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As organizations adopt multicloud and cloud-native application environments to enhance agility and productivity, they are modernizing application delivery infrastructure, including application delivery controllers (ADCs), to support traditional and modern applications both on-premise and in public clouds.

Multicloud and Cloud-Native Applications Drive Need for ADC Transformation

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Introduction

In their ongoing pursuit of digital transformation, an acute imperative worldwide, organizations are increasingly adopting hybrid IT and embracing multicloud.

They're doing so to increase business agility and to compete more effectively against both new and established rivals across a range of industries. To an unprecedented extent, all organizations are digitizing aggressively, and all enterprises are becoming more like technology companies. The cloud, as both a destination and an operational model, is a critical means to that end, and multicloud is an increasingly prevalent posture for a growing number of enterprises.

AT A GLANCE

KEY STATS

In IDC's 2018 *IaaSView Survey*, 46% of respondents cited application suitability or use case as a top reason for adoption of multicloud, while 34% sought to mitigate vendor lock-in, 32% referenced architectural reasons, 31% said different internal teams had varying needs, and 29% cited the need for pricing/negotiation leverage.

Although the benefits that can accrue from multicloud are compelling, the networking implications are profound. This is particularly true for datacenter networking. In the client/server era, the datacenter network was exclusively on-premise, but multicloud means that the datacenter (and its network) becomes inherently distributed and more complex to provision and manage.

The effect of multicloud is particularly acute higher up the network stack, at Layers 4 through 7, where technologies such as load balancing and application delivery controllers (ADCs) hold sway. It makes perfect sense because as applications become more valuable to enterprises, as both systems of engagement (with customers, employees, and partners) and back-end systems of record, networking at the application layer — the layer closest to the application — grows in stature.

In the case of load balancing and ADC technology, this means that enterprises increasingly value a distributed approach that continues to accommodate traditional applications while providing the cloudlike agility and flexibility required in multicloud environments, which is where modern, cloud-native applications are deployed.

Changes in application architectures and deployment models are demanding such a response. Architecturally, organizations are moving from traditional, monolithic applications to agile, modern, and cloud-native applications based on containers and microservices. Meanwhile, deployment models are evolving from exclusively on-premise datacenters to hybrid IT-based multicloud, allowing each application to be placed where it can provide optimal efficiency and favorable business outcomes. The shift to multicloud reinforces the focus on agility while providing unprecedented levels of availability and elasticity.

We're also witnessing shifts in the operational model, as organizations increasingly adopt DevOps, often in the context of continuous integration/continuous delivery (CI/CD) practices. Increasingly, IT infrastructure and resources must be aligned with developer and application requirements, providing ever greater degrees of agility and automated self-service.

Meeting Cloud-Native, Multicloud Challenges

Change, however salutary, entails challenges. At the forefront of these challenges is mitigation of management complexity spanning both traditional and modern application delivery in multicloud environments. In this context, a need arises for a centralized management plane, establishing consistent application and policy control through orchestration and provisioning of ADC resources across the multicloud landscape.

An additional requirement is for cloudlike and cost-effective consumption models for ADC resources. Traditional approaches to procuring and consuming ADCs, involving oversubscribed hardware appliances and inflexible architectures, are not tenable in multicloud environments. The agility and inherent elasticity of multicloud demand a more comprehensive and flexible approach to providing elastic ADC resources that results in optimized total cost of ownership and service-oriented application delivery that can autoscale for any application environment.

There is also an unprecedented need for deeper visibility and real-time insights into application traffic. This is particularly true for cloud-based applications and cloud-native environments, where dynamic and often ephemeral microservices require pervasive application layer observability. The fact that the application environment is now inherently distributed, extending well beyond the on-premise enterprise datacenter and the traditionally constituted datacenter network, makes this requirement a more daunting challenge.

Similarly, there is a need to ensure that security and compliance are consistently maintained across multicloud application environments, for both north-south and east-west traffic. Multicloud expands potential vulnerabilities and attack vectors and presents traffic patterns and infrastructure, such as containers, that make security a more complicated proposition.

What's more, organizations face the operational challenge of offering greater DevOps agility and efficiency, providing role-based access controls to development teams and IT operations.

Benefits

Organizations that correctly implement an application delivery strategy for multicloud will see a range of qualitative and quantitative benefits.

First and foremost, they will be able to execute the aforementioned use cases and fully derive the benefits associated with multicloud, optimally placing each application where it truly belongs and delivering high levels of availability, reliability, security, and elastic scale.

Second, they will have deployed a cost-effective and dynamic pool of ADC resources that can accommodate and respond to any application need or business requirement, giving them the means of allocating ADC resources efficiently and promptly to meet application requirements across all infrastructure form factors and multicloud environments.

An associated benefit is that they will have to implement a consistent policy model across their application landscape, ensuring that all applications receive the ADC resources necessary to meet compliance and security requirements. Additionally, using a single ADC platform that has the flexibility and cost-effective scale for multicloud helps reduce the complexity of implementing and managing disparate load balancing and ADC resources across application architectures (traditional and modern), form factors, and environments (on-premise, private cloud, and public cloud).

Application visibility and security ensure that application policy and compliance are maintained and that applications remain available and responsive, delivering productivity for employees and satisfying digital experiences for customers. While these capabilities are more difficult to deliver in a context where applications are both traditional and modern, and where those applications reside not only in an on-premise datacenter but also increasingly in clouds, they are more important than ever.

Other important benefits are greater operational agility and efficiency, prized by all organizations pursuing digital transformation and achieved through centralized management of application delivery infrastructure.

Another benefit, especially for organizations embracing DevOps principles, comes from putting into effect a logical separation of concerns for developers and operators. Developers receive the features they want while the operations team gets the capabilities it needs from the application delivery infrastructure. This alignment with DevOps practices can result in mutually beneficial results, such as self-service IT, whereby the operations team uses automation to provide developers with faster provisioning.

Trends

Major trends driving the need for modernized application delivery infrastructure include enterprise embrace of multicloud, the rise of cloud-native applications using containers and microservices, and the growing adoption of DevOps practices.

There are many use cases driving adoption of multicloud. In IDC's 2018 *IaaSView Survey,* 46% of respondents cited application suitability or use case as a top reason for adoption of multicloud, while 34% sought to mitigate vendor lock-in, 32% referenced architectural reasons, 31% said different internal teams had varying needs, and 29% cited the need for pricing /negotiation leverage.

IDC data corroborates the role that cloud and multicloud are playing in enterprises' digital transformation initiatives. In IDC's latest *CloudView Survey,* conducted in the middle of 2018, 37% of respondents identified as "cloud first" — meaning they look to public cloud solutions first when they need a new capability, capacity, or functionality — and another 38% identified as "cloud also," meaning they look to cloud-based solutions while they review traditional suppliers and software. Only 21% of respondents continue to prefer on-premise offerings, resorting to cloud-based offerings only when traditional suppliers can't offer what they need.

In addition, 84% of respondents indicated an embrace of multicloud, with the number rising to 94% when respondents were asked about their multicloud orientation within the next 12 months. On average, organizations responding to the survey said they used five or more cloud architectures. IDC has found a direct correlation between the number of clouds leveraged by an enterprise and the degree of complexity associated with its multicloud challenge. Indeed, multicloud management, including the management of the network infrastructure on which multicloud depends, remains a significant enterprise priority.

Multicloud is redrawing the boundaries of what constitutes a datacenter and redefining what's required of a datacenter network, which now must extend outward to support on-premise workloads and workloads deployed in public clouds. This includes hardware and software infrastructure dedicated to application delivery, such as ADCs and application services.

The need for application delivery modernization is made more acute by the growing appeal of containers and microservices. IDC forecasts that the container infrastructure software market will grow from $131.1 million in 2017 to $1.55 billion in 2022. Though much of the adoption to date has occurred at web-scale companies, it is expanding into enterprises and bringing several challenges in its wake.

In IDC surveys, including IDC's 2018 *Container Infrastructure Software Survey,* enterprise respondents indicated that security, networking, and data management were their top challenges in container deployments. What's more, respondents to the same survey indicated that load balancing, container monitoring systems, and centralized logging systems, followed by software-defined networking for containers, were capabilities or features that they intended to deploy to support their container environments.

IDC is discovering that there is also a need for microservices to be able to find one another, connect, and receive additional application layer network and security services that are essential to runtime elasticity and scalability. Kubernetes orchestrates and provisions microservices in response to incoming demand, but Kubernetes is neither designed for nor capable of handling interservice communication traffic, responding to communication failures, or providing similar microservice networking capabilities such as observability and intracluster east-west load balancing.

This is where the service mesh (including the control plane and the underlying data plane) comes into play. "Service mesh" is a term that denotes an application layer network for microservices — discovering, connecting, securing, and providing traffic management for interservice communication.

As for DevOps, IDC has found that the primary drivers for enterprises are faster deployments (61% of respondents), the need for higher-quality and more consistent software deployments (58%), and improved developer productivity (48%). Increased revenue or profitability (47%), increased agility (47%), and the drive for faster infrastructure modernization (46%) were close behind.

IDC's *U.S. DevOps Survey 2018* found that respondents would run half their workloads in containers within two years. Automation is a heavy focus, with 44% of respondents saying they would seek to automate everything across the DevOps pipeline, and another 44% indicating they would automate infrastructure and provisioning to enable self-service portals. With respect to top features for automation solutions relating to DevOps initiatives, support for containers was cited by 63% of respondents and the ability to continuously scale (autoscaling) was cited by 59% of respondents. Survey respondents also expected developers to have a high level of influence in driving business value within the next 18 months.

Considering A10 Networks

A10 Networks addresses the challenge of multicloud and cloud-native application environments through a product portfolio that includes support for traditional and modern applications residing across a full array of infrastructure.

A10 Networks' ADC portfolio includes hardware appliances, software appliances (virtual editions), software that runs on bare metal, and cloud-native offerings based on containers (such as Kubernetes clusters). A10 Networks recently also introduced a service mesh offering.

By offering support for all application environments, A10 Networks provides customers with application delivery infrastructure that can be applied across the multicloud landscape, from on-premise datacenters and private clouds to public clouds. That means that A10 Networks' portfolio can help customers ensure consistency, compliance, and transition across all application environments.

In that vein, A10 Networks' FlexPool licensing solution allows customers to purchase licensed capacity and then allocate and redistribute that capacity flexibly as needed, from on-premise datacenters to multiple public clouds. A dynamic pool of ADC resources can be deployed across infrastructure and locations, regardless of how an organization's multicloud strategy evolves.

A key component of A10 Networks' multicloud portfolio is the A10 Harmony Controller, which provides centralized management, including application configuration and policy enforcement, as well as analytics for A10 Networks' complete range of secure application services. With Harmony Controller, customers can centrally manage all ADC form factors across different environments, including A10 Networks' cloud-native Lightning ADC and Thunder ADCs (both physical and software editions) as well as other company offerings such as Thunder CGN, SSLi, and CFW. Harmony Controller also enables operators to centrally configure and manage application delivery policies across on-premise datacenters, private clouds, and public clouds. Harmony Controller provides analytics and actionable intelligence that increase agility and efficiency by making management simpler and proactive. For example, per-application analytics provide deep visibility into application traffic, facilitating faster troubleshooting and remediation. This feature also enables proactive management practices, whereby incipient issues are detected, anticipated, and resolved before they become problems that affect application availability, performance, and security. Harmony Controller access can be shared between the IT and developer silos, overcoming a key area of contention within an organization. A10 Networks also supports autogenerated RESTful API capabilities, which can benefit DevOps practitioners.

On the subject of security, A10 Networks offers a wide range of inline capabilities, including offload (TLS/SSL), web application firewall (WAF), authentication services via application access management (AAM), and distributed denial-of-service (DDoS) protection. To go beyond the first-line DDoS detection that many ADCs offer, A10 Networks integrates

full packet-based DDoS detection that can communicate with a full DDoS scrubbing implementation solution. The company calls this One-DDoS and markets it to large enterprises and service providers.

As a result, accurate and granular data is leveraged and applied in a layered DDoS mitigation infrastructure that can redirect traffic for scrubbing. This full packet-based analysis provides more granularity than flow-based approaches, which A10 Networks also supports. A10 Networks' ADC portfolio also provides enhanced security for north-south as well as east-west traffic. In addition, A10 Networks' ADCs support new ciphers for TLS/SSL, giving customers high-performance options for meeting PFS/ECC requirements for TLS/SSL traffic as customers look to upgrade to meet the new standards that have become prevalent.

For multisite and multicloud use cases, A10 Networks includes a Global Server Load Balancing (GSLB) solution, which helps provide low latency and application responsiveness in geographically dispersed scenarios.

A10 Networks has also responded to the increased adoption of containers and Kubernetes clusters (including multicluster, multicloud scenarios) with its Secure Service Mesh, which includes east-west load balancing, security, and observability/visibility for microservices.

Challenges

IDC sees several challenges. First, DevOps influencers and buyers have not traditionally been a buying constituency with which many ADCs vendors have been familiar. Other challenges are represented by competition from both established and upstart ADC vendors, the rise of commodity open source load balancing and ADC offerings, and the growth of IaaS load balancing from cloud providers such as AWS.

At the same time, A10 Networks will benefit from the opportunities deriving from being able to provide a truly elastic, scalable, and service-oriented ADC platform that addresses the multicloud requirements of enterprise customers, which will want and need to consume application delivery services and technologies flexibly to accommodate traditional and modern applications.

Conclusion

The imperative of digital transformation has compelled enterprises worldwide to embrace cloud as both a destination and an operating model. As organizations adopt multicloud and cloud-native application environments to further enhance agility and productivity, they are looking at modernizing their application delivery infrastructure, including a full array of ADC technologies, to support traditional and modern applications both on-premise and in public clouds.

The imperative of digital transformation has compelled enterprises worldwide to embrace cloud.

A10 Networks is responding to these requirements by offering an extensive portfolio of ADC products that supports the full array of infrastructure form factors, deployment scenarios (on-premise, private cloud, public cloud), and application architectures, including traditional and modern applications, as well as flexible licensing based on capacity consumption. It also offers modern orchestration, security, and visibility management capabilities to ensure that multicloud applications continue to be available and responsive. If A10 Networks can continue to meet the challenges cited in this paper, it will remain well placed to help its customers execute their digital transformation initiatives and multicloud strategies.

About the Analyst

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