



White Paper

Cisco Multicloud Datacenter: Powered by Intent-Based Networking

Sponsored by: Cisco Systems

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December 2017

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IDC OPINION

As increasingly valuable business applications are distributed among on-premises datacenters, private clouds, and public clouds, multicloud effectively becomes the datacenter. Within this context, enterprise IT must fully leverage multicloud application environments in pursuit of strategic business objectives.

IDC finds that successful multicloud initiatives require a comprehensive approach to datacenter infrastructure – compute, storage, networking, and security – that addresses the evolution of applications, the proliferation of distributed workloads, and the growing complexity of IT management and operations. To accommodate new IT consumption models, such as cloud and IT as a service (ITaaS), datacenter infrastructure must be modernized, open, and highly automated. Further, such infrastructure must benefit from policy-based control and management as well as real-time analytics that extend across multicloud environments to ensure that policy is applied consistently, securely, and uniformly.

Responding to this challenge, Cisco Systems has developed a multicloud datacenter architecture predicated on a closed-loop intent cycle that features continuous learning, constant adaptation, and pervasive protection. Modernized datacenter infrastructure provides the foundation, supported by intent-based networking that extends throughout the multicloud environment, workload management software, the ability to map and migrate cloud applications as needed, application performance management (APM), and real-time analytics and security.

Built to meet the demands of multicloud and powered by intent-based networking, Cisco's objective is to provide enterprise IT with an extensible datacenter that can support and deliver the increasingly distributed applications that are essential to business success.

SITUATION OVERVIEW

Digital transformation (DX) is an essential imperative across all industries, cities, and nations worldwide. Enterprises and other large organizations recognize that digital transformation is necessary to realize both business process transformation and business model transformation. Even long-standing industry leaders can be and are being displaced by agile digital upstarts that are proficient in their utilization of 3rd Platform technologies such as cloud, mobile, and big data (data analytics), and social business.

IDC believes that technology will increasingly determine how businesses define and distinguish themselves in the market. It will also determine the ability of organizations to meet the increasingly personalized needs of their customers. To this end, a modern IT infrastructure is a critical element of a well-rounded digital business strategy. Most organizations were not born digital. Instead, they have legacy business processes, applications, and infrastructure that require modernization and automation. The goal is a cloud or IT-as-a-service model that supports self-service provisioning, enables real-time insights, and empowers agile operations.

Cloud is a foundational means through which organizations achieve digital transformation, and investments in hybrid cloud and multicloud technologies are ramping accordingly. IDC estimates that by 2020, about 67% of enterprise IT infrastructure and software will be dedicated to cloud-based applications and services. Moreover, by 2018, about 85% of enterprises worldwide will have evolved their digital transformation strategies to encompass multicloud postures. The pace of that shift will be accelerated by additional waves of digital transformation in areas such as the Internet of Things (IoT), cognitive computing, analytics, robotics, and next-generation security.

As a result of these developments, applications – always of great value to enterprises – will gain unprecedented importance, serving as the digital lifeblood for all organizations. In the context of digital transformation, applications are the new face of business. Applications generate revenue, drive the business, and increasingly differentiate organizations from their competitors.

Given the paramount importance of applications, their creators – developers – have become the heart of business transformation. By extension, developers also have become invaluable customers of enterprise IT. Legacy applications remain, but they are perceived as cost centers. Newer applications, designed by developers for customer engagement, directly impact the top and bottom lines and are highly prized for their business value. As a result, IDC sees IT platforms being built and extended to support digital repositories that enable new information-driven processes inside the digitally transformed organizations.

Increasingly, developers are determining whether this new wave of business applications resides in the public cloud or the private cloud. For its part, enterprise IT must address developer requirements so that it can provide business value and contribute meaningfully to the success of cloud and DX initiatives. Enterprise IT also must work more collaboratively with developers to mitigate the spread of shadow IT.

With developers leading the charge, organizations will deploy new applications in multiple public and private clouds while leaving legacy business applications in on-premises datacenters. Effectively, multicloud has become the new datacenter, with distributed applications spanning multiple datacenters. This trend will be accentuated and amplified by the rise of microservices, yielding a growing number of business-critical applications developed with the express purpose and innate capability of migrating between cloud datacenters. Indeed, as a result of microservices, developers are beginning to construct highly distributed application environments in which application tiers and data services are spread across multiple datacenters and public clouds.

Consequently, it becomes critically important for enterprise IT to manage, optimize, and fully leverage multicloud environments in strategic service to business objectives. The inherently complex nature of distributed application environments will make this task exceedingly challenging. Nevertheless, the journey toward digital transformation will necessarily involve a multicloud world.

For successful deployment and delivery of multicloud applications, enterprises will require datacenter infrastructure that provides an all-encompassing architectural approach that addresses the evolution of applications, the proliferation of workload locations, and the resulting complexity of IT management and operations. To be sure, datacenter infrastructure – compute, storage, networking, and security – must be modernized to accommodate both existing and new applications. At the same time, this modernized infrastructure must be open and highly automated. Only with such infrastructure in place can enterprise IT evolve toward new IT consumption models, such as cloud and IT as a service, and establish the foundation needed to reliably deliver and support the applications that are integral to business agility.

The deployment of the right infrastructure sets the stage for the implementation of capabilities such as self-service developer portals. It also affords the flexibility needed to support application portability, giving developers the option of moving applications and data between private and public clouds while offering enterprise IT the means of providing for business continuity and disaster recovery.

To meet these objectives, enterprises will need to define and apply a common, consistent intent-based policy model that spans on-premises datacenters and public clouds. Moreover, they'll need to leverage pervasive, real-time analytics that extend across multicloud domains to ensure that the prescribed intent is being enforced properly throughout the distributed multicloud environment. Intent must be not only well defined but also consistently applied.

Cisco Intent-Based Multicloud Datacenter

Responding to the previously mentioned challenges with a pragmatic model, Cisco's multicloud datacenter is predicated on a closed-loop intent cycle comprising three integrated and interrelated pillars: constant learning, adaptation, and protection (see Figure 1).

FIGURE 1

Cisco's Intent Cycle



Source: Cisco, 2017

The closed-loop intent cycle approach empowers organizations to optimize application performance, security, and reliability by constantly learning, protecting, and dynamically adapting to the ever-changing needs of the application-driven businesses. It is all about accurately and continuously capturing the intent of the applications, the users, and the business, and then ensuring that the defined intent is consistently enforced across the multicloud application environment.

Supplying the foundation for these capabilities is agile, responsive, on-premises datacenter infrastructure. Cisco provides a range of compute, network, and hyperconverged infrastructure (HCI) solutions that include integrated compute infrastructure in the form of Cisco's Unified Computing System (UCS), network infrastructure represented by the Nexus line of datacenter switches, and hyperconverged infrastructure in the form of Cisco HyperFlex, which combines software-defined compute, storage, and networking.

Atop the infrastructure is Cisco Application Centric Infrastructure (ACI), which provides policy-driven automated control, management, and orchestration of on-premises datacenter network infrastructure, multisite datacenter networks, and multicloud network environments. Meanwhile, Cisco Workload Optimization Manager dynamically allocates and aligns application demand with infrastructure supply, elastically scaling up or down environments as needed. In addition, Cisco Intersight leverages analytics and machine learning to provide cloud-hosted systems management for UCS and HyperFlex environments.

For IT teams seeking to build private clouds and PaaS environments, Cisco offers validated integrations with a range of ecosystem partners as well as with OpenStack and Docker. For those looking to leverage public cloud, Cisco offers CloudCenter, which provides a means of aligning and mapping application blueprints between on-premises datacenters and public clouds, suited to application modeling and application migration in multicloud environments.

Developer instrumentation for multicloud is provided by AppDynamics, an application performance management software designed to ensure that applications perform consistently and satisfactorily even in complex, distributed multicloud environments.

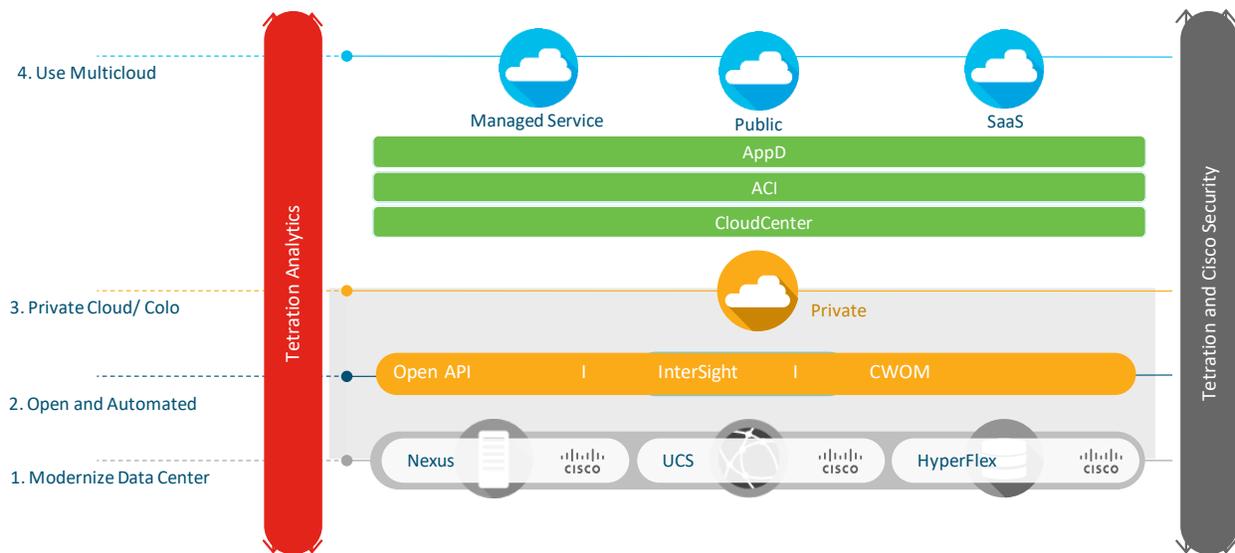
For analytics and security, the Cisco Tetration Analytics platform enables enterprise IT to gain real-time visibility into application components and dependencies while allowing for application segmentation and a zero-trust security model predicated on application behavior and whitelisting. Cisco's broader portfolio of security products also provide additional lines of defense across the spectrum of multicloud environments.

Figure 2 provides Cisco's intent-based datacenter architecture.

To further facilitate the journey to multicloud, Cisco also offers comprehensive services in areas that span advice (advisory services), implementation, optimization, managed services, technical services, and training.

FIGURE 2

Cisco's Intent-Based Multicloud Datacenter Architecture



Source: Cisco, 2017

OPPORTUNITIES AND CHALLENGES

In providing an intent-based datacenter for multicloud, Cisco is embracing a range of opportunities and challenges.

Of the opportunities, the largest is represented by the provision of greater value to Cisco's enterprise customers as they pursue hybrid cloud strategies through a multicloud posture. Further, Cisco has an opportunity to extend its presence in enterprise buying centers other than its traditional core of network professionals. At the same time, Cisco has an opportunity to deliver capabilities in areas beyond traditional infrastructure, such as APM, streaming analytics, and cloud-based networking and security. More generally, Cisco is positioned to deliver greater value and to derive recurring revenue from subscription-based software and services.

That said, there are also challenges, not least of which will come from competing vendors with alternative solutions. Other providers of datacenter infrastructure are witnessing the same developments in the market, and they're also attempting to provide customers with offerings that address multicloud requirements. The competition will be fierce. Moreover, Cisco must continue to adapt its product portfolio and business model to address cloud consumption models and cloud economics. Finally, Cisco must hope that enterprise customers continue their embrace of multicloud, effectively eschewing an alternative that would see them, as individual companies, take all or most workloads to a single cloud or cloud provider. Notwithstanding that potential scenario, IDC research indicates that multicloud is ascendant and will be a reality for the foreseeable future.

CONCLUSION

In just a few short decades, IT has moved from the back office to the front office to the point where it has embedded itself into nearly every aspect of our personal and business lives. Supporting radically different business processes requires that IT transformation becomes a strategic priority for CIOs in all industries. IDC believes that in this era of digital transformation, organizations cannot continue to rely on technology advancements of the past. As business objectives change, IT infrastructure requires a new set of considerations. IT leaders need to start preparing their IT systems today to ensure that they have the IT agility and flexibility necessary to support the scale and agility requirements of their digital business objectives. This shift places IT at the forefront of several decisions aimed at transforming business processes and operational efficiencies.

With digital transformation as an undeniable business imperative, multicloud has become the preferred posture for organizations worldwide. At the same time, applications have gained unprecedented business importance, serving as the digital lifeblood and the face of business across every vertical industry.

As the creators of business-critical applications, developers are at the heart of these changes, driving business value through direct engagement with customers and other stakeholders while emerging as important customers for enterprise IT, which is compelled to provide developer portals and agile, as-a-service consumption models.

Through it all, the parameters of the enterprise datacenter have changed, as have the requirements. Multicloud is the new datacenter, and enterprise IT must respond with an all-encompassing architectural approach that addresses the evolution of applications, the needs of developers, the proliferation of workload locations, and the ensuing complexity of IT management and operations.

Cisco has responded to these needs with a multicloud datacenter architecture predicated on a closed-loop intent cycle that features constant learning, continuous adaptation, and pervasive protection. As a result, enterprises are able to achieve business agility through the embrace of highly distributed, multicloud environments that extend seamlessly from on-premises datacenters and private clouds to public clouds.

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