Multi-Cloud Use Maturity
State of the Market
VMware Market Insights, 2021
**Introduction**

Multi-cloud use is growing quickly—sometimes organically, sometimes deliberately, or sometimes a bit of both. As with any emerging tech trend, it can be hard to know where or how to start, or how to assess your progress. With that in mind, we’ve conducted research on multi-cloud use maturity, based on the framework VMware published earlier this year.

In this ebook, you’ll find data on how multi-cloud use is maturing across enterprise teams in the areas below:

- Cloud Adoption Routes
- Use of Cloud Services
- DevOps Practices
- Data Center Modernization Strategies
- Cloud Financial Management Practices
- Cloud Governance Practices (non-financial)
- Tool and Platform Consolidation Strategies
- Cloud Security Practices

The first eBook on this topic, *Eight Critical IT Practice Areas That Drive Multi-Cloud Use Maturity*, introduced an eight part framework as a way to think about multi-cloud use maturity.

This framework was developed in response to a question: “If multi-cloud use is the future for most organizations, what capabilities or IT practices do organizations need to focus on to ensure that they receive the most value from their investments in multiple clouds?”

To help better understand the extent to which these practices are in use at most organizations we worked with Dimensional Research to conduct a survey of 1,000 global respondents. Our focus for this survey was to begin to develop a numbers-based picture on the percent of organizations that were using specific practices. The balance of this eBook highlights some of the key findings. (For more information on both Dimensional Research and on the demographics of the survey see About this Survey at the end of this eBook.)
The changing nature of multi-cloud use

For many years now, multiple analyst firms have been reporting that most larger enterprises are multi-cloud. Typically, larger organizations are using two-plus public clouds and at least one data center. That is interesting but it is mostly a historical artifact related to how teams adopted the public cloud.

If you dug into the number of clouds used at any particular organization what you mostly found was scenarios such as: Teams A, B, and C were using Amazon and Team D, E, and F were using Azure. That made the enterprise multi-cloud but each team in the organization was mono cloud. Hence none of these teams were challenged by the differences in cloud APIs, semantics, technologies, consoles, etc.

But our latest research shows things are changing. In our research we asked three bellwether questions related to multi-cloud use at the level of teams, not at the level of the enterprise.

We asked:
1. At your company, are there individuals that have responsibilities (hands on application development, maintenance, management, etc.) for more than one public cloud (AWS, Azure, etc.)? For example, responsibilities related to app A on Azure and responsibilities for app B on AWS.
2. At your company are there teams that commonly use more than one public cloud provider? For example, applications running on different public clouds.
3. At your company are there any applications that span multiple environments (cloud plus on-premises, multiple public clouds, etc.)? For example, the data tier runs in the data center but the web tier runs in a public cloud.

The answers to these questions gives us a clue as to how things are changing in the enterprise. In all three of these questions, at least 3 in 4 respondents indicated that their organization was now multi-cloud at a team level.

This data suggests that a major shift is underway in the meaning of multi-cloud. We are moving from a world where most enterprises were multi-cloud but most teams were mono cloud to a world where teams are seeking the benefits of multi-cloud use. These teams must now also contend with the increased complexity that arises from using multiple clouds to support their application portfolios.
The origins of today’s cloud portfolios

What an organization runs in the cloud today may reflect many different origin stories. In order to understand what kinds of capabilities are generally required around cloud adoption, it is insightful to ask “Where did the apps running in most clouds today come from?”

We asked a series of questions related to the origin of the apps running in the cloud. At the highest level, we were interested in knowing whether apps in the cloud had been migrated or if they were built there. For any apps that were migrated we also asked if those apps were then refactored in some way.

Figure 1 below shows the distribution of these three possible origin points and suggests that having capabilities in a broad range of practices related to cloud onboarding is required by most organizations.

Figure 2 shows the distribution of the percent of applications running the cloud that were migrated from the data center.

We also asked respondents about whether they were using DR to the cloud as a strategy within their organization. This is another way that organizations can onboard the cloud. In this scenario, the app continues to run on premises but the cloud provides a way to flex the data center environment to accomplish something that is critically important to the health of the application in question. More than 4 in 5 organizations indicated that they had adopted the practice of DR to the cloud to protect one or more applications that they were running on premises.
Cloud value goes well beyond access to IaaS

It’s hard to say an organization is good at multi-cloud use without considering practices that more directly relate to how the organization develops its software. It really doesn’t matter if you have strong operational practices if your software doesn’t lend itself to the velocity necessary to support your business.

Consequently, application development-related processes such as DevOps and the use of cloud services are important areas of competencies that should be assessed as part of any effort to determine maturity relative to multi-cloud use.

In our survey, we asked organizations about their use of cloud services. What is evident from the data is that cloud services are heavily leveraged by most organizations using the public cloud. Figure 3 below highlights our findings relative to the use of specific categories of cloud services, while Figure 4 highlights how pervasive the use of cloud services are in the portfolios that organizations run in the cloud.
DevOps — not as much progress as you would expect

Figure 5 reflects the responses we received when we asked organizations about their adoption of DevOps-related practices.

The fact that adoption rates aren’t higher is surprising. The concepts associated with DevOps, 12-factor apps, micro-service architectures, and containers have all been around since the first half of the last decade. Agile goes back at least a decade before that. Despite this, what we see in the data is that only about half of the practices we asked about have uptake greater than 50%. The other half are all less widely adopted.

Clearly, most organizations have some distance to travel before they reach a high level of maturity in their application development processes. Organizations will need to adopt and be broadly competent in all of these areas to get the most value out of their multi-cloud investments.
Organizations claim significant progress on financial management, but…

Governance is one of the biggest areas that organizations struggle with when they first begin operations on the public cloud. This first manifests itself in the area of financial accountability. As organizations move to the cloud, the frictionless availability of resources combined with the decentralized nature of the cloud often leads to out-of-control cloud costs.

We asked organizations about their use of automated solutions to support resource usage and cost governance (Figure 6). We found that most organizations are well on their way to adopting practices that support processes to control costs by providing visibility into what is being used by teams and by providing mechanisms to optimize the use of resources through practices that focus on rightsizing oversized resources, terminating zombie instances, and using discounts and reservations strategically.

It is possible that the level of adoption of these solutions is overstated in the numbers shown. Other studies done by the CloudHealth by VMware team suggest that broad adoption of financial management practices across the enterprise is lower than what these findings suggest.

Adopting practices that help organizations manage their use of cloud resources is an area where all organizations will need to have competency to be successful. Today, most organizations are challenged with managing a single public cloud, much less multiple clouds. And as data centers become more dynamic, organizations will need to import this capability back into the data center in order to avoid the cycle of spiraling costs that many have experienced in the public cloud.
Lagging governance practices pose significant risk

In addition to asking organizations about their adoption of practices related to financial management of their cloud spend, we also asked them about other critical general governance, operational, and security practices. Figure 7 represents where organizations are with the adoption of a broad set of critical governance practices and functions. Figure 8 is specific to security-related best practices.

Given the operational, security, and compliance risks that non-adoption of these practices represents, it would have been easy to assume that more organizations would have answered that all of these practices were already in place. Their answers suggest that there are many organizations that have yet to adopt strong practices in many areas that not only support agility but also help to ensure that their operations are efficient, secure and compliant.
Consolidation and standardization — it’s back to the future

AWS was launched in 2006, and Azure and Google Cloud launched at the start of the next decade. Cloud use is no longer a novelty for most organizations. They have progressed from IaaS, to PaaS and now to serverless/functionless. Organizations are starting to move from a single focus on agility to a balanced operational approach that still prizes agility—but not at any cost.

While not as high on the list as agility, efficiency is now becoming a primary concern for organizations who are running significant application portfolios in a multi-cloud environment. We believe that in the future, an aspect of multi-cloud use maturity will be connected to how effective organizations are at getting leverage out of their existing development and operational resources.

Four technology areas lend themselves to standardization by supporting the ability to have common processes across multiple clouds:

• Operationally centric tools that can be used on all clouds being used by the organization
• Development-centric tools that can be used on all clouds being used by the organization
• Application building blocks (cloud services) that can be used on all of the organization’s clouds
• An infrastructure abstraction that can be used on all of the organization’s clouds
Consolidation and standardization — continued

Figure 9 highlights the responses we got to questions we asked about whether or not organizations were considering initiatives around standardizing these four areas. What can be seen from the data is that seeking opportunities to reduce multi-cloud operational complexity is a significant issue for at least half of the organizations.

In addition to the quantitative research of this study, we conducted interviews with a smaller set of individuals in order to provide color on our quantitative findings. The number one take away from those interviews is that organizations are looking to establish new shared service organizations to help them better manage their multi-cloud application estates.

These organizations want their teams to be cross-cloud capable. They want to reduce multi-cloud complexity and get much more leverage out of their resources.

Figure 9: Which of the following strategies is your organization actively pursuing? Select all that apply.

- Use a common set of operations management tools across clouds: 54%
- Use a common infrastructure across clouds: 54%
- Use a common set of development tools across clouds: 52%
- Use a common set of PaaS services across clouds: 43%
Summing up

It has been true for some time that most organizations are multi-cloud but the teams in these organizations, until recently were mostly mono cloud users. However, we see clearly in our research that teams are now starting to use multiple clouds to achieve their business and organizational objectives.

Our research also shows that the typical cloud environment for most organizations is comprised in near equal proportions of applications that were migrated from the data center and now run as is, applications that were migrated and then refactored in some way and applications that were built as cloud native in the cloud.

When it comes to how organizations build and run their apps, we see that organizations have moved beyond simply seeking value from the cloud in the form of IaaS. All categories of cloud services now enjoy a high degree of uptake and a significant proportion of a typical organization’s apps leverage cloud services as part of their application architectures. In the area of DevOps, while most practices have been around for more than a decade, adoption of core practices is somewhat lagging and most organizations still have a long way to go before they can claim maturity.

Similar to the adoption of application development practices, governance practices show a similar pattern of adoption. Uptake of governance practices, whether they are related to operations, financial management or security show a level of adoption that suggests that both process maturity and the ubiquitous application of these processes is not likely to be achieved anytime soon.

Finally, reducing cross cloud complexity in order to increase skills leverage is now a priority for many organizations. Key strategies include standardizing on tools that support cross cloud application development and operations management. Leveraging cloud services and cloud infrastructure that can run across multiple clouds is also in scope.
How VMware can help

Building capability and maturity around multi-cloud use involves practices and activities in multiple areas. Creating competencies in areas related to building and running applications in a multi-cloud environment is not easy but the right partners can make it easier. No matter where you are starting, VMware and its ecosystem of partners can help.

About VMware Cloud

Redefine the foundation of IT with cloud capabilities, modern architectures, and consistent operations in the data center, any cloud, and edge for all applications. VMware Cloud transforms private data centers, hyper-scalers, and remote sites into a unified and elastic multi-cloud platform with integrated compute, network, storage, security, Kubernetes, and cloud management optimized to securely and reliably deliver any application, everywhere.

About VMware Tanzu

Microservices, containers and Kubernetes help to free apps from infrastructure, enabling them to work independently and run anywhere. With VMware Tanzu, you can make the most of these cloud native patterns, automate the delivery of containerized workloads, and proactively manage apps in production. It’s all about freeing developers to do their thing: build great apps.

About this survey

This survey was conducted by Dimensional Research on behalf of VMware during the first half of 2021. Over 1,000 individuals were included in the survey. To be included in the survey organizations needed to have applications in the public cloud. Respondents had to have direct knowledge about both their organization’s application portfolio and where applications were running.

Respondents came from more than 15 distinct industries and ranged from manager level through CxO level. The survey included individuals from North America (54%), Europe (23%) and Rest of World (33%). Just over half of the organizations included were between 1,000 and 4,999 employees, 26% were from organizations of between 5,000 and 10,000 and 24% were from organizations with employees greater than 10,000.