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2017: State of Enterprise Multi-Cloud

Managing the Fragmented Cloud World

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Executive Summary

Welcome to the 2017 State of Enterprise Multi-Cloud Report—a summary of the findings and insights that emerged from a global survey recently conducted among close to 700 IT professionals who lead and implement their organization's cloud strategy. The respondents were evenly distributed across the full spectrum of organization sizes, from startups with less than 50 employees to multinational corporations with more than 10,000 employees. They also represent a wide range of verticals, from software development and IT services to telecommunications, retail, defense & space, and more.

Perhaps the most fundamental insight that we gained when analyzing the responses is that the cloud world is highly diverse, to the point of **fragmentation**. It starts with the infrastructure layer itself. Half of the organizations are managing more than one cloud, with close to 9% of them deployed across five clouds or more. The most popular two-cloud combination is AWS and Azure, showing us that organizations are using public/public multi-clouds in order to avoid vendor lock-in. What surprised us more, however, is that the second most popular two-cloud combination is AWS and OpenStack. Although AWS is more prominent among the smaller organizations and OpenStack among the larger ones, public/on-prem clouds are living happily side by side across organizations of all sizes.

The fragmentation is also evident in the tooling layer. Organizations are using a wide range of cloud management tools, with no single vendor dominating the market. We also saw a higher uptake of DIY, open-source tools than we expected, with two-thirds of the organizations having a DIY/turnkey solution distribution of 50% and higher (in favor of DIY). With DIY open-source tools gaining in maturity, organizations are feeling more confident about using them to accelerate innovative, best-of-breed implementations—at the expense of the more standardized turnkey solutions.

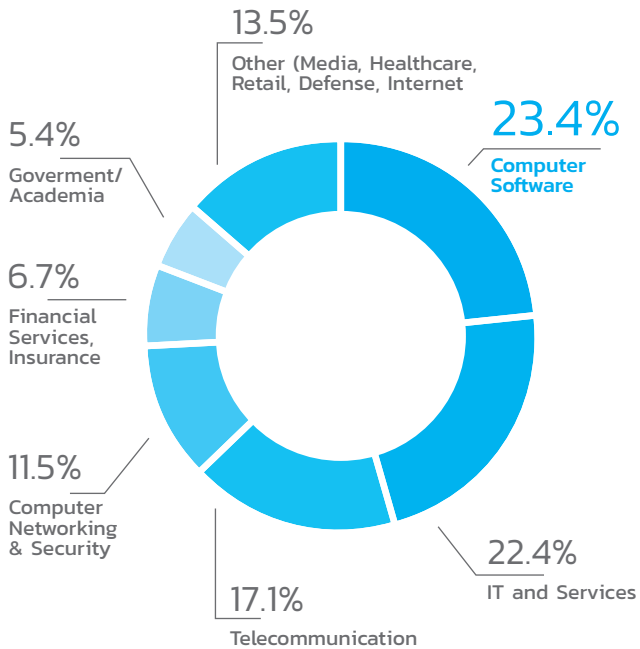
Fragmentation is also part of the IT culture, with two out of three respondents stating that their organization suffers, or may be suffering, from siloism. Much has been written about the disadvantages of siloism, such as loss of control over and wasteful use of IT resources, vulnerabilities created by orphan resources that hold sensitive workloads or data, and inefficient code deployments across development and testing to production. In the survey

results we see clearly that high levels of siloism have a clear impact on innovation and agility. Siloed organizations take much longer to adopt new technologies and are less likely to use DIY tools to create their own best-of-breed stacks.

In this fragmented cloud world, the orchestration layer plays a crucial role in coordinating among diverse infrastructure, tool, and network stacks so that organizations can achieve the value that they seek from the cloud. Our respondents' top two business drivers on their journey to the cloud are increased operational efficiency and disruption & innovation. Clearly, the holy grail of cloud is performance closely intertwined with innovation; **only 9% of organizations** are driven by cost savings.

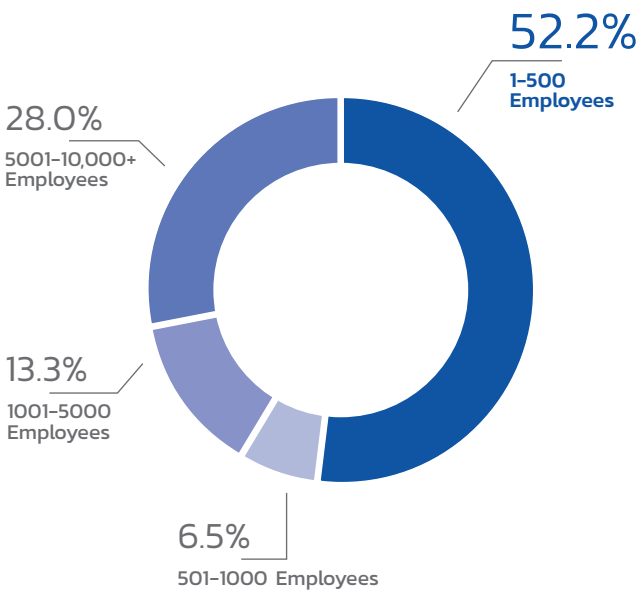
Chapter 1 | Demographics

What industry are you in?



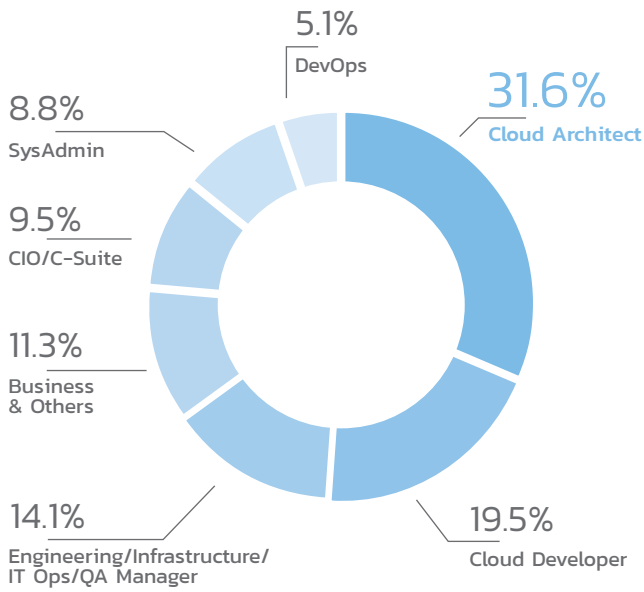
Close to **60%** of our respondents are from the IT industry and various branches of the computer industry (software, security, networking).


How big is your organization?



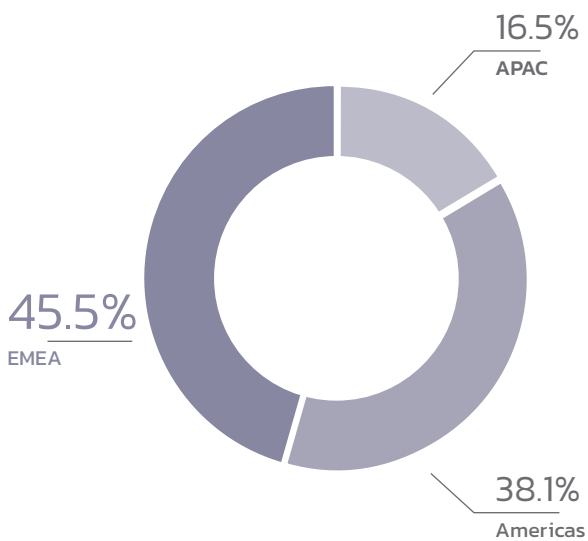
A good cross-section of organization size, from small up to multinational corporations with more than 10,000 employees.

What is your role?



 **25%** of the respondents are in leadership roles, including almost 10% that are C-level. A little more than 56% are responsible on a daily basis for architecting and developing cloud applications.

Where are you located?

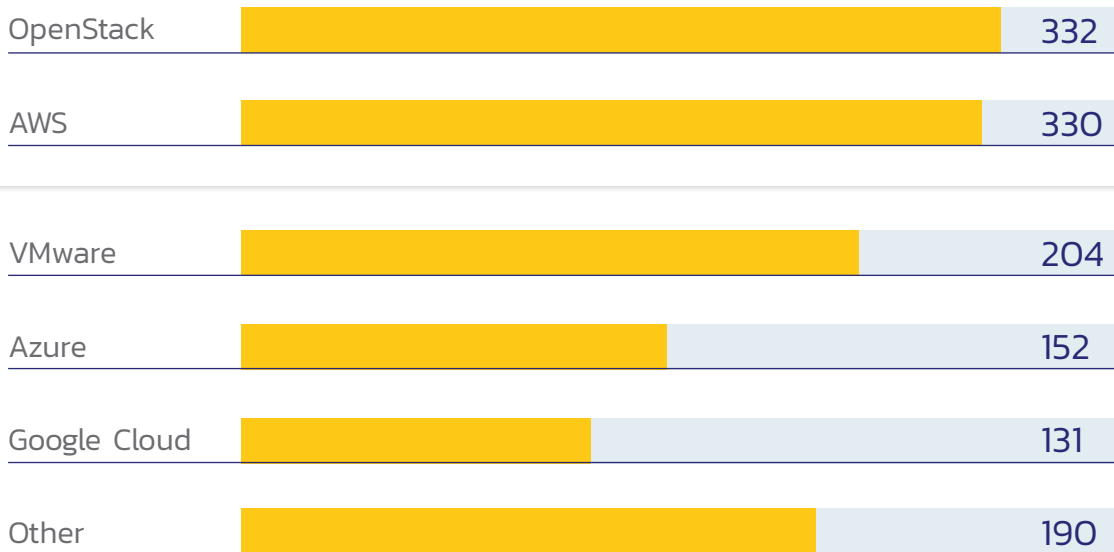


 Our **683** respondents are from all over the globe: EMEA (primarily Europe), the Americas (primarily the USA and Canada), and the rest from the APAC region (primarily Asia).

Chapter 2 | A Cloud Snapshot

This section covers which vendors and technologies our respondents are using in the cloud, as well as their most sought-after cloud features.

Overview of IaaS vendor deployments

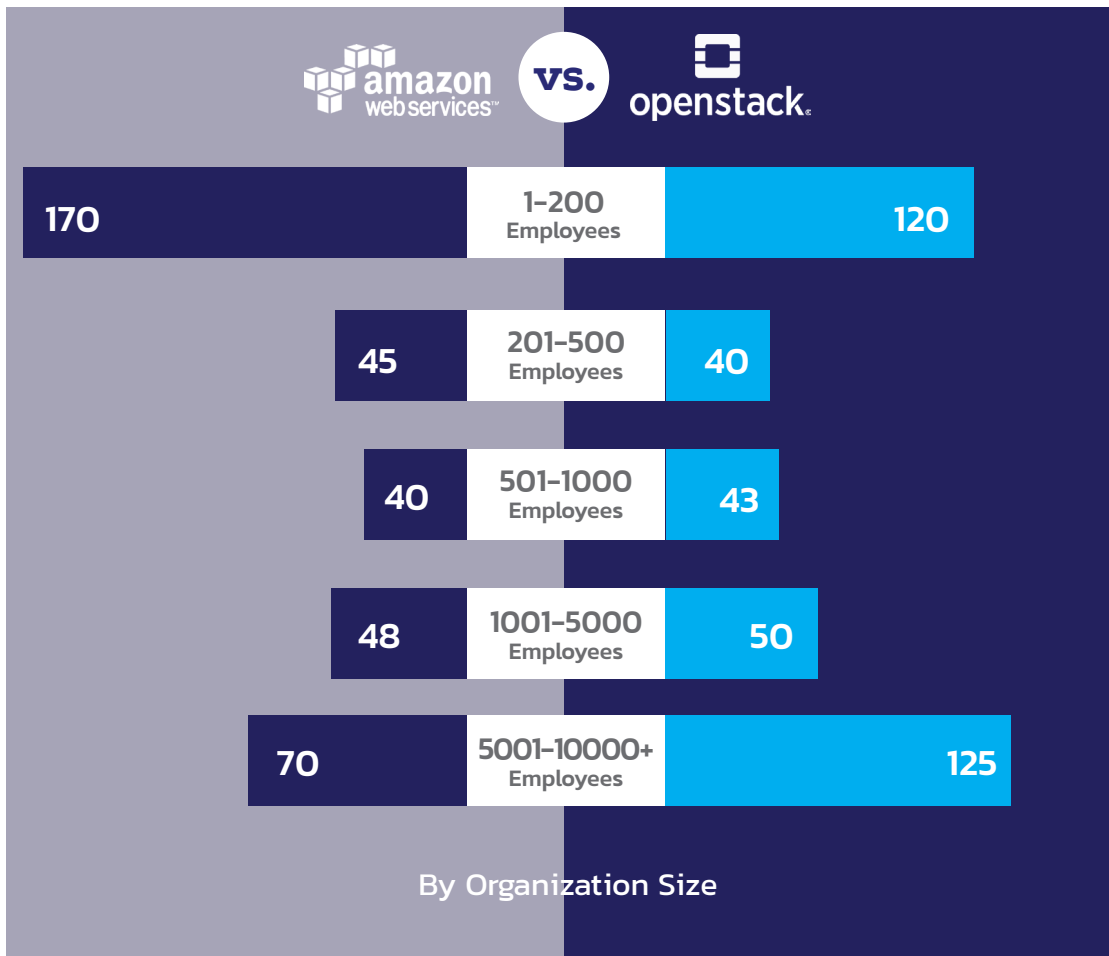


It is interesting to note that **OpenStack** is being deployed as often as **AWS**.

AWS and OpenStack

Taking a look at the IaaS vendors (often multiple) being used by our respondents, it is interesting to observe that OpenStack is being deployed as often as AWS.

And look what happens when we focus on just these two vendors across organization size:



Although AWS is favored more by the smaller organizations and OpenStack by the larger ones, both vendors live happily side by side across the entire spectrum of sizes. We believe that this is a strong indication that all organizations—and especially the more mature ones — are seeking a high degree of control over their workloads, stacks and infrastructure so that they can build best-of-breed stacks alongside turnkey solutions.

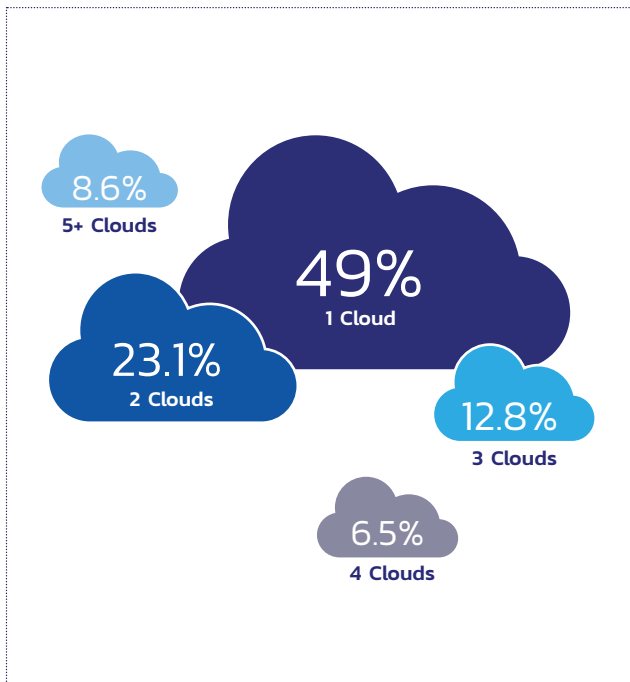
Multi-Cloud is the Name of the Game

Multi-cloud is most definitely the name of the game.

50.3%
of the organizations
are using more than
one IaaS vendor.

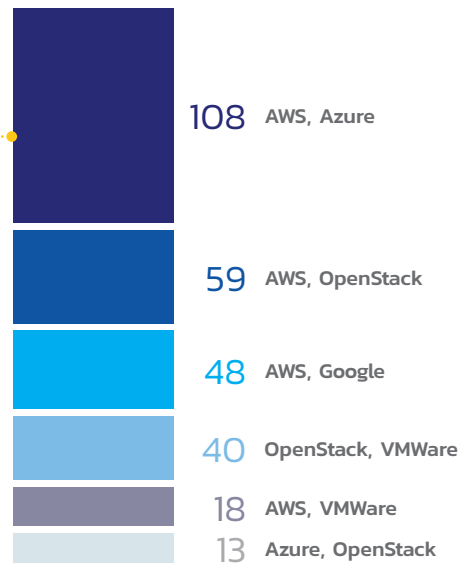
Although a small number are using as many as 8 or 9 vendors, the chart below shows that just under **85% of the multi-cloud organizations** are managing up to 4 clouds.

○ If more than one, then how many clouds?



○ Best friends: Most common combination

And what are the most popular two-cloud combinations?

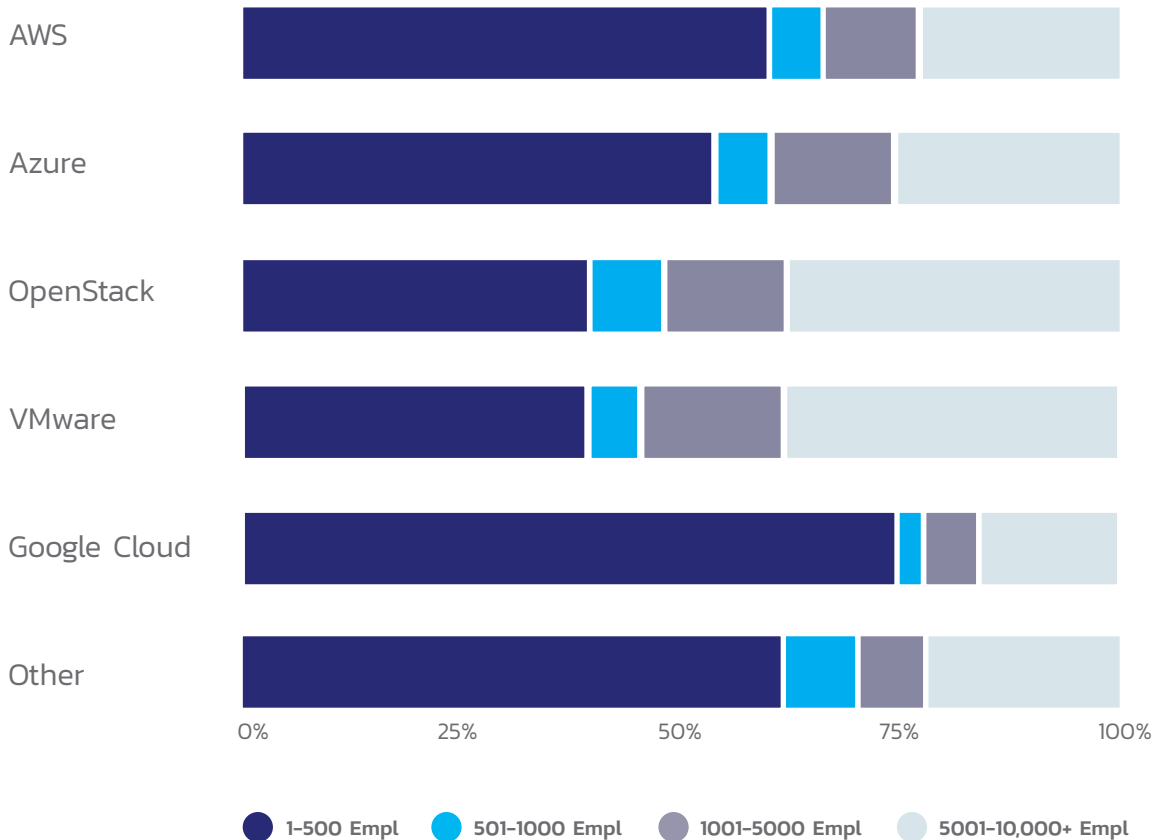


The fact that two public cloud vendors, AWS and Azure, are the most popular two-cloud combination shows clearly that organizations aren't betting on just one cloud. SMBs will often go for a public/public combination in order to avoid vendor lock-in. Larger organizations, however, will tend to select a public/private or private/private multi-cloud model (as we saw above when examining AWS vs. OpenStack).

We believe that these results underscore a trend towards well-managed cloud diversity, with both public and on-prem private clouds consumed in an as-a-service model.

The Impact of Organization Size on Vendor Selection

IaaS vendors correlated with organization size



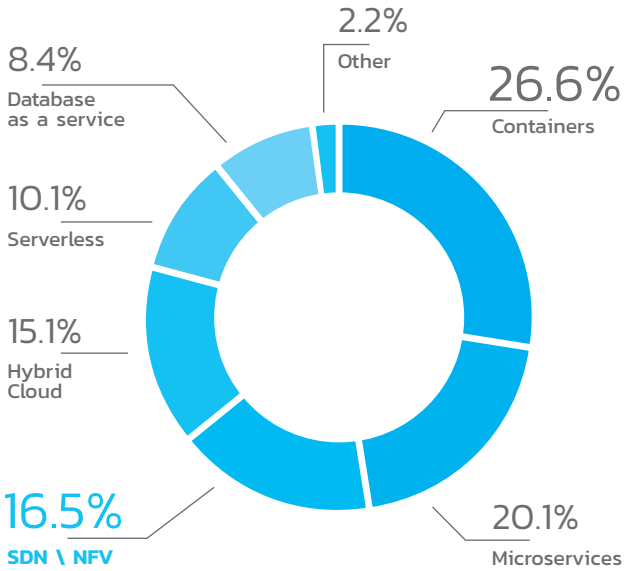
 The largest organizations are using **OpenStack & VMware**

Last but not least, we wanted to see how the size of the organization might influence the choice of IaaS vendor. **Our findings:**

- The 5 vendors listed pretty much "own" the IaaS market, with many small players in the "Other" category (such as RackSpace and Digital Ocean).
- Google Cloud does best in the smaller organizations**, along with the other public cloud vendors, AWS and Azure.
- The **larger organizations are embracing private cloud** deployments, as evidenced by their preferences both for OpenStack and for VMware.
- It is interesting to note that **more than 50% of the VMware users** are from organizations with 1,000 employees and above.

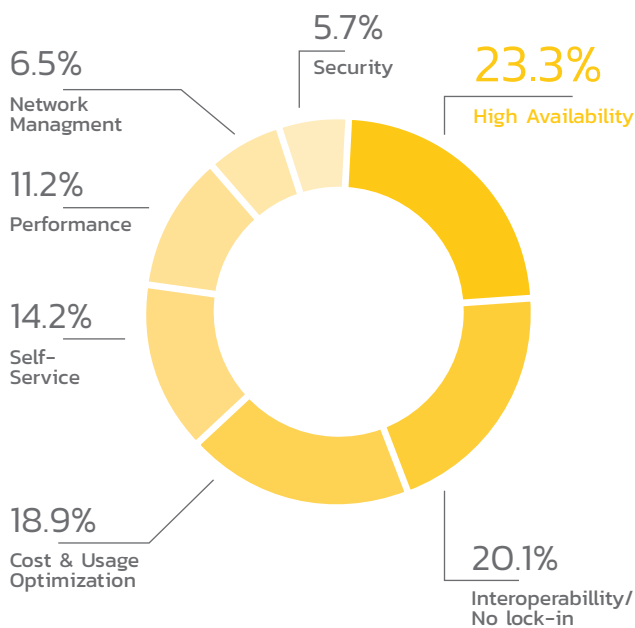
Managing the Hybrid Stack: Technologies, Features, Challenges, Tools

Which emerging enterprise ops most interest you?



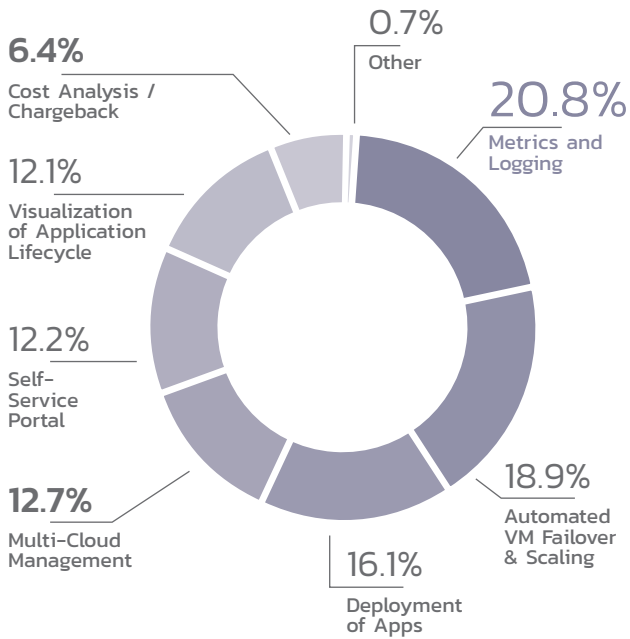
The considerable interest in **SDN/NFV** shows that enterprise NFV is becoming as strategic as cloud initiatives like containers, microservices, and hybrid cloud.


Which cloud feature is most important to you?



HIGH AVAILABILITY and no vendor lock-in are the most important cloud features, but optimization, self-servicing and performance are not far behind.

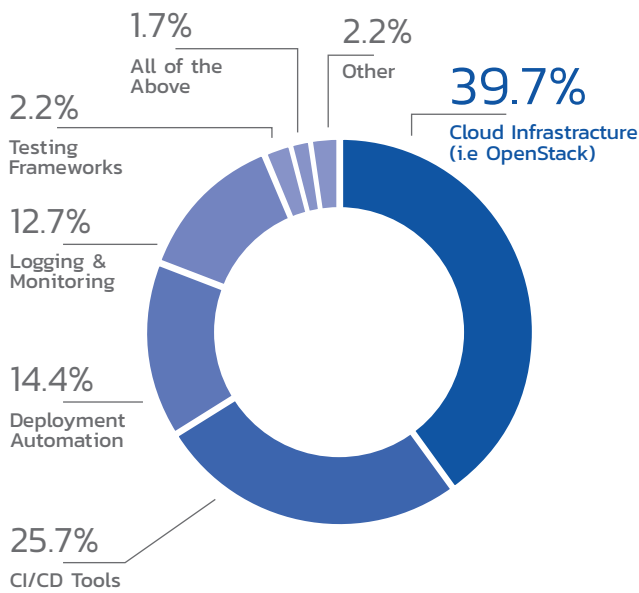
What are your top 3 cloud management challenges?




MULTI-CLOUD MANAGEMENT 

is almost as important as typical cloud management concerns (metrics & logging, app deployment, automated scaling & failover) — and even more important than cost analysis.

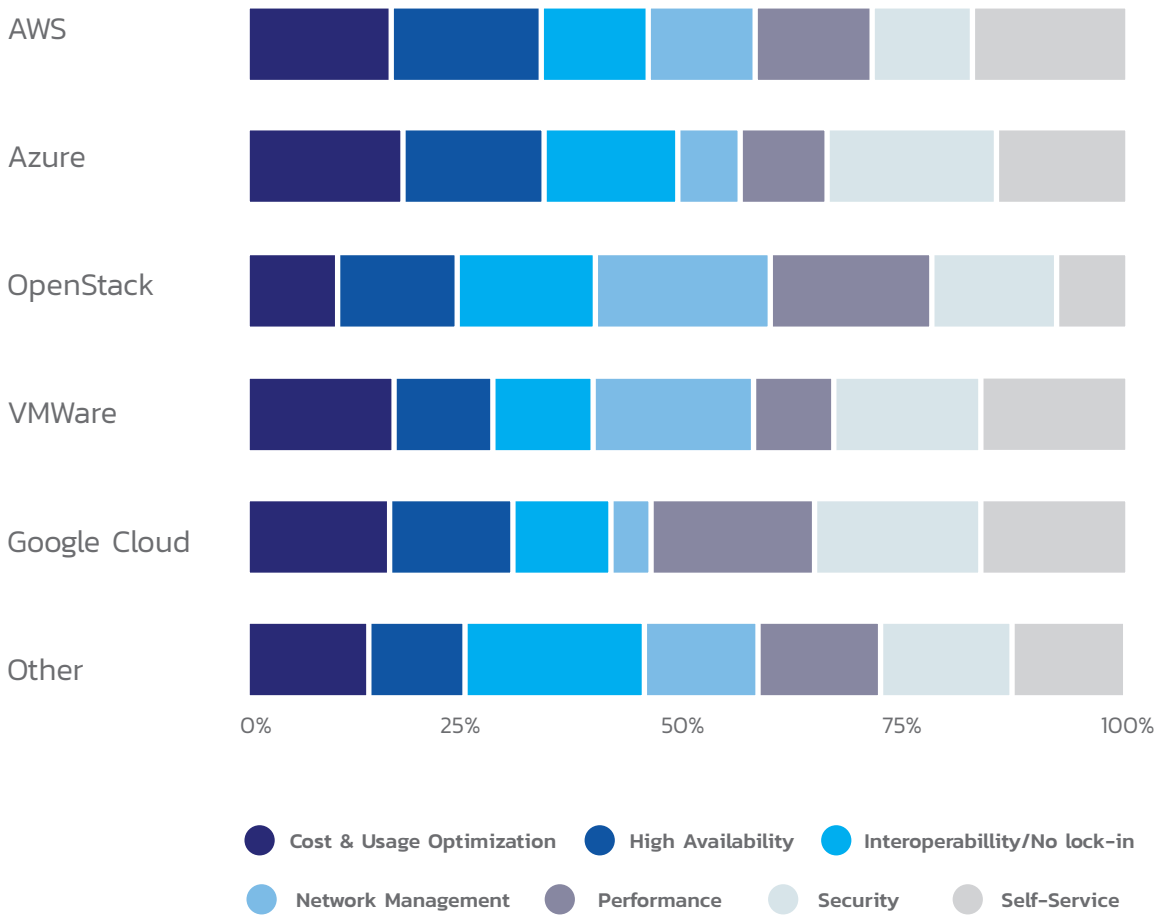
Open source tools evaluated during the last year



 Demonstrates the growing maturity of open source tooling and how the largest organizations are no longer hesitant to adopt these tools for some of the most critical aspects of IT engineering.

Cloud Features vs. IaaS Vendors

IaaS correlated with most important cloud features



The top criteria for selecting public cloud are **cost-optimization and self-servicing**, while the desirable features for private cloud are focused more around performance and infrastructure innovation.

When correlating the most sought after cloud feature with which IaaS vendor(s) they're using, it becomes apparent that the top criteria for selecting public cloud is cost-optimization and self-servicing, while the desirable features for private cloud are focused more around performance and infrastructure innovation.

Thus, although self-servicing was important across all vendors (with the exception of OpenStack, for obvious reasons), it was clearly dominant for AWS and Google Cloud users. This makes sense since, as we saw above, it's the smaller organizations that use the public cloud vendors in their quest for speed and agility.

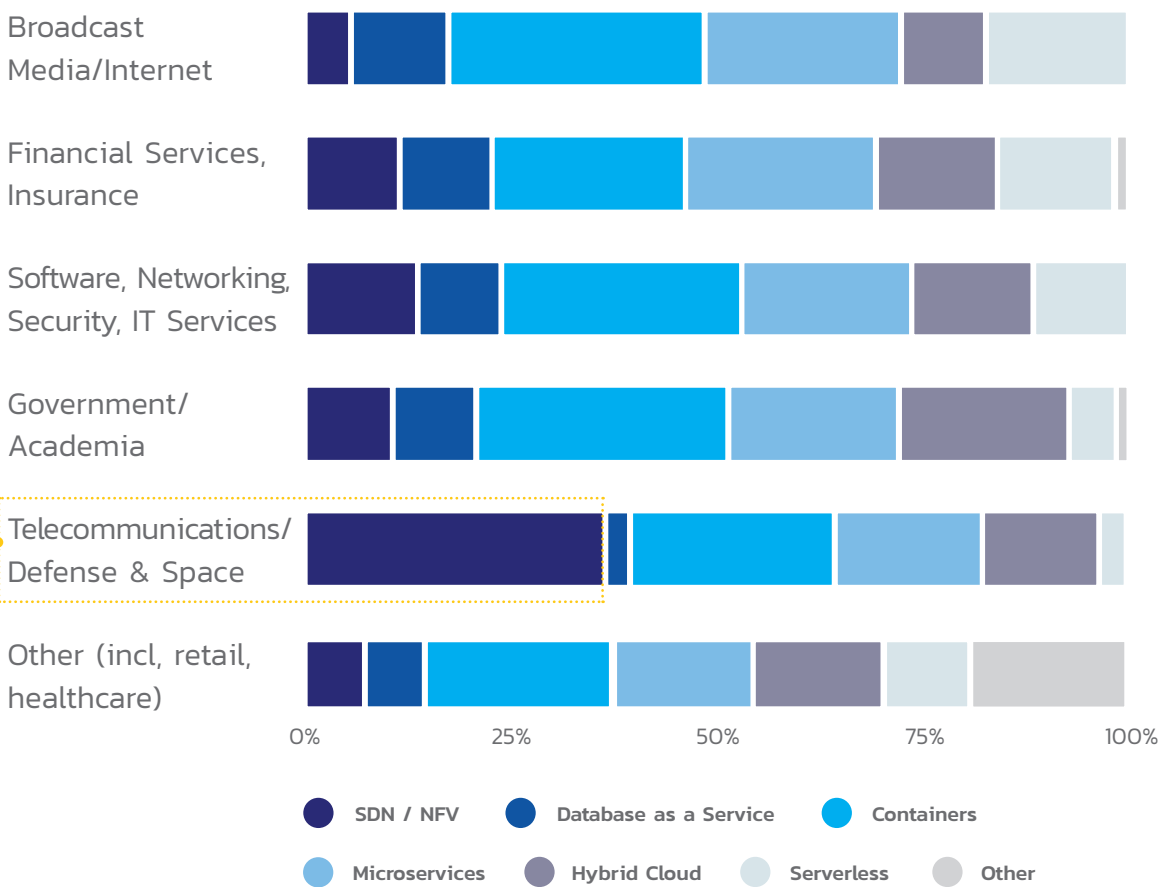
While network management is not usually thought of as the primary driver for selecting OpenStack, they were indeed the pioneers in exposing networking APIs and enabling the NFV revolution. Closed networking models, such as AWS, are lagging far behind in this feature. It's also interesting to note that those seeking performance are not hesitating to turn to OpenStack—leveraging containers and density to run their I/O intensive workloads.

Emerging Technologies vs. Industry



NFV/SDN is not only of great interest in the telecommunications vertical, but also in industries with considerable edge computing, such as Defense & Space and Financial Services.

Emerging enterprise ops of interest correlated with industry



When we cross-referenced interest in emerging technologies with the organization’s industry, we were able to observe that NFV/SDN is not only of great interest in the telecommunications and computer (software, networking, security, IT services) verticals, but also in industries with considerable edge computing, such as Defense & Space and financial services.

The results also show clearly that Hybrid Cloud and DBaaS are particularly interesting to sectors that have high data flows and security needs such as government and academia (research).

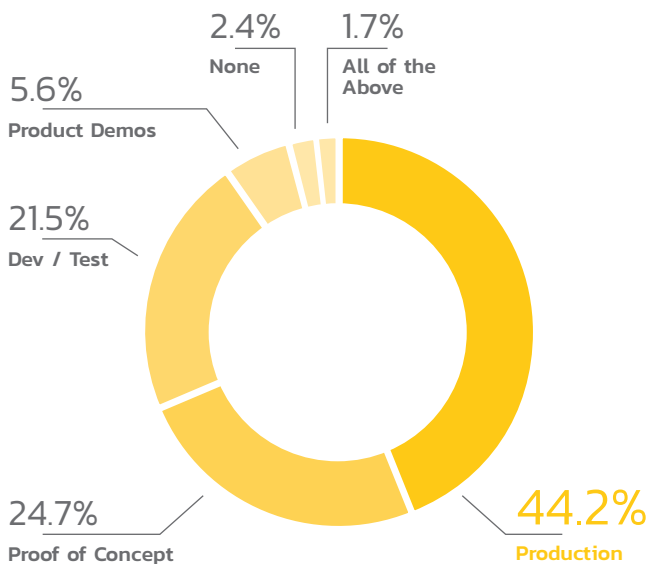
Chapter 3 | The Orchestration Panorama

Today's corporate IT departments have generally embraced the cloud world but they are now struggling with an accumulation of diverse technologies and tools that are running in silos. The emergence of shadow IT in an organization is an indication that development and other business-critical teams require a level of agility that corporate IT cannot provide.

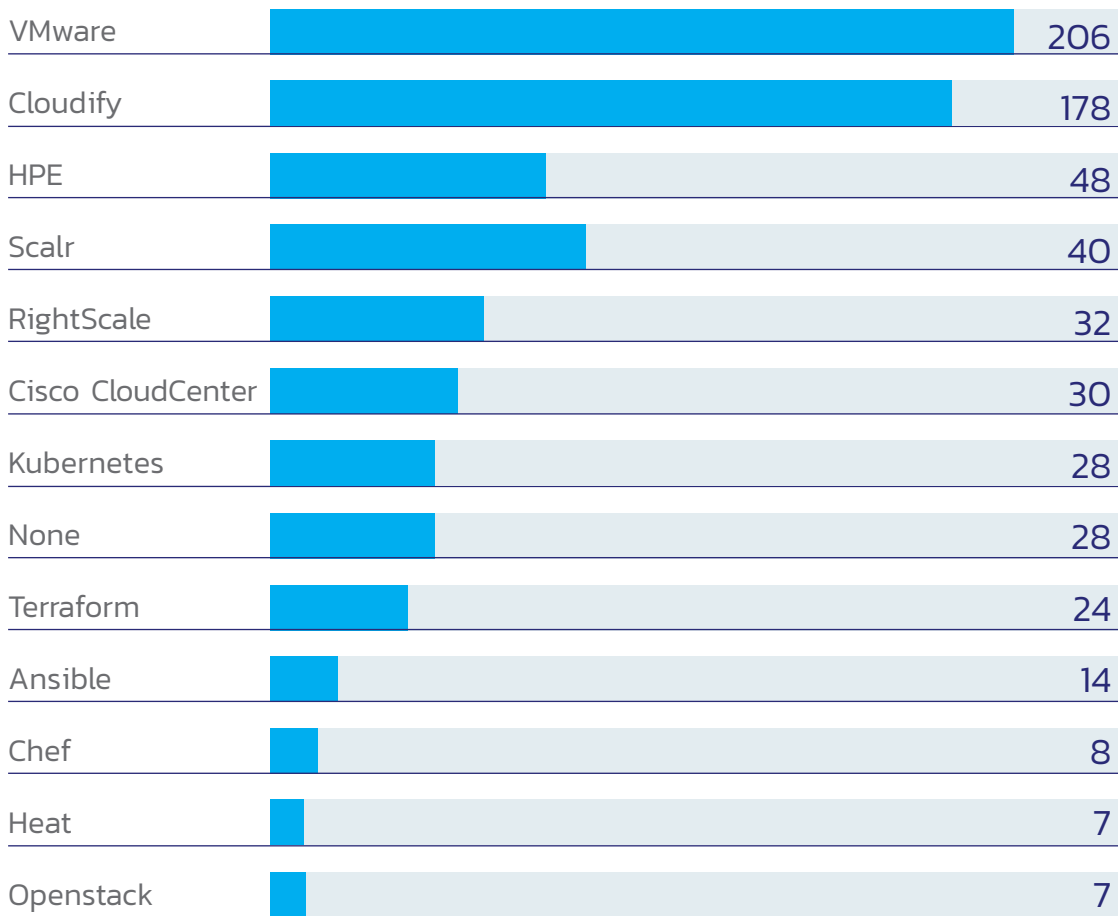
The orchestration layer, therefore, plays a critical role in helping corporate IT manage highly fragmented multi-cloud and hybrid cloud deployments – including the seamless integration of legacy software.

In order to meet today's cloud management challenges, the vast majority of organizations have introduced an orchestrator or similar management platform to coordinate workloads across IT environments. Orchestration is now at a level of maturity where it is **managing the lion's share of production workloads** and not just QA and PoC environments. The highest priority is to orchestrate core business workloads, followed not too far behind by proof of concepts and Dev/Test.

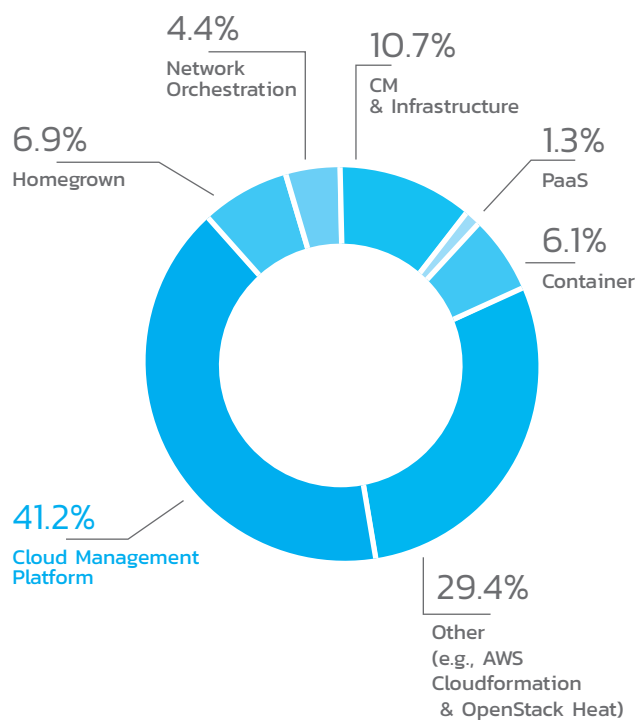
Highest priority workloads being orchestrated today



Most popular cloud management tools



Types of management or orchestration tools used



In the charts here we see that the orchestration tool sector is highly fragmented, with 13 options among the most popular choices. The categories are highly diverse, from traditional cloud management, to configuration management and infrastructure provisioning, through network and container orchestration options, PaaS — and even homegrown solutions.

Chapter 4 | Breaking Down Silos

Silos are still common. As shown in the table below, just about two out of every three respondents believes or suspects that their organization suffers from siloism.

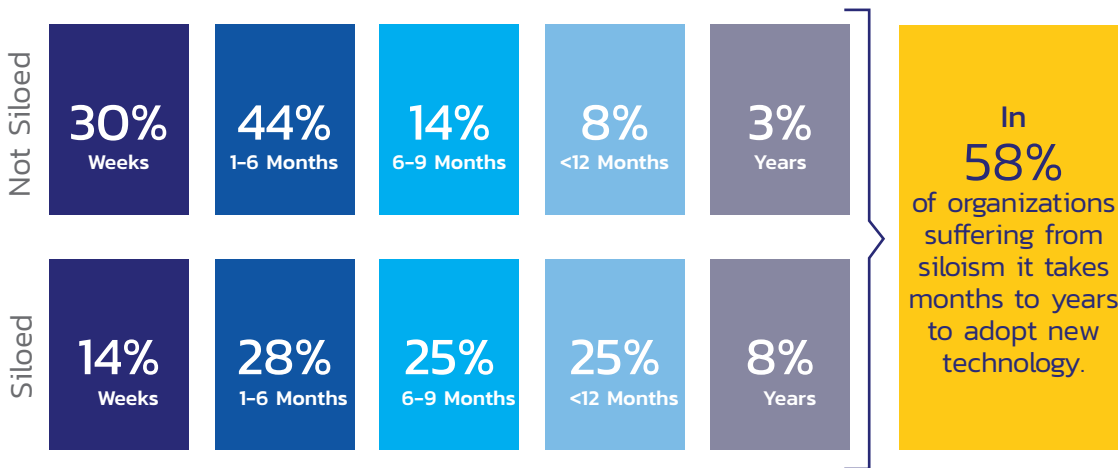
Does your organization suffer from siloism?		NO 37%	YES 35%	NOT SURE 28%
Do you have separate IT/networking organizations?	NO	69%	37%	45%
	YES	25%	58%	35%
	NOT SURE	7%	4%	20%
Does Ops join software delivery meetings?	NO	14%	17%	16%
	YES	64%	50%	42%
	AT TIMES	21%	21%	42%

Of the respondents who believe that their organizations DO suffer from siloism:

- 58% have separate IT and network departments within their organization (vs. 25% in less-siloed organizations), and
- Ops joins software delivery meetings only 50% of the time (vs. 64% in less-siloed organizations).

It is also quite clear from the responses that the level of siloism has an impact on the speed of technology adoption and the extent to which an organization can manage DIY (vs. turnkey) solutions: **the higher the siloism, the more time it takes to introduce new technologies and the higher the proportion of turnkey solutions.**

○ Silos and Speed to Adopt New Technology



 **75% of non-siloed organizations adopt new technology in 6 months or less, and, in many cases, in weeks.**

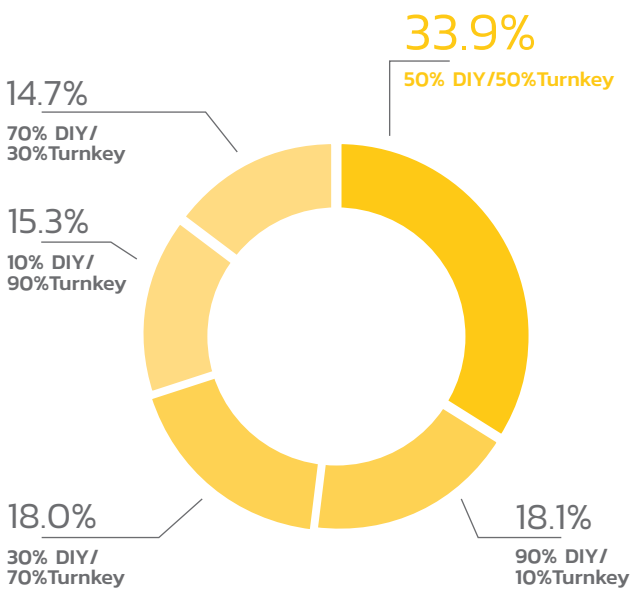
Chapter 5 | Accelerating the Adoption of New Technologies



Disruptive tooling has reached a maturity level that gives organizations the confidence to build best-of-breed stacks with open source technology.

In this chapter we explore other factors that have an impact, for better or worse, on adopting the new technologies that can accelerate business performance—such as open source solutions that break down silos and streamline management in a highly fragmented cloud world.

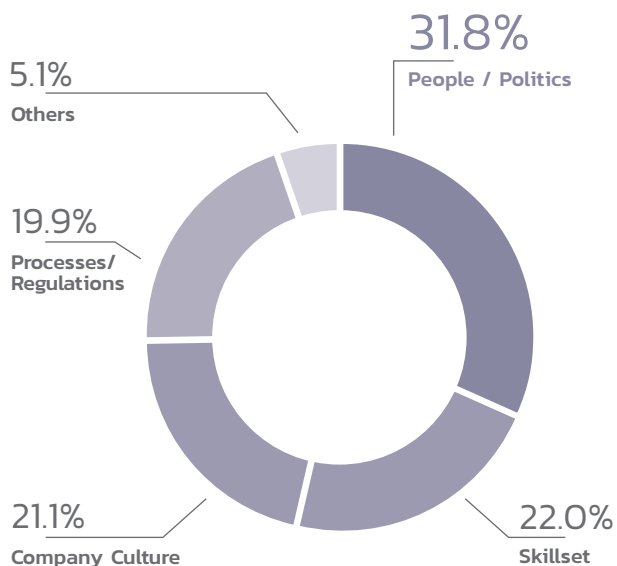
Distribution between DIY/turnkey



In ~67% of organizations **DIY** is at least 50% of their cloud solutions. Disruptive tooling has reached a maturity level that gives organizations **the confidence to build best-of-breed stacks with open source technology.**

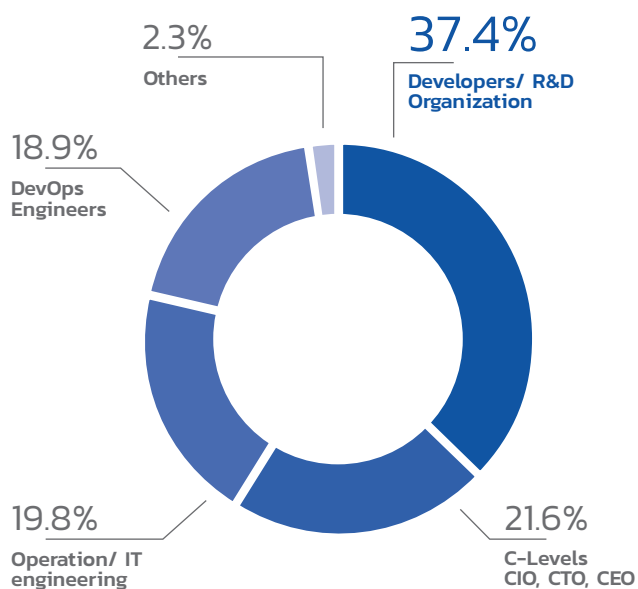


Biggest hindrance to adopting new technology



It's all about  the people (politics and skillsets) and the company culture, which will also be reflected in processes.

Champions for adopting new technology



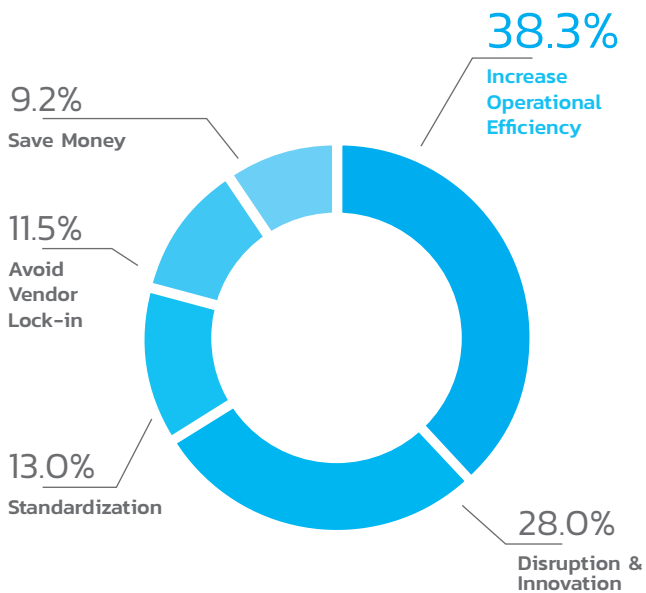
 **R&D** is driving the adoption of new technologies, with strong support from C-level executives.

Top Business Drivers



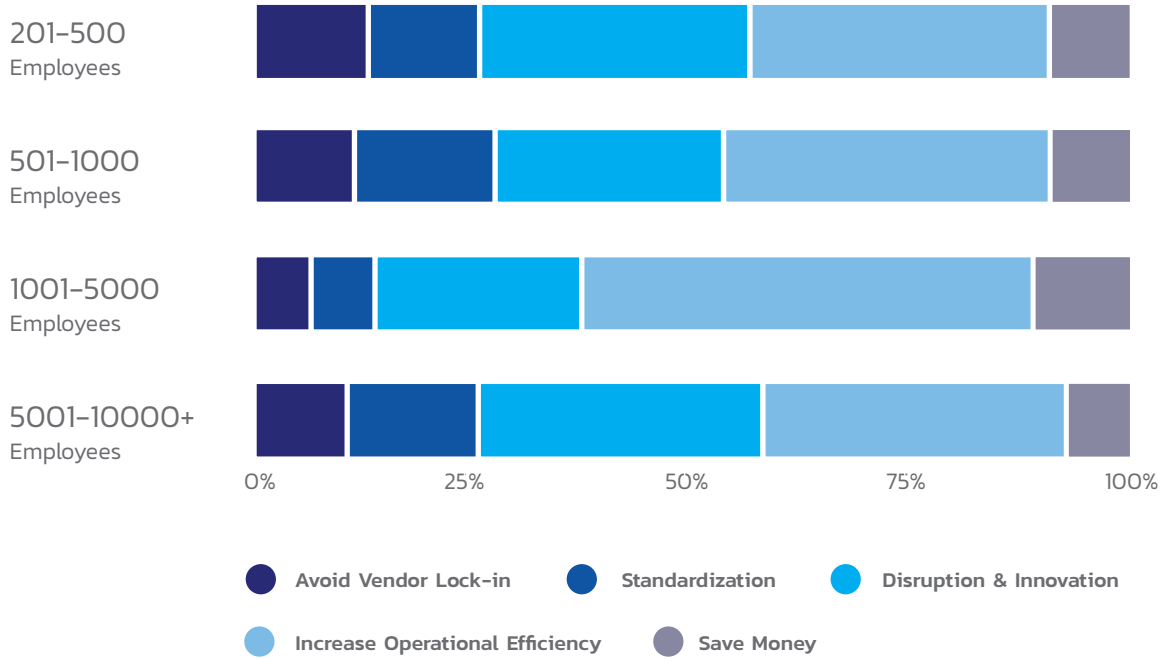
While **operational efficiency** is the top business driver for moving to the cloud, this is in the context of **agility and disruption** — and not cost savings, as often thought.

What are your top business drivers for moving to the cloud?



Increasing operational efficiency and disruption & innovation are the top two business drivers for the journey to the cloud. This makes sense since, in many cases, innovative approaches such as DevOps and automation help keep operations lean while increasing delivery speed and quality. Perhaps the bottom line is that organizations want to be at the forefront of technology but not at the expense of operational agility.

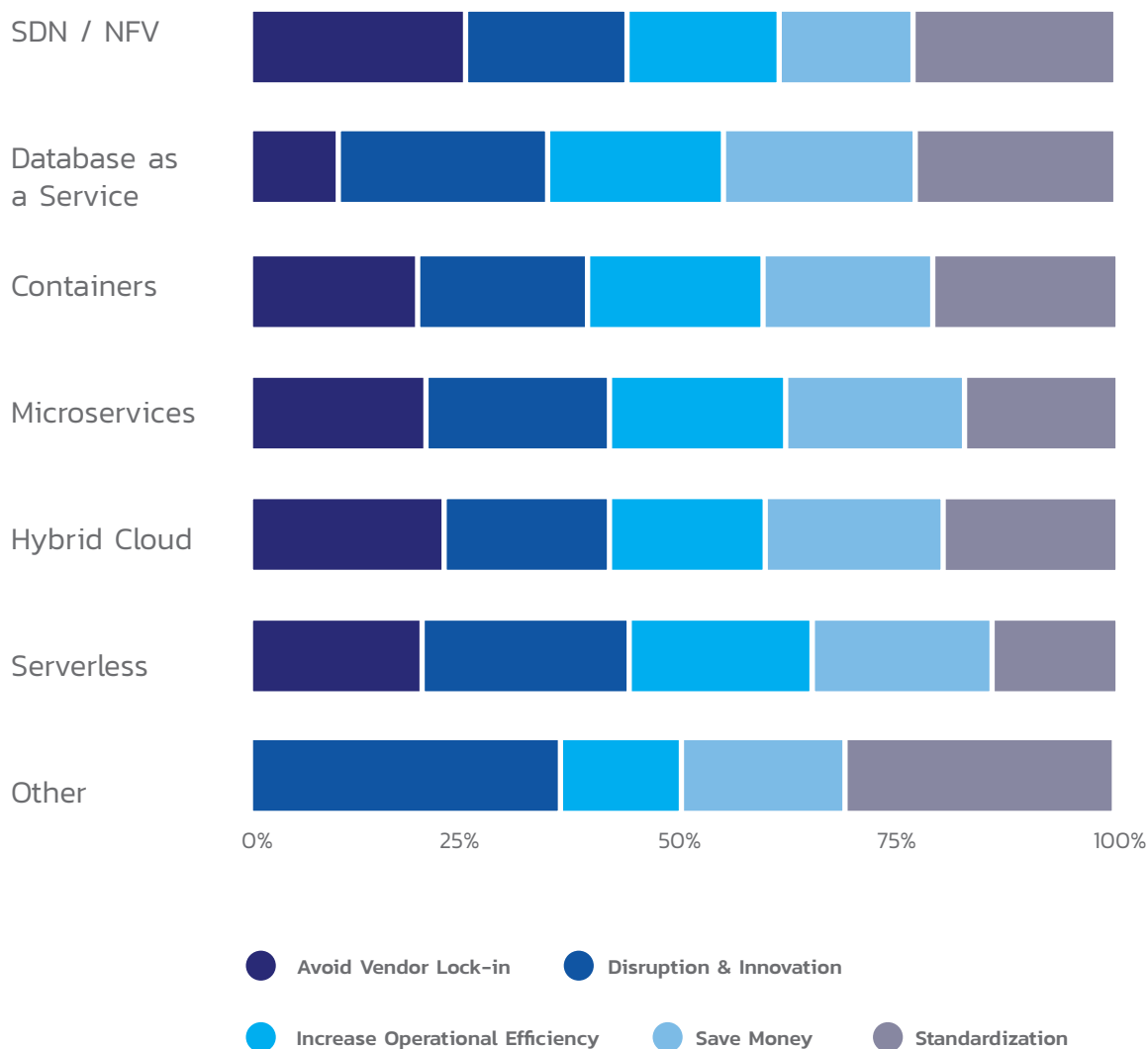
○ Top business drivers by organization size



As shown clearly in the chart above, the drive for both operational efficiency and innovation are the same across all organization sizes.

Orchestration platforms bring these two drivers together: the organization gains immediate optimizations for existing infrastructure operations and support for the gradual migration of enterprise workloads to run on the newest and hottest cloud technologies. Building automation into formerly manual processes speeds up time-to-market, without breaking the bank.

Business drivers correlated with enterprise ops of interest

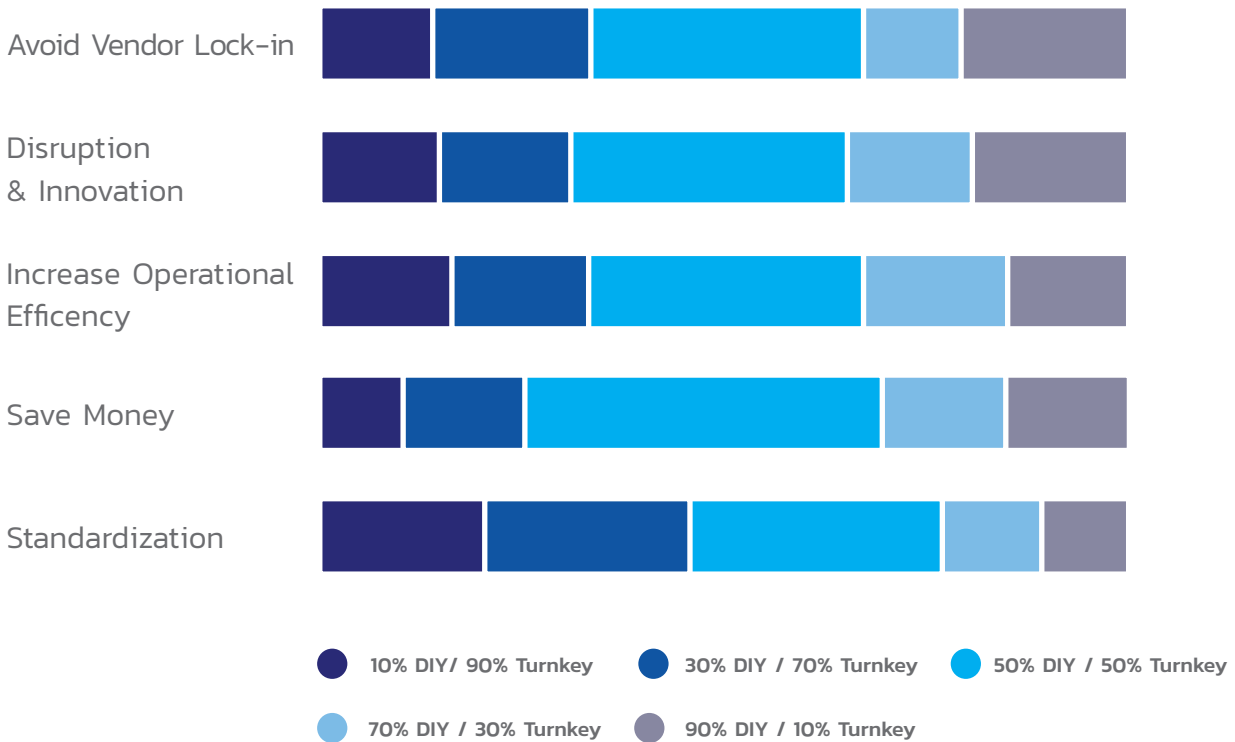


Avoiding vendor lock-in and standardization are two sides of the same coin and are both important factors when assessing which emerging enterprise ops technologies are of interest. DBaaS is the only emerging technology where these drivers are less of a concern, as DBs have long been standardized.

Adoption of DIY vs. Turnkey Solutions

Heavy investment in DIY solutions is a clear indication that an organization is strategically seeking to break the constraints of turnkey solutions. By building their own best-of-breed stacks, they avoid vendor lock-in as well as promote disruption and innovation. We believe that the drive for disruption and innovation is closely related to the drive for increased operational efficiency, since agile operations are the cornerstone of an organization’s ability to continuously deliver new added value.

DIY / Turnkey vs. Business Drivers



More than **2/3 of today's organizations** have more than 50% DIY tooling — demonstrating the growing maturity of new technology.

Final Notes and Conclusions

There are several clear themes that emerge from the survey results.

First, the move to the cloud is being driven not by the desire to save costs but rather the need to achieve operational efficiency and disruptive innovation. These drivers are closely aligned with the cloud features that were deemed most important: high availability and interoperability. In today's highly competitive business environment, enterprises that cannot continuously deliver added value to their end-users are at a distinct disadvantage, and one of the key elements to delivering such value is by continuously evolving through the ability to adopt new technology.

Second, cloud deployments tend to be complex. Although standardization is a strong business driver, more than half of organizations are deploying on more than one cloud, with all flavors of multi-cloud combinations: public/public, public/private, and private/private. Public/public is more typical of smaller organizations, who are most likely cloud-native to start with and are seeking to avoid vendor lock-in. Public/private and private/private are more prevalent among the larger organizations, who still have legacy apps that are not suitable for migration to the cloud, or are doing so in a gradual manner through new tooling.

Third, the hybrid stack is highly fragmented. Organizations of all sizes and across all verticals are mixing and matching infrastructure and platform vendors as well as open-source DIY tools in order to achieve best-of-breed stacks that align IT tightly with core business needs. We were particularly surprised by the extensive uptake of DIY tools, with a little more than two-thirds of organizations having at least a 50/50 mix of DIY vs. turnkey solutions. DIY tools, which were initially used by intrepid pioneers, have reached a maturity that makes them suitable for mass penetration. Thus we see, for example, that AWS and OpenStack happily coexist across organizations of all sizes.

Fourth, breaking down silos and effective orchestration accelerate innovation and operational efficiency. The least-siloed organizations are more agile at adopting new technologies and exhibit higher levels of DIY tools to turnkey solutions. Orchestration tools are no longer being deployed just for non-production workloads such as QA and proofs-of-concept — in 44% of organizations production workloads are the highest priority workloads being orchestrated.

These are exciting times for IT, with barriers to unprecedented agility and innovation being torn down by a rich array of cloud-based platforms and tools. The key is to build best-of-breed stacks without sacrificing overall performance and efficiency—a goal that can be achieved if there is a strong orchestration layer. We look forward to conducting another survey next year in order to track how these trends are playing out.

About Cloudify



Cloudify is an open source TOSCA-based cloud management platform, built on orchestration-first, and model-driven principles. Cloudify is revolutionizing the way modern IT can be delivered, by getting IT and developers working together on a single platform, managing and automating the entire application lifecycle, from start to finish.

Cloudify specializes in IT operations automation technology that manages application and network services through open orchestration. The company's Cloudify software enhances the velocity and reliability of software deployment, lifecycle management and network functions in cloud-native environments. Built and maintained by an open source community, Cloudify is used by telecoms, internet service providers, financial services firms, e-commerce companies and others for NFV operations and cloud management & orchestration.

Cloudify is spearheading open standard initiatives in cloud management and NFV and is the leading orchestration provider behind the TOSCA specification. Cloudify is a founding member of [ONAP](#), a consortium defining open source, next-generation network automation standards, and an active member in OASIS and ETSI standard bodies. Cloudify has corporate offices in the US, Europe and Asia. More at [cloudify.co](#). Contact us: hello@cloudify.co.

About IOD Cloud Technologies Research

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