EXECUTIVE SUMMARY

2020

IDG Cloud Computing Survey

Exploring cloud usage trends, investments, and business drivers.

CLOUD TECHNOLOGY SEEMS FINALLY TO HAVE, established its permanent primacy in the IT environment. The percentage of companies that have moved at least one application or part of their computing infrastructure to the cloud grew 8 percentage points in the last two years.

The average cloud budget, measured by dollar amount, expanded by 59% over the same period. In fact, the majority (55%) of organizations are now using more than one public cloud. And while the resulting challenges complicate infrastructure management, they aren't enough to lure most companies back to on-premise systems, according to a recent IDG survey. The 2020 IDG Cloud Computing Survey represents the practices and opinions of 551 IT decision-makers (ITDMs) who are involved in the purchase process for cloud computing and whose organization has, or plans to have, at least one application or a portion of their infrastructure in the cloud.
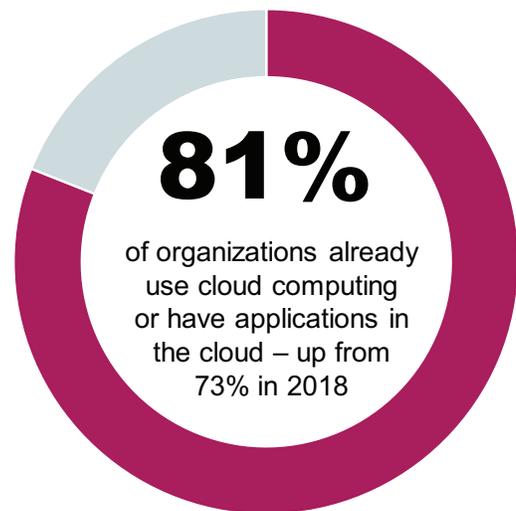
Cloud Wins the IT Environment

Cloud adoption levels that have held steady since 2015 have accelerated in the last two years. In 2020, 81% of survey respondents reported already using computing infrastructure or having applications in the cloud, compared to 73% in 2018. Another 12% plan to adopt cloud-based applications in the next 12 months, and 6% plan to do so in the next 1 to 3 years. Cloud adoption has also reached more than two-thirds in every industry, though adoption is higher in education (88%), manufacturing (87%), and healthcare (86%), than in financial services (75%) and government/non-profit (71%).
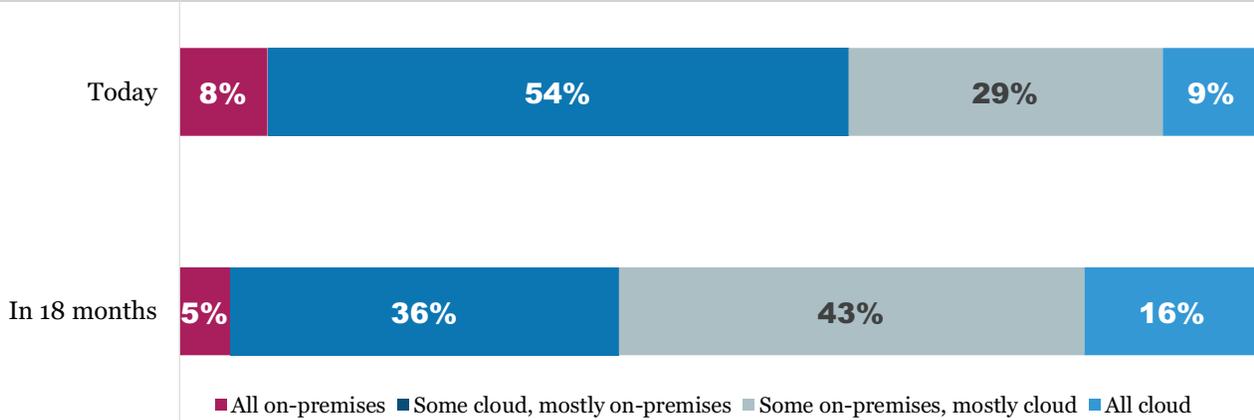
Enterprises are significantly more likely than SMBs to have all (11% to 6%) or most (58% to 50%) of their IT environment on premises, presumably because enterprise organizations are more likely to be transitioning away from legacy systems.

GROWTH IN CLOUD ADOPTION:

81%
of organizations already use cloud computing or have applications in the cloud – up from 73% in 2018

Nonetheless, 92% of organization's total IT environment is at least somewhat in the cloud today. Currently, 29% is mostly in the cloud with some on-premises while 54% is mostly on-premises with some cloud and only 9% is cloud-only. It's also likely that the 8% whose IT environments are entirely on-premises include the 6% of organizations planning to adopt cloud-based apps in the next 3 years, given that ITDMs expect the shift to cloud to continue accelerating.

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PERCENTAGE OF ORGANIZATION'S IT ENVIRONMENT IN THE CLOUD

Today	8%	54%	29%	9%
In 18 months	5%	36%	43%	16%

■ All on-premises ■ Some cloud, mostly on-premises ■ Some on-premises, mostly cloud ■ All cloud
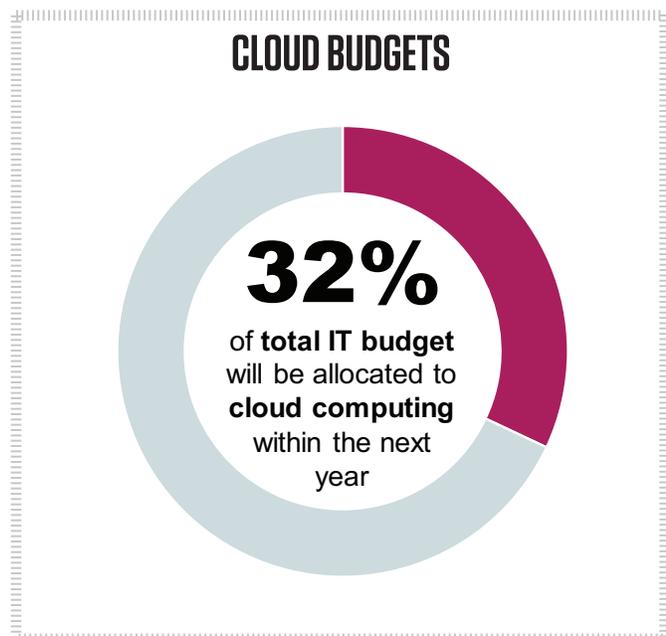
Eighteen months from now, 16% expect their IT environment to be entirely cloud-based, 43% expect to be mostly in the cloud, and 36% expect to be at least somewhat in the cloud, with only 5% expecting still to be entirely on-premises. Enterprises are significantly less likely (10%) than SMBs (22%) to expect to be all-cloud in 18 months, possibly because smaller organizations have fewer departments, applications, and systems to migrate .

Shifting Investments

On average, companies expect to allocate about a third (32%) of their total IT budget to cloud computing in the next year, compared to 30% in 2018. That's a barely significant change as a percentage of total IT budget, but considered in dollars, the average cloud investment is up 59% from 2018 to $73.8 million in 2020.

For obvious reasons, organizations using multiple cloud platforms say they will allocate more (35%) of their IT budget to cloud computing than those using only one public cloud (28%). Since SMBs tend to have more of their environment in the cloud, it's also unsurprising that SMBs plan to include slightly more (33%) for cloud computing in their budgets than enterprises (30%) do. However, measured in dollars, enterprises plan a much larger cloud spend ($158 million) than SMBs do ($11.5 million).

CLOUD BUDGETS

32%

of **total IT budget**
will be allocated to
cloud computing
within the next
year

APPLICATIONS & SERVICES BEING MIGRATED TO THE CLOUD

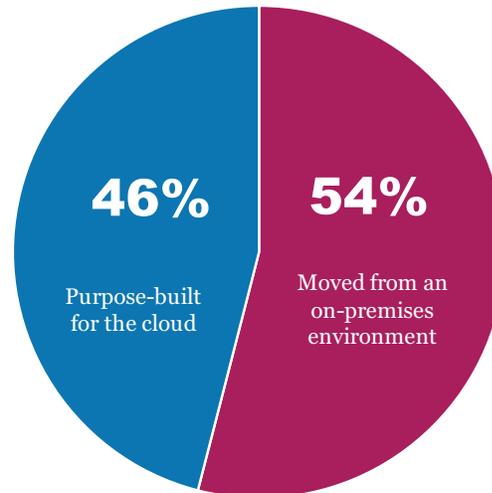|	Currently migrating/deployed in the cloud	Planning to migrate in next 12 months	Planning to migrate in next 1-3 years	Have already migrated but moving/plan to move out of the cloud	Have already migrated but moving/plan to move to a different cloud model	Currently building from scratch/greenfield development	No plans
Disaster Recovery / High Availability	40%	20%	14%	3%	4%	5%	15%
Storage / Archive / Backup / File Server	42%	17%	15%	3%	4%	6%	12%
CRM / ERP / HRMS / LOB applications	41%	17%	14%	3%	3%	4%	18%
IoT connectivity and management	23%	17%	13%	3%	2%	5%	37%
BI /Data warehouse (DW)/ Data Analytics	30%	15%	15%	4%	4%	7%	25%

Respondents expect to see the cloud migration of their software application development and deployment accelerate in the next 18 months. As they use on-premises infrastructure less (52% dropping to 39%), they will shift to cloud-hosted infrastructure as a service (IaaS) (42% rising to 48%), cloud-hosted platform-as-a-service (41% rising to 50%), and on-premises platform-as-a-service (20% ticking up slightly to 21%).

Respondents also expect in the next 18 months to reduce their use of commercially licensed software (65% currently, down to 50%) in favor of software as a service (SaaS) applications (up from 24% to 36%) and free open source software (up from 11% to 15%). Both now and in the future, enterprises are more likely to use commercially licensed software, while SMBs are more likely to use SaaS applications. Certain industries also expect significant changes. For example, 80% of respondents in the highly regulated healthcare industry and 54% of respondents in technology currently use commercially licensed software; those are expected to decrease to 57% and 37%, respectively.

More than half of respondents are currently migrating or have already deployed websites/web apps (53%) and collaboration and communication solutions (52%) in the cloud. In the next three years, respondents plan to migrate disaster recovery/high availability, storage/archive/backup/file server workloads, CRM applications, identity and access management, and content delivery/media processing. SMBs are less likely than enterprises to have plans to migrate emerging technologies like IoT and AI to the cloud, but it's unclear whether SMBs are less likely to be using them or have been using them in the cloud from the start.

Unlike previous years, the survey asked respondents to distinguish between cloud applications that had previously been deployed on-premises (54%) and those that were purpose-built for the cloud (46%). Enterprises were slightly more likely to have migrated on-premise applications, while SMBs were slightly more likely to take the cloud-native approach. Differences between industries were more pronounced: government/non-profit and financial services organizations were significantly more likely to be using previously on-premises applications, while education and technology were evenly split between migrated and purpose-built cloud apps.

CURRENT CLOUD-BASED APPLICATIONS WERE...

46%
Purpose-built for the cloud

54%
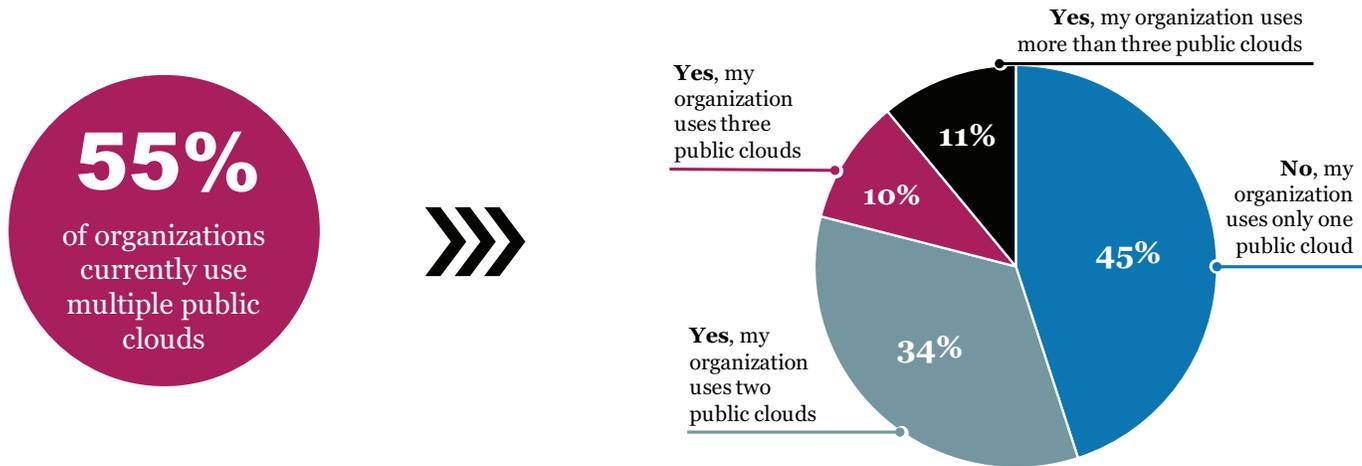Moved from an on-premises environment

Commitment to the Cloud Model

Most (73%) ITDMs do not expect their organization to move cloud-based applications back on-premises, but 12% say they have already moved an application or workload back out of the cloud, and 15% plan to do so in the next 12 months. There could be many reasons for this, such as cost, technical issues, culture issues, security concerns, and/or regulatory requirements. It will be interesting to see how these numbers shift in coming years, given how rare it is for respondents to report moving a specific application out of the cloud (3-4%, depending on application).

Enterprise organizations are more likely to move some of their applications out of the cloud; 17% already have and 18% plan to in the next 12 months, compared to 9% and 12% respectively among SMBs. Interestingly, IT executives and IT managers are notably less likely to say they'll keep applications in the cloud than business managers and IT pros. And while 92% of manufacturing ITDMs are committed to keeping applications in the cloud, nearly half (48%) of financial services ITDMs say that they plan to move applications back on-premises or have already done so.

Organizations also tend to stick to their original decisions about where to deploy different workflows. Only 2% to 6% of respondents (depending on application) have migrated an application from one cloud model to another.

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MULTI-CLOUD: LESS "IF" THAN "HOW MANY"

55% of organizations currently use multiple public clouds

»»»

Yes, my organization uses more than three public clouds — **11%**

Yes, my organization uses three public clouds — **10%**

No, my organization uses only one public cloud — **45%**

Yes, my organization uses two public clouds — **34%**

More than half (55%) of respondents use multiple public clouds: 34% use two, 10% use three, and 11% use more than three. Fewer than half of SMBs (47%) use multiple public clouds, compared to 66% of enterprises, which have more funding and more ability to manage the complexity of a multi-cloud environment. Some industries are also more likely than others to adopt a multi-cloud strategy. Financial services, government/non-profit, and manufacturing organizations are most likely to use only one public cloud, possibly due to security and privacy concerns.

Goals and Benefits of Multi-Cloud

The choice to use multiple public clouds is largely made by IT departments (35%) or executive leadership (29%), with only 5% saying it was a business department decision without IT . That said, ITDMs in manufacturing (55%), education (48%), and healthcare (44%) say IT leadership drives the use of multi-cloud; government ITDMs are evenly split between calling it an IT department suggestion (30%) and an executive leadership decision (30%); and 39% of technology ITDMs say executive leadership makes the call.

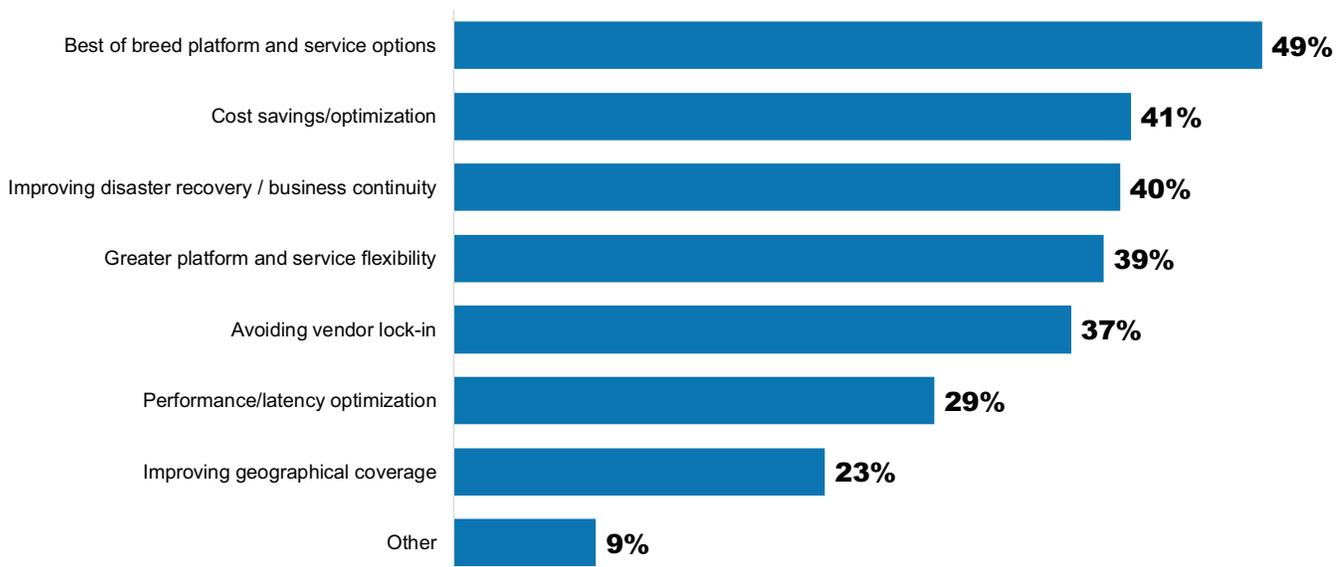**35%** say their organization's use of multiple public clouds was an IT department suggestion

Regardless of who championed the idea, nearly half (49%) of respondents say they adopted a multi-cloud approach to get best-of-breed platform and service options. Other top goals include cost savings/optimization (41%), improved disaster recovery/business continuity (40%) and increased platform and service flexibility (39%). SMBs also prioritize cost savings/optimization, while enterprises want to avoid vendor lock-in .

Respondents also report benefits that align with their goals: greater platform and service flexibility (43%), improving disaster recovery/business continuity (41%), and having best of breed platform and service options (41%). Interestingly, more respondents cited greater platform and service flexibility as a realized benefit than a goal, suggesting that their efforts succeed quickly.

Responses differ significantly by company size. SMBs are more likely to say multi-cloud has improved their disaster recovery and business continuity, cost savings/optimization, and platform and service flexibility. Enterprises are more likely to say they enjoy best of breed platform and service options and better platform and service flexibility while avoiding vendor lock-in.

Notably, even though most respondents have no plans to move applications back out of the cloud or even to a different cloud model, the majority (79%) of respondents also report significant downsides to using a multi-cloud model . These include increased complexity (48%), increased training and hiring costs (34%), and increased costs due to cloud management and security challenges (28%).

BEST OF BREED & SERVICE OPTIONS TOP MULTICLOUD GOALS

Category	Percentage
Best of breed platform and service options	49%
Cost savings/optimization	41%
Improving disaster recovery / business continuity	40%
Greater platform and service flexibility	39%
Avoiding vendor lock-in	37%
Performance/latency optimization	29%
Improving geographical coverage	23%
Other	9%

It's likely that all of these issues come from the management and operational challenges of dealing with multiple cloud vendors and cloud systems that aren't designed to interoperate. In that context, it makes sense that more enterprises (85%) than SMBs (72%) report having issues using multiple public clouds. In fact, significantly more SMBs (28%) than enterprises (15%) say they've experienced no significant downsides at all.

79% of organizations have experienced downsides to using multiple public clouds

Regardless of how many clouds they use or how big their organization, most respondents (94%) say it's challenging to take full advantage of public cloud resources. Their biggest obstacle, cited by 40%, is the need to control cloud costs – possibly because they used cost management to justify cloud migration in the first place and failed to anticipate the growth of both data and cloud services. Other significant challenges include data privacy and security issues (38%), securing and protecting cloud resources (31%), governance/compliance concerns (30%), and lack of security skills/expertise (30%).

There are significant differences among companies using multiple public clouds. Their leading challenges are data privacy and security (40%), controlling cloud costs (37%), and lack of cloud management skills/expertise (34%). Using more clouds apparently makes the need for expertise in managing them more pressing, as this issue was a distant seventh place among respondents not using multiple public clouds.

TOP 5 CHALLENGES TO PUBLIC CLOUD

Challenge	Percentage
Controlling cloud costs	40%
Data privacy and security challenges	38%
Securing/protecting cloud resources	31%
Governance/compliance	30%
Lack of cloud security skills/expertise	30%

Companies of different sizes also report different challenges. Enterprises struggle with data privacy and security challenges (42%), governance/compliance (39%), and controlling cloud costs (37%). SMBs are concerned with controlling cloud costs (43%), data privacy and security challenges (36%), migrating data or applications to the cloud, securing/protecting cloud resources, and lack of cloud security skills/expertise (all 28%).
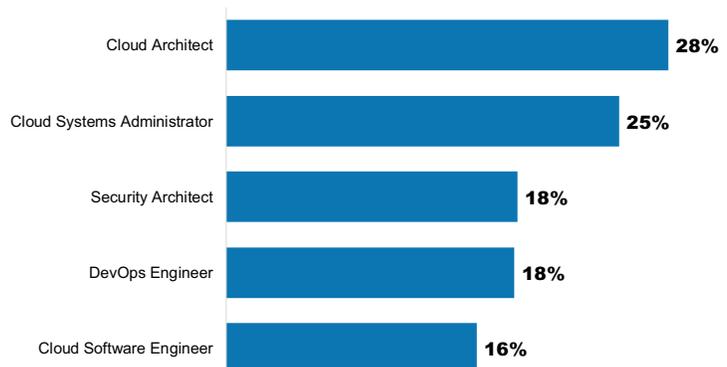
Every public cloud platform has a native cloud management tool, and (64%) of respondents say they use the native cloud management tool for each public cloud platform they use. In addition, 21% use a third-party tool for workload provisioning, automation and orchestration; 14% use a third-party tool for user provisioning and access control; and roughly one in ten use third-party tools for tasks like cost management, security and compliance, and performance management. This suggests rising complexity as tools to monitor and control cloud computing resources continue to proliferate – but it also indicates a market opening for multi-cloud management tools from platform-neutral vendors.

With 25% of respondents citing the increased costs of needing cloud management tools as a downside to using multiple clouds, it's no surprise that more than half of respondents (51%) say that their primary driver for choosing a multi-cloud management tool is cost management, reporting and optimization, followed closely (49%) by performance monitoring and management. Notably, 44% also mentioned security, governance, and policy compliance, which aligns with respondents' challenges in both using and managing public clouds.

Given these challenges, it's no wonder that 67% of respondents – 86% of enterprises and 53% of SMBs – are capitalizing on their cloud investments by adding new roles and functions, most commonly cloud architects and cloud systems administrators.

ADDING CLOUD SPECIFIC ROLES

67%
of organizations are adding new roles & functions due to cloud investments

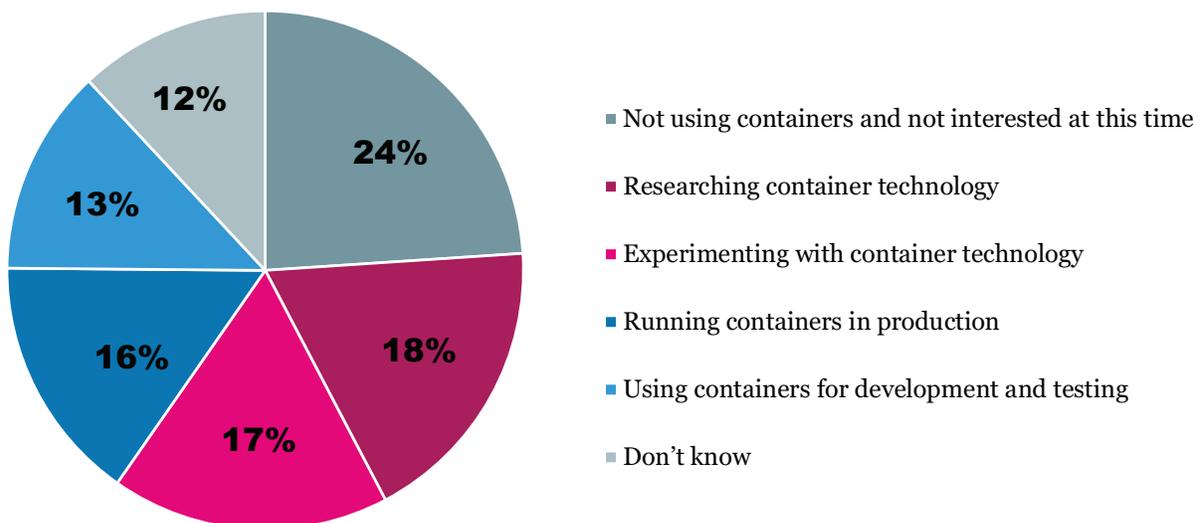| Role	Percentage
Cloud Architect	28%
Cloud Systems Administrator	25%
Security Architect	18%
DevOps Engineer	18%
Cloud Software Engineer	16%

Container Use Remains Contained

Container technology consists of an entire runtime environment (an application, plus all its dependencies, libraries and other binaries, and configuration files needed to run it) bundled into one package, abstracting away differences in OS distributions and underlying infrastructure so the application can run anywhere. Respondents are distinctly interested in this technology: 18% are researching it, and 46% are either experimenting with it (17%) or actively using it in production (16%) or for development and testing (13%). Enterprises are more likely to be experimenting with or using container technology (55%) compared to SMBs (41%), and almost twice as likely (21% to 12%) as SMBs to already be running containers in production.

There's still plenty of room for container adoption, with 24% of respondents saying they are not using container technology and are not interested in it at this time. Broken down by company size, SMBs are twice as likely (30% to 16%) as enterprises to say they aren't using or interested in the technology. In addition, services (39%) and retail (35%) organizations are most likely to say they aren't interested in the technology, in marked contrast to high tech (11%) and education (18%).

ADOPTION OF CONTAINER TECHNOLOGY

- Not using containers and not interested at this time
- Researching container technology
- Experimenting with container technology
- Running containers in production
- Using containers for development and testing
- Don't know

Another increasingly popular tool is Kubernetes, an open-source system for automating the deployment, scaling and management of containerized applications. Its ability to deploy and manage multi-container applications at scale has made it a key part of leveraging containerization, so given respondents' interest in container technology, a surprising 29% of them are not using Kubernetes and are not interested at this time. Nonetheless, 33% of respondents are either experimenting with Kubernetes (13%) or actively using it in production (12%) or for development and testing (8%), and another 21% are researching it.

Enterprises and SMBs are equally likely to be researching Kubernetes, but enterprises are more than twice as likely as SMBs (50% to 21%) to be experimenting with it, running it in production, or using it for development and testing. By comparison, SMBs are significantly more likely than enterprises (39% to 16%) to say they are not using or interested in it, which aligns with their comparatively low level of interest in container technology in general.

Overall, ITDMs say their top perceived benefits of container technology are application portability/compatibility across environments (38%), easier application upgrades/maintenance/lifecycle management (31%), simpler/more flexible continuous integration/deployment/DevOps (30%), and cost savings (more efficient hardware resource utilization (30%.). The ranking of benefits is largely consistent across all company sizes. Continuing the trend of low SMB interest, though, more SMBs (26%) than enterprises (12%) say they see no benefits in container technology.

About the Survey
The 2020 IDG Cloud study is is the 8th year of this research study. This year's survey was conducted to better understand cloud computing trends among tech decision-makers, specifically their use/goals/challenges with multi-cloud as well as their adoption of cloud-native technologies, like containers and Kubernetes. The results outline usage and plans across cloud service models, investments, business drivers and the applications and services that ITDMs plan the migrate to the cloud. The results are based on 551 responses, all of which are involved in the purchase process for cloud computing and their organization has, or plans to have, at least one application, or a portion of their infrastructure, in the cloud.

EXAMINING THE **MARKETPLACE**

Research is a valuable tool in understanding and connecting with customers and prospects. Our research portfolio explores our audiences' perspectives and challenges around specific technologies – from analytics and cloud, to IoT and security – examines the changing roles within the IT purchase process, and arms tech marketers with the information they need to identify opportunities. **To see what research is available, visit idg.com/tools-for-marketers. For a presentation of full results from any of these studies and to understand how we can help you engage this audience, contact your IDG sales executive or go to idg.com/contact-us.**

Want to know more about what content drives IT decision-makers and fuels their engagement during the IT purchase process? IDG's Customer Journey poster, and vertical white papers serve as your content marketing guide to strategically reach your target customers. **Find it all on www.idg.com**.

BUYING PROCESS

Each year we take a deep dive into the enterprise IT purchase process to learn more about who is involved and who influences decision-making, what sources purchasers rely on to keep up-to-date with technology—and throughout the purchase process—and how they want to work with vendors.

- **Role & Influence of the Technology Decision-Maker**
  The annual IDG Role & Influence of the Technology Decision-Maker survey is conducted to gain insight into the evolving role and influence of IT decision-makers in today's corporations. The research examines the involvement of IT decision-makers during each stage of the IT purchase process and the primary influences and information sources they rely on.

- **Customer Engagement**
  The IDG Customer Engagement survey looks at the role content consumption plays in the purchase process for major technology products and services, and provides insights to IT marketers to map their engagement touch-points to customers information needs. The survey looks at how a wide variety of content types are used through-out the individual stages of the IT purchase process and how that content is consumed, discussed and shared.

TECHNOLOGY INSIGHTS

Each year we explore the technologies that are top of mind among our audiences to understand the business challenges, drivers, and adoption within the enterprise. Each research study is designed to help IT marketers understand what their customers are focused on and where the market is moving.

- **Role & Priority Studies**
  CIO Tech Poll: Economic Outlook
  CIO Tech Poll: Tech Priorities
  Developer Persona
  State of the CIO
  State of the Network

- **Technology Specific Studies:**
  Cloud Computing
  Cyber Security Watch Survey
  Digital Business
  Global Information Security Survey
  Security Priorities

CUSTOMER JOURNEY POSTER

Want to know which content drives IT decision-makers and fuels their engagement during the IT purchase process? IDG's Customer Journey poster serves as your content marketing guide to strategically reach your target customers. **Request a copy of the poster at www.idg.com/customerjourney**