White Paper

Leveraging Hyperconverged Infrastructure to Accelerate Data Center Agility & Hybrid Cloud Workflows

Sponsored by: Hitachi Vantara

Eric Sheppard
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IN THIS WHITE PAPER

This IDC White Paper provides an overview of the trends driving the need for truly modern, hyperconverged infrastructure solutions that enable automated operations within a hybrid cloud environment. This paper also provides and overview of the modern infrastructure solutions from Hitachi Vantara and VMware that align with today's data center needs.

SITUATION OVERVIEW

Digital Transformation Tops Priorities for Business Around the World

Most companies have, to varying degrees, embarked on a fundamental transformation to their businesses with an eye towards rethinking how they operate in a truly digital world. This transformation is commonly referred to as digital transformation or DX. At the heart of digital transformation is the use of data to make better business decisions, strengthen customer relationships, expand upon traditional sources of revenue, and create competitive advantages. Not surprisingly, these are wide reaching undertakings that require new capabilities from datacenter infrastructure to support massive volumes of real-time data that is often created in many locations.

Digital transformation also requires IT teams to rethink how they are structured and how infrastructure is managed. CIOs are working through their own transformation strategies to keep pace with new business initiatives and to rapidly deliver new services. The goals of these transformation strategies are:

- Increasing operational simplicity and IT staff agility
- Eliminating dependencies on inefficient/inflexible silos of infrastructure
- Modernizing applications using DevOps methodologies
- Building out private clouds that are software-defined and highly automated
- Incorporating hybrid cloud workflows that include public & private clouds

Such goals have fundamentally changed what is expected of data center infrastructure. While core infrastructure benefits related to resiliency, performance and predictability will always be important, they are not the leading consideration they once were. Demand has shifted towards solutions that are far more holistically thought through in terms of systems design and management. This will be critical to reducing complexity and operation inefficiencies related to deploying, provisioning, managing, and lifecycle management.

In order to be an enabler of digital transformation, business leaders expect their IT teams to automate almost all aspects of data center infrastructure operations and adopt cloud-like features when supporting application development. They also expect increased interoperability between public cloud and on-premises resources. This, in turn, has driven demand for on-premises data center infrastructure able to support private cloud operations that work in conjunction with a broader hybrid cloud environment.

Impact of Global Pandemic to Businesses and Information Technology

The global pandemic has shifted the priorities of the business projects supported by IT teams. IDC surveys show 75% of IT roadmaps are changing, with many long-term projects temporarily shelved. The existing short-term projects that remain are focused on coping with overnight shift to a large remote workforce. IDC's August 2020 "COVID-19 Impact on IT Spending" survey of 670 technology decision makers shows just how striking this sudden shift toward remote working has been. According to this IDC survey, the average organization only had 14% of the workforce listed as primarily working from home before the pandemic. That percent jumped to 45% of the workforce now listed as primarily working from home. While the future state is still fluid, it is safe to expect many of these work from home positions to become permanent in a 'post pandemic' world. And those remote workers cannot go back to being second class citizens from a productivity, connectivity and security standpoint. Therefore, IDC predicts that by 2023, 60% of the G2000 will commit to providing technical parity to a workforce that is hybrid (working in an office and from home) by design rather than by circumstance. This drives short-term initiatives that target the following areas:

- Adopting a standardized set of software tools for the remote workforce and the elimination of any 'bring your own' software tools employees may be using. Unsanctioned tools are impossible to support. They also place critical and sensitive business data outside the reach of centralized data protection policies. In turn, IT teams have quickly begun standardizing on software tools that can be centrally managed and protected. Collaborative platforms are among most common of such tools due to their wide-reaching use within an organization. Indeed, according to an IDC survey conducted during the fourth quarter of 2020, more than 80% of organizations say the number of collaborative platform users has increased this year. Providing employees with a standardized set of such software tools has become a high priority for IT teams and critical to ensuring full control of cost, compliance, and governance.

- Reinforcement of existing data center resources to ensure agility, responsiveness, scalability, and resiliency of infrastructure. For most organizations, these investments will be a mix of on and off premises infrastructure that can be deployed rapidly, offer high degrees of automated management, and can be replicated for edge use cases.

- Bolstering IT service management (ITSM) capabilities to ensure uninterrupted support and continued service level management.

- Adjusting to changes in market demand and routes to market. For some organizations this may require scaling production to meet increased demand created by the large number of customers now always home. For others this could be about cutting production to deal with reduced demand. Many organizations have had to find new forms of production and new ways to bring products to market or to reach their customers (e.g., from physical stores to ecommerce).

Those that have had time to implement many of the short-term investments listed above are now preparing for a "new normal" where many of the changes experienced during this pandemic will be long-lasting, if not entirely permanent. And while many are rightly proud of the herculean efforts made to maintain business continuity thus far, a considerable number gaps have been exposed during this process. Those that can claim to have initial triage efforts in the rearview mirror are now addressing the fixes that were not entirely compliant with privacy and security policies or fully integrated with existing

systems. Many organizations also tell IDC that, now that short-term investments have been made, they have begun focusing on closing gaps in their digital transformation efforts. According to IDC's June 2020 COVID-19 Impact on IT Spending Survey, 42% of the 880 technology decision makers surveyed plan to invest in technology that will close the gap in their digital transformation initiatives.

Hyperconverged Infrastructure Aligns with Today's Unique Infrastructure Needs

The dynamic nature of today's IT world provides users with many options when building out modern data center infrastructure. Businesses of all sizes have long been leveraging a mix of IT solutions that include public cloud resources as well as on-premises data center infrastructure. As such, demand for on-premises infrastructure tends to favor solutions with an architecture designed to offer public cloud attributes and benefits. Such solutions tend to be scale-out, server-based, software-defined and highly automated. They are also increasingly supporting unified management that extends to public cloud resources.

Hyperconverged infrastructure (HCI) is one of the fastest growing segments of the IT industry that checks many, if not all of these boxes for on-premises solutions. First made popular by public cloud operators such as Google and Facebook, hyperconvergence emerged as a modern converged infrastructure architecture for next-generation applications. Smaller companies that were "born on the cloud" ignited further demand for scale-out, software-defined HCI systems. In time, established enterprises with a long history of managing their own infrastructure and datacenters awoke to the benefits of hyperconvergence and began deploying HCI solutions in their own datacenters. Awareness of the benefits these solutions bring to the table has risen steadily among enterprise IT teams, resulting in increased market adoption. Once these solutions are deployed, IT teams frequently expand the set of workloads running on HCI.

Over the years, HCI solutions have become a multi-billion-dollar market due, in part, to their ability to drive new levels of infrastructure agility needed to meet performance, availability, reliability and timely response to business needs. HCI solutions deliver such benefits through a clustered, scale-out architecture built on x86 servers. HCI solutions provide all compute, storage, and networking functions through a cluster of server-based nodes. Each node within a cluster contributes all of its resources to an abstracted pool of capacity, memory, and compute resources. This pool of resources provides the foundation for all server-centric workloads (the hypervisor, VMs and applications) as well as storage-centric workloads (e.g., data persistence, data access and data management). Further, today's hyperconverged solutions provide a high degree of automation and help to consolidate management tools that tend to be specific to a single environment. The result is streamline IT processes that allows IT teams make decisions based on workloads rather than the infrastructure itself.

HCI's Support for Multicloud and Hybrid Cloud Environments

Multicloud and hybrid cloud environments are becoming the de facto architecture in datacenters. Multicloud refers to multiple public clouds, and hybrid cloud refers to the combination of private and public cloud(s). Enterprises must adopt the best practices of hybrid cloud architecture and leverage cloud-centric innovations such as microservices, containers, Kubernetes, and Istio. The best HCI systems will first offer a robust platform that can be used to implement a private cloud within the datacenter; second, the HCI system will support intelligent software that integrates the core, edge, and the cloud (private and public clouds). This will enable a consistent hybrid cloud experience, which allows enterprises to centrally manage the hybrid cloud and easily migrate data and applications between various clouds. Another use of hybrid cloud is to manage "bursting" – a sudden spike in application

usage – by automatically moving workloads between clouds (typically from a private cloud to a public cloud).

Considering Hitachi Vantara Hyperconverged Solutions

Hitachi Vantara is a well-known and long trusted supplier of enterprise data center solutions that are designed to address the diverse needs of today's modern data centers. The company has also been a leading player in the rapidly growing converged infrastructure market for many years, offering a portfolio of converged infrastructure solutions that includes enterprise class hardware, software, support and services. The core of Hitachi Vantara's converged infrastructure portfolio is its Unified Compute Platform (UCP) family of systems and accompanying management software, UCP Advisor. Hitachi Vantara's UCP solutions offer multiple ways for users to consolidate core datacenter technologies – storage systems, servers, networking, and management software – into a single solution that can be deployed managed, scaled, supported, and refreshed in a single motion.

Importantly, Hitachi Vantara extends UCP beyond its core components by leveraging long-standing relationships with key independent software vendors (ISVs) such as VMware. The company also ensures maximum flexibility through comparable relationships with third-party infrastructure vendors. Users that leverage the combined technology from Hitachi Vantara and its core partners are able to create a holistic IT environment capable of supporting the most critical needs of a modern IT environment. This includes a high degree of automated operations as well as a unified view of infrastructure and workloads that move between data center, cloud and edge environments. Further, Hitachi Vantara's portfolio of UCP solutions, UCP Advisor, and ISVs like VMware have been thoughtfully engineered to provide users with a platform to create an enterprise class private cloud environment. Hitachi Vantara has also created the necessary management and orchestration tools for customers to create a hybrid cloud environment that unifies core private clouds, multiple public clouds, and distributed edge infrastructure through a single control plane. In total, the UCP solutions and technology partnership covered in this section of the paper are able to provide users with an IT environment that is:

- Highly automated operations that span from day zero through all ongoing day to day management and includes automation of critical lifecycle management task (e.g., firmware upgrades).
- Holistically managed through a single control plane, thus able to unify a diverse set of infrastructure resources that can include any mix of:
  - On premises and off premises deployment
  - Scale-up and scale-out architectures
  - SAN-based or software-defined infrastructure
  - Private or public cloud platforms

The result for those deploying infrastructure based on Hitachi Vantara's portfolio of UCP hardware and software solutions is a modern IT environment that supports agile operations from core to cloud to edge.

Hitachi Vantara's Software-defined Hybrid Cloud Infrastructure Offerings

This section provides an overview of Hitachi Vantara's portfolio of hybrid cloud solutions and the technology at the center of the Hitachi Vantara and VMware partnership. Hitachi's hybrid cloud infrastructure solutions provide the flexibility to deploy the workload on the most optimal infrastructure that best delivers on SLOs.

- **Hitachi Unified Compute Platform HC (UCP HC) – Powered by VMware vSAN** is Hitachi Vantara's fully integrated hyperconverged solution built on Hitachi servers, VMware's vSphere hypervisor and vSAN software. With UCP HC, all compute, storage, virtualization and high availability features are combined into a simple, scalable and reliable enterprise-grade hyperconverged infrastructure. UCP HC comes with unified support for all parts of the HCI appliance. UCP HC provides a high degree of operational simplicity by automating the provisioning of storage services based on its embedded policy-based management engine. UCP HC also automates upgrades non-disruptively, which simplifies lifecycle management and eliminates critical risks associated with non-compliant/out of date firmware.

- **Hitachi Unified Compute Platform RS (UCP RS) – Powered by VMware Cloud Foundation** is a fully integrated, rack-scale solution built entirely with software-defined infrastructure. This solution is often referred to as software-defined data center or SDDC because it is built with software-define storage, networking and compute; the three core pillars of data center infrastructure. SDDC solutions like UCP RS extend the benefits of software defined infrastructure and HCI solutions to include fully automated, software-defined networking and compute resources. Importantly, UCP RS is more than just a complete software defined data center solution. It is a highly automated SDDC solution that natively integrates an entire cloud infrastructure stack with prepackaged cloud management software. VMware's NSX software provides the software defined networking stack within this solution. This not only extends operational simplicity to network management, it also adds enhanced security features needed to create a secure cloud platform. This includes a hypervisor embedded firewall, granular micro segmentation to prevent east-west breaches and application specific security policies that follow a workload regardless of its physical location.

- **Hitachi Unified Compute Platform Advisor (UCP Advisor)** is Hitachi Vantara's management and orchestration software that is critical to the efficient and unified management capabilities covered throughout this paper. Specifically, UCP Advisor provides a single management console to provision services quickly and provide integrated automation and management of both physical hosts and virtual machines, reducing both deployment and operational costs. UCP Advisor's user interface includes native integration with VMware vCenter to simplify operations and speed time to operation. UCP Advisor provides deep visibility into physical and virtual stack and allows firmware upgrades in a nondisruptive manner. UCP Advisor's built-in remote monitoring software proactively monitors for potential issues and resolves them, before they impact operations.

Customers deploying heterogeneous IT solutions benefit from a common management software Unified Compute Platform Advisor to manage HCI, integrated infrastructure, and traditional SAN eliminating the complexity of dealing with multiple management tools.

Hitachi Vantara and VMware Partnership for Automated HCI Platforms

Hitachi Vantara and VMware have a longstanding partnership that goes back many years. The two companies have jointly engineered multiple fully integrated HCI & SDDC solutions that combine SDI and management software with enterprise-class servers to create Unified Compute Platform (UCP HC) and Hitachi Unified Compute Platform RS (UCP RS), as highlighted in the previous section. While the partnership between Hitachi Vantara and VMware extends well beyond UCP HC and UCP RS, this section provides a brief overview of the ways in which this partnership drives value to customers within these two solutions.

UCP HC can be tied into broader data center management operations through its connection to VMware vCenter and through the integrated of Hitachi Vantara's UCP Advisor software. Combining

these discrete data center resources and management tools into the fully integrated UCP HC ultimately creates a complete scale-out hyperconverged solution that is truly modern and highly automated to a degree that drives real world operational benefits and CAPEX reductions within the data center. Importantly, these benefits go beyond the data center. Indeed, the scale-out, software-defined nature of UCP HC also makes it an ideal solution for remote offices and edge environments where centralized management of many smaller systems represent a critical need.

UCP RS provides a modern SDDC environment by leveraging enterprise class storage and compute from Hitachi Vantara with VMware's full suite of software-defined infrastructure and management software called VMware Cloud Foundation. The core software-define infrastructure building within VMware Cloud Foundation includes compute (vSphere), storage (vSAN) and networking (NSX). These foundational SDDC infrastructure building blocks of UCP RS become a highly automated cloud stack through the integration of VMware's vRealize software with automated lifecycle management provided by VMsare's SDDC Manager and Hitachi Vantara's UCP Advisor.

CHALLENGES/OPPORTUNITIES

Hyperconverged Infrastructure has proven to be a good fit for today's data center infrastructure needs, which is why the market has grown at double digit over the past five years. And while HCI has indeed become a preferred platform for private cloud operations, its use as a platform for a truly hybrid cloud environment represents a step function change for many IT organizations. This places a considerable burden on IT suppliers and their go-to-market partners (e.g., VARs) of helping IT teams make the sometimes daunting transition from independently leveraging multiple private and public cloud resources to a more holistically connected hybrid cloud environment. This will take time and a considerable amount of effort. The good news is that Hitachi Vantara has a long track record of taking time to understand their customers' business needs, not just the needs related to technology. Over the years, many Hitachi Vantara customers have directly tied success within their data centers, in part, to Hitachi Vantara's empathy and willingness to understand their broader business needs. Coupled with the continued development of modern data center technologies and the successful partnerships with companies like VMware, customer empathy will likely be one of Hitachi Vantara's most important strengths as it helps customers adjust to these ever-changing times.

CONCLUSION

Together, Hitachi Vantara and VMware have built a set of enterprise class, software-defined infrastructure solutions that align well with the unique challenges of today's IT teams. These solutions can have an immediate impact by increasing IT staff agility though automated operations and unified resource management; by providing dynamic infrastructure that scales quickly to support needs of a rapidly changed workforce, and incorporating private cloud attributes that become the core platform for a unified, truly hybrid cloud environment.

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Global Headquarters

5 Speen Street
Framingham, MA 01701
USA
508.872.8200
Twitter: @IDC
idc-community.com
www.idc.com