This Spotlight discusses the emerging category of distributed cloud computing and how it is enabled by innovative partnerships between infrastructure and software vendors.

The Next Era of Cloud Will Be Defined by Data Gravity, Distribution, and Portability

August 2023

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Introduction: The Cloud Computing Discussion Has Changed

Over the past 18–24 months, the meaning of the term *cloud computing* has undergone an evolution. It no longer refers to a specific location (such as a hyperscale cloud) but rather describes the cloud as a general operating model for IT across multiple endpoints. Organizations can get the benefits of this model — scalability, consumption-based pricing, and connections to adjacent cloud services — in the public cloud, private or dedicated environments, and at the edge.

The cloud industry is seeing the beginnings of a new era where lock-in, silos, and other limiting factors are mitigated by an abstraction layer that empowers customer choice of workload deployment. This abstraction layer is driven by the need for distributed clouds that maximize customer success in areas such as data locality, data sovereignty, lower latency, higher security for sensitive workloads, and support for cloud-native application development.

Recent IDC survey data found that 60% of respondents had already moved some workloads out of public clouds. A wholescale departure from public cloud is highly unlikely, given the dependencies created by mature use of adjunct public cloud services in new cloud-native applications or modernized ones. But public cloud has its limitations, particularly when weighing the diverse needs presented by data-intensive workloads, including latency, sovereignty (defined here as data stored in a particular country or territory due to regulatory, security, and other concerns), and the size and cost involved with maintaining these workloads.

AT A GLANCE

WHY IT'S IMPORTANT FOR CUSTOMERS

The cloud is no longer about a single location. Instead, it describes a general operating model for IT as vendors evolve their technologies and respond to customer demand for more flexible workload placement.

KEY TAKEAWAY

We are entering a new era of cloud computing where customers seeking to optimize spend and meet ever-evolving business requirements around data have more choices and opportunities to work with vendor partners to distribute clouds to needed endpoints.

New Players and New Partnerships Drive Customer Choice and Success

Colocation providers recognize the opportunity in helping organizations run their workloads with more precision around location, specifically in a realm that lies beyond on-premises locations and hyperscale public clouds. This trend is evolving the concept of edge computing beyond that of smaller devices running in edge locations and toward full-blown offerings with far greater compute and storage potential. Colocation providers are partnering with software vendors to deliver combined solutions that run on bare metal, providing a performance boost, while still selling and managing in a cloudlike manner and adhering to compliance mandates.

This change is not merely a fact of emerging technologies. It also is the result of new paradigms, tied to the distributed cloud model, which will help drive choice for organizations as they navigate a world marked by rapid change in business and social environments. Companies want and need to move faster, more nimbly, and more cost effectively to address challenges such as data gravity and emerging regulatory requirements. They also need to optimize spend in the face of economic realities like inflation, meet the demands of today's increasingly remote workforce, and develop cloud-native applications that appeal to their own customers while improving internal operations.

To summarize, cloud workload portability has long been an aspirational mantra but one not backed by reality as vendors seek to maintain competitive advantage. This is clearly changing as organizations embrace the idea of the distributed cloud operating model. Vendors that remain geared toward customer lock-in risk being left behind.

Trends

Disruptive Forces Lead to New Opportunities

The distributed cloud model aligns with the following macro trends disrupting the IT market today:

» **Generative AI systems:** The explosive buzz around generative AI systems — which generate content such as text, images, and video in response to a user's request — is more than hype. Developers are embracing the use of this technology in their work. A May 2023 IDC survey of developers at companies with more than 1,000 employees found that 67% are using generative AI apps such as ChatGPT and Copilot, while 46.5% are in the process of using generative AI to build an application or develop a business use case. Generative AI requires powerful computing environments, commonly powered by GPU instances; it also utilizes massive data sets to train the models. These needs will only grow as generative AI models are further developed with ever-larger data sets. A distributed cloud strategy supports generative AI by giving customers a choice over where to deploy these workloads in the most cost-effective way while addressing data latency, locality, and proximity.

» **Industry partnerships:** Partnerships such as the Bandwidth Alliance are seeking to lower data egress and networking costs for their customers. The Bandwidth Alliance was founded by Cloudflare in 2018 and has since grown to nearly 20 members, ranging from smaller players to hyperscalers. Members agree to waive or discount data egress fees for mutual customers. This approach supports the distributed cloud model by helping organizations avoid or mitigate the high cost of moving data from one cloud provider to another, allowing them to devote more resources to innovation.

» **Digital sovereignty:** This is defined by IDC as "the capacity for digital self-determination by nations, organizations, and individuals." IDC's digital sovereignty framework describes a "stack" that includes data sovereignty, meaning the practice of collecting and storing data in a manner that meets local regulatory requirements, technical

sovereignty that refers to the actual hardware and software infrastructure used to create a sovereign environment, and operational sovereignty or the tools and processes that enable a sovereign environment. The distributed cloud model supports digital sovereignty through factors such as data locality and cloud neutrality.

Benefits: Why Distributed Cloud Is the New Standard for Enterprise Success

IDC data shows that customers today predominantly live in a multicloud and hybrid cloud world. IDC's *Future of Digital Infrastructure Worldwide Sentiment Survey* found that 72% of respondents plan to use and integrate multiple public clouds. Only 20% center their strategy on a single public cloud. Nearly 80% seek to lower their interconnection costs by modifying how they build their networks, and close to half have invested in multicloud networking. All these findings support the distributed cloud model, in particular with regard to application migration and portability between clouds.

While hyperscale cloud providers continue to build out new regions at a steady clip, they still do not support many parts of the world with local infrastructure. Efforts by telcos and colocation providers to offer cloud infrastructure, often coupled with software vendor partnerships, are helping fill these geographic gaps. The distributed cloud model can take advantage of this trend to minimize data latency, support digital sovereignty, and help customers achieve true global reach with their infrastructure.

For customers to maximize the value of the distributed cloud, a consistent control plane and application development environment are critical. It offers no value and in fact adds significant friction and difficulty for an enterprise to use multiple clouds if they must reimplement applications to run on each one, given the limitations most have on staff resources as well as the need to retrain that staff to work with multiple cloud platforms.

IDC research shows that customers are keen to diversify the locations where they place workloads (see Figure 1).

FIGURE 1: *Allocation of Production Computing Workloads and Storage Capacity Deployments*

Q *What is your best estimate of your organization's current allocation of production computing workloads and storage capacity deployments? And what do you expect the allocation to be in two years?*
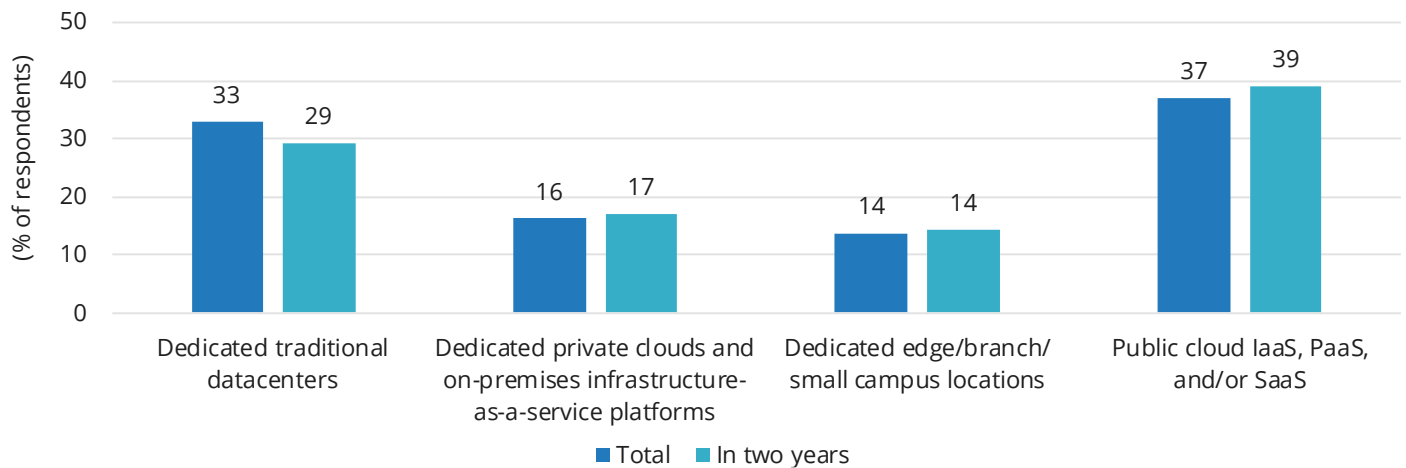
n = 87

Note: The data is weighted by country IT spend.

Source: IDC's Future of Digital Infrastructure Worldwide Sentiment Survey, June 2023

Considering VMware Cloud on Equinix Metal

VMware has partnered with Equinix to deliver a new distributed cloud service to be made available in metro locations around the globe.

VMware Cloud on Equinix Metal

The VMware Cloud on Equinix Metal (VMC-E) solution extends VMware Cloud to distributed colocation endpoints, and when combined with Equinix's Metal, it can address the demands of data-intensive and latency-sensitive applications where data locality and data residency matters.

The vast amount of Equinix metro locations available to deploy VMware Cloud will help customers meet the requirements of data residency and manage data costs while delivering the high-speed, low-latency application performance that end users expect in today's digital business.

VMware Cloud is VMware's multicloud IaaS that effectively creates an abstraction layer for applications to be deployed and managed on any endpoint location while delivering a consistent and predictable cloud experience. In this case, the endpoint is Equinix Metal.

For VMware Cloud on Equinix Metal, VMware fully manages the software as a cloud service to ensure applications are delivered with maximum uptime while providing a highly secure environment that possesses the latest updates and feature enhancements.

Customers subscribe to the bare metal service directly from Equinix, which is combined with the VMware Cloud subscription to build, manage, and operate a robust cloud. The solution is packaged to deliver a predictable cost over the subscription term to limit variability or surprise bills, resulting in better cloud economics for data-intensive workloads.

VMware Cloud on Equinix Metal also meets the demands of a trusted cloud by delivering data residency for highly regulated application workloads. This fully managed cloud solution is delivered with single-tenant occupancy to ensure that tier 1 applications maintain the same policies and procedures that would be delivered on premises. It is able to leverage Equinix Fabric to provide secure connectivity for private B2B network transactions.

VMware Cloud on Equinix offers businesses the opportunity to extend their cloud reach to the distributed locations for both their traditional datacenter and their replicated site locations. It does this by addressing the optimal balance of cost, performance, and control in a single cloud service (see Figure 2).
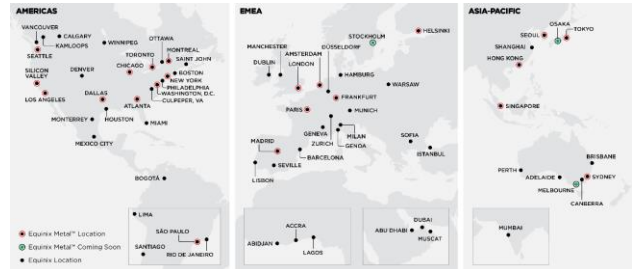
FIGURE 2: *VMware and Equinix Partnership*

VMware + Equinix: Cloud Smart Co-Innovation Agenda

A NEW Distributed Cloud Service

Multi-Cloud IaaS from VMware   Digital Infrastructure Services from Equinix

VMware Cloud on Equinix Metal

Source: VMware, 2023

Challenges

While IDC views the distributed cloud model as ideal for customer needs, it also presents certain challenges around investment choices, cultural change to the way IT operates, and the tight market for top talent.

VMware has been addressing these challenges with the consistency of VMware Cloud across all environments, and its partnerships with Equinix and others are helping drive customer choice. As a longtime leader in software-defined compute, VMware is not resting on its laurels. It has successfully crafted a messaging and product strategy around multicloud IaaS while maintaining its status as a leading virtualization and containerization vendor.

Conclusion

These are changing and challenging times in the enterprise cloud computing market. Customers have allegiances and deep investments with key providers but also are seeking new levels of choice and flexibility.

Switching costs have never been trivial in technology, but the advent of software platforms that can be deployed in any location with a minimum of effort and disruption is critical to the next wave of cloud, which is being defined by factors such as data mobility, data gravity, and workload efficiency. IDC views partnerships such as those being advanced by VMware and Equinix as key to these macro trends.

> These are changing and challenging times in the enterprise cloud computing market.

About the Analysts

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Chris Kanaracus is a research director in IDC's worldwide infrastructure practice, where he focuses on emerging technology and strategies concerning public cloud, hybrid cloud, and related workloads. With 15 years covering enterprise technology as a journalist and analyst, Chris brings a broad perspective to this area of market research with a keen interest and eye toward the needs of end customers and, consequently, how technology suppliers can find greater success serving them.
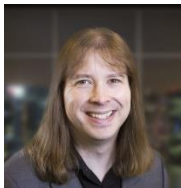
Dave McCarthy, *Research Vice President, Cloud and Edge Infrastructure Services*

Dave McCarthy is a vice president within IDC's worldwide infrastructure practice, where he leads a team of analysts covering shared (public) cloud, dedicated (private) cloud, and edge strategies. Benefiting both technology suppliers and IT decision makers, Dave's insights delve into how hybrid and distributed cloud platforms provide the foundation for next-generation workloads, enabling organizations to innovate faster, automate operations, and achieve digital resiliency.

MESSAGE FROM THE SPONSOR

About VMware

VMware is a leading provider of multi-cloud services for all apps, enabling digital innovation with enterprise control. As a trusted foundation to accelerate innovation, VMware software gives businesses the flexibility and choice they need to build the future. Headquartered in Palo Alto, California, VMware is committed to building a better future through the company's 2030 Agenda.

For more information, please visit www.vmware.com/company.

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