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White Paper

Right-sized Converged Infrastructure: Microsoft's Cloud Platform System

By Colm Keegan, Senior Analyst

December 2015

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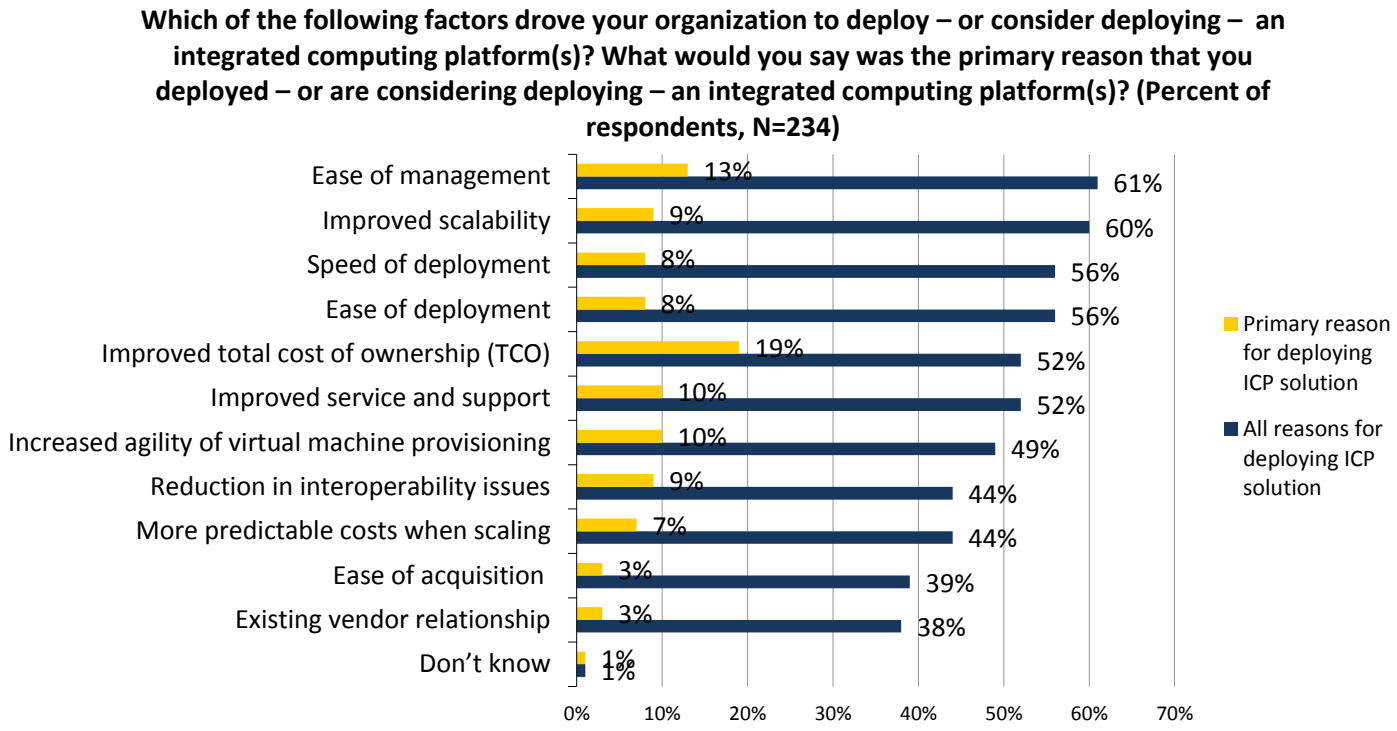
Overview

IT consumption patterns have changed dramatically. End-users, no longer beholden to their internal IT departments, are increasingly turning to cloud solutions as a way to obtain the services they need to be more productive. To stay relevant in an on-demand world, many IT organizations are considering integrated computing platforms (converged infrastructure) as a way to simplify operational management, increase the ease and speed of virtualized application infrastructure deployments, lower IT costs, and improve service and support (see Figure 1).[1] Faced with the need to respond more rapidly to the changing needs of customers, business partners, and end-users, IT decision makers are looking for solutions that can enable their personnel to spend less time on day-to-day infrastructure management and more time focusing on service delivery and business innovation.

Figure 1. Factors Driving Organizations to Deploy or Consider Integrated Computing Platforms



Source: Enterprise Strategy Group, 2015.

In order to help enable IT transformation, IT stakeholders are increasingly looking at solutions that can drive complexity out of their virtualized environments and enable the following capabilities:

- **Faster time-to-market**. In a cloud-computing world, businesses can easily find themselves outflanked by a more nimble competitor. Getting new services to market quickly, therefore, has become a business imperative.
- **Lower costs**. According to ESG research, respondent organizations spend 62% of their IT budgets on maintaining existing infrastructure.[2] This leaves only 38% of the budget for business innovation. By contrast, newer businesses often don't have this financial overhead, leaving them freer to innovate. This can place those businesses at a significant competitive disadvantage.
- **Business enablement**. Key end-users, like application developers, have become accustomed to spinning up virtualized computing resources on demand in the public cloud to create instant application development and test beds. To meet the need for instant application infrastructure, while reining in shadow IT,

[1] Source: ESG Research Report, *Trends in Private Cloud Infrastructure*, April 2014.
[2] Source: ESG Research Report, *2014 IT Spending Intentions Survey*, February 2014.

businesses need solutions that can simplify and speed up infrastructure deployment and provisioning processes.

- **Hybrid cloud services**. Many businesses want the flexibility to run some workloads in their private (on-premises) cloud and other workloads in the public cloud. But importantly, regardless of where application workloads are running, the experience needs to be totally seamless to customers, business partners, and internal end-users.

Converged infrastructure (CI) offerings, like Microsoft's Cloud Platform System (CPS), can deliver on these four key business initiatives by providing easy-to-use, easy-to-deploy, easy-to-manage, and easy-to-scale hybrid cloud capabilities. CPS gives end-users and IT system administrators a consistent cloud experience, whether virtualized application resources are consumed in an on-premises private cloud environment, or in the Azure public cloud. Moreover, with two flexible deployment options, CPS Premium and CPS Standard, businesses and service providers can choose the right CI cloud infrastructure that best meets their unique business needs.

Overview of the Microsoft Cloud Platform System (CPS)

CPS is composed of a pre-integrated rack of virtualized compute, storage, and networking resources. It is designed to meet the demand for CI platforms that can deliver Azure-like hybrid cloud services. Through tight integration with Windows Server 2012 R2, Hyper-V, System Center 2012 R2, and Windows Azure Pack (WAP), businesses can speed up deployment times, simplify operational management, and increase business agility.

Designed to provide an appliance-like cloud deployment experience, CPS enables businesses to dramatically speed up virtualized infrastructure deployment timeframes by going from power on to production in three hours. This rapid deployment capability enables businesses to achieve:

- **Faster time to value**. Less time and administrative resources are required to integrate, configure, and deploy CPS into a production environment. This can help lower IT operational costs, but perhaps more importantly, it can shorten the window of delivering new business-revenue-generating application services to market.
- **Transition to hybrid cloud**. By delivering a fully tested and validated rack of private cloud computing infrastructure based on Windows Azure Pack, CPS enables businesses to quickly deploy a private cloud that can seamlessly integrate with key Azure public cloud services.
- **IT transformation**. By eliminating the need to focus on infrastructure assembly, integration, tuning, and maintenance, CPS can help IT organizations to spend less time on infrastructure piece-part management and more time on business service delivery.

One of the keys for enabling IT organizations to focus on business innovation is to remove the complexity from managing virtualized application infrastructure. Microsoft's CPS was designed with simplicity in mind. This can help lower IT operational costs and free up the time necessary to make IT transformation an achievable objective.

CPS Management Simplicity

System Center Standardization

One of the fundamental design premises of CPS is simplicity. By leveraging common management tools like Microsoft System Center 2012 R2, managing hardware and software resources on CPS becomes second nature. Since there aren't any new tools to learn, administrators can hit the ground running with managing CPS.

Automated Patch and Update Framework

In some instances, administrators can spend upwards of 70% of their time applying operating system patches and updating firmware across their application infrastructure. In addition to the employee hours lost managing these

processes, there is always the risk that a new patch can have detrimental effects on other devices or applications downstream, resulting in business application downtime.

Directly integrated into CPS is a patch and update tool that automatically manages the patching process. This eliminates the administrative time spent managing and scheduling patch updates. And since the CPS patch and update tool inherently understands the relationship and dependencies that exist between all the infrastructure components, it can mitigate the risk of unplanned downtime events associated with the patching process.

Consistent Azure Cloud Experience

Contributing to additional administrative simplicity is the fact that the Windows Azure Pack private cloud software integrated into CPS has the same look and feel as the interfaces in the Azure public cloud. So whether administrators are managing or assigning Azure resources on-premises or in the cloud, they will have the same administrative portal experience. Likewise, end-users will have the same self-service portal experience when utilizing applications on-premises with CPS or in the Azure public cloud environment.

CPS Deployment Options

- **CPS Premium** is a fully configured rack solution that is primarily designed for large data center environments and for mid-sized cloud and managed service providers.
- **CPS Standard** is a flexible, modular deployment offering that allows businesses to implement Azure-like hybrid clouds with configurations as small as four nodes but with the ability to scale up to 16 nodes.

CPS Standard is ideal for organizations that are looking for a converged infrastructure (CI) offering with a lower cost of entry that can grow over time and meet the needs of the business in a just-in-time fashion. This "pay-as-you-grow" approach helps ensure that infrastructure resources are not needlessly overprovisioned and helps to preserve precious capital so that IT can invest in other business projects.

CPS Standard's CI architecture combines compute and storage nodes that are interconnected via the system backplane. This design eliminates the need for dedicated network switches. This further simplifies infrastructure management and reduces hardware costs. Flash storage can also be integrated into CPS Standard nodes to support ultra-high storage performance, but it is purely optional; there is no design requirement to configure flash alongside hard drives.

CPS Standard is ideal for several deployment scenarios. Mid-sized businesses, for example, often have IT generalists on staff rather than administrators with specialized knowledge in compute and storage. By utilizing CPS Standard, mid-sized businesses can greatly simplify the day-to-day operational management of their application infrastructure environment and free up busy administrators to focus on business-related initiatives.

Deploying modular CI systems for departmental applications in large enterprises is another strong use case for CPS Standard. A classic example is test/dev environments for application developers. The modularity of CPS Standard provides businesses with a cost-efficient way to implement virtualized application resources to meet the real-time needs of developers. As the environment grows, IT planners can add single nodes (or several) at a time to keep up with demand.

Managed service providers offering hybrid cloud hosting services often work with businesses that have edge locations or small offices to support. CPS Standard's small footprint enables MSP and hosting companies to quickly and cost-effectively deploy localized private cloud resources into edge locations that can tie directly back into hosted Azure cloud services offered by the provider.

Pre-validated Architecture

One of the primary benefits of the CPS Standard offering is that all the components are pretested and validated prior to shipping to the customer location. This means that businesses can be confident that implementing CPS Standard will be as simple as installing the nodes into a rack, powering them up, and assigning IP addresses.

As a long-time Microsoft partner, Dell will offer CPS Standard as a fully integrated and pre-validated architecture utilizing Dell server and storage devices that are designed for high availability and resiliency. In addition to ease of acquisition and deployment, through a single support call, IT managers can receive end-to-end support from Dell for all software- and hardware-related issues (no vendor finger pointing).

Flexible Licensing

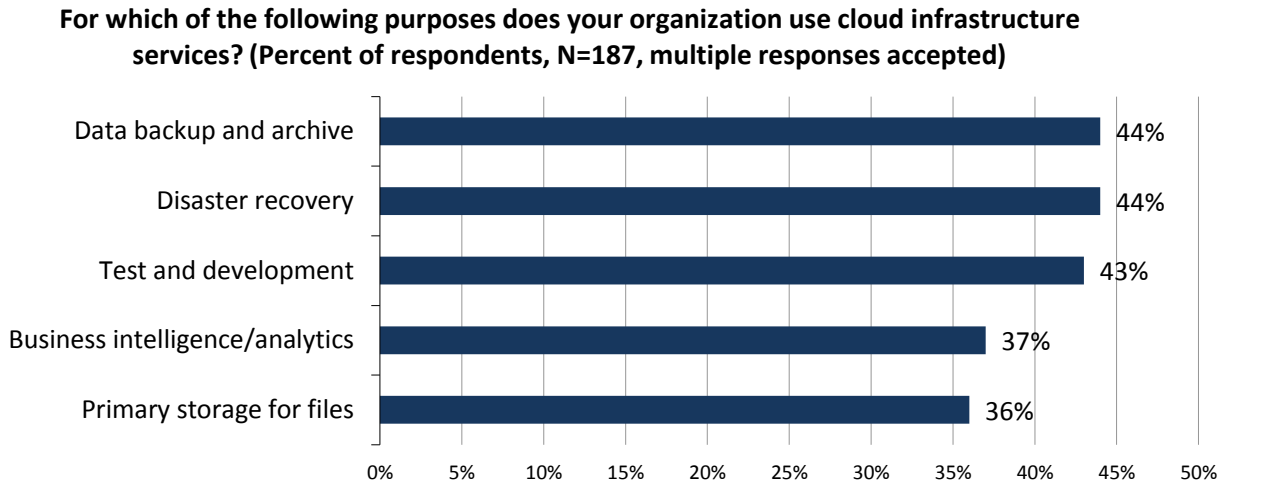
CPS Premium users purchase a subscription license for the CPS "fabric software" (Windows Server 2012 R2, System Center 2012 R2, and Windows Azure Pack (WAP)) and have the option to utilize their existing Microsoft licenses for the guest VMs running on CPS. CPS Standard users can simply use their existing Microsoft licenses.

Use Cases for CPS Standard

In addition to providing optimized performance for MS workloads, CPS Standard can enable businesses to simplify and automate data protection and disaster recovery across the enterprise. For instance, CPS Standard contains a wizard-driven setup process for configuring optional Azure backup services. This gives IT administrators a simple way to implement and configure backup policies that can leverage local storage capacity for rapid recoveries and cost-efficient storage in the cloud to satisfy long-term retention requirements.

In fact, ESG research continues to track cloud-based backup and DR as two of the most popular cloud use cases across surveyed businesses of all sizes.[3]

Figure 2. Top Five Cloud Infrastructure Service Use Cases



Source: Enterprise Strategy Group, 2015

Low-cost cloud storage can be used to meet corporate data governance and regulatory requirements for maintaining long-term copies of data, while also giving businesses a viable way to recover information in the event of a local outage or site failure. For example, IT planners can enable seamless failover to the cloud by utilizing the Azure Site Recovery (ASR) feature for DR that is embedded in the CPS Standard solution. This can provide organizations with a way to meet stringent recovery time and recovery point objectives (RTO/RPO). In addition, this can be accomplished in a cost-effective manner by utilizing public cloud IaaS resources instead of incurring the major expense of building out dedicated DR data center facilities.

[3] Source: ESG Research Report, *2014 Public Cloud Computing Trends*, March 2014.

CPS Partner Offerings: Dell

Dell CPS Best Practices

As previously discussed, Dell is partnering with Microsoft on delivering both CPS Premium, as a fully integrated Azure-consistent hybrid cloud rack solution for enterprise environments, and CPS Standard, as a modular converged infrastructure hybrid cloud offering. As a technology supplier that has been delivering CPS Premium solutions since its inception to a global clientele, Dell has extensive experience designing and implementing CPS offerings around Microsoft's CPS architecture blueprints.

Architectural Alignment with Microsoft

Dell provides a wide variety of storage solutions to complement CPS deployments. From high-performance SSD storage to cost-effective and highly resilient hard disk drive offerings, Dell can bring the right configuration to bear to meet the unique performance and capacity optimization requirements of each customer.

Dell's storage offerings also provide tight integration and alignment with Microsoft storage technologies like MS Storage Spaces. This allows businesses to leverage MS storage virtualization in combination with cost-effective, but highly resilient, Dell hard drive disk storage to achieve HA and high performance.

Independent CPS Resource Scaling

To further drive infrastructure efficiencies, Dell's CPS Standard offering allows IT organizations to scale compute and storage resources independently. So instead of adding compute and storage resources in tandem, IT administrators can add nodes with a heavier complement of CPU or a heavier complement of storage to meet the underlying needs of the application. This helps to avoid overprovisioning CPUs or storage whenever capacity needs to be added to the converged infrastructure environment. This can help reduce the TCO of the converged infrastructure investment since these resources can be granularly added to the environment as needed.

Dell Financial Services

Whether purchasing CPS Premium or CPS Standard, Dell Financial Services can provide creative financing terms that allow businesses to invest in the right solution while having the flexibility to pay down that investment as end-user consumption increases. In other words, as more cloud tenants begin using Azure services, businesses can allocate more funds toward paying down the principal and interest of their investment. This can help organizations to begin laying the foundation for private and/or hybrid cloud computing capabilities today without having to make a large up-front monetary outlay.

CPS Standard: Hewlett Packard Enterprise (HPE)

HPE CPS Standard – First Hyperconverged MS CPS Offering

HPE and Microsoft are partnering to deliver the first hyperconverged version of the MS Azure Pack private cloud solution through the HPE Hyper Converged (HC) 250 platform. Built on market-leading HPE ProLiant Gen9 server technology, the HC 250 solution is composed of enterprise-grade compute, coupled with Hyper-V virtualization software and storage and networking components, which are deployed in a flexible and highly scalable nodal architecture.

Start Small and Scale Out

As a highly scalable, modular architecture, the HC 250 enables businesses to start with an appliance as small as three nodes, which can provide up to 5.6 TBs of highly available (HA) storage, and scale out up to a total of 16 nodes (30 TBs of HA storage capacity). Each node contains an optimal blend of compute, storage, and networking resources that are automatically pooled together. Capacity can be added non-disruptively in increments as small as

a single node or via multiple nodes to enable IT organizations to rapidly meet demand for new and existing business applications.

Simple and Rapid MS Azure Pack Deployment

As a pre-integrated and pre-validated appliance solution, the HPE HC 250 helps satisfy the need for simple and rapid MS Azure Pack private cloud deployments. For example, upon being racked and powered up, IT administrators can begin provisioning VMs in under a couple of hours. And through the HPE OneView management interface, and integration with MS System Center, administrators can quickly and easily provision infrastructure resources across their virtualized application environment, helping to make IT more agile and more responsive to the needs of the business.

Likewise, the HC 250 gives businesses a way to enable hybrid cloud, Dev/Ops capabilities by providing MS Azure Pack private cloud services on-premises, and seamless integration to the MS Azure public cloud. By providing a consistent administrative and end-user experience, IT organizations can help empower key end-users, such as application developers, to gain access to virtualized MS Azure Pack application resources on-premises and/or in the MS Azure public cloud.

Enterprise-class Data Services

The HC 250 is bundled with HPE's Store Virtual VSA technology; a software-defined way to manage and flexibly provision storage resources within the HC 250 appliance, as well as with external storage resources. In addition to helping IT organizations simplify and consolidate storage management across the data center, the Store Virtual technology enables the independent scaling of storage and compute, as additional storage resources can be optionally configured and provisioned outside of the HC 250 appliance.

The HC 250 also provides a robust set of data center-class storage services like thin provisioning, application integrated snapshots, and backup and DR services with integration to the MS Azure public cloud.

Investment Protection

By supporting existing and previous generation HC 250 nodes in the same appliance, HPE provides businesses with long-term protection on their MS Cloud Platform System Standard investment. Moreover, the powerful combination of HPE's HC 250 private cloud resource modularity, scalability, and flexibility combined with a consistent, end-to-end hybrid cloud experience based on MS Azure Pack and MS Azure public cloud empowers businesses to choose the right blend of hybrid cloud resources to best meet their needs.

The Bigger Truth

According to ESG research, many businesses are planning on running the bulk of their core business application workloads on-premises, in a private cloud environment, while selectively using the public cloud for non-core business workloads.[4] But while there is increasing demand across businesses of all sizes for hybrid cloud computing capabilities, many IT decision makers are emphatic about the need for simplicity in these environments. This is especially critical given the fact that ESG has been tracking a critical shortfall in IT skill sets over the last several years.[5]

These IT professionals aspire to move away from infrastructure management and closer to more strategic business initiatives. In order to achieve both ends, they need solutions that can rapidly enable private/hybrid cloud computing capabilities and do so in a way that removes the complexity and operational burden from managing highly siloed compute and storage infrastructure. This calls for affordable converged infrastructure offerings that can deliver ease of deployment, ease of scaling, and perhaps most importantly, ease of management. This can help streamline operational management, lower IT costs, and better enable IT organizations to focus on service delivery while giving end-users the flexibility to consume from multiple cloud services.

[4] Source: ESG Research Report, *2014 Public Cloud Computing Trends*, March 2014.
[5] Source: ESG Research Report, *2015 IT Spending Intentions Survey*, February 2015.

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20 Asylum Street | Milford, MA 01757 | Tel: 508.482.0188 Fax: 508.482.0218 | www.esg-global.com