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Hybrid cloud infrastructure can be a technology conundrum as it provides flexibility and operational effectiveness at the cost of added complexity. This dichotomy challenges many organizations when implementing a consistent, long-term strategy.

Enterprise Proclivity for Hybrid Cloud Creates Challenges, Complexity, and Opportunity

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Enterprise Cloud Infrastructure Strategies Are Increasingly "Hybrid"

Hybrid cloud is increasingly becoming the de facto standard for enterprises looking to deploy an infrastructure strategy that utilizes public, private, and dedicated resources. For clarity and the purposes of this paper, IDC defines hybrid cloud as any infrastructure (compute and storage) environment that uses a mix of private cloud and public cloud services, with orchestration between the platforms, allowing data and applications/solutions to be shared among them.

The concept of hybrid cloud is nothing new; for years, enterprises have used the term "hybrid" to describe a combination of cloud deployment types (e.g., shared multitenant offerings alongside dedicated single-tenant offerings). However, what is noteworthy is the continued evolution of hybrid cloud as an overarching infrastructure strategy, which enterprises are adhering to in order to meet the cost, performance, and accessibility characteristics needed for specific workloads or applications. Today, just 30% of cloud IaaS buyers use a single cloud provider, according to IDC. The other 70% of buyers use some combination of multiple public cloud providers and private cloud providers. In terms of cloud budgeting, "hybrid" is also a standout: According to an IDC survey, 72% of respondents said they allocate 20% or more of their cloud budget to building a hybrid cloud. The buyer landscape clearly shows a proclivity to hybrid and multicloud adoption.

However, many organizations remain challenged when it comes to securing, managing, and orchestrating these complex cloud environments to achieve the levels of cost efficiency and performance desired. Hybrid cloud might be the predominant model pursued by enterprises, but it is by no means simple or straightforward. A poorly managed hybrid environment can result in fragmented data silos, operational inefficiencies, security risks, and data management gaps. The analysis in this paper focuses on the evolution of hybrid cloud strategies as they relate to infrastructure and explores how comprehensive hybrid cloud infrastructure deployments can help enterprises address three important use cases: managing data growth,]ensuring data security and compliance, and enabling cloud workload placement.

AT A GLANCE

KEY STATS

According to IDC, just 30% of cloud IaaS buyers use a single cloud provider today. The other 70% of buyers use some combination of multiple public cloud providers and private cloud providers — often referred to as "hybrid cloud."

KEY TAKEAWAYS

Many organizations face challenges when securing, managing, and orchestrating complex, hybrid cloud environments.

To prove the use case and value of hybrid cloud, organizations should start small and focus on single applications and workloads that can be deployed in hybrid environments to help improve their ability to manage data growth, ensure security and compliance, and enable application portability.

Hybrid Cloud Market Trends and Context

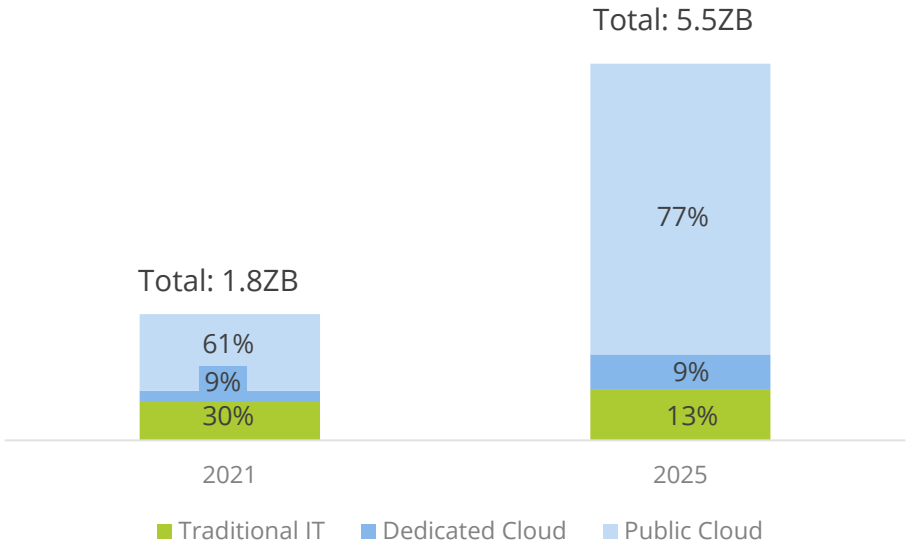
When discussing cloud archetypes, we find it helpful to begin with a detailed definition:

- **Hybrid cloud:** IDC defines hybrid cloud as the usage of IT services (including IaaS, PaaS, SaaS apps, and SaaS-infrastructure services) across one or more deployment models using a unified framework. The cloud services used leverage more than one cloud deployment model. Hybrid cloud services include "public-public," "public-private," and "private-private" combinations. Cloud and noncloud combinations (sometimes referred to as hybrid IT) where the noncloud applications are front-ended with cloud services interfaces (e.g., RESTful APIs) are also included.

With this definition of hybrid cloud in mind, we turn to IDC's enterprise storage systems installed base to better understand the continued movement of infrastructure — specifically storage — resources to cloud environments:

- In 2021, 70% of the enterprise storage installed base resided in the cloud (this includes public, private, and/or dedicated deployments) and 30% in traditional IT (noncloud, on-premises) environments.
- We expect that by 2025, the mix will have shifted further in favor of cloud, with 87% of the total storage installed base residing in cloud and 13% in noncloud, on-premises environments. This equates to 4.7ZB of enterprise storage capacity in the cloud (see Figure 1).

FIGURE 1: ***Installed Base of Enterprise Storage Shifts to Cloud***



Source: IDC's Enterprise Storage Systems Installed Base

This expanding installed base of storage in public, private, and dedicated cloud environments is driving adoption of enterprise hybrid cloud deployment strategies as organizations look to establish cohesive data management and security capabilities that ensure smooth operation of applications and workloads reliant on hybrid cloud infrastructure. Growth of stored data and data location are not the only drivers of hybrid cloud adoption. IDC's *IaaSView Survey* findings, published in December 2021, show that 82% of respondents use a partner-delivered cloud storage service from a storage OEM (e.g., NetApp Cloud Volumes, HPE Cloud Volumes, Pure Cloud Block Store). These infrastructure services are an effective way for many enterprises to begin marrying infrastructure assets across their hybrid cloud estate while maintaining consistency with familiar data management platforms.

Exploring the Benefits and Challenges Associated with Hybrid Cloud Deployment

For many enterprises, frictionless hybrid cloud operation remains a work in progress. In many cases, the ideal state of hybrid cloud might be unrealistic to implement at a massive scale. Separate workflows, different resource management tools, and lack of unified security monitoring are typically the top challenges organizations face when connecting multiple cloud infrastructure environments. Sharing data across cloud environments can also present its own unique challenges, especially when it comes to managing data transfer and networking fees associated with data movement in/out of public clouds.

With this complexity in mind, IDC recommends that enterprises establish a strategy for hybrid cloud that includes a phased approach that can be targeted to specific enterprise applications, use cases, or workloads. This analysis explores three enterprise use cases to illustrate the benefits and challenges associated with a hybrid cloud approach to infrastructure deployment:

1. Managing Exponential Data Growth

- **Use case context.** Organizations indicate to IDC that they expect annual data growth in the 30–40% range. That means an enterprise managing 10PB of stored capacity today can expect to manage upwards of 13PB next year. IDC's enterprise storage systems installed base forecast also aligns with this trend, showing the amount of data stored by organizations in 2020 will almost triple by 2025. To be more precise, IDC forecasts the storage systems install base will grow from 1.8ZB in 2020 to 5.5ZB in 2025 — a 31% compound annual growth rate (CAGR) over the forecast period.

- **Hybrid cloud strategic approach.** Enterprises will require novel forms of storage and data management, partly as a result of the relentless data growth. That means integrating solutions for long-term "cold" storage as well as higher-performance "warm" and "hot" storage, all of which can be installed across a range of cloud environments. A comprehensive hybrid cloud approach allows enterprises to abstract the complexity of efficiently storing data across different cloud environments and different tiers of storage, creating unified and automated data tiering, migration, and storage policies that span all of an enterprise's data estates. A hybrid cloud approach also enables elasticity and agility across environments, enabling enterprises to scale infrastructure resources up or down based on workload requirements, or automate this process through policy, unlocking additional cost and time savings.

- **Challenges to consider.** Networking costs and data access fees (e.g., puts, gets, egress, API calls) associated with data movement in and out of cloud environments — specifically public clouds — can become prohibitive and are sometimes difficult to predict (e.g., in the case of an unplanned disaster or outage). Access patterns of data and the relative location of data and their associated application(s) should be well understood to ensure that these fees do not become prohibitive and that data movement is executed in the most cost-effective manner possible.

2. Ensuring Comprehensive Data Security and Compliance

- **Use case context.** IDC's *IaaSView Survey* shows that one of the top challenges enterprises face when using multiple cloud IaaS providers is the lack of unified security monitoring and management systems across all providers. This lack of unified security in hybrid environments can make data protection and threat detection extremely manual processes. In many cases, the result is that enterprises struggle to maintain compliance with regulatory requests if they can't identify or protect specific user data across their cloud environments. Even worse, enterprises may be at higher risk of malware/ransomware attacks without the right tools to provide visibility across their cloud ecosystem, identify potential breaches, and quickly recover data and applications that may have been compromised.

- **Hybrid cloud strategic approach.** A comprehensive hybrid cloud approach can ensure that data security and compliance policies are set and enforced across a range of cloud environments. Centralized security dashboards and control planes enable the enforcement of user access to data across cloud environments and help ensure that a specific data type, or data associated with a specific user, can be tracked, audited, and deleted regardless of the underlying infrastructure on which it resides. Higher-level functionality such as security analytics, reporting, and alerting become significantly more effective when enterprises have visibility across their entire hybrid cloud environment. This in turn helps organizations more effectively detect and respond to malicious attacks such as ransomware.
- **Challenges to consider.** Complex cloud infrastructure environments have the potential to create more points of potential failure, human error, and vectors for attack. Deploying infrastructure and applications across hybrid environments requires a comprehensive approach to security, which may extend purchase and implementation processes or require more extensive professional services engagements when compared with alternatives.

3. Enabling Cloud Workload Placement and Migration

- **Use case context.** IDC research shows that there isn't a simple way of categorizing workloads as "suited for the cloud" or "not suited for the cloud" based on the workload functionality, and functionality alone is not a sufficiently strong criterion to prioritize workloads for movement. Moreover, many use cases require multiple workloads operating together, often in close proximity, to deliver the desired user experience. In practice, cloud application migration is typically achieved through a series of discrete migration exercises — each one focused on moving a specific workload or set of workloads into cloud environments that are considered a "best fit" in terms of price and performance.
- **Hybrid cloud strategic approach.** For many organizations, workload movement is an inevitability. When organizations design or modernize an infrastructure environment, it's best to assume applications will never remain static. Digital transformation and infrastructure modernization, combined with unforeseen events such as COVID-19, will drive application churn within enterprises. A hybrid cloud infrastructure strategy should ensure that applications and their underlying data have the flexibility to move across environments as requirements change over time, eliminating any requirements that limit applications to a single location or physical system necessary for operation.
- **Challenges to consider.** It is important to remember that cloud adoption in enterprise IT organizations is still relatively nascent. Self-reported numbers on cloud maturity gathered by IDC (measured on a 1–5 scale) show that about half of the enterprises see themselves in the early stages of cloud maturity (1–3). This relatively low self-identification of maturity means many organizations might not find it effective or feasible to jump straight to a complex migration of mission-critical workloads to hybrid cloud environments. IDC's recommendation is for organizations to start small — with a single use case or application, such as email, or a specific set of digital records/data — with the goal of quickly executing workload migration, proving the viability of the project from a user perspective and a business perspective, and then incorporating additional applications/workloads in subsequent projects.

Considering TierPoint's Hybrid Cloud Solutions

TierPoint offers a portfolio of solutions and services built on a software-defined, hybrid cloud infrastructure. TierPoint positions its infrastructure services at the critical intersection among cloud instantiations (e.g., public, private, dedicated). This makes TierPoint a key partner for organizations looking to deploy hybrid cloud infrastructure across a range of environments and/or use cases.

TierPoint provides several hybrid cloud solutions, primarily based on technology from VMware, including VMware Cloud Foundation (VCF). TierPoint services are validated and optimized to work alongside a host of VMware Cloud and VMware Cloud Foundation solutions.

- **What is VMware Cloud Foundation?** A core component of the VMware Cloud ecosystem, VCF is a hybrid cloud infrastructure solution that provides a software-defined platform (i.e., compute, network, and data services) for highly virtualized and container-based workloads. VCF's fully integrated software stack combines software-defined compute (VMware vSphere), software-defined and hyperconverged data services (VMware vSAN), network virtualization (VMware NSX-T), and cloud management (VMware vRealize Suite) into a single platform that can be deployed on premises as a private cloud or run as a service within a public cloud.

Close integration with VMware Cloud and VCF allows TierPoint to help customers deploy infrastructure resources and applications across hybrid environments, regardless of workload requirements. TierPoint offers a range of automated infrastructure provisioning tools and data life-cycle management solutions that can be deployed across hybrid cloud environments to help enterprises achieve high-level data visibility, security, and management. TierPoint's goal is to help enterprises deploy, optimize, and automate as much of their hybrid cloud infrastructure as possible — allowing organizations to focus on application and workload management.

Relevant in the context of this paper is the fact that TierPoint also provides consumption-based subscription pricing models that align with cloud billing models. Many organizations rely on these consumption-based subscription models to make operating across cloud environments a cost-effective option. If a customer chooses a multitenant solution from TierPoint, it can price the deployment per resource pool (which is determined by the storage, compute, and memory sizes utilized). If the customer requires a private cloud solution, TierPoint can separate the capital expenditures of the hardware from the cost of the virtual resources it will be using. Customers can also "burst" their compute and storage capacity and pay an on-demand, hourly rate as needed to accommodate emergency scale-up or scale-out situations.

Challenges

As a services provider, TierPoint is responsible for helping enterprises deploy and operate their hybrid cloud infrastructure. For many organizations, partnership with TierPoint may be their first experience deploying a hybrid cloud service. Delivering a satisfactory experience may require a significant amount of planning and education as well as a high level of execution — no small task for any cloud services provider. Few customers have the maturity to come to TierPoint with a fully baked hybrid cloud strategy and data/application migration plan. Many times, engagements with providers such as TierPoint start small, at the level of a single application, database, or workload, and then grow over time based on the customer's adoption rate, maturity, and satisfaction. Such relationship building takes time and diligence on the part of the services provider to ensure the customer's cloud strategy is executed correctly.

TierPoint also faces challenges inherent to the VMware Cloud ecosystem. Organizations unfamiliar with application virtualization, VMware, and VCF will likely evaluate alternative solutions and may require additional education regarding the value of VMware in the hybrid cloud, as opposed to traditional virtual environments deployed on premises. There are also technological challenges associated with this type of hybrid cloud, software-defined infrastructure deployment. Multiprotocol storage (file, block, object) workloads often require very different features and administrative skills. Supporting these different workloads on the same system, in a hybrid environment, requires more than just access; each workload type requires its own set of storage management functionality that also needs to be available. And an administrator skilled in managing low-latency, transactional, and mission-critical workloads may not have the skills to manage multipetabyte object-based workloads where massive capacity, low cost per gigabyte, and geographic distribution are critical. While this complexity may slow adoption or deployment times for enterprises, it's important to note that one of the major benefits of partnering with a provider such as TierPoint is to gain access to partner expertise and support to overcome these challenges.

Conclusion

In many ways, hybrid cloud presents organizations with a classic technology conundrum: increased flexibility and operational effectiveness at the cost of added complexity. No single tool, whether from a large platform provider or specialized partner, can handle the job of managing, securing, and optimizing an organization's data and workloads across the myriad instantiations of technology and platforms that make up an enterprise hybrid cloud. However, the buyer analysis and trends outlined in this paper indicate that many organizations are designing a cloud strategy with "hybrid" as their long-term goal. In many cases, the flexibility of this hybrid approach (including public, private, and dedicated cloud assets) is what makes it compelling for enterprises as they adopt a range of cloud-based applications and infrastructure.

Many organizations are designing a cloud strategy with "hybrid" as their long-term goal.

About the Analyst

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Andrew Smith is a Research Manager within IDC's Enterprise Infrastructure Practice. Andrew's research focuses on public cloud infrastructure-as-a-service platforms and solutions, with specific focus on storage services. Andrew contributes to market sizing and forecast efforts across IDC's public cloud IaaS segments, as well as adjacent markets like multicloud data management, data protection as a service, and public cloud cold storage.

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Organizations have endless options when implementing IT transformation initiatives, and it can be complex and overwhelming. TierPoint, a leading provider of secure, connected datacenter and cloud solutions, works to fully understand clients' business needs in order to craft an end-to-end solution that will help you grow today, tomorrow and in the years to come. VMware is a pioneer and leader in virtualization and cloud infrastructure solutions and is a core component of TierPoint cloud services. Leveraging industry leading virtualization and cloud infrastructure solutions from VMware, TierPoint guides clients in choosing the right cloud solution(s), helping to ensure the optimization of cloud computing systems. The strategic partnership between TierPoint and VMware helps customers along their journey to IT transformation.

IDC Custom Solutions

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