WHITE PAPER

MANAGING AND OPTIMIZING YOUR MULTICLOUD ENVIRONMENT

By crafting a detailed strategy, organizations can optimize the security, cost and performance of their cloud ecosystems.

EXECUTIVE SUMMARY

Only a few years ago, many organizations were hesitant to place corporate workloads in the public cloud for fear of security and regulatory missteps. Now, the vast majority of enterprises are leveraging resources from multiple public clouds. Many organizations rely on a private cloud and two or more public clouds — along with dozens of cloud software vendors — for infrastructure to power their mission-critical applications and house their most important data.

Often, however, organizations arrive at a multicloud approach as the result of case-by-case decisions surrounding specific workloads, without an overarching strategy to guide their investments. This can lead to unwanted complexity, cost overruns and subpar performance.

To build out an architecture that will empower a company to meet its goals, business and IT leaders must invest in a range of solutions, strategies and services that will help them to optimize their multicloud environments.

The Evolution of the Multicloud Landscape

Over the span of just a few years, the cloud has gone from something of a niche resource to being nearly ubiquitous.

As recently as 2012, fewer than half of large enterprises were leveraging any cloud resources at all. Today, as more organizations move to digital platforms, virtually all of them are using cloud software or infrastructure, and the vast majority are leveraging more than one cloud. According to a recent survey, just under 90 percent of enterprises have adopted a hybrid cloud strategy that incorporates both public and private cloud resources. Meanwhile, just over 90 percent of enterprises employ a multicloud strategy incorporating resources from two or more public cloud vendors. In fact, around half of enterprise workloads currently live in the public cloud. Still, only 1 in 3 enterprises use multicloud management tools.

Part of this is likely due to the way most organizations arrived at a multicloud approach in the first place. Business and IT leaders are unlikely to seek out a multicloud environment for its own sake. After all, resources in multiple clouds means more to track, more to manage and more to optimize.

Instead, multicloud environments have popped up over time as organizations have sought to optimize factors such as cost and performance for different workloads. Here's a pretty typical path: A company moves its email to the public cloud, then invests in other collaboration features such as file sharing and video meetings with the same vendor.

A while later, when it's time for a hardware refresh, the company opts to move some of its resources to an Infrastructure as a Service (IaaS) model with a different cloud vendor. Then, over time, business and IT leaders make decisions about applications, infrastructure and platforms on a case-by-case basis, with some workloads bursting from on-premises resources into the public cloud during peak periods.

Suddenly, the organization has adopted both a hybrid cloud and multicloud approach but may not have a strategy in place to guide future investments and ongoing management and support.

Early on, many organizations focused on a single cloud vendor, seeking to create a simple, streamlined environment. A company that initially migrated simple workloads such as email might have then moved on to more sophisticated elements such as archival storage and may now be using cloud infrastructure with graphic processing units for analytics. The rapid growth of the cloud was fueled by business leaders seeking benefits that include improved business agility, speed to market and customer experience — and by IT leaders seeking technology outcomes such as improved accessibility, scalability, security and reliability.

In recent years, the move away from commercial software and toward open-source applications has opened the door for app modernization and multicloud capabilities. This has led to widespread adoption of Kubernetes and app containerization, which has, in a way, democratized the cloud. This new landscape encourages multicloud and helps companies avoid situations where they feel locked in with a single vendor.

Instead of "lifting and shifting" an app into the cloud, organizations can be more agile with these workloads and move them where they will perform best. When implemented strategically, a multicloud environment can also improve disaster recovery, data management processes, cloud cost optimization and workload performance.

Although most companies end up pursuing a multicloud strategy almost by default, organizations can amplify the

Level Setting

When talking about multicloud, it's important to clarify the term. Some observers reserve the word for a narrow set of use cases in which a single application lives on multiple public clouds. However, it is more commonly used to refer to any environment that incorporates multiple clouds, regardless of the extent to which these clouds are integrated. In fact, more than half of organizations with a multicloud architecture run apps that are siloed on different clouds, and only around 1 in 3 feature workload mobility between clouds.

advantages of the model by taking a strategic, considered approach to multicloud. According to Gartner, multicloud computing decisions are typically made with three overarching considerations:

Sourcing: This goes back to the idea of increasing agility and avoiding vendor lock-in. After all, the prospect of agility and flexibility is what initially drew many organizations to the public cloud. When a company is overinvested with a single cloud vendor, however, the organization lacks any real negotiating leverage or the ability to move resources when a better fit presents itself.

While many public cloud offerings are essentially commodities, hyperscalers continue to compete with one another on both features and pricing, and a multicloud approach has become necessary in order to truly optimize a cloud environment. Gartner writes: "The decision may be driven by a variety of factors, including availability, performance, data sovereignty, regulatory requirements and labor costs."

The percentage of enterprises that will rely on a mix of on-premises private clouds, public clouds and legacy platforms in 2021[1]

Architecture: Because modern applications are more modular by design, Gartner notes, they can span multiple cloud providers or consume services from multiple clouds. Containerization isolates apps within their entire runtime environment, allowing users to move these apps between clouds while retaining full functionality — which, in turn, allows IT and business leaders to choose public cloud providers based on standards such as uptime and cost, rather than whether a given cloud will support a workload based on proprietary restrictions.

Using app containerization and Infrastructure as Code (IaC) in the cloud also allows organizations to achieve greater consistency with their IT infrastructure. These methods deliver the scalability that organizations use to rapidly adapt to changing conditions, such as the huge spikes in business online retailers see on Cyber Monday.

Governance: "To ensure operational control," Gartner writes, "enterprises want to unify administration and monitoring of their IT systems." This means standardizing policies, procedures and processes and sharing tools that enable cost governance and optimization across multiple cloud providers.

While a multicloud model has numerous benefits, organizations must work to ensure that their efforts aren't undone by common challenges such as cloud sprawl and shadow IT.

The State of the Private Cloud

On-premises infrastructure remains a central component of many organizations' multicloud strategies. According to a recent survey by Forrester Consulting, 45 percent of IT decision-makers say their organizations continue to leverage on-premises resources due to compliance concerns, while 43 percent do so for application or infrastructure performance reasons and 42 percent for cost benefits.

Still, these organizations' data centers vary widely in their infrastructure and architecture. According to Forrester, IT decision-makers describe their private cloud environments in the following terms:

- **65%** Large developer environment designed to handle all new development efforts not launched on public cloud
- **65%** Infrastructure stacks with software-defined infrastructure
- **50%** Somewhat dynamic virtual server environment
- **50%** Static virtual server environment
- **35%** Small developer environment designed to launch fast standardized resources
- **24%** Container environment

Source: Forrester Consulting, "The Key to Enterprise Hybrid Multicloud Strategy," January 2020

The Challenges of Effective Multicloud Management

Merely placing workloads with multiple public cloud vendors is one thing. Creating a multicloud environment that keeps data secure, is optimized for cost, performs at a high level and meets an organization's business goals is quite another. None of these challenges are insurmountable, but the nature of a multicloud strategy means more balls to keep in the air at once — and organizations need appropriate monitoring and management tools and services to keep any of them from hitting the ground.

Here are some of the most common challenges organizations face when managing a multicloud environment:

Complexity: In a recent report, Forrester calls complex cloud environments "the new normal," and notes that complexity deepens as organizations use multiple cloud vendors for different capabilities. Roughly 60 percent of multicloud organizations, the report notes, use 50 or more unique cloud software vendors. With so many different cloud vendors to manage, it is perhaps unsurprising that business leaders bemoan an increase in cloud complexity.

According to Forrester, 77 percent of organizations agree that their multicloud environment "is increasingly complex,"

Source: [1]IDC, "Applications, Businesses, Clouds of Enterprise Digital Transformation," November 2020

and 85 percent agree that their goal is to "reduce complexity when it does not add value." In other words, cloud complexity is not a marginal problem; it's one that nearly all organizations now grapple with. By reducing complexity, Forrester notes, companies can improve customer experience, security and total cost.

Management: While management tools provided by cloud vendors offer some level of visibility into an organization's cloud environment, they are often insufficient for managing a complex multicloud environment. According to Forrester, only 40 percent of organizations are "very satisfied" with the management capabilities of the cloud platforms with which they partner. As a result, many companies find that they need to lean on a managed service provider to streamline multicloud management.

Forrester notes that organizations that use managed services to help get a handle on cloud complexity see a 21 percent average improvement in performance year over year. They are also more likely to keep down costs, achieve security improvements, win more customer trust and improve their customer experience.

6 Steps to an Effective Cloud Strategy

Gartner outlines the following steps for IT leaders to follow when building, implementing and maturing their cloud strategies:

1. Develop a cloud-first and multicloud strategy: IT organizations should look beyond the technical steps and work to build a strategy that emphasizes business benefits.

2. Continuously practice workload placement analysis: Decision-makers should look at workload placement options on an ongoing basis, accounting for new options and evolving with new workload lifecycle management models.

3. Plan for cloud adoption maturity: IT shops should develop necessary skill sets and continuously improve processes to speed the path to maturity for their cloud environments.

4. Establish multicloud governance and management processes: To overcome governance challenges posed by multicloud environments, organizations should establish protocols and management processes that increase visibility into their cloud resources.

5. Develop a multicloud management tooling strategy: Organizations should select and adopt the most appropriate cloud management solutions to meet their needs.

6. Evaluate multicloud SaaS integration requirements: Just as IT leaders should continuously reconsider options for infrastructure investments, they should constantly look for new opportunities to extend and integrate Software as a Service (SaaS) solutions that help them to meet their business goals.

Source: gartner.com, "6 Steps for Planning a Cloud Strategy," July 30, 2019

Cost optimization: Cost is a significant factor that drives organizations to a multicloud model in the first place. When one cloud vendor offers a better price on a new service than a business's current vendor, managers often decide to place their new workloads with the vendor offering the better deal. However, once multicloud environments grow in size, business and IT leaders may struggle to continue to optimize costs over the long term.

According to industry survey data, nearly 75 percent of organizations plan to cost optimize their existing use of cloud resources, making it the top cloud-based initiative. On average, organizations exceed their cloud budgets by nearly 25 percent. Many factors go into optimizing a multicloud environment for cost, beyond simply placing workloads with the vendor that offers the lowest price.

Many organizations fail to right-size their cloud environments. Rather than trimming their resources down to what is truly needed to run a given workload, they merely replicate their on-premises data center environments in the public cloud. Software licensing is another significant challenge; more than half of organizations struggle to understand the cost implications of cloud software licensing agreements.

In addition, it is important not to overlook shadow IT as a potential budget buster. It is easy for a multicloud environment to quickly sprawl out of control at organizations where employees have been empowered to spin up new cloud resources with little oversight.

Security and compliance: Not long ago, concerns about keeping data secure prevented some organizations from even considering the placement of many of their workloads in the public cloud. Today, most organizations don't consider the public cloud to be inherently any less secure than on-premises infrastructure.

Still, just as with on-premises resources, security and regulatory compliance remain top concerns for organizations with multicloud environments. According to Forrester, 37 percent of organizations consider underlying security a top factor impacting selection of a cloud platform provider, and 39 percent use "reduced time to remediate security issues" as a metric to determine the success of their multicloud strategies.

Efficiency and performance: Organizations must be deliberate about how they migrate resources to the public cloud, endeavoring to create a new architecture that will guarantee the highest possible level of availability and performance. Dependency mapping often proves to be a major challenge in cloud migration. According to industry survey data, more than 60 percent of organizations struggle with understanding app dependencies. Nearly half of organizations cite the difficulty of assessing technical feasibility as a cloud migration challenge, and nearly 1 in 3 organizations struggle to prioritize which apps to migrate.

Performance is already a key consideration for organizations pursuing a multicloud strategy. According to Forrester, 50 percent of organizations use performance improvements as

a metric to determine the success of their multicloud efforts, and 26 percent say they wish that their nonhyperscale cloud partners offered "better transparency of performance."

Strategies, Solutions and Services for Multicloud Environments

To solve the common challenges that inevitably pop up as multicloud environments grow to include more cloud vendors and different types of resources, a mix of strategies must be adopted — solutions and services that will set organizations on the path to success. A third-party partner is a vital component of most multicloud strategies. With strong cloud vendor relationships, these partners can help solve business problems for organizations, assessing and evaluating the existing environments, recommending solutions to enhance security and performance, and providing ongoing management services.

Business and IT leaders should consider the following factors as they look to optimize their multicloud environments:

Security: One reason that many organizations initially resisted a move to the public cloud is because it shattered the notion of a network perimeter. While security teams knew how to best protect data moving through their internal networks, the prospect of sending sensitive information out into the public cloud was scary and unfamiliar.

Tools such as a cloud access security broker (CASB) and solutions like cloud security posture management (CSPM) can help organizations manage security and compliance concerns, providing the same level of security organizations can achieve for their on-premises environments. A CASB sits between users and cloud applications, monitoring activity and enforcing organizations' security policies.

Meanwhile, CSPM solutions can alert organizations to configuration vulnerabilities and compliance risks. Security problems are often the result of human error, such as assigning overly broad permissions to users. External security assessments and workshops can help internal leaders to see security gaps they previously missed.

Migration: A cloud partner can help an organization migrate its workloads to the cloud by identifying which applications should be moved (and which should stay on-premises), determining if some applications would benefit from modernization, vetting different public cloud options and guiding the company through the transition from the corporate data center to the public cloud.

Automation and orchestration: An orchestration layer stretching across various clouds will allow an organization to take advantage of all resource pools without fracturing operations. Automation is an essential part of orchestration, a broad term that includes tools and processes to reduce the manual effort required to provision and manage complex environments. By embracing orchestration and automation, organizations can simplify critical business processes.

Cloud management: A cloud management platform (CMP) gives organizations real-time visibility into their private and public cloud resources, offering a centralized view of the entire environment. Organizations with strong policies around compliance, performance and cost management can utilize a CMP to implement these policies across their multicloud ecosystems, ensuring standardization.

Managed services from a cloud partner can allow organizations to stay on top of their multicloud environments without having to take internal IT staffers (who often lack the necessary cloud expertise) away from their day-to-day tasks. Through management platforms and managed services, enterprises can truly optimize their multicloud environments, looking at usage patterns and right-sizing workloads to promote efficiency and prevent waste.

Application modernization: One of the chief benefits of a multicloud model is that it allows organizations to seamlessly move applications from one cloud environment to another. However, this only works if the apps have been modernized (with containerization being a common approach). Most organizations understand the importance of application modernization. According to a recent report, more than 70 percent of businesses rank application transformation as a top priority. Similarly, 40 percent plan to build new applications using containers and nearly 75 percent plan to containerize existing applications. However, some organizations may lack internal expertise with application modernization, requiring assistance from a partner.

Governance: When it comes to multicloud environments, governance is what makes everything possible. Setting up a cloud center of excellence (CCoE) can help establish an overarching cloud strategy and provide governance that will guide when, where and how workloads are migrated, run and secured.

A CCoE is a cross-functional team of internal stakeholders who set cloud policy, guide provider selection and assist with architecture and workload placement — with the goals of improving outcomes and managing risks. While a CCoE typically doesn't have any project management function or day-to-day operational responsibilities, the role it plays in the organization's cloud computing practices is critically important.

CCoE members should be considering questions such as how the organization can develop and enforce policies promoting both flexibility and security,

The percentage of global decision-makers for IT infrastructure environments who say they anticipate increasing their public cloud investments in the next two years[2]

Source: [2]Forrester Consulting, "The Key to Enterprise Hybrid Multicloud Strategy," January 2020

how to guide internal users to select the best resources for various workloads, and how to best manage current costs and forecast future expenses.

The State of Multicloud

According to a recent report from IDC, many organizations have adopted hybrid cloud or multicloud strategies, but some are slowed by challenges including technology integration, security and cost.

- **Forty percent** of enterprises' data center investments in 2020 were associated with running composite applications that need reliable interconnection with third-party resources in the cloud or colocation facilities.
- Only **34 percent** of enterprise applications are deployed completely outside of a cloud environment.
- For organizations with interoperability among their hybrid and multicloud environments, **43 percent** have interoperability from on-premises private clouds to public clouds, making this the most common type of interoperability.
- **Thirty-four percent** of organizations say that the complexity of application interoperability and the exchange of data across a heterogeneous environment represents an obstacle to successful hybrid and multicloud implementation. **Twenty-nine percent** cite the difficulty of ensuring information security of core applications and data to fulfill regulatory requirements, and **26 percent** cite cost efficiency.

Source: IDC, "Applications, Businesses, Clouds of Enterprise Digital Transformation," November 2020

CDW: We Get Multicloud

Armed with deep, cross-industry experience and expertise, CDW's solution architects can help you with every step of your cloud journey.

Design: Cloud success begins at the planning stage, and an effective design is particularly important for hybrid and multicloud environments. Through a Cloud Jumpstart engagement from CDW, business and IT leaders can get started down the right path to building a cloud environment for development, testing or production. CDW's migration and planning services help organizations to assess their options, identify appropriate environments for different workloads and develop a detailed migration strategy for the cloud.

Orchestrate: Through CDW's Professional Services, organizations can adopt and integrate cloud resources securely. CDW's experts can review cloud environments to discover business drivers, governance strategies and opportunities to optimize costs.

Manage: By allowing a trusted partner such as CDW to manage their multicloud environments, organizations can obtain on-demand cloud expertise while allowing their internal staffers to keep their focus on other mission-critical projects. Some CDW cloud engagements offer management services, such as recommendations around right-sizing and the identification of common security gaps. More advanced management tiers, meanwhile, offer proactive monitoring and remediation. CDW's relationships with major cloud providers deliver expertise that isn't easy to find. CDW is part of the AWS Managed Service Provider program and also is a Microsoft Azure Expert Managed Service Provider.

CDW Can Design, Orchestrate and Manage a Comprehensive Infrastructure Strategy

CDW's simple, smart, scalable and flexible services portfolio provides a fully automated and managed infrastructure across your entire network, whether on-premises, hybrid or in the cloud.

DESIGN for the Future
Consult with our team of technology experts to plan a solution that fits your unique needs and optimizes business impact.

ORCHESTRATE Progress
CDW Amplified™ Infrastructure services help you build and deploy your custom infrastructure utilizing best practices.

MANAGE Operations
Our world-class, certified staff monitors and manages your infrastructure 24/7/365 to ensure operational efficiency and security.

Sponsors

NetApp Microsoft TREND MICRO vmware

Learn more about how CDW can help you manage your multicloud environment more effectively.

CDW PEOPLE WHO GET IT

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