



# Cloud-Smart Strategy and Workload Repatriation Best Practices

Increase profits by reducing cloud costs

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## Executive summary

After nearly a decade of being laser-focused on cloud transformation, organizations increasingly embrace a multi-cloud model. Among the key reasons are having more flexibility in when and where applications and workloads are run, and having more control over rising cloud costs.

Multi-cloud has been very successful and has become the norm. Partners are broadening their managed services offerings to support customers' multi-cloud deployments. The growth of the multi-cloud paradigm has created issues. Using multiple public clouds plus private clouds compounds complexity with new DevSecOps needs and processes introduced with every additional cloud. To address these issues, forward-looking partners will provide multi-cloud services, bringing extra value to their customers.

However, maximizing the opportunities presented by multi-cloud means overcoming the increased complexity it creates. Failing to do so is costly. In a recent Flexera study, organizations reported that nearly a third of their cloud budget, on average, is going to waste.<sup>1</sup>

As a result, organizations need guidance from trusted advisors who are sensitive to customers' budgets amid the complexity and business-criticality of cloud operations and economics—in other words, partners that can help them become cloud smart. VMware partners are uniquely positioned to provide value-added, cloud-smart service offerings to help customers succeed.

## The move to multi-cloud

After nearly a decade of cloud adoption, enterprises have realized a multi-cloud strategy supports the needs of their entire application portfolio while overcoming the challenges of legacy infrastructure. They saw the need for more flexibility in where they run applications and workloads. Increasingly, enterprises move to highly distributed multi-cloud architectures that span multiple public clouds as well as colocation facilities, edge locations, and on-premises data centers. In fact, according to recent VMware research, 87 percent of enterprises use at least two public clouds.<sup>2</sup>

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1. Flexera. "Flexera 2022 State of the Cloud Report." March 2022.

2. VMware. "FY23 H1 Benchmark." May 2022. N=1,080 enterprise (5,000+ employees) technology decision-makers.

## The business benefits of multi-cloud<sup>3</sup>



- **42%** faster app release times, equating to **35%** more revenue



- **41%** cost decrease, with less hours spent on IT infrastructure and security incidents



- **35%** productivity savings across a distributed workforce

## The benefits of multi-cloud

Many factors drive multi-cloud adoption, such as improving the performance of latency-sensitive applications, meeting data sovereignty mandates, addressing application-specific requirements, and ensuring employees can do their best work wherever they are. While most cloud providers offer similar baseline functionality, they each have unique value or features. By using multiple clouds, organizations can choose the cloud provider with the services that best meet the needs of the applications they are using and building while reducing complexity and normalizing control.

For example, some workloads or apps perform better on a particular platform while others work best with a service offered by a specific cloud vendor. As organizations continue to mature cloud native development, a multi-cloud strategy provides access to the broadest array of services when building new apps.

VMware found organizations that leverage a multi-cloud environment to modernize IT infrastructure and apps, automate operations, and provide secure access to apps and data from any device and location see substantial business benefits. However, as with any major cloud migration or technology transformation, embracing multi-cloud successfully requires organizations to overcome significant obstacles and risks.

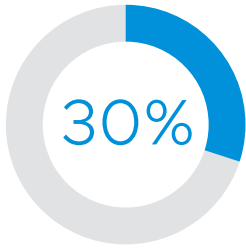
## The rise of multi-cloud services

The surge of multi-cloud adoption is driving cloud spending—already estimated to be \$100B annually—to new heights. Synergy Research Group states “worldwide spend on data center IT hardware and software grew by 10% [from 2020 to 2021], primarily thanks to a 20% jump in spending on public cloud infrastructure, which pushed it to an all-time high.” Overall, public cloud infrastructure accounted for 47 percent of the \$185 billion in total data center infrastructure equipment revenues in 2021.<sup>4</sup>

With spending on public cloud infrastructure continuing to grow, organizations will have even more choice in how and where they run workloads. However, more choice doesn’t always deliver more value. In fact, some organizations have made the mistake of adopting multi-cloud architectures without the visibility needed to manage a diverse mix of traditional and cloud native applications. Now, they find it both difficult and expensive to manage their entire application portfolio across disparate clouds, given that each cloud uses proprietary tools that are incompatible with another cloud’s.

3. VMware. “FY22 H2 Benchmark: Digital Momentum.” August 2021. N=201 | 174 | 302 | technology decision-makers using 2+ public clouds citing benefits from recent digital initiatives.

4. Synergy Research Group. “Sales of Data Center Gear Continue to Grow Thanks to Surging Cloud Provider Spending.” March 28, 2022.



The [Flexera 2022 State of the Cloud Report](#) revealed organizations estimate more than 30 percent of their cloud spend is wasted.<sup>5</sup>

The concept of multi-cloud software services has gained popularity because it solves the challenge of how best to build, manage, govern, and optimize apps and workloads across a multi-cloud environment. To envision how multi-cloud software services do this, consider a model of cloud features and functions—a grid in which the verticals comprise data centers, private and public clouds, and edge locations, and the horizontals provide functionality across all these locations. A multi-cloud service provides a consistent API, an object model, identity management and other core functions across clouds. The service has one or more of the following characteristics:

- Runs on a single cloud but supports interactions with at least two different clouds
- Runs on multiple clouds and supports interactions with at least two different clouds
- Runs on any cloud or edge, even in disconnected mode, and basic operations are fully automated

The common horizontal functions that organizations seek to standardize across clouds and that can be provided by a multi-cloud service include the following:

- **Application services** – Enable teams to use core services in a standardized manner across clouds to speed innovation.
- **Infrastructure services** – Deliver consistent infrastructure as code across public, private and edge cloud environments. Multi-cloud infrastructure services interact with infrastructure-as-a-service (IaaS) APIs from individual cloud providers to improve application and service resiliency, security, interoperability, performance and portability.
- **Security services** – Deliver security and networking as a built-in distributed service across users, apps, devices and workloads in any cloud.
- **End-user services** – Enable organizations to provide the correct level of role-based access to applications and data across clouds.
- **Data plane services** – Enable the workloads, analytics and data that make up applications to operate across containers, services and clouds

In this model, public clouds, data centers, private clouds and edge locations are all verticals, and multi-cloud services are horizontals, providing functionality across these locations. These horizontal capabilities integrate with and complement the native services of each cloud while providing the consistency and standardization that development, operations and security teams need.

Partners offering multi-cloud services and consulting can address these needs and help customers take full advantage of multi-cloud.

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5. Flexera. "2022 State of the Cloud Report." March 2022.

## Applying a cloud-smart approach to strategic workload location

The costs of operating in the public cloud are another opportunity to provide cloud-smart value to customers. Due to the fast, self-service nature of cloud consumption, it makes sense that many organizations are not maximizing opportunities to optimize their cloud spend. While elastic resource consumption is a key benefit of public cloud, IT teams don't always consider I/O data transfer costs, shut down non-production environments that are not being used, or move data to less expensive storage when possible.

In its oft-quoted blog post "[The Cost of Cloud, a Trillion Dollar Paradox](#)," venture capital firm Andreessen Horowitz suggests "that while the cloud clearly delivers on its promise early on in a company's journey, the pressure it puts on margins can start to outweigh the benefits, as a company scales and growth slows." According to the firm's research, public cloud expenses dramatically increase the cost of revenue (COR) and the cost of goods sold (COGS), and for enterprises operating at scale, sky-high cloud costs impact profit margins and, subsequently, company valuations or stock prices.<sup>6</sup>

Many software-as-a-service (SaaS) providers have found themselves with a massive financial outlay on public cloud and want to rein in their cloud spending by repatriating workloads from the public cloud to a colocation facility or on-premises data center. Because cloud vendors' profit margins can top 30 percent for their cloud services, it makes sense that a company could save money by operating their own on-premises infrastructure. Their costs would be higher than the public cloud, so they couldn't necessarily realize the full savings of 30 percent and more, but the potential savings are still substantial.

Such an extreme shift by no means makes sense for every enterprise. When an application matures and the deployment solidifies, the premium paid for public cloud flexibility may no longer be necessary. It would, however, be a mistake to make that decision based on cost alone. Each cloud offers advantages and disadvantages that need to be weighed against business and workload priorities.

Being cloud smart means having the ability to choose the cloud that makes the most sense from an economic, technology or policy perspective. It means knowing where to first deploy a new application, as well as if, when and why to consider moving it. The following are a few factors to consider.

### Optimizing cloud spend

Organizations need clear visibility into cloud usage so they can report and forecast cloud spend as a key performance indicator for the business. Tools need to deliver intelligent insights and automation that help control costs, improve governance, and strengthen cloud security posture—including identifying unused virtual machines (VMs) that continue to run and incur charges even though they are not delivering any value.

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6. Andreessen Horowitz. "The Cost of Cloud, a Trillion Dollar Paradox." Sarah Wang and Martin Casado, May 27, 2021.



Cloud-smart companies take full advantage of multiple clouds as well as resources in their own data centers to improve resiliency and deliver better experiences and business outcomes.

### Identifying workloads ripe for repatriation

From a cost perspective, it might seem that the most resource-intensive workloads are the best choice for repatriation. However, applications that leverage services specific to a public cloud provider, such as AWS Lambda, are much more difficult to repatriate, given that they would need to be refactored to run on a different cloud.

There are a multitude of business and technology factors to consider when it comes to identifying which workloads to repatriate and when. However, many organizations lack the time and talent to do so effectively. As a result, there is a tremendous opportunity for partners to help them understand the advantages, disadvantages and implications of repatriation on performance, security and compliance.

**Performance** – Applications with extreme latency sensitivity, long-running I/O intensive periods, or large datasets that require transport between various locations might perform better in an on-premises environment than in the public cloud.

**Compliance** – Cloud providers offer customers the ability to manage resource utilization, but customers have limited control over where their application workloads are hosted or even where their data is stored. For companies that must meet industry and governmental compliance regulations, repatriating workloads on-premises can ensure they meet mandates.

**Security** – Many customers assume that the data they place in the cloud is protected and secured by the cloud provider, but this is not always the case. Regardless of where sensitive information and data reside—in the public cloud or on-premises—organizations need to implement controls for security.

### Moving workloads on-premises

Historically, running workloads in an on-premises environment required a large upfront CapEx expenditure to buy servers, network gear and other equipment, and possibly a physical location for the data center. If it is determined that the workload would need to be repatriated, there are now OpEx options that make onsite or colocation options more affordable.

### Developing modern applications with repatriation in mind

Applications built with modern frameworks and tools, such as Kubernetes, can be more easily repatriated in the future. This allows consistent infrastructure for running on the software-defined data center (SDDC) or Kubernetes instance without modification. Additionally, modern application environments allow for turnkey microservice-based applications. These ensure that applications are built in a consistent manner and leverage the same tooling for updating them after repatriation.

### Securing operations

DevSecOps is another area that needs tight integration. DevSecOps methodology requires that management of and responses to issues or outages are automated through a set of tools. DevSecOps tools should either exist in a multi-cloud service or integrate with the multi-cloud service or single-cloud platform APIs. It is possible to leverage individual cloud provider DevSecOps tools, but this choice should be intentional because it limits the ability to easily expand to another cloud platform.

### VMware's solution to multi-cloud complexity

VMware Cross-Cloud™ services, an integrated portfolio of SaaS solutions, helps organizations maximize their cloud ROI. Cross-Cloud services expand the capabilities of VMware's product portfolio for a multi-cloud world, and allow customers to pick and choose the services needed to build, run and better secure applications across any cloud. Cross-Cloud services help customers accelerate innovation with faster cloud adoption, and enjoy the freedom and flexibility of being able to work across any cloud environment by building on VMware's proven history of providing a trusted foundation for infrastructure and innovation, a non-partisan public cloud perspective, and deep relationships with every hyperscale provider.

### The cloud-smart imperative

The cloud is the standard operating model for digital business, and multi-cloud is now the norm. However, each cloud offers advantages and disadvantages that need to be weighed against company and workload priorities. As cloud use and cloud spend grow, having a multi-cloud strategy provides greater flexibility in terms of placing workloads and managing costs. Being cloud-smart means choosing the right cloud at the right time for each workload, and VMware is unique in the industry in providing the means to move workloads between clouds quickly and easily.

VMware believes multi-cloud complexity is best addressed through a rich layer of multi-cloud services that equip enterprises with a broad set of capabilities to build, run, manage and secure apps consistently across clouds. By abstracting the complexity of multi-cloud, businesses can reach new levels of agility and growth without compromising sovereignty or security. VMware's cloud-smart ecosystem comprises one of the world's most powerful networks of technology expertise that can help them meet those goals.



## Cloud smart as a service offering

Becoming cloud smart is a journey, and not always an easy one. Organizations need help navigating the inherent complexity of today's multi-cloud world so they can drive a consistent, secure and cost-efficient operating model across clouds.

For VMware partners, this presents an opportunity to help their customers succeed, especially when they don't have strong or available in-house technical infrastructure talent. As trusted advisors, VMware partners are ideally positioned to provide a cloud-smart consulting and service offering that integrates VMware's multi-cloud strategy and technology solutions with the reality of multi-cloud adoption to deliver significant value to their customers.

## Take the next step

Organizations need help working out their strategy for managing their workloads and applications, migrating workloads to multi-cloud destinations, and managing them on an ongoing basis to optimize performance and cost. They need to become cloud smart, and VMware partners can serve as the trusted advisors to help them be successful. In turn, partners need to understand each customer's needs and how the principles of being cloud-smart can be applied to their business strategy, regulatory environment, and available resources. Creating a cloud-smart practice will prove not only helpful to your customers, but also open new areas for business growth.

Visit the [VMware Cross-Cloud services webpage](#) for more information about our entire portfolio of services for building, running, managing and securing applications across multiple clouds.

Visit the [VMware Aria Hub™ powered by VMware Aria Graph™ webpage](#) for more information about our multi-cloud management solutions.

Contact VMware for help developing or expanding the vision, strategy, skills, tactics and offerings needed to be successful in the multi-cloud world.

