



WHITE PAPER

CLOUD

The Future of IT Systems

Abstract

The public cloud provides unparalleled flexibility in how resources are provisioned, consumed, and recovered – spurring rapid adoption. Workload placement should be based on organizational requirements and not infrastructure limitations. The elasticity, self-service automation, and cost savings of using Infrastructure as a Service (IaaS) is achievable through both public and

private cloud infrastructure. You should be able to place workloads in the environment that best suits their needs without sacrificing efficiency or experience, and have the ability to shift workloads seamlessly between public and private cloud offerings as their needs evolve. Hybrid cloud is the answer.

What is Cloud?

Cloud computing refers to the abstraction of IT systems such as compute and storage to allow developers and end-users the ability to consume these resources as a service (aaS). While this concept has its roots in the time sharing available on mainframes in the 1960s, today it is embodied in server and storage virtualization. Virtualization separates individual workloads from physical hardware. It is instructive to view this in two phases. First, monolithic servers containing both compute and storage in individual devices were consumed as a unit. Server virtualization disaggregated workloads from the underlying hardware, allowing workload mobility and more efficient use of processing power. This separated the consumption of compute and storage, launching the age of storage area networks (SAN), breaking processing and data storage into separate hardware platforms. More recently, storage virtualization has created similar efficiencies in data location and allowed storage to move back into a single hyperconverged infrastructure (HCI), allowing full freedom of workload placement and resource allocation.

Pools of resources can now be allocated and recovered as the organizational needs dictate. This virtualization of resources also enables new automation and orchestration tools, allowing ITaaS modalities which bring ease of operation, ease of consumption, and unprecedented scale. This is the foundation of cloud. A cloud infrastructure is comprised of a combination of hardware, software, and services. Where these components reside determines the type of cloud infrastructure being discussed.

Public cloud provides end-users access to the control plane but offloads the burden of deploying and maintaining the underlying infrastructure to a cloud service provider. Private cloud provides similar agility, but the upkeep of the underlying infrastructure falls on the end-user. Hybrid cloud acknowledges the reality that some workloads need to be maintained in-house for security, availability, compliance, or performance reasons, and therefore allows for workload portability between public and private cloud infrastructure based on where the location for individual workloads should best reside.

Why Cloud Matters

Cloud computing is a key component to organizational transformation using information technology. A cloud infrastructure allows departments and teams the ability to utilize pools of elastic resources provisioned through self-service tools to react to opportunities, ride out market disruptions, and leverage technology as a competitive

differentiator. The abstraction of underlying hardware from the applications and services needed to operate offers a combination of agility, scalability, reliability, security, and cost control simply not available through traditional IT systems.

Unhindered workload mobility means that organizations can now leverage the tradeoffs between control and simplicity, latency and elasticity, cost and reliability, security and performance to place workloads where they best fit today, with freedom to migrate them as those needs change. Hybrid cloud enables the flexibility required to weigh and balance factors such as data gravity, data sovereignty, service availability, and application lifecycle by moving workloads between on- or off-premises private clouds and a growing multitude of public clouds.



A private cloud built on HCI provides all the automation, orchestration and self-service tools found in a public cloud, right in your own environment. This can first serve as a way to experience the benefits of utilizing cloud before handing over control of your infrastructure to a public cloud service provider. HCI also offers a similar pay-as-you-grow model to public cloud, further enhancing the compatibility of this HCI+Public hybrid cloud approach. In addition to these benefits, HCI simplifies networking requirements in your private cloud by removing the need for Fiber Channel and the operation of a distinct SAN.

Your employees, partners, and customers demand immediate access to needed systems, storage, software, and services at any time from any location. A properly designed and built hybrid cloud infrastructure can meet these demands today and into the future.

How to Deploy Cloud

Traditional IT methodologies create sunk cost in siloed servers, storage, networking, and software. These silos demand high capital outlay for initial deployments and incremental expansion. To make matters worse, there is typically a lack of visibility into resource utilization and the cost for active and idle systems. Deploying and sunseting applications in this environment is involved and labor-intensive. Even when approached programmatically, niche skills are required to maintain underlying physical infrastructure and it is time-consuming to ensure continued interoperability through patch and update cycles.

The hybrid cloud model utilizes a Cloud Management Platform (CMP) on top of any number of hypervisor and hardware platforms to produce role-based access to pooled resources, enable granular chargeback and utilization reporting to reduce unnecessary spending (vs traditional IT where new applications typically require new servers and additional storage), and centralize management of resource pools regardless of where these resources physically reside.

While legacy deployment models comprised of servers, storage appliances, storage networks, hypervisors, and management platforms can be combined into a converged solution that functions as a private cloud, the limited scalability, burden of administrating the underlying platforms, and cost associated with the disparate infrastructure components (blades, FC switching, storage arrays, ToR switching, hypervisor licensing, monitoring & management software) makes for a sub-optimal cloud platform.

HCI is an ideal foundation for private cloud building. HCI combines commodity server software with hypervisor and storage virtualization software into a single solution that can scale out linearly, be provisioned, monitored, and managed through widely available Cloud Management Platforms with less integration risk and a faster time to production, all with none of the ancillary costs associated with deploying a purpose-built storage array and network.

An alternative to building a HCI based private cloud is a hosted private cloud. This is a great option for organizations

that have security, availability, data sovereignty or other requirements for dedicated hardware, but do not wish to manage it themselves.

All workloads that are not burdened by the requirements that would indicate a private or hosted private environment should be placed in a public cloud. The cloud service provider should be chosen carefully to meet your needs, and a CMP that can abstract the implementation details, allowing true multi-cloud mobility of workloads, is highly recommended.

Conclusion

Hybrid Cloud is the future of IT systems. No single deployment option is best. Resources should be selected based on the profile and needs of individual workloads. The key is to assemble IT infrastructure in such a way that allows easy consumption (ITaaS) and transportability of workloads from cloud to cloud as organizational needs evolve.