The Future of Convergence Is Here

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The Future of Convergence Is Here

Introduction

IT convergence is not a new idea. Decades ago, IT was fully converged on mainframe computers. That changed over the years, however, as separate compute, network and storage solutions emerged, leading to what we see now: a proliferation of siloed technologies. With disparate components from various technology vendors, these siloed technologies complicate IT support while incurring expenses and requiring more time to integrate, deploy and manage.

In response to these challenges, organizations are increasingly returning to the "old school" idea of pre-integrated and validated solutions. Unlike traditional approaches, new converged infrastructure solutions are based on open systems, as well as the applications that run on them and handle today’s workloads.

In this paper, we take a closer look at the challenges plaguing today's IT environments, including shadow IT. We explore the growing complexity of architectures and the difficulties of managing workloads in various virtualized and nonvirtualized environments. Then, we examine the advantages of converged systems, and the key elements to look for when evaluating the possibilities, such as end-to-end automation and simplified support.

The future of convergence is here today. It’s now possible to move from a siloed IT architecture with disjointed server, storage and networking buying cycles to a converged system. From improved application performance and higher uptime to quicker troubleshooting and faster deployments, converged systems offer a host of benefits. These benefits can quickly pay off the initial investment and translate into real value for your organization.

KEY DRIVERS FOR ADOPTION OF CONVERGED SYSTEMS

According to IDC1, businesses are adopting converged systems for 3 main reasons:

- **Time to service or market.** IDC notes that IT is under pressure to respond faster to new business apps and projects and shorten times to provision. Executives also want to shift to on-demand or IT-as-a-service models, and take advantage of opportunities that mobile, social and analytical workloads create.

- **Cost advantage and efficiency.** According to IDC, moving to converged systems can help reduce operational and management costs over time by automating management and centralizing and consolidating the infrastructure overall.

- **Infrastructure and operations improvements.** IDC points to operational improvements, such as single-point-of-contact support, increased interoperability among software and other components, and improved security, disaster recovery, and governance, risk and compliance (GRC) issues and processes.

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More Complexity Leads to More Problems

To understand today’s IT challenges, let’s compare them to the challenges of a few decades ago. In those early days of IT, a single mainframe computer took care of compute, network and storage. A small team of IT generalists managed perhaps 5 or 10 applications and 20TB of data.

Of course, a lot has changed since then. As business demands grew and new solutions proliferated, organizations began buying various hardware components and adding hypervisors for virtualization on top of them. They bought storage from 1 vendor, servers and switches from another, and the hypervisor from yet another. Then, they cobbled the solutions together, each with its own management tool. The idea was to keep pace with growing needs. However, the result was a siloed infrastructure with high ongoing management costs that organizations are finding unsustainable in today’s era of flat or declining IT budgets.

Siloed architectures were a challenge even 2 decades ago. That challenge is coming to a head today because the amount and variety of data, the number of applications, and the overall complexity of the IT infrastructure are growing exponentially. IT departments are now asked to manage hundreds of terabytes or even petabytes of data. They must administer dozens of increasingly sophisticated applications, and hundreds or even thousands of physical and virtual machines (VMs). Workloads, VMs and clusters are growing in size and numbers rapidly. At the same time, employees, customers and partners demand secure access from anywhere, at any time (see Figure 1). As a result, IT has become more specialized and more costly, with escalating needs for server experts, IP experts, storage experts, virtualization experts and more.

Figure 1. IT is under enormous pressure to meet requirements that are growing almost exponentially in size and complexity.

To better understand the complexity facing today’s departments, consider a single business enterprise application. To support that application, IT administrators need to ensure that all the relevant hardware is running the right version. They must apply the right patches to the firmware and operating system. Plus, they must complete end-to-end testing to ensure that the application’s performance will meet business requirements.
Now consider that many general-purpose environments run hundreds of virtualized and nonvirtualized machines with dozens of applications. It’s easy to see how the complexity and resulting costs can become overwhelming. The open nature of x86 solutions is giving IT more choices through increased interoperability, but that only adds to the lifecycle complexity that organizations face today.

Until a few years ago, the typical response to these IT challenges was to pour on more money for people, equipment and outside services. Now, budgets are not growing, so many organizations are only able to pay more to support their mission-critical applications. All other tiers of applications are suffering as a result: Deployments are slow and IT risks are not meeting the service levels the business and its customers need.

In this budget-constrained environment, IT application teams are increasingly unable to meet the new demands that pour in daily from business units and users. To fulfill time-to-market requirements and other evolving business needs, end users are increasingly resorting to shadow IT solutions, even for mission-critical applications. But applications accessed in the real world and not under IT control can introduce threats to the business that IT can neither predict nor prevent. Shadow IT adds to the silos and subsequent lack of standardization that complicate the IT environment and undermine IT productivity. Uncontrolled shadow IT jeopardizes service level agreements (SLAs), complicates storage provisioning, and interferes with cost-efficient long-term planning.

The addition of more equipment and outside services has left many organizations with various disparate IT systems, vendors and tools (see Figure 2). In this environment, IT development is costly, time-consuming and a strain on company resources.

Figure 2. Today’s IT infrastructure can include a wide variety of products from multiple vendors. According to IDC, “IT organizations spend 23.3% of staff time and resources on this type of presystem deployment.”

A common response to today’s IT challenges is for users to turn to public cloud services from companies like Amazon Web Services. After all, if a public cloud provider can provide on-demand services for a low cost, why should organizations continue depending on their increasingly overworked internal IT department? However, unlike the public cloud, IT operates on behalf of enterprise goals. This makes enterprise IT a better candidate for determining and
delivering appropriate levels of performance, availability, security and provisioning. Increasingly, this level of control requires moving to a converged system solution that offers faster time to service, cost advantages and operational efficiencies without the compromise.

**Advantages of Converged Systems**

Converged systems represent a significant departure from the way IT infrastructures have been built and managed over the past 20 years. Yet, despite the need for a major shift in thinking and an upfront investment, organizations worldwide are increasingly turning to converged solutions.

The reason for the growing movement is simple: Businesses recognize that traditional IT approaches aren’t working and aren’t supportable over the long run, while converged systems have been proven to deliver major benefits, including:

- **Better support for internal and external customers.** With traditional IT solutions, a key application deployment can take 6 months or more. Converged systems routinely cut deployment times in half and can reduce deployment operational costs by up to 45%.

- **Reduced management requirements and costs.** By replacing siloed technologies with a converged infrastructure, organizations can increase automation and reduce operational costs by an average of 30%. Simplified management enables IT to spend less time performing day-to-day services, such as provisioning storage or upgrading firmware. Instead, IT can spend more time providing high-value services, such as planning for the future or architecting more efficient backups and disaster recovery solutions.

- **Increased utilization.** Siloed architectures have notoriously low utilization rates because they operate independently, which means that 1 subsystem’s unused capacity is not available to another that’s running out of capacity. Converged systems, on the other hand, are fully integrated to ensure maximum utilization across the system.

- **Optimized performance.** Converged system vendors work closely with major ISVs (independent software vendors) to prevalidate and optimize application performance, helping to ensure high performance and availability.

- **More control over shadow IT.** Shadow IT projects can help enterprises reach important goals. However, when IT remains unaware of these projects or is aware but has no control over the resource, the business risks inadequate security, compliance, storage, performance and availability. Converged systems give IT the flexibility to include shadow IT where appropriate while controlling its scope and ensuring a close fit with an organization’s long-term technology vision.

While the benefits of converged systems are clear, the systems on the market today differ in fundamental aspects, from the way management is automated to their ability to integrate with existing infrastructure elements. Today’s solutions also differ in overall quality and key features, so it is important to evaluate converged system solutions based on what’s most important to your business.
Key Advantages of Best-In-Class Converged Systems

- Faster, simpler maintenance, troubleshooting and tech support.
- Increased application performance and availability.
- Lower acquisition and operational costs.
- Faster time to deployment.
- Simplified management and deployment.
- Predictable path to scalability.
- Private cloud capability.

5 Key Requirements of Converged Systems

When you begin shopping for a converged solution, you may be overwhelmed by the options. Converged systems may have single or multivendor stacks and open or closed software stacks. They will likely offer support for some but not all hypervisors, and there will be different levels of management abstraction, among other differences.

To help you cut through the complexity, we suggest that you focus on these 5 key elements, which are essential to any high-quality converged system solution:

1. **Ready for use.** Choose a solution that is fully pretested, prevalidated and pre-integrated, with the flexibility to meet your needs so it comes to you ready for use.

2. **Comprehensive support.** Ensure that the solution supports both virtualized and nonvirtualized environments within a single converged stack, since you will likely always have at least some applications that are nonvirtualized.

3. **Extensive automation.** Every solution will offer some level of automation, but it is best to employ full automation, across all system elements and a wide range of functions. The less manual, time-consuming and error-prone activity for your IT department, the better.

4. **Mission-critical support.** Select a solution that supports not only commodity-level applications, but also mission-critical applications. Make sure it can achieve a high level of performance and scalability with those applications.

5. **Open Architecture.** Choose the converged system that is designed to integrate with different hypervisors to avoid lock-in and enable multihypervisor IT solutions.

Along with those individual requirements, make sure that the converged system you select is a truly holistic solution. Choose a solution that is fully integrated and supported to ensure not only a seamless deployment but also a smooth post-deployment experience. The optimal solution reduces your operational costs and translates into real value for your business.

Service Provider Cuts Deployment Time and Costs With Converged Infrastructure

A recent converged system deployment for a leading service provider offers a real-world example of the benefits of meeting the 5 criteria listed in the previous section.

The service provider runs SAP enterprise resource planning (ERP) and other high-level business process applications. The company’s IT team understood the applications. They were selling them to their customers, but to continue supporting the applications, the company was going to have to keep adding more IT staff. Such additions would mean inflated costs for the foreseeable future.
By moving to a pretested, prevalidated and pre-integrated converged system solution, the service provider was able to serve its customers faster without adding to its IT team. The deployment phase for new applications was cut by more than 25%. Further, through increased automation and other improvements, the company lowered its operating costs by about 30%. A different company deploying the Oracle database also boosted its performance, reporting a reduction of query time from 26 hours to less than an hour.

With the right converged system solution in place, you can achieve benefits like these, while also creating a foundation for cloud computing. The ability to respond faster to business needs without increasing costs creates opportunities for growth and responsiveness that many organizations haven’t seen in years.

**TRANSITION TO THE SOFTWARE-DEFINED DATA CENTER**

Converged systems play a key role in “software-defined data centers,” a term initially coined by VMware and now recognized by industry and analysts. In software-defined infrastructures, the entire data center is virtualized to lower costs and simplify provisioning and management. Compute, storage, networking, security and availability services are pooled, abstracted and automated management by policy-driven software.

Converged systems can support software-defined data centers by providing a centralized, application-optimized environment. Solutions can be easily configured and deployed based on the specific requirements of business enterprise applications, while also providing a flexible and easily scalable foundation for cloud computing.

**Hitachi Delivers Converged Infrastructure Solutions**

Hitachi Data Systems is the recognized industry leader in storage, and we've brought the same dedication, and the same level of quality and reliability, to our converged system solutions. The Hitachi Unified Compute Platform (UCP) family is a broad portfolio of converged system solutions. It combines best-in-industry storage, server, networking and software management in fully integrated packages designed for mission-critical workloads. For example, Hitachi Unified Compute Platform Director delivers the orchestration capabilities IT professionals require to easily and quickly manage a virtualized converged infrastructure (see Figure 3).
Figure 3. With Hitachi Unified Compute Platform Director, familiar VMware tools become more powerful because the converged infrastructure elements and subelements can be provisioned and monitored. Also, remediation procedures based upon alerts can be enabled.

The converged system solutions from HDS and our partners are validated and certified to ensure their supportability across specific workloads. They are sold as fully integrated systems with virtualization software and application-optimized reference solutions, with the flexibility you need to mix and match components to suit your needs. Our Hitachi Data Systems Global Solution Services (GSS) team handles all technical support needs for each solution, which greatly reduces troubleshooting time and overall operational costs.

What Sets Us Apart?

**HDS delivers Hitachi Unified Compute Platform** as an integrated, turnkey solution or as a reference architecture. We add Hitachi Unified Compute Platform Director as an extra orchestration layer that makes it faster and easier to manage and administrate a virtualized cloud infrastructure. As a turnkey solution, UCP can help you cut deployment time and reduce the complexity associated with implementing a foundation platform to support a public or private cloud infrastructure. UCP provides a single platform for all your workloads. The common elements that set us apart from the competition include:

1. **Best-in-industry technologies.** We start with best-in-industry, not commodity, highly reliable technologies. By integrating the best server, network, storage, virtualization and other components, we give your organization a significant competitive advantage.
2. **End-to-end automation.** With the UCP family of solutions, you can not only deploy applications faster but also manage your environment faster and easier with end-to-end automation. The Unified Compute Platform Director orchestration tool enables you to manage and administrate an entire virtualized cloud infrastructure, not just 1 or 2 elements. In predominantly Microsoft® or VMware environments, you can choose single-pane-of-glass management through the management interface that’s most familiar to you: Microsoft System Center or VMware vCenter.

3. **Performance optimization.** We know that support for your mission-critical applications is a top priority. That’s why, for mission-critical applications like databases and business process apps, we’ve optimized our offerings. We have added accelerated flash and unique capabilities to our server and storage solutions to ensure higher performance and scalability.

The results of these 3 differentiators include operational efficiency that is unmatched by any other provider, as well as industry-leading time to value. Plus, our solutions give you the flexibility you need to easily convert your environment into a private cloud when and if you want to do so.

**Hitachi UCP Solutions for Mission-Critical Workloads**

We recognize how important it is for you to be able to run top-tier infrastructure applications without overpurchasing or overprovisioning equipment. Our portfolio of app-optimized reference solutions features integrated and converged platforms that accelerate mission-critical apps. Each UCP solution, from business analytics to desktop and server virtualization, protects your investment with a building-block approach that is ready to scale when needed to meet your changing business needs.

The full Hitachi UCP solutions portfolio includes specific platforms for business analytics, collaboration, databases, data warehousing, VMware vSphere and Microsoft Private Cloud. We design each solution to help you spend less time managing your converged system and more time addressing the rapidly changing needs of your business.

**BENEFITS OF HITACHI UNIFIED COMPUTE PLATFORM SOLUTION FAMILY**

- Preconfigured, tightly integrated turnkey solution.
- Built with best-in-industry Hitachi servers and storage, and industry-standard networking: Cisco or Brocade switches.
- Innovative Hitachi Unified Compute Platform Director software integrated natively with VMware vCenter or Microsoft System Center for automated management and orchestration.
- A series of prevalidated reference solutions supports a wide range of top-tier applications.
Summary: The Future of Convergence Is Here With Hitachi Data Systems

Converged systems are an increasingly viable alternative to the siloed architectures and shadow IT projects that organizations have built up over the past 2 decades. Pouring more resources into those isolated architectures is leading to more headaches, not fewer, as organizations discover that the silos add lengthy deployment times, extreme management difficulties and rising operational costs. To meet today’s challenges and prepare for the future, it makes sense to replace the silos with a centralized, consolidated infrastructure that automates management tasks.

The Hitachi UCP solution family features custom-configured, prebuilt, certified solutions that can increase flexibility and efficiency in your environment while improving control. We design each solution to solve the reliability, availability, scalability and performance challenges that today’s IT departments face while delivering unmatched operational efficiency. By providing a holistic experience, our solutions help ensure a seamless deployment and post-deployment experience, fully backed by the expertise of the HDS Global Solution Services team.

Whether you are looking for a tightly integrated turnkey solution or a prevalidated reference solution, Hitachi is an ideal partner. We can help you explore the possibilities of converged systems and select a pretested, prevalidated and pre-integrated solution that will help your business simplify IT management, cut deployment times and lower costs. We’ll help you build a platform for future growth while supporting an IT-as-a-service cloud model.