

DATA DRIVEN GLOBAL VISION CLOUD PLATFORM STRATEG
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WHITE PAPER

Gear Up for the “As-a-Service” Era

A Path to the Private Cloud

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Gear Up for the “As-a-Service” Era

Executive Summary

Many organizations are opting for private clouds as a way to address the drivers behind the transformation and modernization of data centers taking place today. Ultimately, this transformation allows IT to move to a more services-driven model whereby stakeholders can quickly and easily access the resources they need. They can rely on IT's ability to meet committed service levels. IT is then able to more effectively support the business, enabling end users to create the intelligence and innovation to grow the bottom line.

This transformation can best be achieved by first addressing a number of organizational and technical considerations. Such concerns impact not only building and maintaining a private cloud, but also preparing the organization to leverage its capabilities and advantages. Then, IT can use a methodology involving a series of well-defined steps, and employing the right choices of platforms and tools. IT can build a private cloud that leverages existing assets, minimizes disruption to business operations, and reduces costs.

Introduction

Whether used for storing data and content, providing compute resources, or both, cloud implementations are growing in popularity. The cloud serves as a way to provide information technology services and capabilities to a wide variety of user segments. From corporate executives striving to maximize profits to college students streaming music to smartphones, most individuals have been exposed to the cloud in recent years.

For enterprises, the cloud represents a potential way to address increasing demands to more effectively support the business while working within level or shrinking budgets. IT departments are being pressured to create environments in which the services their stakeholders require to become more competitive and stay that way are available “on demand.” Getting there means literally transforming their data centers in a number of important ways.

This paper outlines the major drivers responsible for IT’s interest in the cloud. Then, it provides an overview of the various cloud delivery models available to IT today and the conditions under which each of them are used. It explains why one model, the private cloud, is the choice of many enterprises today. And, finally, this paper explores the technical as well as business and organizational issues with which organizations must deal before implementing a private cloud. It looks at the transformational steps to get them there as part of a well-designed cloud-enablement methodology.

Following a step-by-step approach to modernizing the data center can help organizations more thoroughly reap the benefits of a private cloud. They can achieve lower costs, better service delivery, and higher-quality IT support for business operations.

Drive IT to the Cloud

As competitive pressures continue to intensify, stakeholders continue to look to IT to provide the resources and services to get their jobs done. In response, IT must create an environment in which applications and infrastructure resources (software, compute and networking) are available on demand. The goal, however, is more than just a different foundation on which to run applications, store data and communicate. The result has to be the delivery of IT “services” based on committed, well-defined service levels.

This result is a direct effect of one of the major drivers pushing IT to leverage cloud-based implementations. The on-demand requirement means that to deliver the resources required to run the business in a timely and efficient manner, IT must change how it does its job. Hardwiring applications and their data to compute and storage platforms using a siloed approach certainly guarantees that those assets are available with required infrastructure resources for their target users. However, the infrastructure cannot be available for other purposes, even when those silos are not being used.

Making IT “service-driven” using an on-demand model is therefore a major driver in prompting IT to transform their data centers to be more flexible and agile. This approach means decoupling services from the underlying storage and compute platforms so that the latter can be deployed and used where and when required to meet committed services levels.

Cost is another significant driver of IT’s interest in the cloud. Three aspects of this driver that have a significant impact on where IT is headed include:

- **Budgetary constraints.** The pressure on IT to “do more with less” is a significant factor in IT’s transformation. Limited IT budgets are not new, but they are a continuing constraint. They force IT to create greater efficiency, optimize existing resource usage, and limit new capital acquisitions.
- **Pressure to grow return on investment (ROI).** We have seen a long-term trend to create greater alignment between IT and business goals and an enterprise’s bottom line. This trend has led to IT incorporating capabilities

into their data centers to monitor and analyze resource usage. As a result, information about who is using application and infrastructure, for what purposes, and for how long can help IT as well as corporate management. Companies can ensure that they are getting the most value out of IT in terms of growing the bottom line. If the organization chooses, stakeholders can even be charged for what they use, making them even more accountable.

- **Public competition.** As noted in the next section of this paper, there are a number of cloud delivery models that organizations can choose. Many of them are public, and offer cost benefits that rival what many IT organizations can match with traditional data centers. Stakeholders see these *public cloud options as a flexible and fast means getting the applications and other resources that they require to do their jobs.*

Speed, efficiency and cost are the major drivers for interest in the cloud. These benefits are motivating businesses to consider one or several forms of cloud delivery to meet the challenges for IT today.

Why the Private Cloud?

Enterprises have a number of choices in terms of the types of clouds they deploy and the service delivery models they use.

Types of Cloud Delivery Models

Private clouds are implemented totally within the firewall of an enterprise, and under complete control of the IT department. They are looked to for greater control over security, governance, compliance and performance to committed service levels.

Public clouds are implemented by service providers who make resources available to enterprises and/or the general public over the Internet. They are looked to for low costs (particularly capital costs), greater flexibility, and speed of reaction to change.

Hybrid clouds combine the private and public models, enabling workloads, applications, and data to reside on either and interoperate with one another. They balance advantages of private and public clouds.

For a number of reasons, IT would prefer to keep corporate applications, workloads and data within the organization. First, despite technologies such as multitenancy and others that isolate accounts and workloads, access control and security remain concerns for public clouds. Second, compliance and governance issues can generally be more effectively addressed when an enterprise has control over its cloud. Finally, enterprises have made significant investments in technologies, platforms and skills that they are incented to leverage as they transform to a cloud-based model.

Still, IT is challenged competitively to deliver the flexibility, performance and financial models versus a public cloud. There may be pressure for IT to justify not moving at least some workloads to a public cloud. In fact, many enterprises have built or are building private clouds, or are planning do so. However, architecturally, they have their eyes on a hybrid cloud model. The rationale is that once they gain experience with, and confidence in, cloud implementations, they will be ready to leverage inexpensive public clouds for appropriate workloads.

The Path to the Private Cloud

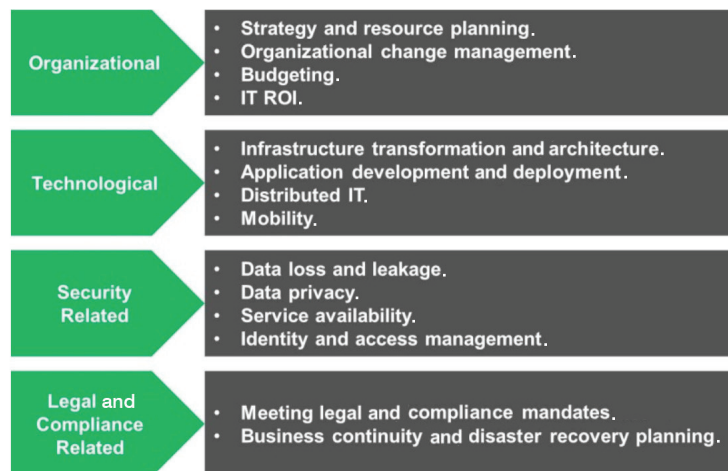
Creating a private cloud is in great part an exercise in creating data centers that transform from their traditional siloed structures to ones that are more agile and flexible. The process begins with consideration of a set of both organizational and technological issues. Since IT is an integral part of every business process and function today, moving to a service-based, cloud-centric infrastructure impacts how an organization functions, and perhaps its very structure. Its financial models and budgeting processes are directly impacted as ROI, accountability and costing become ingrained in the way IT delivers services. New architectures and technologies must be employed to create cloud delivery capabilities. They must be capable of accommodating new devices (many of them classified as “mobile”) that are fast becoming part of how stakeholders do their work.



In fact, the distributed, geographically dispersed, and mobile characteristics of enterprises today make even private clouds risky in terms of security and access control. Ensuring that data and content are accessed only by those individuals approved to do so remains a challenge, especially given the “in flight” nature of data. Finally, in moving to a private cloud, IT must guarantee the continued ability to address legal and compliance requirements, ensuring the continuity of business operations in the event of a disaster.

In other words, clouds can be used to improve services and lower costs, but enterprises moving to the cloud must plan for it in various ways. Many of the considerations involved are not new, but will change in scope and implementation (see Figure 1).

Figure 1. Organizational and Technical Considerations for the Private Cloud



Once the organization and IT are ready to make the transformation of their data centers to support the cloud, they must confront a number of challenges. They must acquire the skills and technologies to achieve more efficient asset utilization and manage a collection of both virtualized and nonvirtualized applications. They must automate the management of an environment where technologies such as virtualization that, while creating agility, increase the complexity of the management challenge. And, they must raise the level and predictability of performance so that the terms of service level agreements (SLAs) can be consistently met.

The abstraction of services from underlying infrastructure platforms is at the heart of the modernized, transformed data center on which private clouds are built. The path to get there is defined by a series of steps that lead to the creation of a highly efficient and cost-effective private cloud:

- **Consolidate resources.** This act involves decreasing the IT footprint to cut overall costs by reducing capital expenditure, lowering space and utility costs, and lessening the administrative resources required. The goal is to architect a single infrastructure platform for all data and workloads, which increases efficiency by minimizing costs and maximizing utility. For some, this consolidation involves only storage platforms, for others, compute resources, and in some cases, it takes the form of a “converged” infrastructure of all resources. These benefits are particularly evident, as they leverage your existing resources without any significant “rip and replace.”
- **Virtualize.** Here, a single virtual pool of all resources allows you to extract greater value and to become more efficient. This pool can include file, block and object storage, servers and applications. If done correctly, you are able to manage across all of these resources, which can then be dynamically provisioned on demand. The resulting flexibility can mean more optimized usage because resources are no longer tied to legacy application or platform “silos” that remain unused when they can be leveraged somewhere else. Ideally, this virtualization can be applied to single, converged infrastructure where both storage and compute resources work together to get tasks done.
- **Automate.** The next step is to automate your IT management and administrative processes to enhance your ability to meet committed service levels while making IT and stakeholders more productive. When applied to a fully converged and virtualized infrastructure, automation can ease managing and provisioning tasks, and enables delivery of services with greater speed and reliability. With this approach, policies can be effectively enforced, and risks associated with tasks prone to human error can be reduced.
- **Add self-service.** Adding self-service capabilities completes the path to the private cloud. They are provided via a portal or other user access framework that enables end users to select the services they need and choose the service level required based on their roles. Provisioning and delivery of resources can then be automated to execute upon service requests. A complete self-service implementation would include chargeback and/or showback functionality as part of an overall business and operational framework. This approach allows IT to measure where resources are being used, and internally charge users, if that makes sense. The result is more accountability and better alignment of resources with business activities that bring the greatest ROI, and a faster time to market for the work stakeholders do.

As noted earlier, security must be at the top of the list as the data center is being transformed to embrace the private cloud. However, many organizations are trying to balance the control they require to maintain security and compliance with a desire to take advantage of best-in-industry infrastructure, portals, open source frameworks, and management capabilities. Such elements allow them to build and deploy the most functional private clouds possible while avoiding vendor lock-in. This balance for many enterprises is critical to achieve superior service delivery without sacrificing the safety of their sensitive data.

Solutions for the Private Cloud

Hitachi Data Systems has been helping its customers transform their data centers for many years with platforms and technologies that help make them more efficient and “services-ready.” These offerings include:

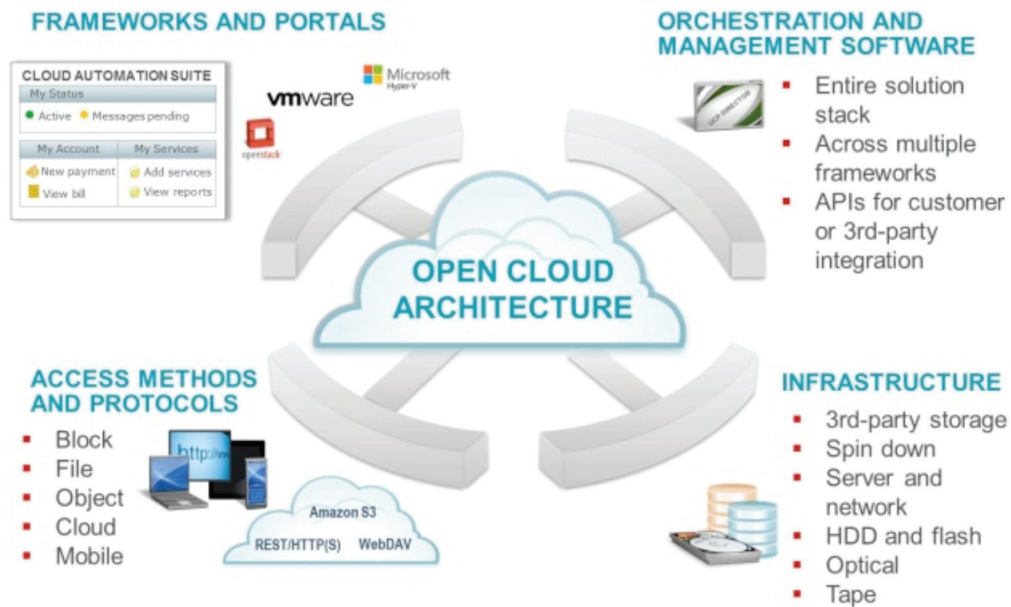
- **HDS cloud automation suite.** This suite provides self-service capabilities for private cloud implementations, enabling self-service via a service catalog, automated provisioning, chargeback, subscription management, billing and other capabilities required to support private clouds.
- **Hitachi Virtual Storage Platform (VSP).** This full 3-D storage management platform enables the consolidation and virtualization of multivendor storage resources into a single pool of storage capacity. By combining VSP with

Hitachi Dynamic Provisioning, administrators can draw from this central virtual storage pool without immediately adding physical disks when an application requires more storage capacity.

- **Hitachi Unified Storage (HUS) and Hitachi NAS Platform (HNAS).** These powerful consolidation platforms enable organizations to consolidate existing file servers and NAS devices on to fewer nodes. This capability allows them to perform the same or even more work with fewer devices and lower overhead. At the same time, they reduce floor space requirements and associated power and cooling costs.
- **Hitachi Unified Compute Platform (UCP).** This family of converged infrastructure solutions brings together storage, server, networking, hypervisor and software management in fully integrated packages. These pretested, cloud-ready infrastructure solutions can be deployed quickly and, because they bring together various resources into a converged platform, management is greatly simplified. Hitachi Unified Compute Platform Director software allows administrators to pool, aggregate, manage, provision and monitor all physical and virtual infrastructure from within VMware vCenter. This capability makes it easier to implement optimized best-in-industry solutions as part of a cloud-ready converged stack.
- **Hitachi Content Platform (HCP).** This product is intended to address the accelerated proliferation of unstructured data. An object storage solution, HCP enables high-density, high-efficiency storage, sharing, synchronizing and protection of unstructured data using a single system. When combined with Hitachi Data Ingestor, HCP serves as both a private cloud-based object storage solution and an on-ramp to the private cloud for remote and branch offices. Introducing Hitachi Content Platform Anywhere to the solution adds secure file sync and share capabilities. These abilities enable a mobile workforce to collaborate easier and faster and supports bring your own device (BYOD) for employees, all from a safe, secure private cloud environment.



Figure 2. Hitachi Approach: Open Cloud Architecture



These products and others from the HDS portfolio, as well as our cloud transition and transformation services, support the Hitachi open cloud architecture approach. We support open source and other APIs, access methods and protocols, and standards-based interfaces (see Figure 2). This approach allows us to deliver best-in-industry infrastructure components, portals and frameworks, storage and compute resources, and management capabilities. We help organizations to build the best private clouds for their needs while avoiding vendor lock-in and leveraging existing resources.

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