HPE GreenLake

Self-evaluate your cloud migration to maximize your investment

Discover peer perceptions and sound advice for your cloud journey

Business white paper

Get started >

Business white paper

Table of contents

3 Executive summary »

4 Key findings summary »

5 Methodology »

6 The just-in-case dilemma »

10 The expense of moving data »

12 The best home for critical workloads »

17 Evolving market realities now and in the future »

20 Final thoughts »

Executive summary

Cloud computing has been around since the early 2000s and in these 20 years, cloud definitions have spanned from the early onset of applications over the internet to full-blown entertainment, finance, government, and healthcare use cases. Being in the cloud means different things to different people, which can generate misconceptions about what is the right way to implement cloud technologies. The fact is, there is no right or wrong way. Just because an organization chooses to use one cloud model versus another, doesn't mean they are satisfied with that decision or it is right for their business.

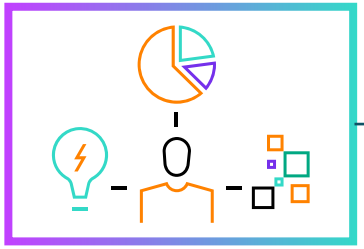
For many, this is a great opportunity to step back from current perceptions and ask yourself, "What have I learned? What has changed in the industry? And where can I improve?" Looking inward and evaluating is a step many are overlooking. This self-evaluation can uncover areas of opportunities that can move the needle on maximizing the value of your cloud computing investments.

This paper reveals the results of a November 2020 cloud perceptions study commissioned by HPE,[1] where queried respondents provided this self-evaluation and shared their perceptions of the cloud. The fascinating insights exposed areas of opportunities around redundancy, data movement, workloads, and cloud transformation.

Read on to see how your company's IT cloud strategy compares with others around the world.

[1] HPE GreenLake Challenger Research Report (HPE commissioned report), Emerald Research Group, November 2020

Key findings summary



Due to perceptions of mitigating risks, about two-thirds of companies are using less than 60% of their infrastructure resulting in higher, preventable IT costs

Across public and private cloud options, most organizations simply aren't utilizing a majority of their infrastructure on any given day resulting in higher-than-expected costs. These preventable costs could be reinvested in innovative, revenue-generating opportunities.

Due to data egress challenges, 70% of organizations are keeping their data on-premises, in a colocation or private cloud

The research revealed 76% of respondents acknowledged data egress as one of their biggest anxieties. The desire to monitor data traffic volume and sensitivity risks for malicious activities continues to lead organizations to on-premises solutions.

Almost 40% of decision-makers believe their organization runs critical workloads in the wrong location

Three in four companies say their workloads leverage some form of hybrid cloud; however, there is a significant disconnect between where workloads reside versus where they could be optimized.

Even though innovation is top of mind, more than half of respondents are still spending 60% or more of their IT budgets on maintenance

As a result of COVID-19, the research indicates an average of 62% increase in cloud migration due to the quick transition to a remote workforce and adoption of new cloud strategies. However, most respondents are spending more on maintenance, a trend that needs to change with the requirements for more innovation in this time of balancing market turmoil and transformation.

Methodology

The research was conducted among respondents who are at least 25 years old and are employed full time at organizations with 500+ employees (in the U.S.), or 100+ employees in the rest of the world. All these companies have revenues of at least $100 million in the U.S. or at least $50 million equivalent in the rest of the world. Close to 5,000 IT decision-makers, business decision-makers, data scientists, and developers were surveyed across the U.S., Canada, the United Kingdom, France, Germany, Australia, Singapore, Korea, India, and Japan.

Only 1/3 of organizations use

60%

of their capacity

About 33% of public cloud capacity, 33% of on-premises capacity go unused

The just-in-case dilemma

To overprovision, or not to overprovision, that is the question

IT's quandary of how to balance handling peak and valley demands with managing costs has been a reality for ages. And the answer traditionally has been to overprovision or underutilize capacity to accommodate this anticipated fluctuation.

The research revealed that organizations are not effectively using a surprisingly large portion of their IT capacity across both their public cloud and on-premises estates. When asked about their compute and storage capabilities and how much was being used on a typical day, the output showed that only about one-third of organizations were using more than 60% of their capacity.

When asked to reflect across the breadth of their provisioned infrastructure, respondents reported that about 33% of their public cloud capacity and 33% of on-premises capacity goes unused on a typical day. This pattern is reflected across all geographies surveyed.

How much of your **compute** capacity is utilized on a typical day in each environment?

How much of your **storage** capacity is utilized on a typical day in each environment?

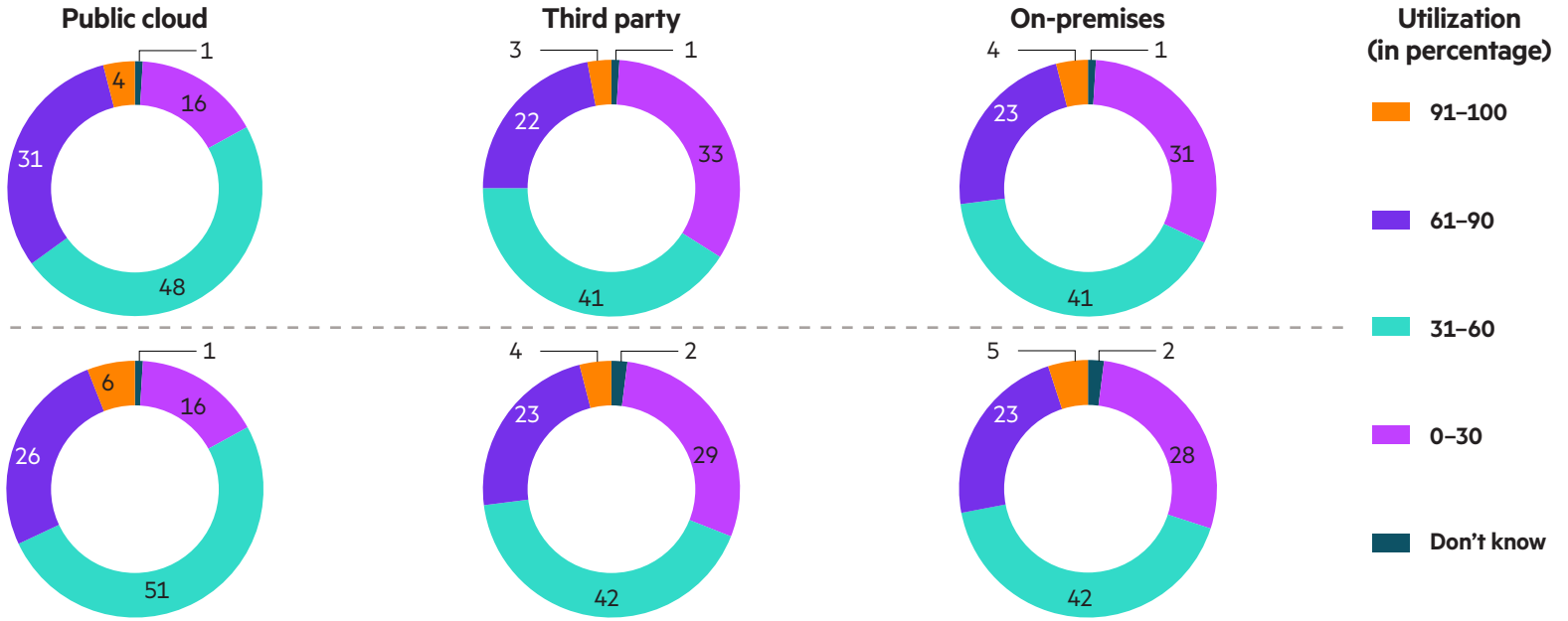


Figure 1. Compute and storage utilization

$7.7M

per year on overprovisioned public cloud

+

$7.5M

per year on underutilized on-premises infrastructure

=

Over

$15 million

on misaligned resources

The shocking cost of redundancy

If your company is in the overprovisioning camp, you're not alone. As this study reveals, overprovisioning and underutilizing IT resources is reported with cloud implementations, regardless of which cloud model. While it may not affect day-to-day operations, chances are this redundant approach could attest to the fact that organizations simply don't understand the financial impact, which is taking a sizeable bite out of budgets that could be better served in other parts of the business. The ability to have true line-of-sight across the environment can alleviate problem areas where sprawling and fragmented architectures are contributing to the excess phenomenon. With this intelligence, you can make informed, smart, and data-driven decisions. This produces an immediate opportunity to improve the business bottom line and to invest these recovered dollars in other revenue-generating projects.

To determine actual impact, respondents reported their annual expenditures across both public cloud and on-premises, and their overall annual IT budgets.

Based on the findings that slightly more than a third of provisioned infrastructure capacity goes unused on any given day across both public cloud and on-premises estates, calculations revealed these companies are allocating about $7.7 million per year (on average) on overprovisioned public cloud and about $7.5 million per year on underutilized on-premises infrastructure. That's a total of over $15 million annually, on average, on misaligned resources.

Risk mitigation triggering surplus

When asked to select the top three reasons why their organization carries more capacity than is required, public and private cloud consumers only slightly differed. The main causes in both models were backup, disaster recovery, and emergency preparedness. This reasoning isn't surprising since most businesses would be at a standstill should access be severed for any reason. Risk mitigation should be front and center in any cloud implementation—public, private, or hybrid.

What is striking is that slightly less than 60% of respondents did not include risk mitigation in their top 3 reasons for carrying excess capacity day-to-day. The implication? In more than half the cases, the reason for surplus redundancy capacity is due to the difficulties in managing complex, hybrid cloud estates, exacerbated by siloed management capabilities, a lack of end-to-end visibility, and confusing or obfuscated pricing schemes.

Beyond that, distinctions between public and private cloud consumers surfaced.

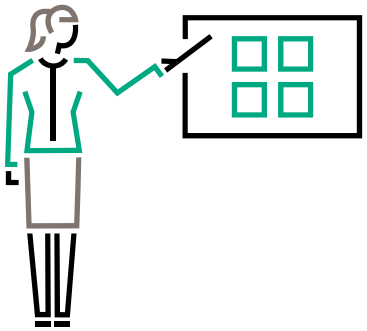
- **Uncertain demand:** Among private cloud users, the second most popular reason for underutilizing their infrastructure (43%) was because it was difficult for their company to anticipate demand for each workload. (This was the third most popular reason among public cloud users.)
- **Changing cost of public cloud:** About one-third of public cloud users (35%) said it is strenuous for their company to anticipate future resource demands and believed—in equal numbers—because the issue resides in public cloud providers continually changing their pricing and offers, making it challenging to optimize cloud expenses.
- **Human influences:** Processes that are dependent on human intervention are playing a major role in the allocation dilemma. About 36% of respondents stated they forgot to terminate private cloud provisions after they were no longer needed compared to 26% utilizing public cloud neglected to terminate provisions after completion. Both models present an opportunity for recovering costs if an automated process was in place.

Table 1. Top reasons for surplus redundancy capacity

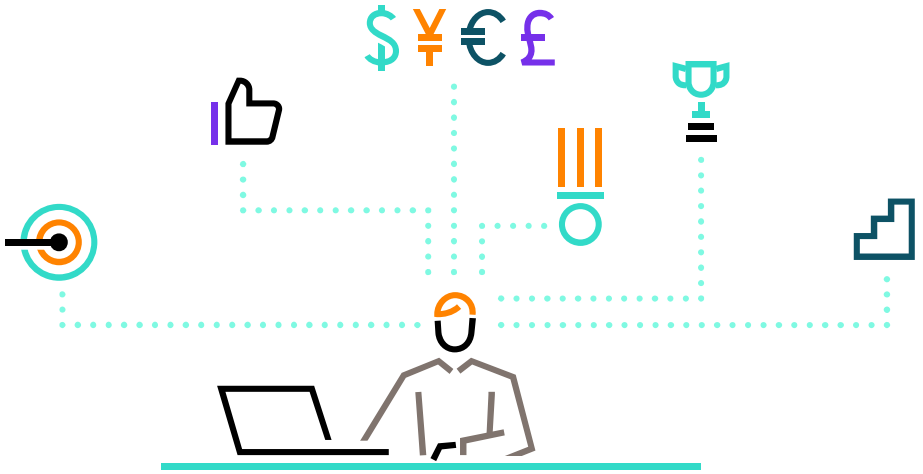
	Public cloud	Private cloud
My company uses public/private cloud resources for backup or disaster recovery purposes, reserving this capacity in case of emergency.	**43%**	**47%**
My company provisions private/public cloud resources for peak capacity requirements.	**38%**	**42%**
It's difficult for my company to anticipate demand.	**35%**	**43%**

Key takeaway—About two-thirds of companies are using less than 60% of their compute and storage resources daily, concluding that regardless of which cloud model, organizations are looking for a safety net to mitigate risks without really comprehending the overall financial impact to their decision.

Self-evaluation checkpoint



All-inclusive visibility into your cloud costs



From provisioning for peak capacity requirements to difficulty anticipating demand to forgetting to terminate unneeded instances—all can be directly correlated to a lack of visibility into infrastructure conditions. In fact, one-fifth of public cloud users and one-third of private cloud users acknowledged a deficiency to assess where excess redundancy might be.

You can't manage what you can't see. For companies to determine where change is necessary, visibility into where this excess capacity is residing should be a top priority. And once you have visibility, you can then resolve. Consumption-based IT and pay-per-use models have grown in popularity. Look for solutions that bring the cloud experience to your apps and data, wherever they reside. Software platforms are now available that centralize the operations and insights for your cloud services, enabling you to gain cost and compliance insights, rapidly deploy cloud services, and simplify management across your hybrid estate. And usage metering and active capacity management ensure you'll always have the capacity you need ahead of demand. You no longer need to overprovision or underutilize capacity for just-in-case scenarios. Instead consume what you need, when you need it, and only pay for what you use.

76%

acknowledged egress as one of the biggest challenges

The expense of moving data

Enabling your data to work smarter

An important consideration IT must face is the priority of data in-flight. As data moves to and from its destination, how that data is stored, protected, and managed plays a critical role in which cloud model can optimize the experience and outcome. Let's look at the transfer of data. When considering the appropriate cloud models for your business, attention to how the data goes in (ingress charges are fairly non-existent) and how the data gets back (data egress charges) should be evaluated.

In the study, when asked how much of a challenge data egress is for their organization, 76% acknowledged it as one of their biggest (top two) challenges. Data-intensive workloads such as artificial intelligence (AI) or customer relationship management (CRM) require not only the storage of large amounts of data but also the data movement to utilize the data in real time for analyzing and faster decision-making.

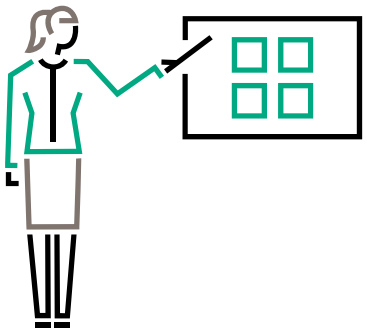
An important factor to consider is public cloud provider costs, which will vary depending on how much data is stored, how often you need access, and the speed at which you require access. Many cloud consumers are caught off-guard with these surprise, volatile charges, which is why it's become a top priority when considering data placement in the cloud.

Requiring stronger security measures

There's a reason security has become part of the regular vocabulary in any digital transformation implementation. Risks regarding business continuity, compliance, and data confidentiality are far too important to ignore given possible negative implications if security is breached. As data and workloads move, the need for data protection intensifies. Data egress traffic is more susceptible to malicious activity and the financial consequences can be considerable. In the study, 45% of respondents stated their primary reason for bringing workloads back on-premises in the next two years was better security.

Key takeaway—Security risks and volatile data egress costs will entice many cloud consumers to continue to use hybrid cloud models.

Self-evaluation checkpoint



Data considerations are more than ones and zeros

Data movement costs

Ultimately, your company needs to evaluate what is best based on priority factors such as sensitivity, volume, and velocity of the data—keeping in mind that not all workloads and data are created equal. As you evaluate your cloud environment, take the time to investigate how much your organization has been spending on these mysterious data egress charges. Many like yourself have been surprised by the financial impact and continuous burden, which could be avoided.

There is no single cloud journey answer of what is best, which explains why many implement a hybrid cloud approach. Nowadays, a growing number of IT decision-makers are focusing on solutions with hybrid and multi-cloud capabilities because it enables them to gain value from the cloud on day one while fully leveraging their on-premises infrastructure. This provides the freedom to deploy select apps in the public cloud while still running a majority of their critical and core business workloads on-premises. You can also employ a DevOps approach to begin to develop and run cloud-native apps. Multi-cloud takes those benefits one step further by enabling portability of workloads between two or more clouds.

Data strategy

Now is the time to evaluate the maturity of your data strategy. In the study, respondents were asked about their data strategy of which 47% voiced they have a mature data strategy. However, when asked, "Are you leveraging data mining and analytics using machine learning (ML) to create a data-driven strategy?" the numbers fall dramatically at only 31% using AI/ML. Here's an opportunity for you to evaluate and/or define a mature strategy with real-time insights.

Data security

Regardless of which cloud model you implement, security hygiene is a must. However, trials of increased interconnectivity across disparate cloud platforms, cloud services, software components, and degrees of user or systems trust have grown strikingly complex. The zero-trust security approach is making headway into successful transformation instances. Zero trust demands that all users, devices, and application instances must prove who they are or what they claim to be and that they are authorized to access the resources they seek. There are many discussions about what zero trust means and how to best implement it, but you want this discussion to be business-led more than technology-led. Zero trust is not about implementing one or another security or networking technology. It's a completely new approach to the way you do security architecture.

The best home for critical workloads

Which workloads are most critical?

To find out where organizations are running their critical workloads, it was first necessary to establish what they considered most important. We asked respondents to prioritize a list of workloads that included:

- **Enterprise IT infrastructure/management:** Applications used to manage essential IT operation components, such as policies, processes, equipment, and data
- **Business applications:** ERP, CRM, financial management, and human capital management (HCM)
- **AI/ML:** Using the speed of modern computing to iterate quickly and solve computational problems, such as classification models, decision trees, or predictive algorithms
- **AI operations:** Identifying early warning symptoms for IT issues and remediating them
- **Virtualized desktop infrastructure:** Applications that separate the desktop environment and associated application software from the physical client device that is used to access it
- **Robotic process automation:** Using bots to enable self-service for basic IT/operations processes
- **Data management:** Relational database management system/nonrelational database management system (RDBMS, NRDBMS)
- **Data mining/Analysis:** End-user query, predictive analytics, geographic information system (GIS), content analytics, search, and cognitive platforms
- **Media streaming:** Video streaming, content, and media applications
- **Application development and testing:** Tools used to test and develop software applications
- **Remote collaboration:** Conferencing, instant messaging, email, social networks, file sharing, and office productivity
- **Web services/Web applications:** Software and hardware used to respond to client requests on the World Wide Web
- **Content delivery:** Collection, management, and/or publishing of digital information
- **Product engineering/technology:** Computer-aided design (CAD), computer-aided engineering (CAE), and computer-aided manufacturing (CAM)

Results indicated that IT management was deemed the most important workload at 40% with data management a close second at 38% respectively. Overall, 30–40% of workloads tested were deemed critical.

Workloads: Public or private?

Using the same list of workloads as mentioned earlier, each organization responded where the identified workload is currently running in their organization. Results were evenly divided between public cloud usage and the more private options that include on-premises, colocation, and private cloud.

Where are the following workloads primarily located?

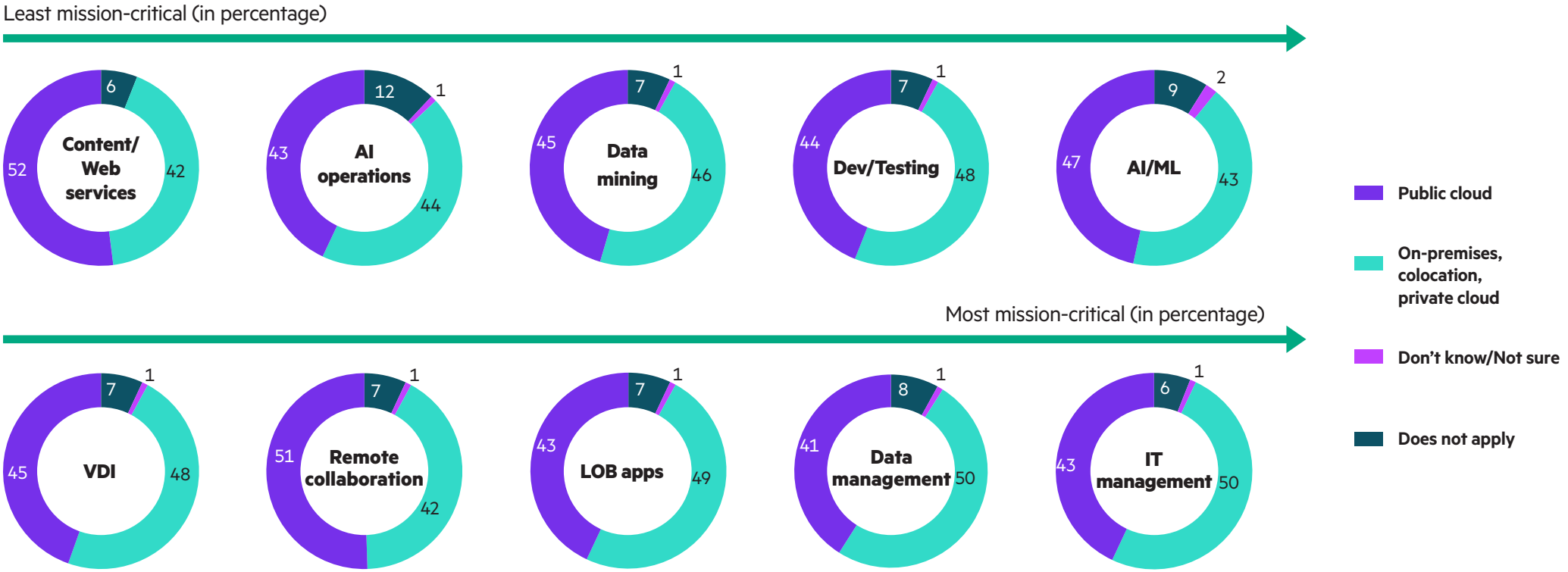


Figure 2. Where organizations run workloads

When the question was rephrased to ask, "Where should these workloads be located?" the results were again evenly split between public cloud and private resources. Only the content, media, and web services workloads showed a higher public cloud bias at 54%.

An insight to take notice of is about 40% of decision-makers said their workloads are in a nonpreferred location, a trend that was consistent across all workloads.

The market has a strategic momentum toward utilizing a hybrid cloud approach and is validated within the research. Three in four companies say their workloads leverage some form of hybrid cloud. And in anticipation, respondents indicated in two years their workloads are projected to move slightly toward on-premises, especially with enterprise IT management, remote collaboration, and app dev/testing workloads.

Where do you think the following workloads should be primarily located?

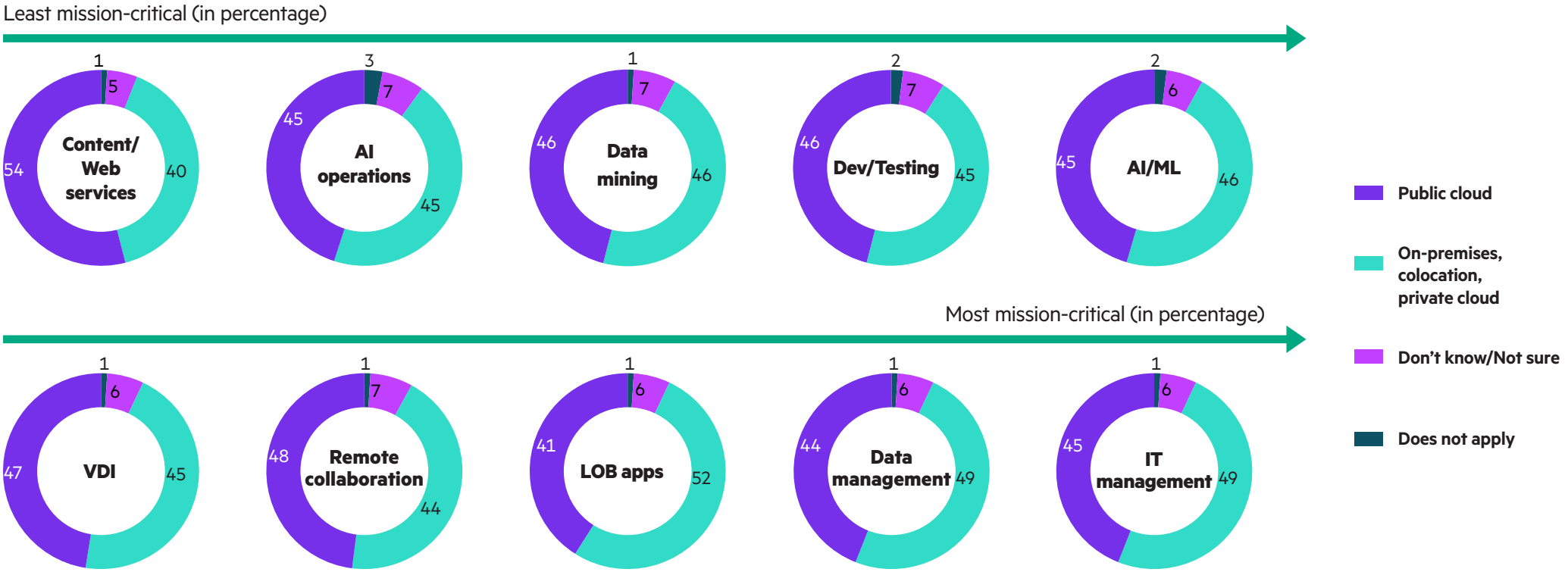


Figure 3. Where organizations think workloads should be run

Workload placement in the cloud

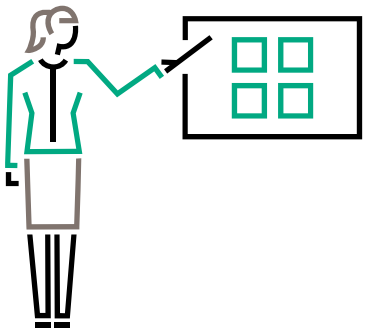
As cloud models are evolving, more organizations are bringing workloads, applications, and data currently in the public cloud back on-premises and/or to hosted colocation providers. The research determined within the next two years, 40% of respondents have plans to bring back 25–50% of their workloads to on-premises and another 25% are bringing more than 50% back. These are significant strategic decisions. Requirements for better security and more control over the infrastructure are leading the charge for these changes.

As cloud technologies have matured, the realization that each company's right cloud mix is diverse is a key milestone in determining workload placement. Regardless of which model(s) of the cloud is implemented, it is about delivering the agility and speed the business expects.

By matching the workload with the appropriate destination based on specific business objectives, ask yourself, "What is my end goal or outcome I'm trying to achieve?" The survey data indicates that when it comes to workloads running the business, what's considered mission-critical varies by industry. The survey also showed a sizeable disconnect in where critical applications should be run, reflecting a lack of knowledge on the benefits or risks of running in the public cloud versus on-premises. Perceptions can be subjective as it is a viewpoint but as cloud technologies and solutions have evolved, perceptions could be misconceived based on dated information, which is why self-evaluation is so critical.

Key takeaway—There is a significant disconnect between where workloads currently reside versus where they could be optimized triggering actions to bring back workloads to on-premises.

Self-evaluation checkpoint



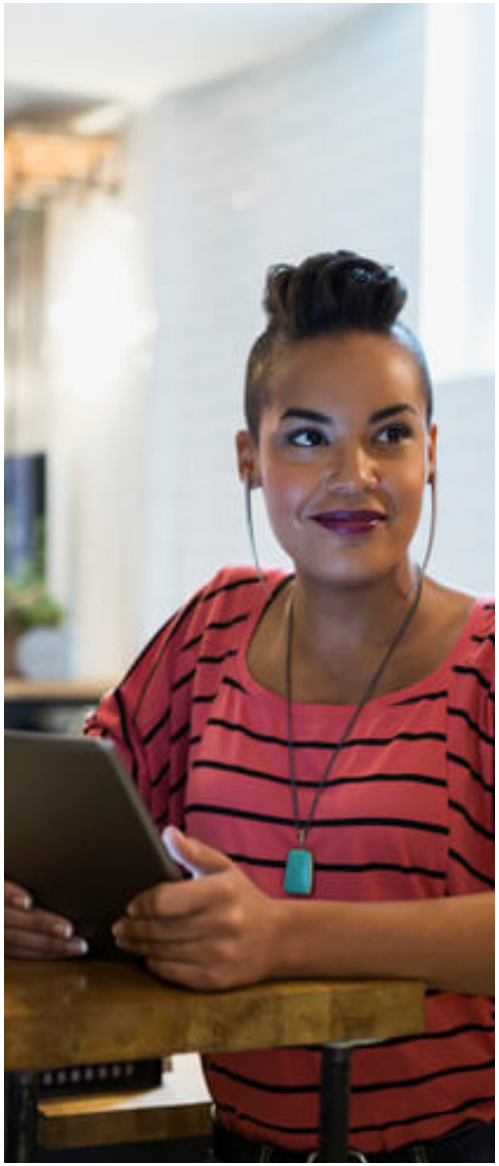
Achieving your desired steady state

As indicated, the research revealed a large disconnect of where workloads reside versus where they should. As you re-evaluate your cloud strategy, this is an optimal opportunity to remove any bias or preconceived notions of your current workload strategy. Start fresh to better match the business requirements you have today. Engaging a strategic partner who has professional experience and is a trusted advisor can help provide new perspectives.

Whatever your company does, whether it's online transaction processing (OLTP), database workloads, application modernization, or data analytics that are crucial to your business, your cloud models should accelerate your high-value workloads and give your company an edge in revenue and reputation.

Evaluate these deciding cloud success factors in workload placement:

- **Risk**—Can your business isolate exposure and attack surfaces for possible sophisticated cyberattacks and adhere to complex regulatory compliance? Have you tested for any security vulnerabilities that exist?
- **Performance**—Can your business tolerate inconsistent latency, or do you require instantaneous access to critical information? Do you require real-time processing for IoT implementations? Have you determined resource prioritization in a shared environment?
- **Control**—Can your business provide users what they need, when they need it, and at the right economics? Does this demand fluctuate where your business provides the agility required? Which of your workloads distinguishes you from the competition? For these workloads, how much control do you or your line-of-business counterparts feel you need?
- **Costs**—Can you build IT investment and lifecycle management strategies that accelerate your digital transformation today and help you stay flexible for future technology needs? What are your revenue-generating applications that keep your business ticking?



Evolving market realities now and in the future

Essential flexibility to market demands

A pronounced market demand which can't be ignored are the implications of the COVID-19 pandemic. Due to COVID-19, the research indicates an average of 62% increase in cloud migration, with remote workforce demands being the most common driver across the globe. Organizations, particularly in the healthcare industry, are receiving funding to help deal with the pandemic and support mobile workforces, which is accelerating them to the cloud. Across all industries, supporting the remote workforce—enhancing their productivity, securing their access, and enabling their efforts to collaborate are seen as key focus areas.

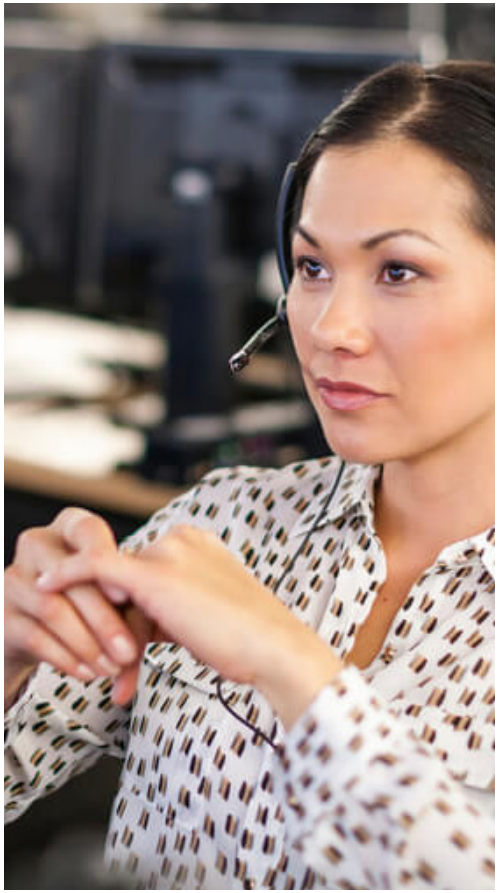
One surprise in the statistics: Despite the changes caused by COVID-19 and the resulting demands to support a suddenly remote workforce, most companies are still spending more of their IT budgets on projects related to maintenance as opposed to initiatives focused on innovation. When asked to reflect on how the mix between maintenance and innovation projects in IT budgets has shifted, respondents indicated very little change, with more than half saying they spend 60% or more of their IT budgets on maintenance—a watermark that has not changed significantly in the past two years.

Clearly, many organizations are viewing IT investment to help navigate uncertain and changing market conditions caused by COVID-19. However, the needle is not moving fast enough toward innovation. The need has never been more important, especially given rapidly changing market conditions and the need to support a remote workforce during the global pandemic.

In next two years,

26–30%

of key workloads will be located in a hybrid cloud environment



Equipping the modern workforce

As the workplace ecosystem evolves, organizations are being forced to reinvent their workplace strategies. Just as the COVID-19 pandemic fast-tracked the move to a remote workforce, there are reasons to believe once the pandemic is over, many organizations will remain in a newfound hybrid environment. In fact, research respondents stated they project within the next two years 26% to 30% (depending on geography) of key workloads will be located in a hybrid cloud environment.

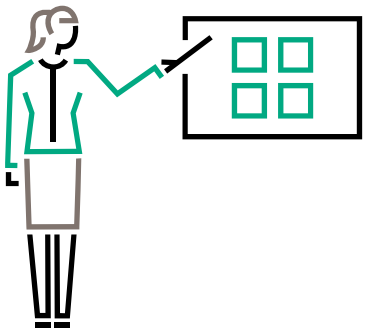
One thing for certain is productivity across all work types and locations, as well as ensuring a safe, healthy environment for employees is a top priority for any organization. For those who will return to a physical location, companies will require continuity of business that can provide fast and accurate health and safety measures such as cleaning and contact tracing using data and automation. And for those remaining remote, a secure, reliable connection that can be managed simply across the distributed edge will enable smooth and effective cloud adoption.

Future outlook

While no one can predict the future, it is possible to learn from current experiences and anticipate what the future might hold. Respondents were asked to pick one of the following—The future of hybrid cloud will be driven by the extension of either on-premises providers creating a cloud experience everywhere or public cloud providers offering their services everywhere. The results varied by the role of the respondent with enterprise IT decision-makers and data scientists favoring on-premises at 56% each and SMB decision-makers and developers favoring public cloud at 53% and 54% respectively. Regardless of which model you favor today, the way of hybrid cloud is on the rise.

Key takeaway—IT's flexibility is sought after as a main driver in accelerating change and transformation required in the new world; however, the majority of IT organizations have not made the move to branch out of maintenance mode and into innovation.

Self-evaluation checkpoint



Flexible transformation

As discussed earlier, study respondents have reported that sub-optimized IT spend is leading to an average negative impact of $15 million on their IT budgets. Perhaps IT organizations need only look inward, at improving IT efficiencies across their estates, to begin to tip the budgetary scales in favor of ongoing innovation projects. When taken together, the imbalance between maintaining and innovating across IT infrastructure and the sub-optimization of capacity utilization across hybrid and multi-cloud estates speaks to the urgency of embracing technology solutions that are more automated, intelligent, and simpler to manage.

As all can attest, reimagining the workplace was key in the COVID-19 pandemic. And while most companies were in reactive modes in 2020, many are looking to the future on what 2021 and beyond holds. One thing is clear, there are no strict brick-and-mortar boundaries anymore. Embrace this transformation as an opportunity rather than just prepare for disruption by looking at change as a prospect for innovation and cultivating your business. An all-inclusive strategy from edge to cloud can facilitate this realization of a complete hybrid workplace vision.

Final thoughts

The most successful companies in integrating cloud are those that are open to changing the way they operate to align with the business goals. Forward-thinking companies are constantly changing, innovating, and transforming. Your mission is to achieve real business outcomes like driving customer satisfaction, boosting revenue, reducing costs, and managing risk. The cloud transformation journey is just that… a journey. At times, this experience will be challenging, awkward, and complex. But on the upside, it is also exciting, innovative, and inspiring. You will be part of something remarkable.

It's time for a self-evaluation of your current environment and discover opportunities for improvements.

Start with these five guiding principles to get you on the right path in your cloud transformation:

1

No fault security

To ensure that your business does not end up as front-page news for the wrong reasons, it is imperative that security stops being a bolt-on option and becomes a core component of everything done in the cloud. Revisit integrating security into the entire cloud migration including technology, people, and processes.

2

You can't manage what you can't see

Visibility into the performance, usage, and costs of your environment is the steppingstone to effectively using your cloud resources. No longer is overprovisioning or underutilization a crutch and excess, preventable costs a given. The key is to understand the peaks and lows, and act accordingly with a clear cloud strategy.

3

Enable your data to work smarter

Organizations require the constant movement of data to make critical business decisions, ensure customer satisfaction, and run the business. The need for a power of immediacy is increasing in use cases such as self-driving cars, patient medical information, and fraud detection where data access can't wait. Evaluate the ease of accessibility, the velocity at which you can obtain access and any hidden data egress costs. And of course, data traffic needs to be safeguarded and compliant with industry regulations.

4

Location, location, location

Depending on which industry you are in and how best to serve your customers, will determine which workloads are critical to run your business. When deciding workload placement, consider the security required, flexibility in making changes, and data access requirements. Examine the strategies through a fresh lens and ensure alignment with your business objectives. Always come back to the question, "What is my end goal or outcome?" The workloads will follow.

5

Empower flexibility to achieve innovation

The ability to embrace the unexpected and flourish in times of the unknown is where the leading organizations will stand out. Ensure that your IT can not only make changes during unpredictable circumstances should they arise but also thrive with the opportunity for innovation. Look for ways you can better balance your maintenance costs and introduce more modernization. A prime example is how your cloud ecosystem equips the change in your remote worker's environment with the right access, security, and tools to encourage higher productivity and efficiencies. Be ready for the next big thing.

With the continuous innovation in the cloud and the shifting workflows of companies, the conclusion is that cloud is not a one-size-fits-all reality. Every organization has unique needs and business objectives, and as the COVID-19 pandemic demonstrated—change is inevitable. The good news is, there are more options and variants than ever to choose from so you can strike the best balance for your organization and find a strategic partner with the expertise that can grow with you and enable you to get the most from your cloud, data, and applications, wherever they live.

Learn more how the HPE experience and innovation can help maximize your cloud investments

HPE GreenLake cloud services: Transform the way you do business with the HPE GreenLake edge-to-cloud platform. Gain one experience and one operating model across your distributed clouds, for apps and data at the edge, in colocations, and your data center.

Learn more at

hpe.com/greenlake

Make the right purchase decision.
Contact our presales specialists.

Chat now (sales)

Call now

Get updates

Visit **HPE GreenLake**

Hewlett Packard Enterprise

© Copyright 2022 Hewlett Packard Enterprise Development LP. The information contained herein is subject to change without notice. The only warranties for Hewlett Packard Enterprise products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. Hewlett Packard Enterprise shall not be liable for technical or editorial errors or omissions contained herein.

a50003966ENW, Rev. 2