2022 Global Hybrid Cloud Trends Report

Black & White

May 2022

Commissioned by

CISCO

451 Research

S&P Global
Market Intelligence

About this paper

A Black & White paper is a study based on primary research survey data that assesses the market dynamics of a key enterprise technology segment through the lens of the "on the ground" experience and opinions of real practitioners — what they are doing, and why they are doing it.

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Executive Summary

Hybrid cloud environments have become the new normal, particularly as consumers of IT services have become more empowered to make cloud choices that fit their needs. Hybrid cloud combines two or more clouds that are centrally managed to enable interoperability, and can include on-premises private, hosted private, or public/IaaS cloud. Today, organizations around the world are increasingly using multiple clouds for critical workloads, relying on them to improve security, performance, business agility and resilience, and to meet regulatory or sovereignty requirements.

This report, based on a recent survey conducted by 451 Research on behalf of Cisco, explores and gauges the progress of organizations around the globe as they work to achieve the promise of hybrid cloud. The 2022 Global Hybrid Cloud Trends Report offers guidance for businesses to achieve better outcomes in hybrid cloud, by evolving to an infrastructure strategy that is cloud-ready and uses a cloud-smart operations model that accelerates the adoption of cloud-native technologies. The report incorporates responses from 2,500 global IT decision-makers and professionals in cloud computing, DevOps and enterprise networking roles, representing 13 countries across North America, Latin America, APAC and Western Europe. Respondent organizations are advanced users of cloud, with keen interest in leading-edge technologies.

While hybrid cloud provides a range of opportunities and benefits for organizations, many are acutely aware of the challenges in operating these environments. Cloud-native architectures and emerging technologies compete for the attention of staff and for budgets, while security and networking challenges remain top of mind. Adding new elements to an existing infrastructure mix raises the level of operational complexity, and organizations are grappling with ways to tame this issue. The survey results highlight the correlation between delivering better business outcomes and collaboration between cloud operations, DevOps, and networking teams, suggesting that regardless of the technology at play, cooperation between these teams is critical for successful hybrid cloud operations.

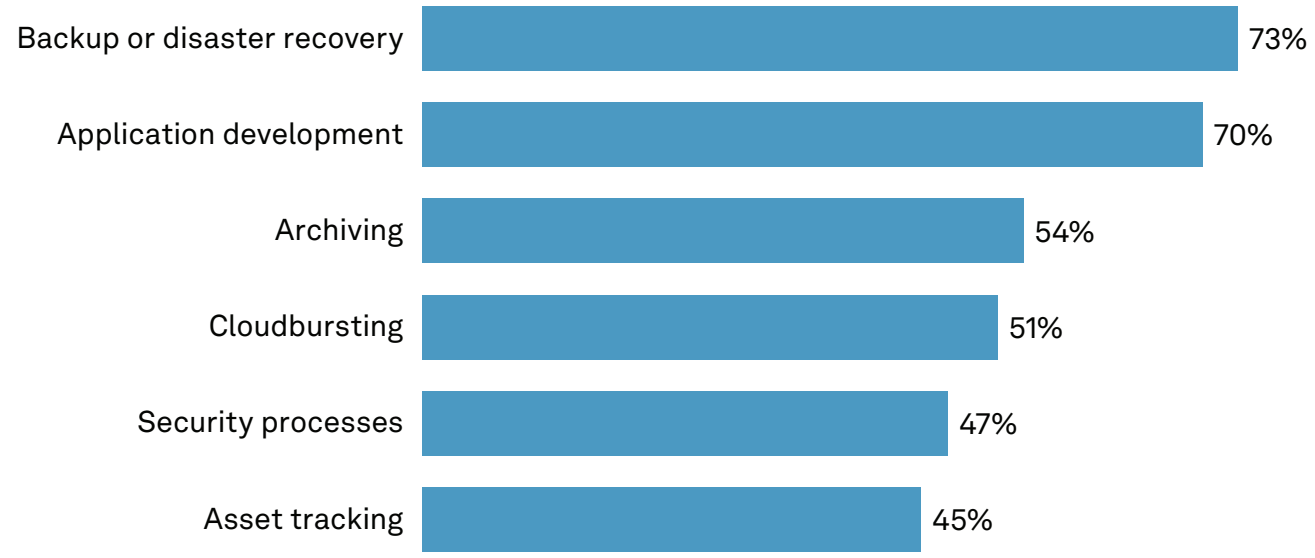
Key Findings

- **Hybrid cloud and, increasingly, multicloud are the new norm**
  - 82% of survey respondents have adopted **hybrid cloud**
  - 47% of organizations use between **2-3 public IaaS clouds**
  - **The need to balance security with business agility and access to cloud-based services is driving enterprises to multicloud deployments.**
- **Customer challenges grow with multiple cloud use**
  - 37% of respondents see **security concerns** as a significant challenge to deploying to multiple clouds
  - 35% view **increased operational complexity** as a top challenge when using multiple clouds.
- **Building cloud-ready**
  - 58% of respondents are **moving workloads** between on- and off-premises environments weekly
  - 47% of CloudOps and DevOps respondents say that a **"cloud first" mandate** is the tipping point for changing development processes and tools.
- **Operating cloud-smart**
  - High deployment among respondents of **emerging technologies**, including AIOps (45%), infrastructure automation (41%), composable infrastructure (37%) and edge computing (41%)
  - 57% in networking roles strongly agree that it is important for their DevOps team to be involved in developing their organization's network strategy
  - Cost management is the second highest concern (33%) in multicloud operations
  - 79% of respondents say that more than 51% of their workloads will run on different hardware across environments, which reinforces the need for a comprehensive toolset for managing workloads regardless of where they reside.
- **Accelerating cloud-native**
  - 91% in DevOps and CloudOps roles say their organization plans to refactor applications using **cloud-native technology**, or has already done so
  - 73% say **security** is their top concern for cloud-native use.

Hybrid Cloud Is the New Normal

Most organizations around the world now use multiple clouds to support myriad applications and deliver improvements in business agility and scalability. In the Global Hybrid Cloud Trends survey, 82% of respondents currently use hybrid IaaS cloud infrastructure to host their workloads. This hybrid approach enables organizations to achieve a more agile and scalable development environment (42%) and accelerate business agility and innovation (40%). In addition, as organizations consider the best venue for their workloads today and in the future, the use of multiple clouds has become a popular approach that allows organizations to select the best environment for their workloads, considering factors such as regional compliance, security and performance. Figure 1 illustrates the top workloads and applications that surveyed organizations are running in hybrid IT environments.

Figure 1: Organizations Use Hybrid IT Approach Across Myriad Workloads



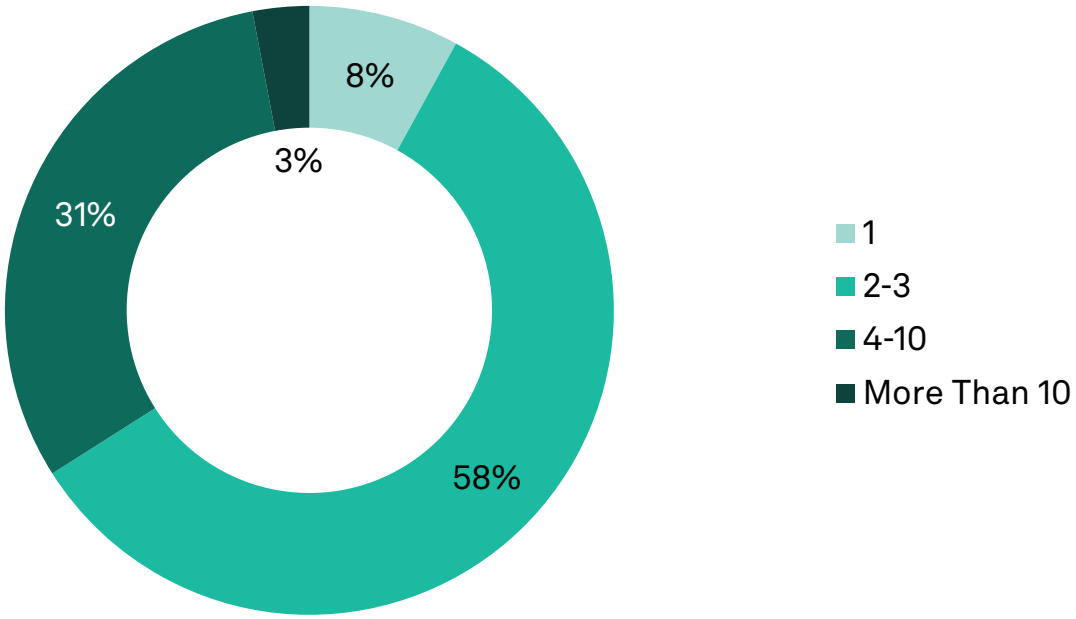
Q. Which of the following workloads or processes do you currently run in a hybrid IT environment?
Base: All respondents (n=2,577)
Source: 2022 Global Hybrid Cloud Trends Report

Most surveyed organizations (58%) use 2-3 public IaaS cloud providers for their workloads, with 31% of respondents using 4-10 public cloud providers (see Figure 2). The organizations that use more than three cloud providers make use of alternative cloud providers outside of AWS, Azure and Google Cloud, which may include pure-play public cloud providers or cloud services offered as part of a broader portfolio (e.g., telcos).

Only 8% of surveyed organizations use a single public IaaS cloud provider.

451 Research considers these alternative cloud providers a fit for customers that have requirements such as simplicity, cost-effectiveness and ease of use. Organizations with 5,000+ employees are slightly more likely (8% of respondents) than smaller organizations (5%) to have more than 10 public cloud providers in use, since large organizations have more line-of-business requirements that can drive usage across platforms and outside the view of IT. A comprehensive cloud strategy can help an organization audit the number of IaaS vendors in use and ensure optimization around costs and performance.

Figure 2: Most Organizations Use 2-3 Public Clouds

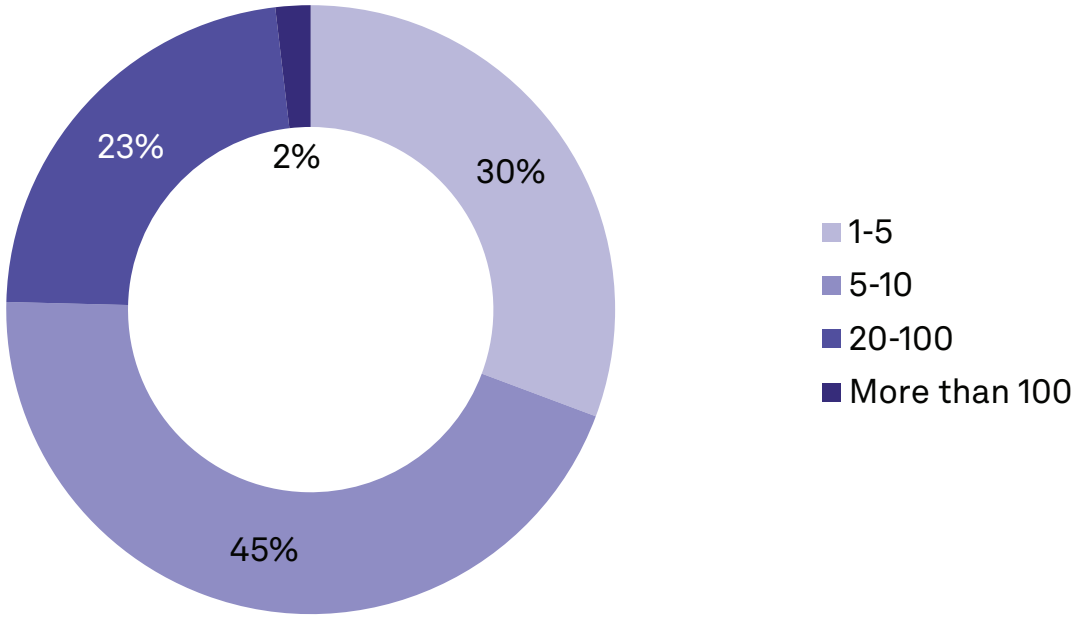


Q. How many public cloud providers, such as AWS or Azure, do you currently use for these workloads and processes?
Base: All respondents (n=2,577)
Source: 2022 Global Hybrid Cloud Trends Report

Interestingly, there were only small variations across geographies in most areas of the study. That speaks to a common set of experiences of those who are operating hybrid cloud environments. They are a select group that is dealing with issues that are common around the globe.

When it comes to SaaS, organizations are stretched across even more providers, with 23% of respondents reportedly using 20-100 different SaaS providers for their business, across categories such as email, collaboration and video calling, customer relationship management (CRM), and human capital management (HCM). Nearly half of respondents (45%) in the survey have 5-10 SaaS vendors in use (see Figure 3). Many SaaS applications address a specific business or IT need and require organizations to spread usage across numerous vendors.

Figure 3: Nearly Half of Organizations Have 5-10 SaaS Providers in Use



Q. How many different Software as a Service (SaaS) providers, such as Office 365, Salesforce, Workday or Zoom do you currently use for your organization?

Base: All respondents (n=2,577)

Source: 2022 Global Hybrid Cloud Trends Report

Survey respondents that either use or would use multiple IaaS, PaaS and SaaS providers tell us that using multiple clouds enables their organization to effectively manage security considerations such as data residency and exposure risk (42%), to achieve more agile and scalable development environments (42%), and to access best-of-breed cloud services and applications (41%).

Multiple cloud use has the potential to deliver a range of improvements, including stronger security and compliance and better business agility and resilience, and to eliminate vendor lock-in. But there are numerous challenges that can stall progress for an organization, including an incomplete cloud networking strategy or inadequate controls for managing costs and performance.

Multiple Clouds Multiply Challenges

The road to hybrid cloud and multicloud use is not without its challenges, and security stands above the rest as the greatest challenge that survey respondents face in using multiple clouds. As noted earlier, security is also the top reason that survey respondents use multiple clouds (37%), as they look to balance security with the needs of performance and scale (42%), while one-third of respondents face challenges related to operational complexity (33%) and managing costs (33%) in these environments. Survey respondents employ various strategies to overcome these roadblocks and demonstrate a strong appetite for implementing new technologies to help them do so.

Top Challenge No. 1: Security

Regardless of where an organization is at in their journey toward multicloud use, security remains a critical challenge as threats are constantly changing, and technology and processes need to adapt. It's important to keep in mind that security encompasses many aspects of hybrid operations. Operational security concerns are common to any new environment, and cloud is still a new discipline compared with other infrastructure elements. Hybrid approaches allow organizations to implement one of security's most fundamental controls, segmentation, as well as isolation, which allows them to use different clouds for different use cases.

One factor in the maturing of cloud operations is managing risk by being selective about where workloads and data are placed. Hybrid environments can give security teams options that allow them to balance placement, putting some workloads in public clouds while keeping others on-premises, or using different regions for data residency requirements. While that's an advantage, it's one that has risk elements of its own in terms of the additional complexity of operating in multiple, dissimilar realms. Each cloud environment can have its own operational model and management environment. Without a common framework to manage them, security teams need to develop fluency in each new cloud – a significant investment in time and resources.

Security can be even more difficult to handle when you consider how often applications are moving from one environment to another – more than half of total survey respondents say they are moving applications between on-premises and off-premises environments ***weekly***. Enterprises are looking at all options to improve their security posture, including using cloud-native technologies (44% of respondents) and using infrastructure as code (58%). In addition to managing the security of the overall environment, securing APIs across multiple clouds is a significant challenge for 32% of respondents.

This is an area where automation and abstraction can deliver the best of hybrid cloud's promise for security while overcoming security-related challenges. If security teams can implement tools that let them use a common framework for security management across multiple clouds, they can mitigate the largest risks of misconfiguration and operational mistakes, while ensuring that guardrails are in place to get the right workloads deployed in the proper environments. The abstractions that capable management platforms offer can be force multipliers for security teams that are already overtaxed by hybrid complexity.

Top Challenge No. 2: Operational Complexity

The use of multicloud contributes to operational complexity for one-third of surveyed organizations, even as there is a proliferation of tools on the market designed to simplify the management of cloud environments. For instance, the majority of survey respondents use a cloud-based IT operations platform delivered as a service (94%), which can help an organization quantify operational complexity, provide full lifecycle management, and offer proactive support of on-premises infrastructure – all key capabilities identified by respondents as top criteria in selecting a cloud-based ITOps platform.

The majority of survey respondents (94%) use a cloud-based IT operations platform delivered as a service.

Hybrid environments not only mean that organizations must manage disparate cloud environments, but also different hardware. Many survey respondents (79%) tell us that more than 51% of their workloads will run on different hardware across all environments, which reinforces the need for a comprehensive toolset for managing workloads regardless of where they reside. Concerns about visibility into more complex infrastructure have placed a focus on management support that can span multicloud environments. To ensure they meet their business objectives, a SaaS-based operations platform is the leading choice (60%) for respondents.

Top Challenge No. 3: Managing Costs

Managing costs can be challenging; however, most organizations' use of multicloud is not driven by the expectation that this approach will help reduce cloud services costs (66% of respondents). More than half of respondents (56%) use a cost/benefit approach to justify and load-balance cloud service purchasing.

Cost optimization is one measurement of multicloud success, but saving money is not a guarantee in the cloud, and it is the ability to connect cloud strategy to overall business objectives that drives real value. As understanding of cloud's value matures, expectations are shifting from cost reduction to cost management to enable business agility and scale – one of the top two motivations for multicloud in the study.

Building Cloud-Ready: DevOps and CloudOps Perspectives

Developers have become more influential in determining an organization's cloud strategy, and they frequently play a key role in selection of cloud platforms and services that support application development and infrastructure modernization.

Survey respondents in cloud operations and DevOps roles indicate that a cloud-first mandate for all new application development (34%) is the tipping point toward changing development processes and tools at their organization, while cost optimization (19%) and automation (18%) are contributing factors. This is another indication of the maturing expectations around cloud environments, as organizations expect operational capabilities to be part of their multicloud journey.

A cloud-first mandate may be applied to net-new applications as most businesses are dealing with legacy applications that require a different approach to transformation. CloudOps and DevOps respondents tell us that their approach to mission-critical and legacy applications moving forward is to modernize in place (38%) or refactor and shift (25%), leveraging cloud-native technologies to support this transition. Our survey respondents are bullish on transformation, with only 8% planning to retain mission-critical workloads where they are.

Regardless of where an organization decides to run a particular application, networking is a critical capability that ensures applications function and perform properly, and developers consider their involvement in determining networking priorities as non-negotiable. The majority of developers either agree or strongly agree (92%) that having a seat at the table in determining their organizations' networking strategy and priorities is important. The importance of networking is reinforced by the frequency with which survey respondents move workloads between off-premises and on-premises environments – 53% move workloads/applications between these venues weekly, while 39% do so monthly.

Meanwhile, networking professionals also view this relationship as critical: 57% of respondents in networking roles strongly agree that it is important for their DevOps team to be involved in developing their organization's network strategy. In fact, most developers indicate they already have a process in place to collaborate with networking teams, with 71% of DevOps respondents having a regular cadence of meetings with this team – either weekly (62%) or monthly (9%) – while 8% of respondents describe ad hoc meetings as the norm (see Figure 4).

Although most survey respondents feel their current level of collaboration between DevOps and networking teams is sufficient (83%), there are roadblocks that prevent even more cooperation. Competing priorities between teams (45%), resistance to change (43%) and different objectives and incentives (41%) are all factors that prevent further collaboration between DevOps and networking teams. Speaking the same language around how networking can drive faster and more effective development and identifying common business goals could go a long way in bringing these teams together. It is evident that while collaboration is happening at some level, there is still room to improve outcomes that address developers' concerns around networking.

Figure 4: Collaboration Between Networking Operations and DevOps Teams Is Frequent

Q. How often do you collaborate with your network operations team?
Base: Respondents in DevOps roles (n=647)
Source: 2022 Global Hybrid Cloud Trends Report

In our survey, 48% of developers note that network reliability is one of the most pressing challenges they encounter. DevOps teams want more visibility into networking issues, and 41% of developers tell us that accessing root-cause analysis is a key challenge they face, along with lack of common tools, platforms and interfaces. More productive collaboration would help developers better understand networking priorities while ensuring that application requirements and business needs are considered as part of the overall networking strategy.

Leading-Edge Technologies Support Cloud-Smart Operations

The respondents to our survey show keen interest in a range of leading-edge technologies that can benefit from hybrid architectures, including deployment of infrastructure automation (49%), edge computing (41%) and composable infrastructure (27%).

Some form of edge computing capability is already deployed by 41% of survey respondents, while an additional 53% expect to deploy edge in the next two years. It's a technology that has broad application, and hybrid approaches to edge computing can ensure that the right level of capacity is in the right place to optimize application performance and customer experience. Organizations that use 10 or more IaaS cloud platforms were more likely to be further along (57% already in deployment) in edge computing.

94% of surveyed organizations have deployed or intend to deploy edge computing.

Infrastructure automation is critical to operating at cloud scale and efficiency, and a slightly larger number of surveyed organizations (49%) reported automation deployment. It's an area where there has traditionally been underinvestment, and when compared with overall cloud use, there's a striking difference. Of those organizations with only a single public cloud in use, 39% said automation was deployed. Those with more than 10 clouds in operation reported much higher levels of automation deployment – 55%. This is an indication that automation is becoming mandatory to manage growing hybrid cloud complexity. Tools that leverage automation – such as IT operations platforms delivered as a cloud-based service that support infrastructure lifecycle management – can further help make sense of the complexity in hybrid cloud.

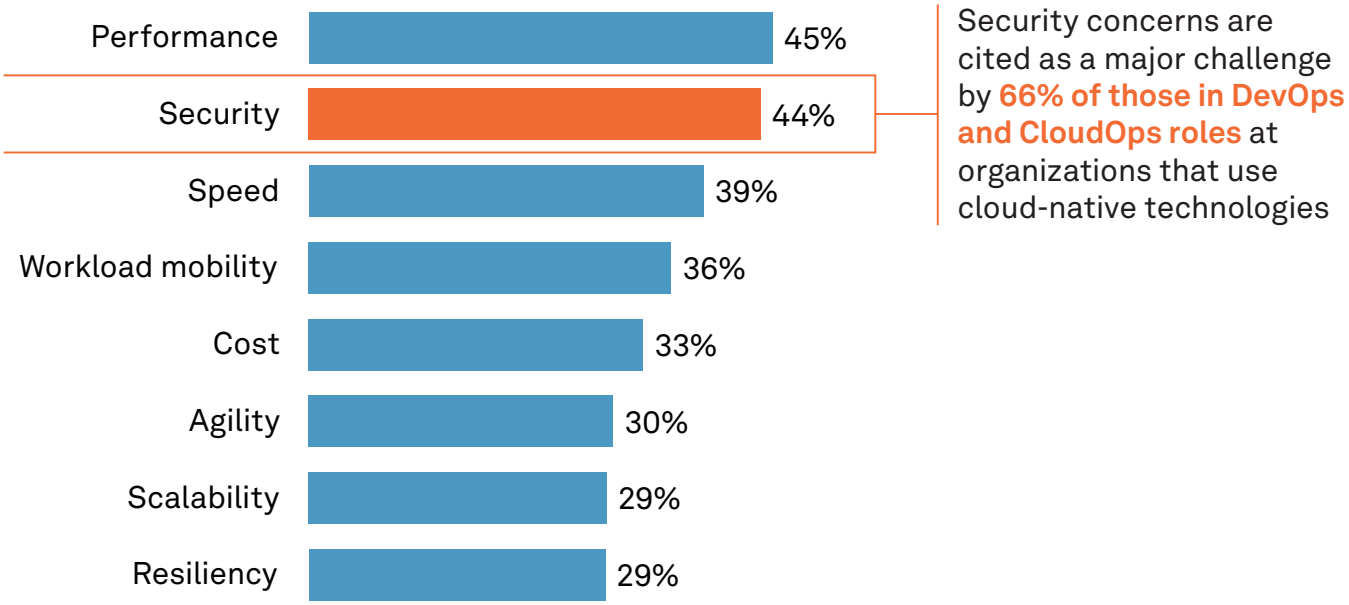
At the same time, survey respondents are also looking for more efficient operation, with a strong interest in predictive capabilities using telemetry and AIOps. This is a maturation of operational mindsets, as they move from reactive models to predictive ones on the way to being fully proactive. Almost half of surveyed organizations (45%) are using some form of AIOps technology today, and 49% are expecting to deploy it in the next year.

There are strong signals in the study about interconnection and the importance of access to data. Data fabrics can ensure that data is available across a hybrid environment, and 88% of respondents either have that capability in place today or expect to have it within two years. Building performant infrastructure to access the applications that are handling all that data is also seen as critically important, and private 5G wireless networks are expected to be utilized by 91% of respondents in the next two years. Hybrid environments depend on effective data distribution and access capabilities.

Accelerating Cloud-Native

The transition to cloud-native application architectures is accelerating as organizations look to these technologies to support better performance and security of their applications. Most survey respondents (91%) are actively moving or planning to move or refactor production workloads and applications using cloud-native technologies. When you look at the considerations that are driving use of cloud-native technologies, requirements around performance (45%), security (44%) and speed (39%) are among the top responses from those in DevOps and CloudOps roles (see Figure 5).

Figure 5: Performance and Security Are Top Drivers for Using Cloud-Native Technologies



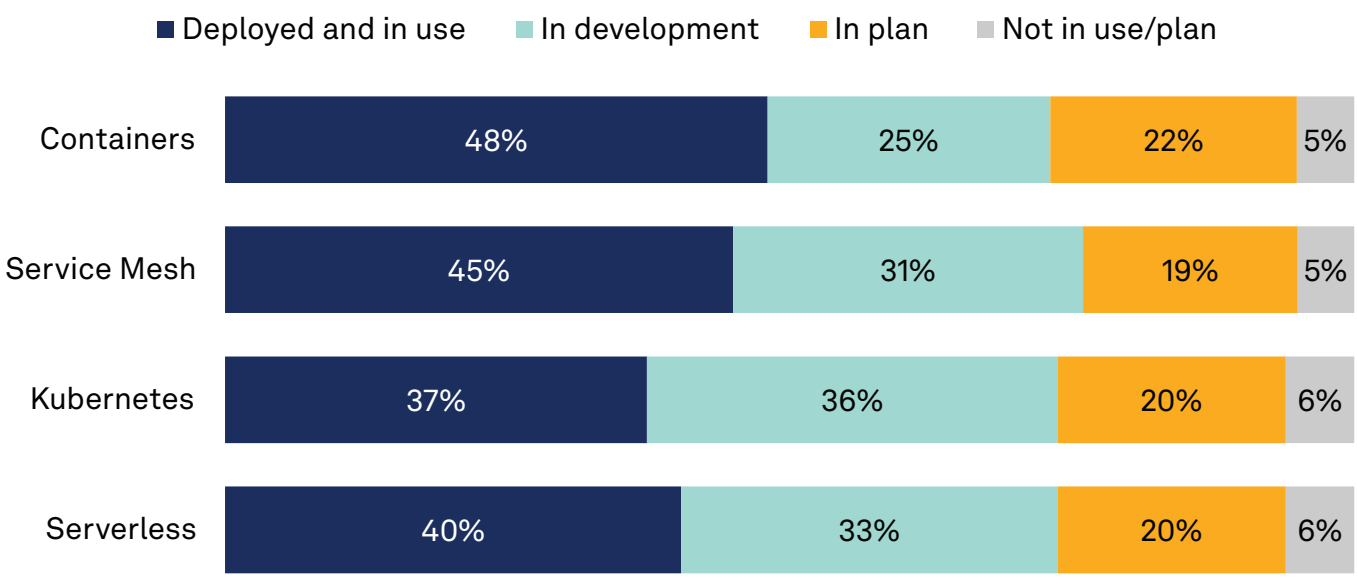
Q. You indicated previously that you were aware of your business' plans for using cloud-native technologies. What requirements would you say are driving these plans? Q. What are the main challenges to your organization's use of cloud-native technologies?

Base: Respondents in DevOps or CloudOps roles (n=1,286)

Source: 2022 Global Hybrid Cloud Trends Report

Nearly half of survey respondents at organizations using cloud-native technologies tell us that their organization has containers deployed and in use (48%), while 45% use service mesh, 40% use serverless, and 37% of these respondents have deployed Kubernetes. Fewer than 5% of respondents do not currently use or plan to use any of these cloud-native technologies, with many organizations in the planning or development stages (see Figure 6).

Figure 6: Nearly All Organizations Currently Use or Plan to Use Cloud-Native Technologies



Q. Which of the following cloud-native technologies are being considered or are already in use?
Base: Respondents that use cloud-native technologies (n=1,165)
Source: 2022 Global Hybrid Cloud Trends Report

While survey respondents are optimistic about the potential of cloud-native technologies, they are also acutely aware of the challenges their organizations face when it comes to effective implementation. Two-thirds (66%) of respondents in DevOps and CloudOps roles indicate that security concerns are the main difficulty in using cloud-native, followed by process and tools integration (57%) and budget constraints (52%) as other key challenges.

These security concerns are likely exacerbated by a lack of skills and budget in many organizations, which can lead to a strategy that fails to protect data and workloads in cloud-native environments – where development happens faster, and there is greater use of automation. In addition to influencing an organization's security strategy, the use of cloud-native application architectures also affects networking strategy. Survey respondents in CloudOps and DevOps believe that cloud-native technology has had a positive impact, making networking more automated (24%) and more secure (25%).

Using Infrastructure as Code

Developers and CloudOps professionals that leverage cloud-native applications can further build on an organization's automation and security capabilities using infrastructure as code (IaC), which enables the management of infrastructure through code instead of manual processes. Improved security is a critical outcome of IaC use, particularly among respondents in cloud operations roles, 68% of whom said that security improvements are a key driver of IaC, compared with 48% of DevOps respondents. Managing cloud security is among the dominant use cases of IaC for 69% of DevOps and CloudOps respondents . IaC is crucial in helping to manage complex applications (61%), especially among organizations that use over 10 public clouds (72%).

Survey respondents in DevOps and CloudOps roles also value IaC for its ability to deliver more efficient development (52%) and improved infrastructure consistency (52%). Geographically, over half of organizations in Latin America indicate that reducing risk (52%) is the key driver of IaC use, compared with 34% of surveyed organizations in North America.

DevOps and CloudOps respondents are split on how they built existing IaC functionality, or how they expect to build it – either by extending existing management systems (36%), using a SaaS-based IaC offering (34%) or building new development environments (30%). When looking at the steps necessary to secure IaC, DevOps and CloudOps respondents focused on identifying vulnerable settings and scanning IaC configurations for vulnerable settings as their leading imperatives (55% each). It's a preference that could be tied to expectations of broader cloud security issues. Interestingly, these vulnerability concerns were prioritized over two areas that are also common security issues with cloud-based infrastructure – identity and access management (41% of respondents) and embedded secrets (47%). It's clear that all these security issues are of significant concern to survey respondents.

Developing a Culture of Collaboration

Organizations we surveyed are generally optimistic and open-minded about working with collaborators outside of their core team to ensure that hybrid cloud environments are secure, while delivering efficiency and performance. Respondents see value in cooperation between networking, cloud operations and DevOps teams.

More than half of respondents (55%) have created a cross-functional team with technical and business representation, while 50% of respondents have a centralized CloudOps and NetOps function to help ensure their organization's hybrid cloud strategy meets business objectives. Respondents in North America are slightly more likely to have this function in place (58%) than organizations in APAC (48%).

Survey respondents agree that greater collaboration between networking and cloud operations teams has numerous benefits, with improved cloud security (45%) at the top of the list, followed by greater operational efficiency overall (41%) and enhanced cloud application performance (39%).

Conclusions

When executed properly, hybrid cloud can enable organizations to improve security, performance, business agility and operational resilience. It's a capability that can offer support for a range of leading-edge technologies that accelerate developer efficiency while driving effectiveness of cloud operations. Organizations that we surveyed are advanced users of technology that rely on multiple clouds for delivery. What sets them apart is a more mature approach to cloud use and operations. They are looking to capitalize on agility, scale and technology advances, while expecting to leverage automation to manage costs and complexity.

The pursuit of digital transformation places demands on an organization to address the challenges of security and operational complexity. Hybrid cloud environments require collaboration between stakeholders that can identify the implications of technology decisions on other areas of the business and the overall hybrid cloud strategy. Proactive and consistent collaboration between cloud operations, networking and DevOps teams can help ensure that security, performance and agility remain priorities as the organization pursues new paths and looks to foster innovation.

Organizations must realize that hybrid cloud environments are a reality for their infrastructure. They will risk their competitive position if they are not able to secure and manage them effectively and efficiently. There are significant benefits that hybrid infrastructure operation offers, and organizations must master the skills and build the operational capabilities to realize them and put them to work.

Methodology

A Black & White paper is the result of a quantitative study of a key technology topic, and presents insights based on the results of that study, intended to help guide decision-makers through the issues associated with that topic.

Survey data referenced in this report was collected by 451 Research, part of S&P Global Market Intelligence, as part of an independent web survey of over 2,500 global IT decision-makers and professionals in cloud computing, DevOps and enterprise networking roles. It was commissioned by Cisco. The 2022 Global Hybrid Cloud Trends Report was completed between April 11 and May 6, 2022. The survey was conducted in 13 countries across North America, Latin America, APAC and Western Europe (US; Canada; Brazil; Mexico; Australia; China; Indonesia; South Korea; Japan; Singapore; UK; France; and Germany).

The survey was designed to examine trends in hybrid cloud as they relate to enterprises' overall infrastructure and global networks strategy. This report explores the progress of organizations around the globe as they work to achieve the promise of hybrid cloud through new technologies and processes, and makes recommendations to help organizations marry expectations with reality of hybrid cloud, and complementary and emerging technologies.

Gain more insights from what your peers are doing by attending the 2022 Global Hybrid Cloud Trends webinar.

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