



Automation, Analytics, and Governance Power Enterprise Multicloud Management Strategies

IDC OPINION

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VMware

Author:
Mary Johnston Turner

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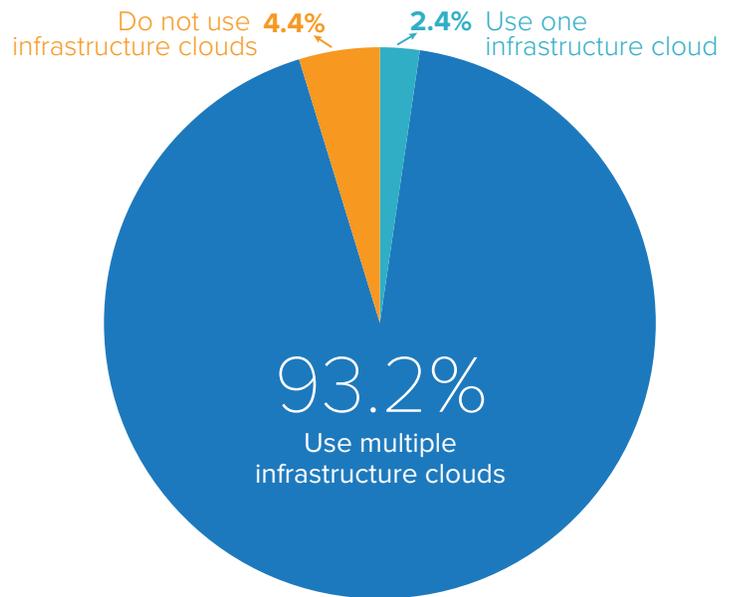
Digital business transformation is driving rapid innovation across many global industries. Business units and development teams look to public and private clouds to enable dynamic DevOps programs powered by microservices and containers and to provide access to advanced analytics, highly scalable on-demand infrastructure, robust automation, and differentiated serverless functions while allowing the organization to match IT spend to business utilization on a global basis.

Different clouds may offer unique capabilities and pricing options. Development and line-of-business (LOB) decision makers may have strong preferences for one cloud versus another cloud. Regulatory and compliance considerations, geolocation concerns, and resiliency, performance, and latency constraints may all dictate that an enterprise rely on more than one cloud. As a result, most enterprises are adopting multicloud architectures that blend infrastructure and advanced services from one or more public clouds and, in many cases, on-premises private clouds.

According to IDC's 2019 *Multicloud Management Survey* of United States–based enterprise IT decision makers, 93.2% of respondents reported that their organization is currently using more than one infrastructure cloud (see Figure 1). These multicloud users reported that optimizing cost, maintaining performance, and ensuring interoperability across clouds are critical to keeping the business competitive. They also confirmed that traditional management and governance tools are often unable to keep up with many challenges that result from IT organizations having to play the dual role of an infrastructure provider and an infrastructure services buyer. They cited the need for advanced automation, analytics, cost management, and governance capabilities to help optimize multicloud use.

This white paper describes the findings from IDC's 2019 *Multicloud Management Survey* and discusses how VMware is addressing enterprise multicloud management priorities. The insights in this white paper will help enterprise decision makers better set priorities and evaluate management solutions as they work to bring consistent governance, cost control, and automation to their evolving multicloud environments.

FIGURE 1 Use of Infrastructure Cloud by Enterprises



n = 296 United States–based enterprise IT decision makers

Source: IDC's *Multicloud Management Survey*, 2019

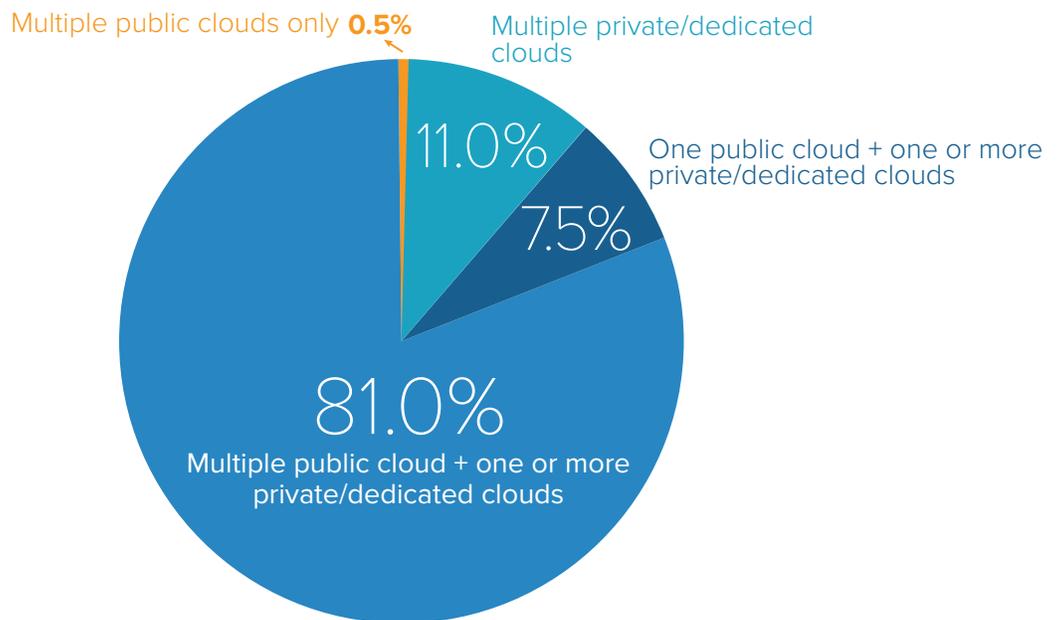


SITUATION OVERVIEW

Multicloud architectures are the new enterprise normal. IDC's 2019 *Multicloud Management Survey* shows that among current multicloud enterprise users, the most common pattern (81%) is to use two or more public IaaS clouds plus one or more private/dedicated clouds (see Figure 2). The most frequently used public IaaS clouds include Amazon Web Services (AWS), Microsoft Azure, and Google Cloud.

For organizations that are in the early stages of crafting a multicloud management and governance strategy, it is important to recognize that many cloud purchasing decisions are initially driven by business and application development teams that want to move quickly and take full advantage of large-scale cloud infrastructure and advanced analytics and services. Developers and LOB decision makers frequently see spending on cloud infrastructure and services as a critical business investment. They are often less concerned about cost or security than about agility. As a result, IT operations and cloud management teams often face competing pressures to be good stewards of corporate funds while maximizing application performance and compliance and still providing the business with on-demand access to new, innovative enabling technology.

FIGURE 2 Typical Enterprise Multicloud Strategies



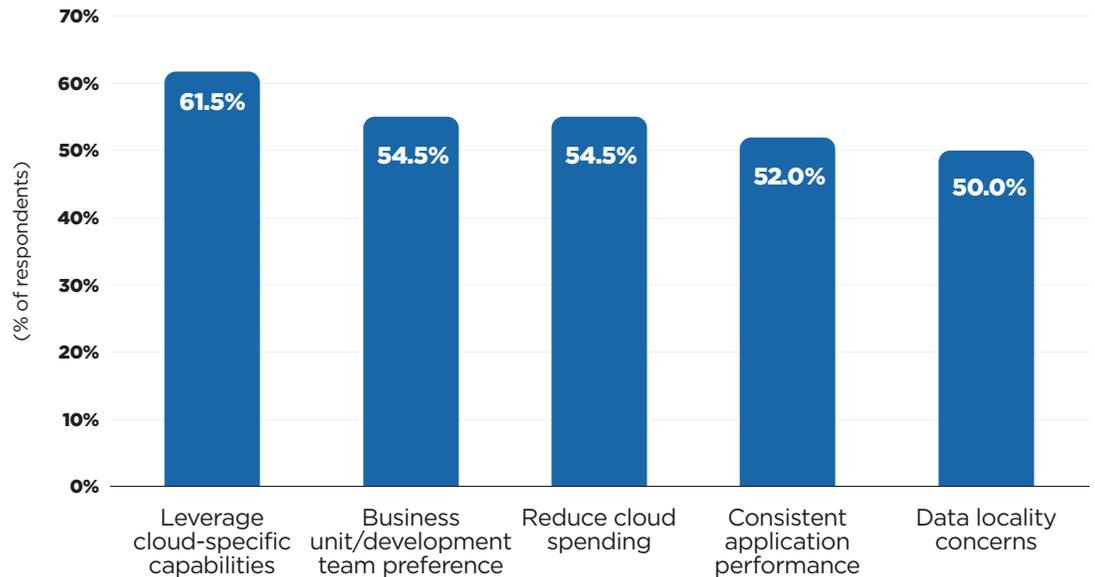
n = 200 United States-based enterprise multicloud users
 Source: IDC's Multicloud Management Survey, 2019

Multicloud Architectures Create Management and Governance Challenges

IDC's 2019 *Multicloud Management Survey* documents the fact that enterprises are choosing multicloud approaches for many reasons, including enabling agile business innovation, reaching global markets, satisfying compliance and regulatory concerns, and ensuring appropriate application performance and cost management. As Figure 3 shows, the most frequently cited reasons that enterprises opt to use multiple clouds are to leverage unique cloud-specific capabilities (61.5%), to support business and developer preferences (54.5%), and to reduce cloud spending whenever possible (54.5%). The tension between agility and cost is ever present across innovative IT operations and development teams. As enterprise spending on public cloud services ramps up rapidly, IT operations and cloud management roles are being asked to implement mature best practices for governance, cost control, and compliance — all without slowing down the business. For IT decision makers, this means blending traditional skills related to providing IT infrastructure and support with emerging requirements to proactively evaluate, select, and govern public cloud service consumption across diverse business teams.

FIGURE 3 Most Important Reasons for Multicloud Usage

Q What are the most important reasons your organization uses multiple clouds?



n = 200 United States-based enterprise multicloud users

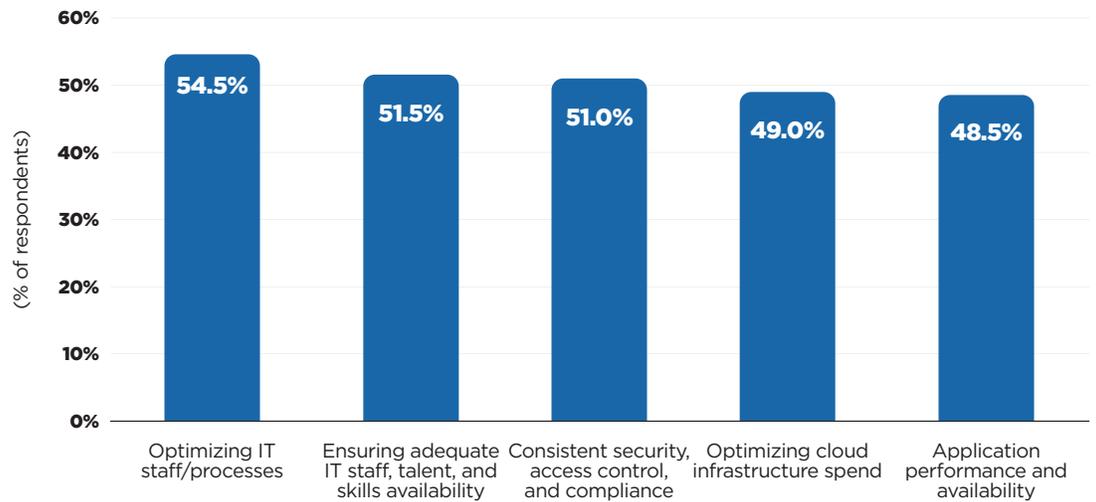
Note: Multiple responses were allowed.

Source: IDC's Multicloud Management Survey, 2019

IT decision makers who are working to deploy and maintain diverse legacy infrastructure and modern applications across multicloud environments reported that these operational requirements and changing roles often create a number of management and governance challenges related to the lack of appropriate IT skills, tools, and funding. IDC's research highlights the fact that most enterprises are struggling to balance their competing goals of optimizing multicloud management processes and skills (54.5%), ensuring the availability of adequate IT talent (51.5%), and maintaining consistent security (51.0%) while optimizing cloud infrastructure costs (49.0%) and application performance (48.5%) (see Figure 4).

FIGURE 4 Multicloud Management Challenges

Q What are your most pressing multicloud management challenges?



n = 200 United States-based enterprise multicloud users

Note: Multiple responses were allowed.

Source: IDC's Multicloud Management Survey, 2019

Automation and Analytics Address Multicloud Management Challenges

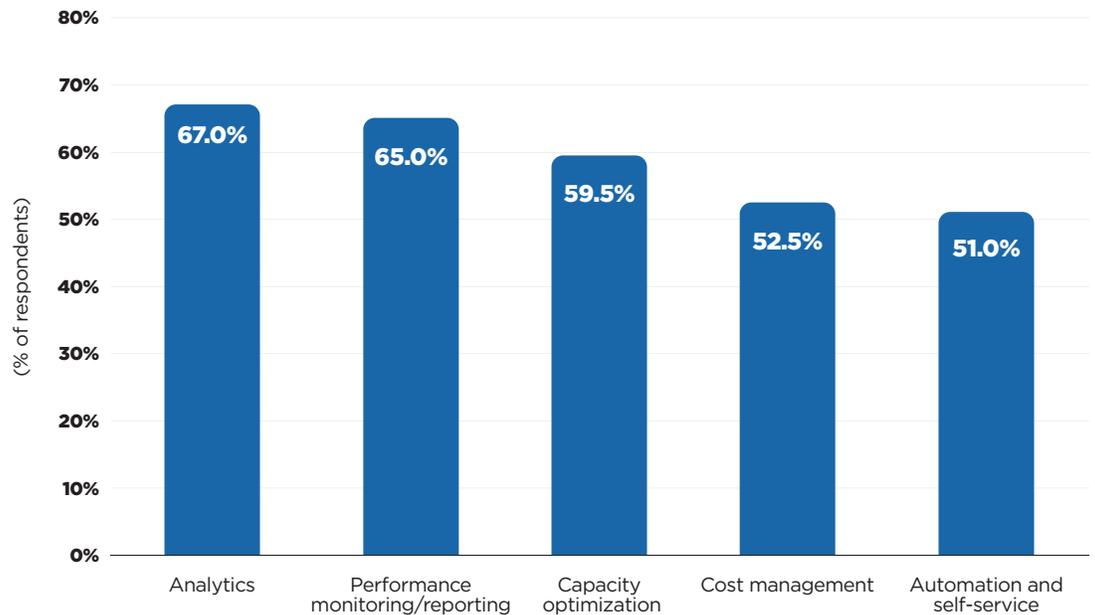
IT organizations have long struggled to balance staff, skills, process, security, cost, and performance concerns. As multicloud environments become the norm, most IT management teams are finding that traditional manual or ad hoc approaches cannot adequately coordinate the configuration, provisioning, and day-to-day management of multicloud infrastructure and applications. Specifically, IT not only is expected to purchase and maintain in-house datacenter resources but also is required to collaborate with developers and business teams that may have very divergent expectations when it comes to consuming public cloud resources.

Multicloud environments typically change and evolve much faster than traditional datacenters. Business units are expected to pay for the resources they consume. The complexity and speed of change seen in these environments require more sophisticated and collaborative policy-based management and governance to optimize the cost and performance of dynamic applications across multicloud infrastructure. IT and LOB decision makers and developers need to collaborate across the life cycle of the applications to ensure that performance, cost, compliance, and configuration requirements all stay in sync.

According to the survey, over the next two years, enterprise decision makers are expected to prioritize analytics (67.0%), performance monitoring and reporting (65.0%), capacity optimization (59.5%), cost management (52.5%), and automation and self-service (51.0%) when it comes to investing in new management capabilities for multicloud management and governance (see Figure 5). These management tools are deeply interconnected. Cost decisions must be made in the context of capacity requirements and application performance. Similarly, the effective use of automation and self-service requires advanced analytics to match user requests with approved profiles for resource cost, performance, security, and geography.

FIGURE 5 Investment in New Cloud Management Functionality, 2019–2021

Q What types of new cloud management functionality do you expect to purchase in the next two years to enable your cloud management strategy?



n = 200 United States–based enterprise multicloud users

Note: Multiple responses were allowed.

Source: IDC’s Multicloud Management Survey, 2019

FUTURE OUTLOOK

IDC's research shows that most enterprises expect that they will need net-new multicloud management tools to keep up with their emerging business and infrastructure operations demands. The users of these tools are expected to include traditional IT operations teams, DevOps teams, emerging cloud centers of excellence (CCOEs), and site reliability engineers (SREs). CCOEs provide a forum for business, IT, and development teams to align around policies and priorities for templates, service levels, budgets, and governance policies. SREs are increasingly becoming the enterprise experts on making effective use of multicloud automation and analytics by focusing on optimizing configurations, improving performance, and lowering the cost of multicloud usage by making better choices in terms of the types of cloud services and instances used by the enterprise.

The success of these CCOEs and SREs will depend heavily on their ability to collect, normalize, and share performance, cost, consumption, and compliance data across multiple clouds. IDC recommends that customers consider a number of factors as they evaluate multicloud management solutions, including:

- Time to value in terms of staff learning curves and tool deployment
- Level of analytics
- Consistent visibility and governance across on-premises and public clouds
- Support for emerging container- and microservices-based applications

IDC's research shows that many organizations are looking to SaaS-enabled solutions and a combination of SaaS and on-premises management tools to address the full range of requirements. The availability of robust open APIs to enable effective workflow integrations and data sharing across SaaS and on-premises software is particularly important. Strategies that balance on-premises and SaaS-based multicloud management solutions allow enterprises to create a management environment that best matches their business goals, compliance requirements, and budget preferences.

Microservices, Containers, and Multicloud Are Expected to Exacerbate Cloud Cost Management Challenges Over the Long Term

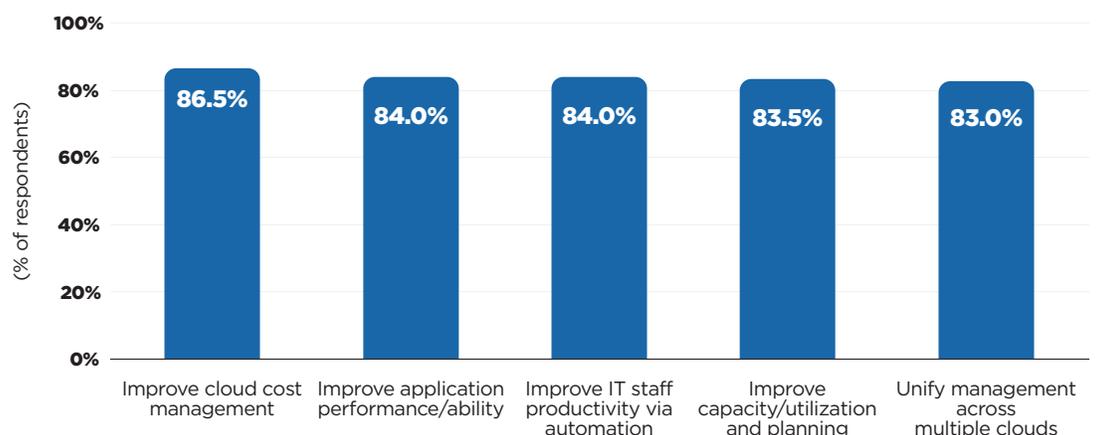
The challenges facing enterprise teams will only increase in complexity as more and more applications using microservices, containers, and Kubernetes are introduced. Most large enterprises will continue to rely on extensive virtual machine (VM)-based applications even as new generations of applications are deployed.

Currently, IDC's research shows that 59.5% of enterprise multicloud users believe their company is overspending on cloud resources, largely as a result of developers making inefficient use of public cloud resources or organizations as a whole failing to fully understand the best mix of services and types of instances and reservations they should be buying. These organizations are not planning to stop using cloud; rather, they are prioritizing plans to reduce inefficient spend and better optimize overall infrastructure use. In most cases, these organizations will likely see their overall public cloud spending increase over time as developers and business decision makers continue to innovate.

With regard to multicloud management and governance, many organizations are concerned that the shift to highly modular, dynamic container infrastructure and microservices-based applications has the potential to make it even more difficult to monitor, secure, and control cloud consumption and costs. In fact, 86% of surveyed organizations expect containers, microservices, and Kubernetes to have moderate or significant impacts on their multicloud management strategies in the coming years. These organizations recognize that they will need a new generation of cloud cost management (86.5%), application performance management (84.0%), automation (84.0%), and capacity/utilization planning tools (83.5%) to succeed (see Figure 6).

FIGURE 6 Top Enterprise IT Management Priority, 2019–2023

Q How important are the following overall IT management priorities to your organization from now through 2023?



n = 200 United States-based enterprise IT decision makers

Note: Multiple responses were allowed.

Source: IDC's Enterprise Containers and Cloud Management Survey, May 2019

CHALLENGES/OPPORTUNITIES

Enterprise multicloud management decision makers typically report that standardizing IT environments (54.0%) is their top evaluation criterion when it comes to evaluating competing cloud management solutions. These decision makers want to reduce operational complexity and take much greater advantage of automation. Simplification and standardization of the management environment are critical to successfully meeting these objectives.

Simultaneously, multicloud architectures are introducing a new wave of management complexity as developers and business groups implement cloud services and tools that best align with their application and business innovation road maps with limited regard for corporate preferences. The introduction of containers, microservices, and Kubernetes creates further complexity. As a counterpoint, non-depreciated traditional capital assets and strategic applications remain in play, and many existing IT administrators may not be equipped to fully adopt programmatic, software-defined multicloud configuration, provisioning, and control.

Getting the full benefit out of any multicloud management portfolio requires organizations to make trade-offs and strategic investment choices. In fast-moving technology environments, it can be difficult to fully anticipate the impact of new processes, methods, and tools. Multicloud management software buyers need to consider the following:

- Costs and time required to retrain or hire new multicloud management admins and SREs to take full advantage of modern automation tools and services
- Best practices for creating effective multicloud management centers of excellence and processes to gain consistent business and development participation in shaping and enforcing policy management choices
- Recognizing that optimization of cloud costs is not simply about reducing spending to the bare minimum; rather, it is about making appropriate choices and trade-offs about the costs to ensure sufficient application performance, security, resiliency, redundancy, and compliance (Customers may need to purchase connectivity and access to multiple zones and pay for cloud-native backup, monitoring, or recovery services. Buyers must be sure to conduct apples-to-apples comparisons and track actual versus expected costs and performance over time.)

Many cloud migration, cost management, and automation solutions are engineered with the idea that workloads go one way (i.e., from on-premises datacenters to the public cloud). As multicloud architectures become more widely used, more and more workloads may migrate from one cloud to another cloud and even be repatriated back to on-premises resources away from public clouds. Enterprise multicloud managers, CCOEs, and SREs need to invest in solutions that have open APIs, strong support for multiple clouds including on-premises private clouds, and the ability to integrate workflows and analytics across traditional and modern applications and infrastructure.

VMware Addresses a Full Range of Multicloud Management Priorities

VMware has been consistently ranked as the number 1 vendor by revenue in IDC's annual assessment of cloud system and service management software market shares for the past five years (see *Worldwide Cloud System and Service Management Software Market Shares, 2018: Multicloud Strategies Take the Lead* (IDC #US44895519, June 2019).

Recognizing the increasing need for enterprises to integrate multicloud cost management with day-to-day cloud configuration, provisioning, self-service, monitoring, and compliance activities, VMware acquired multicloud optimization and governance SaaS vendor CloudHealth in mid-2018. CloudHealth allows customers to track and analyze public cloud and on-premises cloud datacenter usage, cost, performance, and configuration information all in one place. CloudHealth reported that it had over 3,500 customers prior to the VMware acquisition.

VMware vRealize customers can continue to manage VMware resources on-premises and in public clouds while sharing data with CloudHealth by VMware to provide visibility, optimization, governance, and security aligned with business objectives. They can also track and report on cloud and datacenter cost and usage by department to enable chargeback and to analyze usage and performance data to identify underutilized or overutilized infrastructure. Using vRealize and CloudHealth by VMware together allows customers to assess an individual virtual machine's migration cost to public clouds and to set policies that define and consistently apply cost, usage, performance, and configuration policies. CloudHealth by VMware is also available to customers that want to focus exclusively on optimizing public cloud spending, security, and performance.

CloudHealth by VMware is part of a growing VMware portfolio of cloud and container management SaaS offerings. This portfolio also includes Log Intelligence, which structures and indexes log data from on-premises and selected public cloud resources and allows customers to analyze the data and troubleshoot performance issues via a public VMware Cloud SaaS service. Likewise, Wavefront is a VMware Cloud SaaS service that offers real-time metrics monitoring and streaming analytics to optimize both traditional applications and applications that rely on containers and microservices.

VMware has been extending its automation and configuration management capabilities to provide customers with several developer- and DevOps-focused SaaS choices. With the 2018 launch of VMware vRealize Automation Cloud, VMware introduced the following services:

- **VMware Cloud Assembly** delivers unified developer infrastructure provisioning across all clouds through declarative "infrastructure as code" automation software. IT and cloud operations teams can orchestrate infrastructure and application delivery and provide developers with an experience similar to native public cloud provisioning processes.
- **VMware Service Broker** provides simple self-service access to multicloud infrastructure and application resources from a single catalog, including security, deployment, and business-driven, policy-based governance for resource access and use.
- **VMware Code Stream** automates the code and application release process for application deployment, testing, and troubleshooting. It features integrations with popular developer tools and supports VMware-based private clouds, VMware Cloud on AWS, and native public clouds.

VMware's goal is to provide customers with a single, consistent, secure multicloud operational model to optimize cloud costs, deploy and scale cloud applications, provide interoperability across on-premises and public cloud infrastructure, and support large-scale, highly automated multicloud configuration, deployment, scaling, and migration.

CONCLUSION

Enterprise technology buyers generally recognize that cloud and containers represent the future of their IT infrastructure strategies. While individual organizations may make different choices about the rate at which these technologies are deployed, IDC's research shows that consistent, automated, policy-based management, governance, and analytics will be critical to ensuring that applications meet performance, cost, security, and compliance requirements across multicloud architectures.

Enterprise cloud managers should invest in tools, processes, and skills development to support the use of programmatic, software-driven automated approaches to cloud management coupled with advanced analytics and cost optimization capabilities. Optimizing cloud management at scale will require well-organized and well-documented processes that promote ongoing collaboration with IT and business teams and developers to define appropriate operational policies and SLAs. By evaluating cloud management solutions based on their ability to streamline operations and reach across multiple clouds, enterprise IT buyers will be well positioned to make strategic management investments that can bridge the on-premises and multicloud worlds of today while setting the stage to support containers, microservices, and Kubernetes as those technologies mature.

IDC Global Headquarters

5 Speen Street
Framingham, MA 01701
USA
508.872.8200
Twitter: @IDC
idc-insights-community.com
www.idc.com

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