows Azure Pack, a collection of Microsoft Azure technologies, integrates with Windows Server, System Center, and SQL Server, providing virtual machine hosting (IaaS), and database-as-a-service (DBaaS), as well as scalable web application hosting (PaaS).

Microsoft Cloud Platform System Standard: Easy to Consume, Easy to Deploy

Microsoft Cloud Platform System (CPS) Standard is designed to simplify IT management, presenting organizations with an easy entry point, common management tools for both the cloud and on-premises, and simple scalability for managing the changing needs of the business. CPS Standard offers the following:

- **A small, three-node entry point**, scaling up to 16 nodes.

- **An Azure-consistent experience.** CPS Standard leverages some Azure services for business continuity of hybrid cloud for virtualized Windows and Linux workloads using Azure services.

- **The ability to run workloads based on business needs** instead of being restricted by technology via simple management and automation of enterprise workloads across hybrid cloud environments, using a universal control plane.

- **Enhanced performance for Microsoft workloads, as well as simplified and automated data protection and disaster recovery.** CPS Standard employs a wizard-driven setup process for configuring optional Azure backup services. This provides IT with a simple means to implement and configure backup policies, which can leverage local storage capacity for rapid recoveries, and cost-efficient storage in the cloud.

- IT planners can enable **seamless failover to the cloud** using the Azure Site Recovery (ASR) feature for DR, (integratred in the CPS Standard solution). Not only does this offer organizations a way to comply with recovery time and recovery point objectives (RTO/RPO), but it can also be done cost-effectively, using public cloud IaaS resources rather than incurring capital expenditures by building out dedicated DR data center facilities.

Nutanix and Microsoft: A History of Success

If it is not already obvious, these two companies have been working together for quite some time, and have a history of success. Nutanix was a pioneer in the hyper-converged movement, recognizing early on that Microsoft would be a key partner. In fact, Nutanix was among the first software-defined vendors to publish a Fast-Track reference architecture for Microsoft Windows Server 2012 R2, System Center that included integration with Windows Azure Pack.

From delivering an Azure-like experience on-premises with CPS—to optimized platforms for Microsoft applications including SQL Server, Exchange, and SharePoint—Nutanix delivers a simple, agile, secure, and scalable platform for Microsoft solutions. Today, Nutanix and Microsoft solutions continue to deliver optimal results, garnering customer satisfaction across a wide range of industries that include large enterprises, service providers, and government agencies.

Together, Nutanix and Microsoft provide a compelling solution that offers enterprises the ability to collapse multiple infrastructure components into a single, scalable, easily managed system. The Microsoft-Nutanix solution allows IT to realize the scalable elasticity of the cloud, keeping primary data easily accessible on-premises behind the firewall, while providing a direct path to the cloud for backup and DR.

While there are a number of use cases for the Microsoft-Nutanix solution, those that realize the biggest benefits include the following:

- Companies requiring an efficient platform for Microsoft applications, including SQL Server, Exchange, and SharePoint. They will benefit from predictable performance and tight integration between Nutanix and Microsoft.

- Regulated industries uncomfortable with the public cloud, but wanting to deliver a compelling private cloud experience to end-users. These organizations will benefit from Microsoft's public cloud experience, bringing it on-premises, in conjunction with the simple, scalable, efficient Nutanix infrastructure to create a seamless operating environment.

- Large enterprises looking to streamline and simplify services delivery. It's about minimizing the time needed for provisioning applications and infrastructure.

- Distributed enterprises with many remote offices looking to simplify remote infrastructure and management.

- Service providers and enterprises deploying IaaS that need to scale quickly and efficiently in a multi-tenant environment—driving efficiency within the organization, and being able to scale at the speed of the business.

The Bigger Truth

Organizations are building enterprise hybrid clouds to keep the benefits of public cloud resources at their fingertips. But just as important is having a common management experience across the two—to be able to react quickly and efficiently, optimize staffing, and reduce training costs while mitigating the risk of training on multiple platforms, and not having to translate the different languages used to manage on-premises and cloud resources. And that's just what Nutanix and Microsoft are delivering together. They're making the hardware side of the infrastructure invisible, removing the complexity that organizations have been dealing with for the last 30 years and providing a software-defined vision of the world, allowing organizations to quickly respond as their business needs change. In essence, Microsoft and Nutanix have invested in a partnership that provides true value to IT.

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