THE MODERN IT INFRASTRUCTURE INSIGHT REPORT

Orchestrated by CDW

Volume 03

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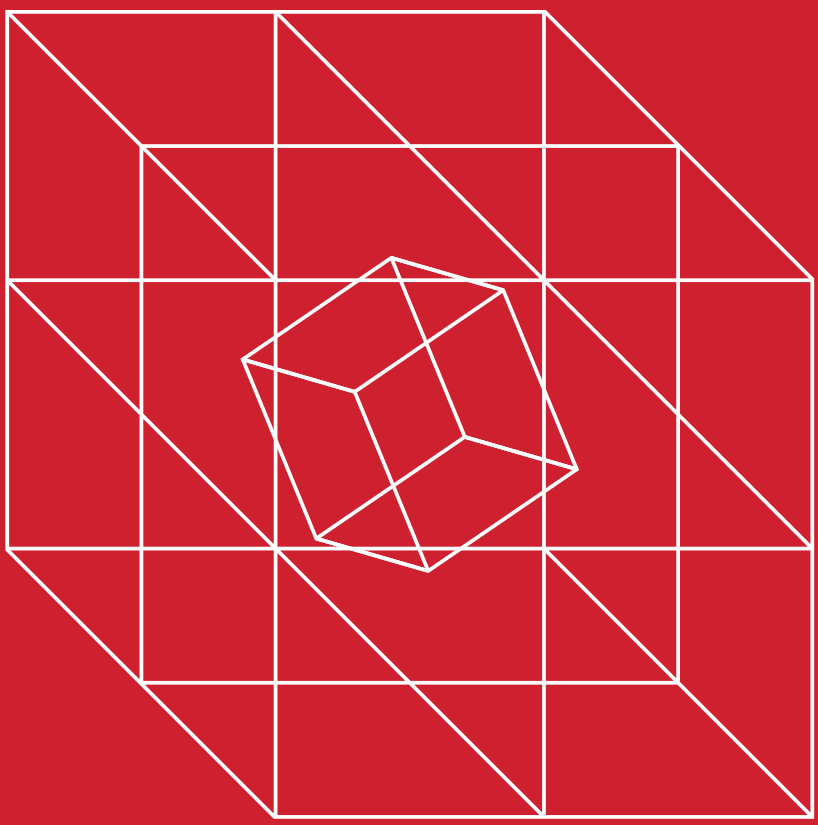
CDW® PEOPLE WHO GET IT®

A DIFFERENT CONVERSATION:

HOW TRANSFORMATION IS NOW THE DRIVING FORCE BEHIND IT



Perhaps surprisingly, as an IT service provider, most of the conversations we have with C-suite leaders don't revolve around technology. We're talking about keeping pace with business, driving innovation and freeing up resources because today, technology isn't just about keeping up. It's about utilizing assets to accelerate outcomes, not just achieve them — a sports franchise trying to create a better fan experience, or a company in SoHo that's looking to better utilize its space because real estate prices are astronomical. Using technology to add true business value that creates differentiation for customers is the hallmark of modern IT and progressive IT leadership.

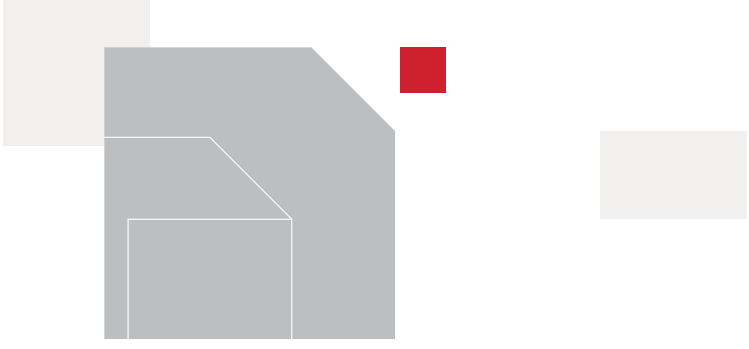
"Today, technology isn't just keeping the lights on. It's giving organizations new capabilities, better insights and much faster ways to do business."

This represents a shift from where most organizations were only a few years ago. Conversations around IT tended to focus on transactional technology, frameworks or the bones of a solution. Today, however, real business transformation is borne on the shoulders of technology. From internal stakeholders all the way to customers, IT is taking center stage as a strategic investment.

Indeed, we have entered an era of transformational IT. What we have found working with progressive leaders across several different industries is that they tend to see three different types of transformational technology solutions:

1. **As a Service Capabilities**
As a Service platforms provide organizations with unprecedented flexibility, the foundation of transformational IT. These platforms are also helping them increase speed to market, providing a competitive advantage.

2. **Hybrid Infrastructure**
Infrastructure as a Service consists of storage and compute-based facilities — typically hosted by a public or hybrid cloud provider — for organizations to deploy and manage any variety of workloads, such as disaster recovery and backup, e-commerce, Big Data and analytics. Organizations can also take advantage of basic monitoring, security and networking services native to the provider.



3. **Emerging Technology Tools**

Internet of Things (IoT), artificial intelligence and machine learning are all helping organizations discover new, incredible insights that are capable of transforming business.

By investing in new, emerging technologies and deploying them effectively, organizations are adding an advanced level of security and performance to their infrastructure. But perhaps more important, they are preparing themselves for the future.

New Technology, New Capabilities

Modern IT equips organizations with new capabilities, better insights and much faster ways to do business. The cloud brings with it ever-expanding possibilities that have changed the game. Web developers no longer have to wait on their IT team to develop applications. A research department within a university can stretch grant money further and do amazing things with new compute availability.

Transformational IT also improves the way individual employees work. It's faster to build and faster to market. Employees gain more day-to-day productivity and flexibility. Those working in IT functions now have the ability to worry less and engage more on higher-level projects that drive business results.

Two Roadblocks to Innovation

On the journey from transactional to transformational technology, organizations typically face two roadblocks that keep them from innovation:

1. **Capability and Bandwidth**
This year, security was replaced as the No. 1 barrier for cloud adoption. Instead, organizations are held back by bandwidth and capabilities. It's hard to blame them. There are simply too many technologies to keep up with. Progressive IT leadership is best served not tackling such a huge undertaking alone. Trusted partners who are flexible, understand the customer base and can facilitate implementation across a wide range of solutions have become more and more valuable.

2. **Structuring Innovation**
Technology and innovation are expanding so fast that organizations are having a hard time keeping up. Engineers are developing and deploying applications in containers instead of using corporate tools and infrastructure. Different business functions are creating their own cloud-based solutions in silos. The cloud provides infinite potential to transform an organization, but natively may not meet requisite levels of performance, security and redundancy. Progressive IT leaders must balance having the right guidelines and tools in place in a way

that lets innovation thrive. Managing who has the authority to provision services, orchestrate workloads and even reconcile consumption and billing are important — and often overlooked — steps in running an efficient IT department.

Using Technology as a Competitive Advantage

To continually innovate through transformational technology, organizations must deliver unprecedented value to their customers. And they need to remain differentiated and in a defensible market position. If organizations can understand and build the right mix of technology around both, they won't just deliver positive outcomes, they will accelerate them.

It's an exciting, albeit challenging, time. As IT providers and leaders, we have the opportunity to help steer our clients and organizations toward outcomes that we could have never imagined before. Throughout this report, we will combine research with expert opinion and insight to help you navigate the challenges that come with transformational technology and plan for solutions that will prepare you for the future.

Stephen Braat
Vice President, Cloud and Managed Solutions, CDW

Perspectives

By using technology as a transformational game-changer, IT has become a central force for driving real business results within organizations. But from hybrid infrastructures to as a Service platforms, understanding how to best harness and implement new technology so it increases productivity and agility isn't always clear.

To help organizations better utilize technology as a business driver, we have asked some of the best and brightest minds within the industry to identify some of the biggest trends impacting IT today and how organizations can better understand and capitalize on them. Their expert perspectives are included here.

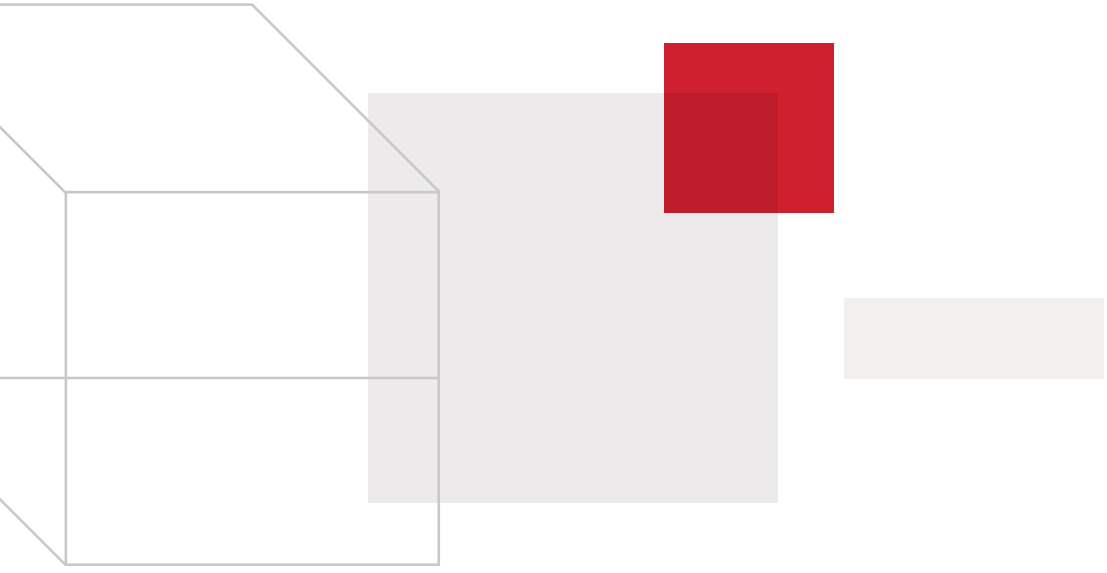
MOVING ON UP:
USING THE CLOUD AS A STRATEGIC BUSINESS DRIVER

by Shane Zide
Principal, Cloud Client Services,
CDW

As cloud capabilities expand, so do the inherent promises of helping organizations become faster and more agile. This is leading to cloud adoption at a massive scale, and for good reason. Moving workloads to the cloud is actually delivering on those promises, helping drive business results through more flexibility and efficiency. It's making organizations more nimble and productive — the new ROI in this era of transformational technology.

Learning to maximize the benefits of the cloud architecture isn't just representing a fundamental change in how organizations deliver on their mission, it's leveling the playing field. Today, organizations can remain focused on delivering value without being weighed down by infrastructure, and IT can make decisions that have a meaningful impact on the business as a whole.

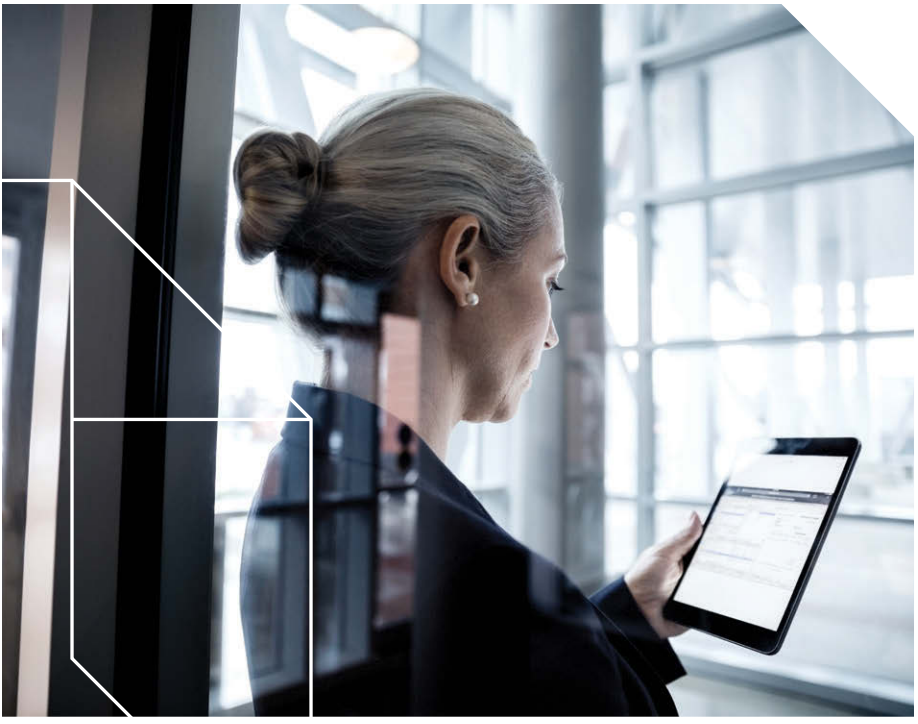
But the decision to move workloads to the cloud isn't always so cut and dry. In addition to sifting through so many products and proposals, organizations must also ask themselves if it will help them cut costs or ultimately reduce revenue. If you are considering moving workloads to the cloud, these insights may help make the decision easier.



The Ever-Evolving Cloud

Despite its ability to rapidly transform organizations, cloud adoption was traditionally slow. This was — and somewhat continues to be — influenced by the large infrastructure investments organizations have made over the years. Spending $20 million on an infrastructure is a hard cost that keeping workloads on-premises seems to justify.

But as the cloud continued to evolve, the efficiencies it created began to outweigh the costs. And many organizations started moving workloads to the cloud while keeping mission-critical applications on-premises where dedicated teams could manage and support them.



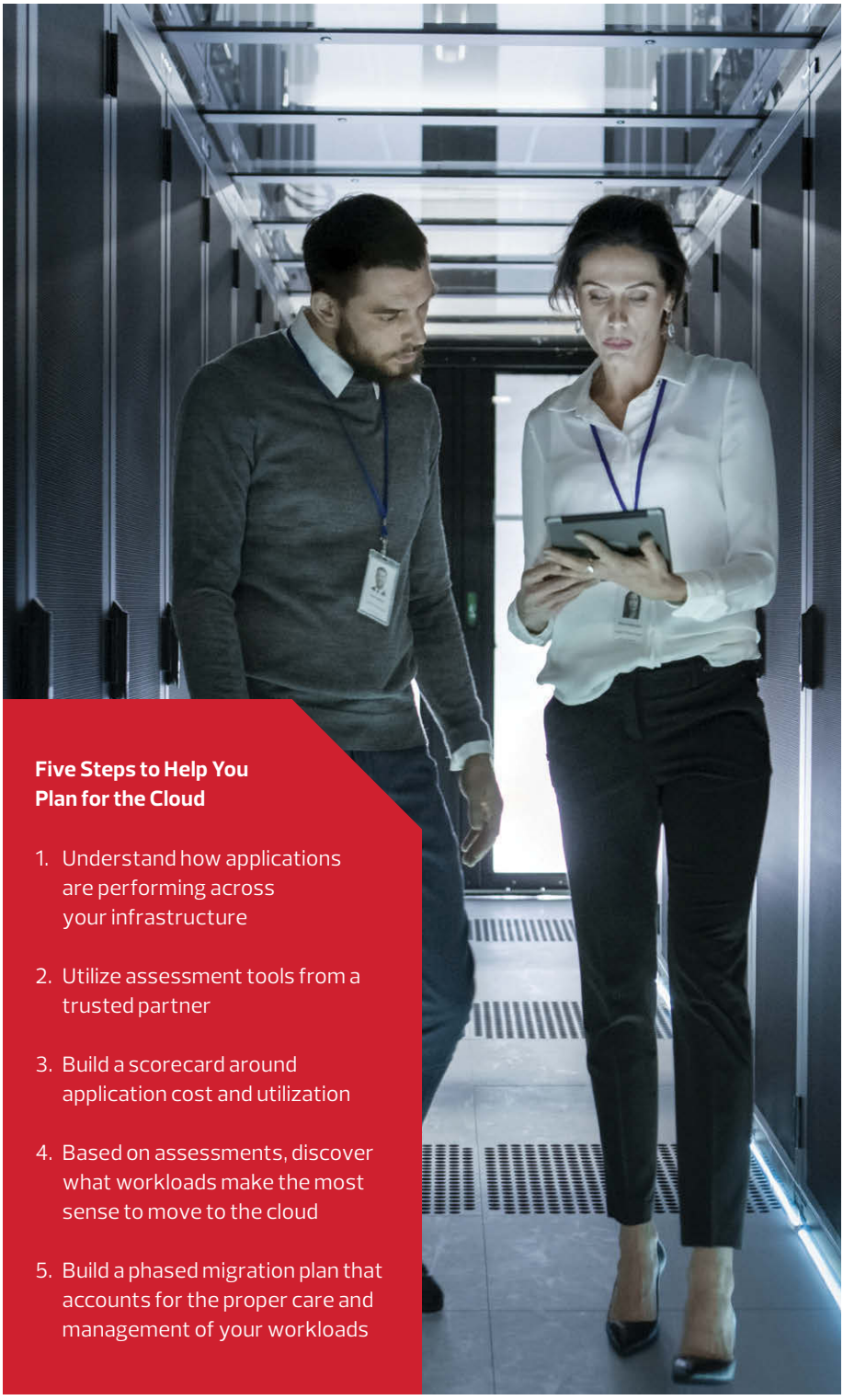
Today, cloud-enabled efficiency continues to grow, and so do the number of workloads that organizations are moving to the cloud. For example, developers can now create new applications and workloads quickly, thus providing more avenues to deliver revenue. But despite newfound agility, migrating to the cloud isn't always easy.

Expanding to the Cloud Often Comes with Growing Pains

Despite its growing list of advantages, many organizations struggle with moving their workloads to the cloud. More often than not, they are starting with legacy equipment. And "legacy" by today's standards could mean anything that was purchased just a few years ago. Justifying the replacement of this equipment to a CIO is an uphill battle.

The IT world is also, to some degree, experiencing a changing of the guard. Many of CDW's clients are traditional, self-described "hardware guys" in a world where cloud technology is relatively new. These clients want to make a transformational impact on their company, but often lack the resources or background to do so.

The cloud is also suffering from an overabundance of market hype. There is still a lot of noise surrounding all the offerings available. Today, organizations need to understand how moving workloads to the cloud and using it to optimize data can drive innovation. Having a trusted partner who can help them break down the benefits and sift through the noise can be extremely valuable.



Five Steps to Help You Plan for the Cloud

1. Understand how applications are performing across your infrastructure
2. Utilize assessment tools from a trusted partner
3. Build a scorecard around application cost and utilization
4. Based on assessments, discover what workloads make the most sense to move to the cloud
5. Build a phased migration plan that accounts for the proper care and management of your workloads

"The cloud is far more complicated than most realize. Deciding which workloads to move can be daunting, but getting it right makes a huge impact."

When it comes to moving workloads to the cloud, organizations can also get caught up in looking for "quick wins" instead of focusing on the bigger picture. The cloud is far more complicated than most realize. Deciding which workloads to move can be daunting, but getting it right makes a huge impact. From data warehousing and Big Data to implementing and utilizing security across the cloud, there are complex operations happening under the hood, and they come with formidable knowledge gaps.

How to Get Moving

With so much complexity and so many potential benefits on the line, moving workloads to the cloud can seem daunting. As such, many organizations don't know where to start, and it's a big reason why cloud consulting has gained so much traction.

Unfortunately, the cloud doesn't come with an easy button. And there is often a steep learning curve before implementation. First, organizations need to know what is right to move to the cloud. Memory and utilization, for example, can consume more memory over the cloud than it would on-premises. Determining which workloads should move to the cloud and which should stay is an important first step.

At CDW we ease clients into cloud solutions by starting small. We begin with one workload. Then we practice on it. Once it feels like second nature, it's repeated with additional workloads. As organizations begin to see more and more benefits, the process becomes more streamlined and they start seeing the potential benefits finally realized.

While moving workloads to the cloud can be complex, it is a critical step as organizations prepare for the future. If it's done right, cloud migration can help them use technology as a transformational tool that drives powerful, tangible business results.

A FOUNDATION FOR INNOVATION:

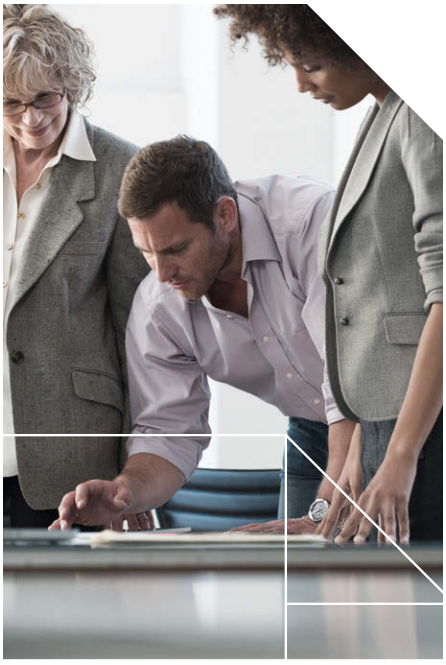
HOW NEXT-GENERATION NETWORKING ARCHITECTURE LAYS THE GROUNDWORK FOR FUTURE SUCCESS

by Sven Rasmussen
Team Lead – Enterprise Networking, CDW

As the pace of digitization grows, more and more data needs to be transmitted over existing networks. And as it does, organizations must face the challenge of being able to consume it all. The rise in data processing and consumption has led to the development of next-generation networks, and they are changing the way organizations approach their entire infrastructure.

Implementing next-generation networking begins with understanding how organizations use their networks. They might be accessing applications; staying connected to people, devices and data; or consuming digital information. Network expansion caused by IoT devices and the need for constant connectedness have given way, resulting in the need to identify and segment network devices so they can be used for their intended purpose rather than being considered security vulnerabilities.

More speed, more connectivity and the need to use both as business drivers means that today, nobody can afford downtime. Organizations need constant access to information, and they need it faster. This is how next-generation networking was born.



Safer, Faster, Stronger

The role of IT is shifting. CIOs are now asked to drive business results. To do this, they need to develop and deploy transformational technology that helps organizations become faster and more dynamic while also staying secure. Next-generation networking technologies deliver a few distinct advantages that can help.

Automation

Networking used to be simple and flat. Today, organizations need to scale operations. Automation accomplishes a lot of tasks in a short amount of time. What previously took many steps is now automated based on the user's intent. Next Generation Architecture (NGA) is designed with policy that follows the user and not an IP address.

"More speed, more connectivity, and the need to use both as a business driver means that today, no one can afford downtime. Organizations demand continuous access to information, and they need it faster."

Virtualization

Next-generation networking can virtualize network components so they can be used anywhere, giving organizations the ability to move data quickly across hybrid platforms. Whether you have a physical or cloud data center, you can manage and configure your infrastructure easily and consistently across platforms.

Visibility
With next-generation networking, organizations have end-to-end visibility into all of their network traffic passing through all of their devices. By analyzing the data that flows through the network, they gather valuable insights into the application, client and network health. This helps easily pinpoint problems and guarantees network resource availability at peak times when workers need them.

Security
More devices are connecting to networks than ever before. And the rate is increasing exponentially. More devices create more entry points for potential threats from cybercriminals. The traditional security approach of only protecting the network perimeters with firewalls has become woefully inadequate. Today, organizations need to be proactive with security. They need the network to be both a security sensor and a security enforcer. Software-defined access lets organizations micro-segment their network to keep users and information secure and separate from each other.

Implementing Next-Generation Networking

Organizations often look at next-generation networking as a fixed solution that needs to be implemented, and then it's done. Nothing could be further from the truth. Building an effective solution is a journey, not a destination. Here are some milestones along the way.

1. Organizations must evaluate their infrastructure to determine if it's ready for an NGA. The first step is a network assessment to determine an organization's readiness for change. The assessment provides a gap analysis that explains the current state versus the future state of the network. Creating a budget for the network upgrade is an important step following the assessment.

2. Professional services will make the transition easier when the implementation phase becomes complex. When you combine different network technologies from wireless, routing and security, a project manager can help coordinate the planning and transition.

3. One overlooked area of implementation is knowledge transfer. Understanding exactly how the network has changed and the new features and benefits that are available is a critical component when adopting new technology.

Organizations are working in an environment where the ability to stay agile, adapt and scale faster than the competition is the new ROI. As such, success often lies squarely on the shoulders of IT and the ability to deliver technology that drives results. If organizations design and implement it correctly, next-generation networking can be a valuable tool in an arsenal that prepares them for the future.

TURNING LEGACY INTO OPPORTUNITY:
GUIDE TO ADOPTING CLOUD MANAGED SERVICES

by John Chancellor
Senior Manager, Service Offerings,
CDW

The demand for technology is increasing at an incredible pace. And it's showing no signs of slowing down. This is placing new demands on IT to manage complexity while keeping costs low.

The cloud is fundamental in driving this pace of innovation, and it has brought new competitive advantages along with it. Just five to seven years ago, organizations had to build their own capabilities in-house, which ended up costing them massive amounts of money and resources, and kept them from focusing on driving business outcomes.

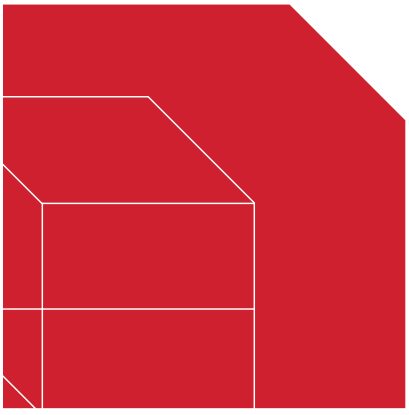
Fast forward and today the same organizations have the ability to consume technology in previously unimaginable ways through the use of cloud services. However, many companies struggle to find or develop the skills to take advantage of this new consumption model.

Cloud managed services are at the forefront of helping organizations drive innovation by helping them use cloud services. By offloading the management of everyday services, they also open the door for existing teams to explore more complex applications, creating a more agile infrastructure that can help anyone keep pace with business demands.

Common Cloud Misconceptions

While the benefits of cloud managed services are numerous, implementing them within your organization requires the right mix of planning and execution.

The cloud has become somewhat of a catchall phrase that leads to a few misconceptions. Some organizations view the cloud myopically as a platform for simple workloads like moving files. Others believe that by moving to the cloud, there is nothing left to manage. However, this couldn't be further from the truth. Even with the best cloud solutions, organizations still need to manage utilization and availability while configuring their environments to meet any gaps within their infrastructure.



More often than not, when clients approach us about migrating to the cloud, they're often just looking for a place to start. With so much IT complexity and current infrastructure in place, and so much on the line, the cloud can seem daunting. And that's where cloud managed services come in.

Managing Complexity

Cloud managed services are operational services that let organizations outsource everyday IT management activities and help them better utilize resources in-house. Far from the static, set perception that most people have of the cloud, it can be extremely complex to manage. From scaling applications to meet peak demands to optimizing network performance, managed cloud services can take a large portion of that daily management and complexity off of IT's plate.

Additionally, cloud economics are always difficult to manage, especially when it comes to controlling costs. Migrating the right services to the cloud and utilizing workloads correctly can keep organizations from racking up a large bill. Cloud managed services can help organizations optimize spend and avoid surprise impacts to their budget.

And because the cloud is primarily a platform, it delivers access to resources faster. It used to take months to deploy an app. Now it can take minutes. The ability to deploy applications faster to market is creating more agile organizations and giving them a competitive advantage. Above all, cloud managed services are helping organizations think strategically about how to invest in cloud technology and use IT as a business driver.

Adoption of cloud as a platform within an organization doesn't come without challenges. Understanding and using cloud services requires learning new technologies and skills. But operations teams are already overloaded with their day-to-day responsibilities and rarely have time to explore cloud services. That's why it's more critical than ever for organizations to find someone who can both take on day-to-day operations and give a broad view of the landscape, and help them understand and implement different solutions.

Four Necessary Elements for Cloud Adoption

When an organization starts looking to implement cloud managed services, we recommend four key areas to consider.

1. Training
Always make sure workers know how to use the new technology. Perhaps more important, help them understand how that technology is helping the business. Using a cloud managed services partner to help support your team with their expertise will help ramp up cloud skill sets within your internal operations staff.

2. Tools
When it comes to tools such as network and server monitoring, and ITSM toolsets, almost all of them were built to manage traditional workloads. Successfully moving to the cloud means changing your tooling to adapt to a new cloud infrastructure. Cloud managed services providers will bring their own toolsets to the relationship that work with cloud technologies.

3. Governance
Managing security standards and data while staying compliant is critical. It's a complex process that a trusted partner can help with.

4. Time
There will be an inevitable learning curve. Giving staff the time to understand and experiment with new technology and setting realistic expectations are all important steps. With a cloud managed services partner, you have to free up time for your team to really explore these new platforms. At their core, cloud managed services, when implemented and adopted correctly, can help organizations better utilize the cloud. And that, in turn, can help turn IT into a force that drives business results that have the power to propel organizations into the future.

So You're Considering Cloud Managed Services

Relationships are critical. Designate a team member to own your provider relationship. Don't direct work. Instead, give feedback on the quality of service your organization is receiving.

Choose your provider wisely. Many have only managed public cloud and lack the maturity your organization may need in a hybrid environment.

Understand your entire environment and find someone to manage both traditional and cloud workloads.

Find a provider that has the capabilities and functionality to grow with you as your cloud consumption expands.

SECURE AND PROTECT:
KEEPING SOFTWARE-DEFINED DATA CENTERS SAFER

A Q&A with

David Grube
Vice President,
Product Marketing,
Carbon Black

Geoff Shukin
Senior Systems
Engineer – Network
Virtualization, VMware

As technology innovation continues to advance, more organizations have shifted to software-defined models for structuring their data centers. The ability to replace manual provisioning with much easier management while allowing organizations to share more resources in a tightly isolated environment is creating more flexible environments. It's also making them integral features in the deployment of IT resources. To learn how software-defined data centers are reshaping IT and helping organizations work with more agility, we sat down with Geoff Shukin, Senior Systems Engineer – Network Virtualization at VMware and David Gruber, Vice President, Product Marketing at Carbon Black.

CDW: Over the years, we have seen a rapid change in data centers and more and more organizations moving to virtualized, software-defined data centers and taking advantage of hybrid IT. What has been the cause of the shift?

David: There's no doubt that more people have moved and continue to move into the software-defined model. For a long time, people had dedicated systems in place for individual applications. That meant they had to plan for peak performance times, which

ended up costing a lot of money and left significant idle resources. Leveraging a software-defined environment, they can share resources easily and leverage the entire system in a more flexible way. This results in significant optimization of hardware investments and fewer idle resources.

Geoff: I'd argue that data centers haven't really changed like they should have. Organizations have been resistant to change. It's resulted in more breaches than ever, and we actually end up seeing more unsecured and unprepared environments than we should.

Today, organizations are finally starting to see IT as a strategic resource rather than a cost center. I think software-defined models are a good case in point. They're helping organizations adapt and innovate faster, and that includes security. They're also helping organizations react to new demands in a business world, where turnarounds need to be quicker.

CDW: Traditionally, how have organizations sought to secure and protect their data in on-premises data centers? And what types of technologies and solutions defined their security plans?

David: Data centers, whether they are hardware- or software-defined, that run in a corporate location have often been thought of as a walled-off environment, protected by firewalls. As applications have become more distributed across multiple locations, many are outside the protected, corporate environment, and it's creating a shift in mentality. We need to think differently about securing these complex applications as attackers gain

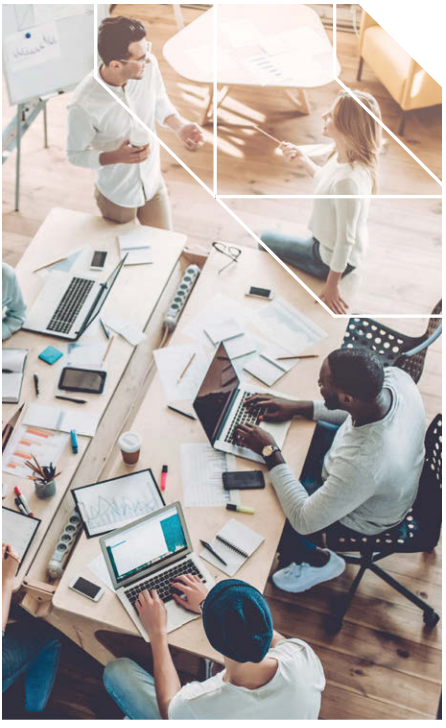
a better understanding about today's application landscape.

Geoff: The traditional approach to security didn't really understand or possess adequate knowledge around applications. IT expected servers to do everything without fully anticipating shifts. Approaching security from a network and infrastructure perspective was a miss. Bad guys really care about apps and data, and firewalls made us feel safe from attack. The issue is that firewalls didn't necessarily add any strategic security value. Software-defined models have really helped organizations protect applications and data. Today, security overlay follows your data.

CDW: In moving to a software-defined data center, how does the threat landscape change versus a traditional data center?

David: While today's threat actors are using new approaches to attack systems, the threats really aren't that different. What's different is the way organizations are approaching their infrastructure. Today there are thousands of endpoints vulnerable to attack. And this is where hackers love to focus their attention. Organizations should try and group those endpoints and establish security protocols using next-generation technology.

Geoff: We live in an era where everything is web accessible, and data is out there. It's the new realization that data might not be inside the walls of my data center. It could be on an employee's laptop at Starbucks. Organizations must figure out where the data is, who has access to it and how it needs to be protected.



CDW: What are the biggest challenges that organizations face in securing their software-defined data centers?

David: We're moving away from a time where most security solutions were based on firewalls or designed for individual devices instead of applications. With today's agile development, security solutions need to be more active. Additionally, software-defined applications tend to change shape and size dynamically, requiring security that can adapt. All this requires establishing a level of organizational intelligence that is built to keep up with the dynamic nature of today's infrastructure. This can be a big challenge.

Geoff: Costs and resources always seem to be an issue when it comes to security. But I think those are justifica-

tions. Securing software-defined data centers requires effort, and applying the old security overlays seems to be an easy way out. But when traditional information extends beyond firewalls, you need to expand your solution.

Organizations need to get more visibility into their infrastructure – what they have, where it is and what's most important to protect. Better visibility leads to greater understanding and prioritization.

CDW: How should organizations seek out, choose and implement security solutions across software-defined infrastructure solutions? What are the key milestones? What should decision makers be cognizant of?

David: First, organizations need to recognize that the environments they are protecting aren't standalone systems. Applications are often running across multiple servers in multiple locations. This requires a shift in mindset. They need to get more visibility into their environments and understand what's running. Next, organizations need to work together to meet objectives. Security and system administrators need to meet objectives when it comes to security, reliability and uptime.

Last, organizations need to measure system performance. They should do this in terms of measuring how much data is compromised and think about attack chains. Teams must both understand what those attack chains are and kill them.

Geoff: I like to start with the boring stuff. Begin by patching systems and understanding the data criticality before moving onto bigger topics like segmentation.

Visibility is critical. I recommend that organizations do a reset. Try to understand the risks associated with different data sets, and make sure a lot of dollars aren't wasted securing the wrong things.

Next, understand the governance structure with a focus on big ticket items.

Finally, implement solutions, and then break down specialty barriers. That means having everyone understand holistically how the solutions work and getting them to work together on security initiatives.

CDW: How can a partner help to ensure that the right steps are taken?

David: Partners are great at bringing teams together because they have access to incredible security and system administration contacts and can help organizations gain awareness of the latest solutions available to secure a software-defined data center. It can be a lot of heavy lifting if organizations are trying to do it on their own.

Geoff: There are two things I always tell organizations I work with: One – it's not if you're breached anymore. It's when. And two – go talk to your competitors. Try to understand what their issues are. It will give you an idea of what steps you need to take. Then don't bury your head in the sand.

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THE BEST OF BOTH WORLDS:
TRANSFORMATIONAL POWER OF HYBRID INFRASTRUCTURES

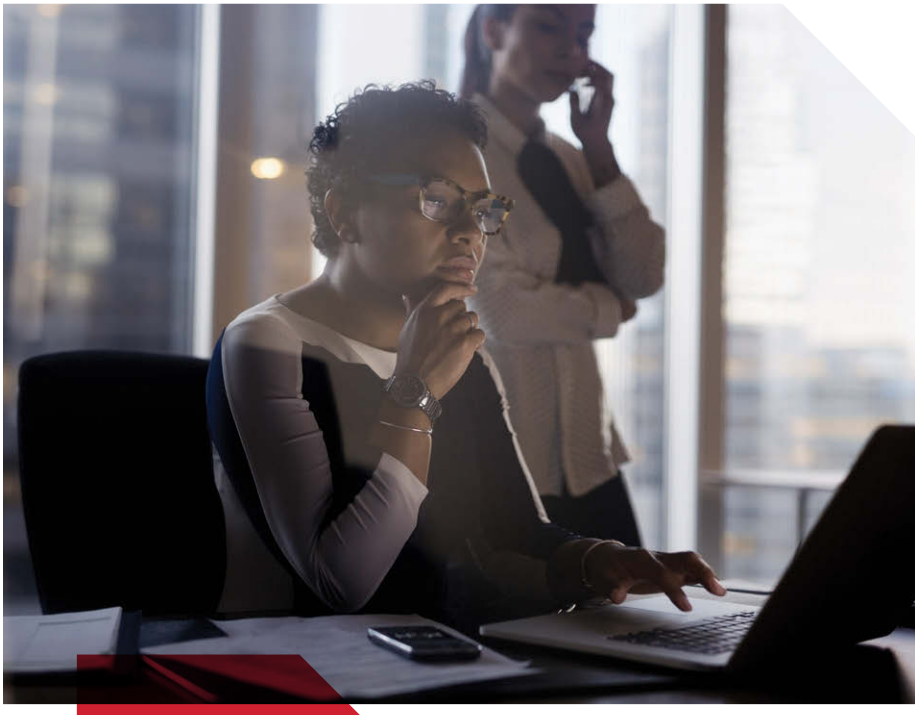
by Chris Gibes
Manager – Solutions Practice, CDW

The ways in which organizations use the cloud continue to evolve. In large part, this is due to the rapidly expanding capabilities that the cloud brings. When public cloud platforms such as Amazon Web Services (AWS) and Azure debuted, the offerings were so strong out of the gate that many organizations went all in. And it was hard to blame them. These organizations could whip up new apps in a fraction of the time and handle variable workloads like they never could before. Retailers ramping up for Black Friday sales no longer needed to buy and implement completely new infrastructures to accommodate peak times – they could simply pay for what they used with new flexible, pay-as-you-go models.

But gradually, organizations learned that the cloud wasn't always cheaper. In fact, if it wasn't carefully managed, it could take bills way beyond pre-cloud levels. For many, this was fine. The increased capabilities were worth it. But other organizations have recognized that there needs to be a balance of on-premises versus off-premises cloud technology built into stronger, flexible software-defined data centers designed to meet customer needs.

Meeting in the Middle

As organizations have looked to capitalize on the benefits of both on-premises and cloud solutions, they have realized that the two are not mutually exclusive. This recognition is leading to solutions that make workloads more predictable while giving organizations the flexibility to scale. With predictable workloads, where data is doesn't matter as much as where it makes sense. And housing security on-premises also helps alleviate security anxieties.



But controlled flexibility is just the start when it comes to the advantages of building a hybrid infrastructure. Here are three more.

1. **Continuity**
   Archiving data in the cloud eliminates the need for a second data center and keeps things running.

2. **Speed and Agility**
   With a hybrid infrastructure, organizations can fail fast without huge consequences.

3. **Innovation**
   By giving organizations the ability to offload maintenance tasks, IT staffs can get to work on strategic business initiatives.

Navigating the Pitfalls of a Hybrid Infrastructure

Despite the benefits of a hybrid infrastructure and the rise of cloud access security brokers that add sophisticated protection, many organizations are still wary. Security remains top of mind, and there is still a lack of trust with putting information into the cloud.

Additionally, there is a lack of understanding when it comes to utilization. To build an effective hybrid infrastructure, organizations have to know how applications interact with multiple networks — and most don't. If the infrastructure isn't set up properly, a broken component can cause a domino effect across the entire infrastructure.

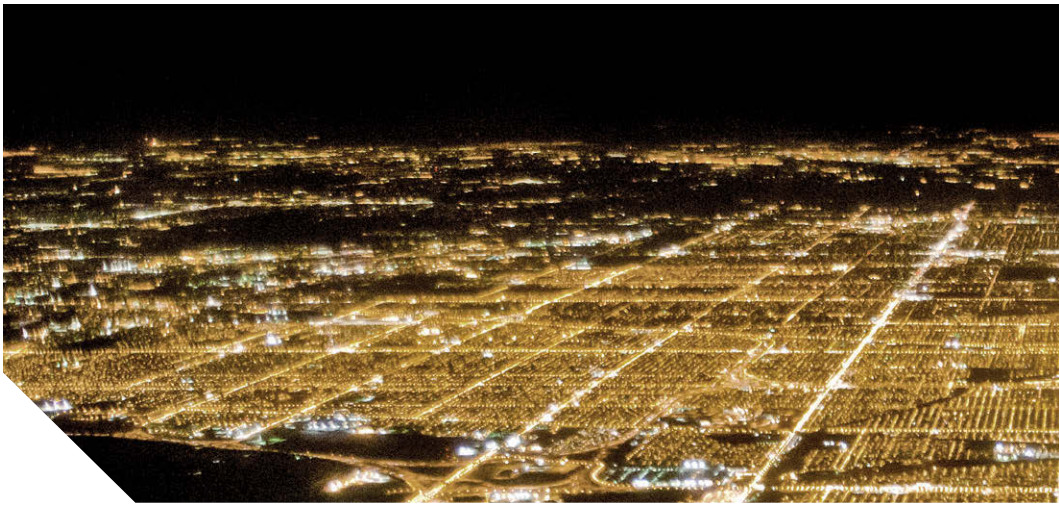
Finally, organizations often don't incorporate strong governance into their hybrid infrastructure plans — a critical misstep. Without strategic organization and preparation, cloud solutions can quickly get out of control as operations expand.

Three Considerations Before Developing a Hybrid Infrastructure

1. **Compliance**
   Determine what requirements you need to implement when securing or moving data.

2. **App Dependency**
   As you begin to plan, look at what apps you use and when.

3. **Economics**
   Decide which predictable workloads you can keep on-premises, and understand the resources you will consume and how much you will pay if workloads are moved to the cloud.

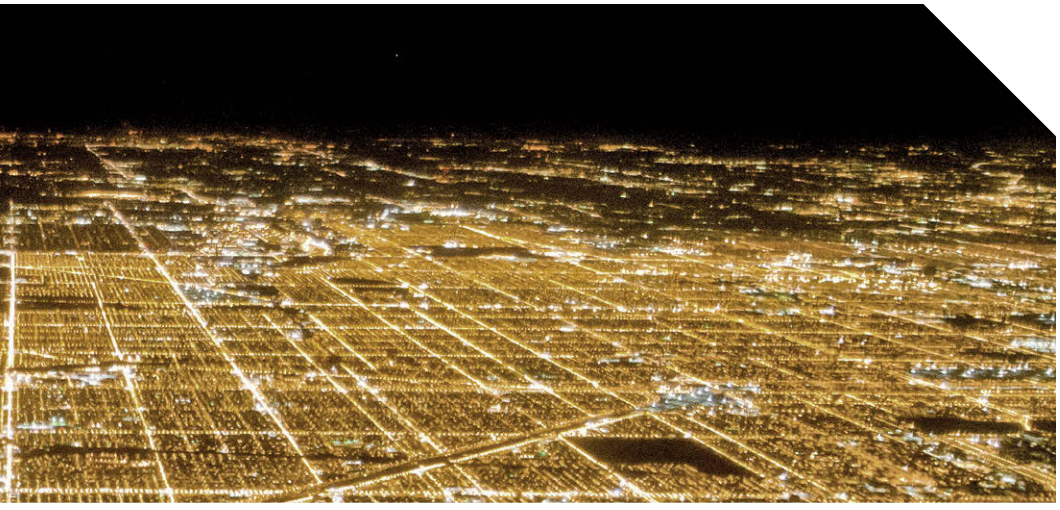


"As technology continues to become a rapid transfor-mational force for business, one thing is clear: the data center of the future will be smarter, more scalable and easier than ever to manage."

Developing an Effective Hybrid Environment

As technology continues to become a rapid transformational force for business, one thing is clear: the data center of the future will be smarter, more scalable and easier than ever to manage. And the boundaries that separate on- and off-premises will continue to get smaller. This will mean that customers won't need to pay so much attention to where the data is, but to what the economics are behind it, and how that data can be secured as it moves. It will also require that organi-zations become more open-minded and dynamic when it comes to developing the right solutions that will ultimately drive business results.

To build an optimal hybrid environment that has the ability to actually transform business, organizations should take three important steps.



1. **Build a Detailed Inventory Map**
   Mapping out the infrastructures and the apps running on them helps organizations do their due diligence. It also helps CIOs get a more comprehensive picture of how everything works together.

2. **Implement Governance**
   Find the right balance of governance that keeps your cloud solution controlled, but still gives the organization enough flexibility to innovate.

3. **Understand the Toolset**
   A good hybrid infrastructure will require new tools that current staffs often lack. Designate someone to lead the build, let them devote enough time to learning the new tools and then support everyone with education and training.

As organizations look to become smarter, more scalable and more agile, incorporating a hybrid infrastructure can help them build solutions designed to fit the unique ways in which they work while helping them gain more control as they continue to grow and keep pace with innovation. And by navigating the challenges and complexity that come with hybrid solutions, they can do it in a way that sets them up for success today while preparing them for the future.

Key Insights

Over the course of this report, IDG interviewed over 400 IT leaders about the technology currently transforming organizations. With expanding capabilities come new possibilities. From hybrid environments to increasing productivity, driving business results has become the new ROI for IT.

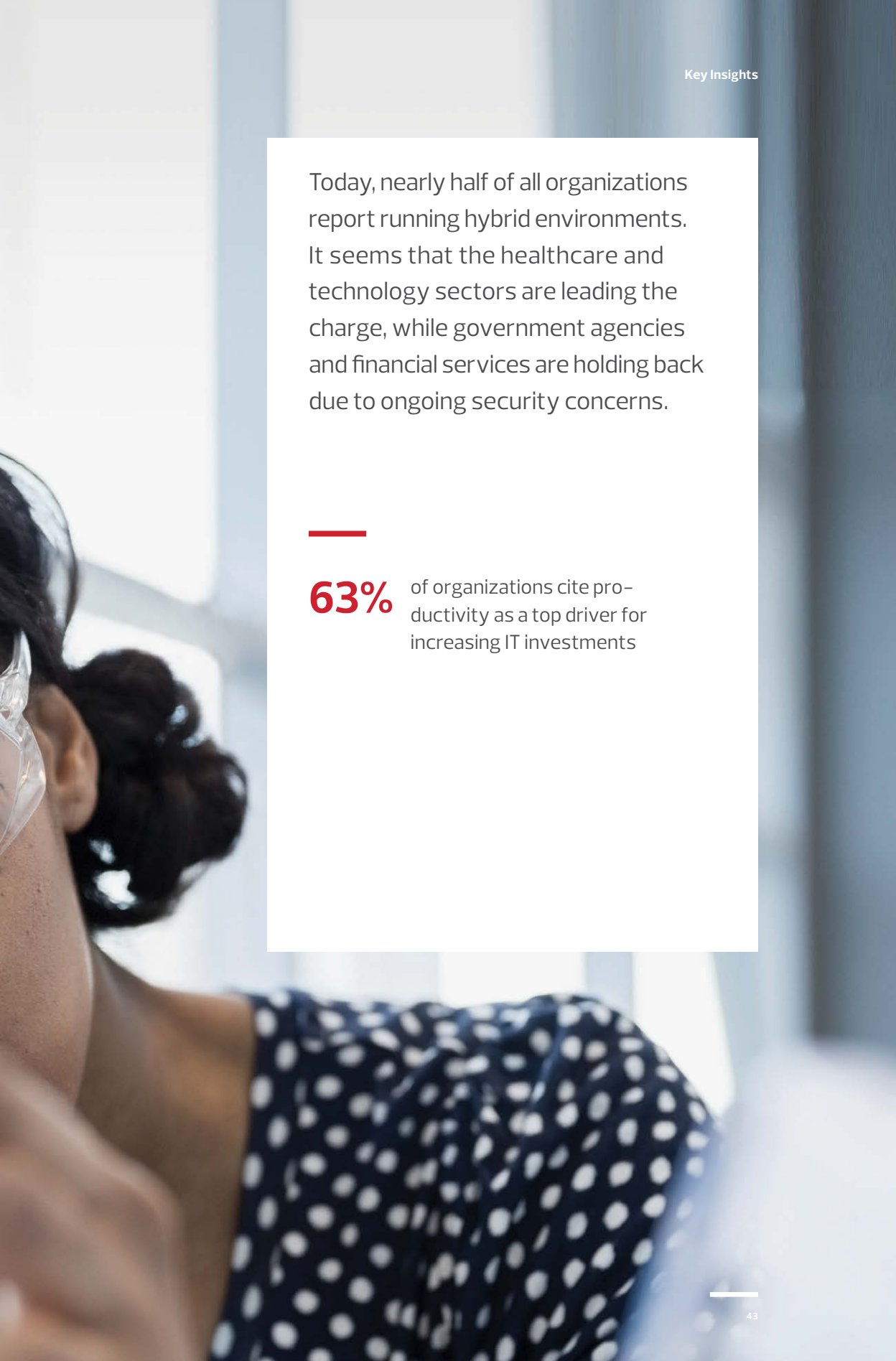
We distilled the research into seven key insights. Along with the accompanying report, they help paint a bigger picture of the current technology landscape and shed additional light on the challenges organizations face integrating into their current infrastructure. For the complete research report, please reference the conclusion of this guide.

KEY INSIGHT 1

HYBRID IT ENVIRONMENTS ARE GAINING TRACTION IN SOME SECTORS, BUT STRUGGLE IN OTHERS

Today, nearly half of all organizations report running hybrid environments. It seems that the healthcare and technology sectors are leading the charge, while government agencies and financial services are holding back due to ongoing security concerns.

63% of organizations cite productivity as a top driver for increasing IT investments



KEY INSIGHT 2

ORGANIZATIONS WANT THEIR IT INVESTMENTS TO DO MORE THAN KEEP THE LIGHTS ON

In the age of digital transformation, organizations want to invest in technology that leads to innovation. These IT purchases increasingly focus on infrastructure and cloud, as many industry sectors are investing at a higher rate to play catch-up or replace legacy technology.

42% of IT investments over the next 24 months will be allocated toward transformational purchases

KEY INSIGHT 3

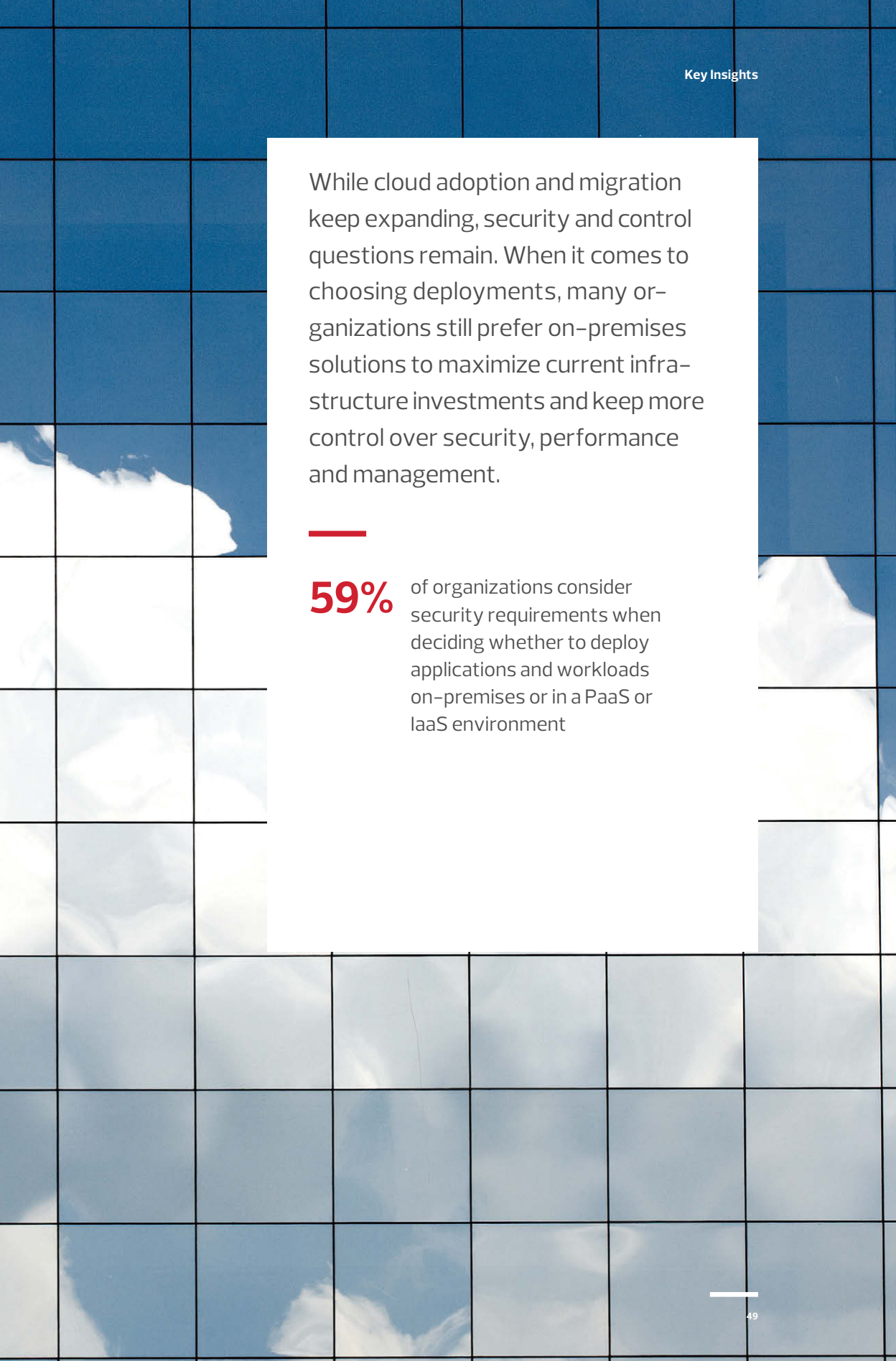
CLOUD INVESTMENTS CONTINUE TO INCREASE TO CAPITALIZE ON BIGGER CAPABILITIES

The cloud continues to deliver on its promises of greater flexibility, cost savings and faster speed to market. As it does, organizations continue to earmark more and more budget for more cloud investments, especially when it comes to hybrid environments.

57% of organizations expect an increase in SaaS deployments over the next 24 months

KEY INSIGHT 4

DESPITE INCREASING CLOUD ADOPTION, MANY ORGANIZATIONS STILL PREFER ON-PREMISES SOLUTIONS

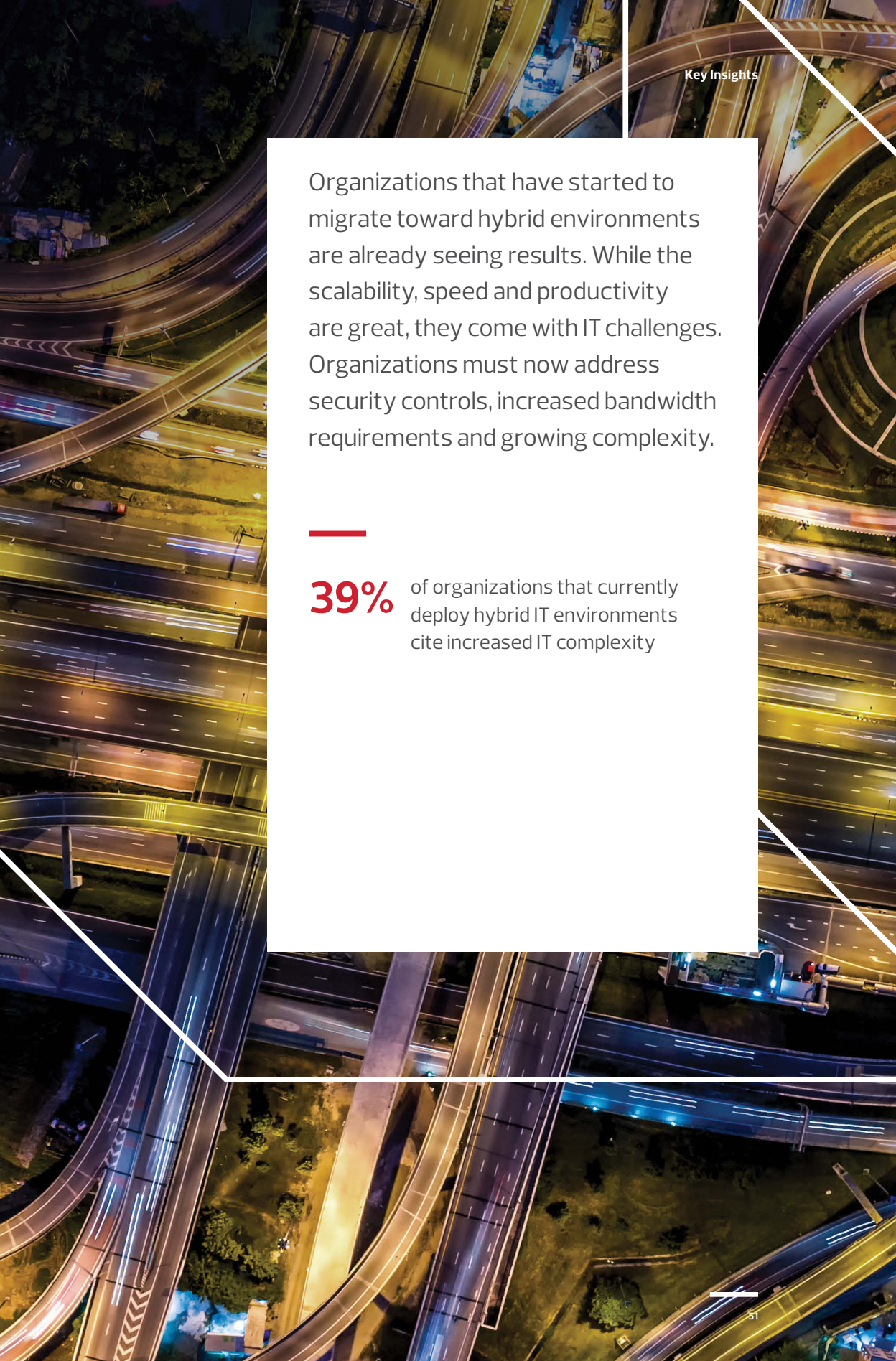


While cloud adoption and migration keep expanding, security and control questions remain. When it comes to choosing deployments, many organizations still prefer on-premises solutions to maximize current infrastructure investments and keep more control over security, performance and management.

59% of organizations consider security requirements when deciding whether to deploy applications and workloads on-premises or in a PaaS or IaaS environment

KEY INSIGHT 5

HYBRID IT DELIVERS RESULTS – BUT ALSO BRINGS CHALLENGES



Organizations that have started to migrate toward hybrid environments are already seeing results. While the scalability, speed and productivity are great, they come with IT challenges. Organizations must now address security controls, increased bandwidth requirements and growing complexity.

39% of organizations that currently deploy hybrid IT environments cite increased IT complexity

KEY INSIGHT 6

THIRD-PARTY PROVIDERS ARE HELPING IMPROVE HYBRID IT ENVIRONMENTS

Many organizations are turning to third-party providers to help them navigate the inherent complexity that comes with building and deploying hybrid IT environments. The most sought-after capabilities include cloud monitoring/management, IT cost management, technology upgrades and IT strategy development.

27% of organizations are likely to turn to a third party for help with cloud monitoring and/or management

IN CLOSING

Today, organizations must handle more information that is being created faster than ever. And to stay ahead, they must build technology solutions that increase both flexibility and agility.

This takes a new perspective. IT is no longer merely transactional. Simply keeping the lights on has given way to the realization that technology can be a transformational force that can drive real business results. It's helping organizations develop stronger capabilities, innovate and work faster, and glean more insights than ever before. Thanks to software-defined infrastructure and as a Service platforms, organizations have become faster. But they have also become savvier, developing applications in less time and positively impacting both employee and customer experiences in the process.

While bandwidth, capabilities and budgets are all hurdles organizations must overcome, the age of transformational technology has arrived. And it's here to stay.

Working with a wide range of organizations and partners across different industries to orchestrate and empower transformational technology has given us a unique insight and perspective into IT's evolving role as a force for generating business results. We are working hard to bring that collective learning together so it's easy to understand and implement.

For more information, interviews and perspectives, we invite you to visit CDW.com/modernit

OUR PARTNERS

The valuable time, research and perspectives that went into making this report would not have been possible without the help of our partners. From assessment to design and deployment, they represent the best and brightest minds in transformational technology.

Learn more about the modern IT solutions that are helping organizations drive powerful business results at CDW.com/datacenter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PEOPLE
WHO
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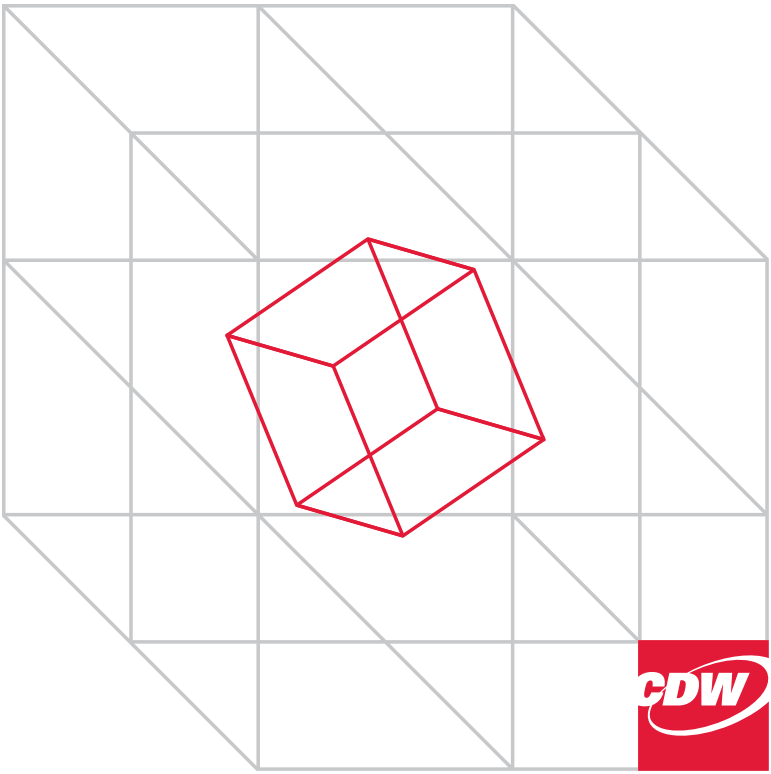
THE MODERN IT INFRASTRUCTURE INSIGHT REPORT

Orchestrated by CDW

COMPLETE DATA AND ANALYSIS



Volume 03

THE MODERN IT INFRASTRUCTURE INSIGHT REPORT
Orchestrated by CDW
COMPLETE DATA AND ANALYSIS
Volume 03

THE MODERN IT INFRASTRUCTURE INSIGHT REPORT

Upgrading and Preparing for the Future

Cloud has revolutionized the IT landscape. Examples of cloud usage are everywhere, from mobile sales teams accessing online spreadsheets to developers testing and deploying innovative apps. In fact, virtually every enterprise considers some form of cloud computing an integral part of an IT strategy, and cloud spend is expected to exceed *$270 billion* by 2020.

As with any transformational technology, many organizations are actively trying to answer these important questions: What enterprise applications are a good fit for the public cloud? What applications require on-premises protection? How does a hybrid IT environment impact a business? What criteria should dictate deploying workloads on-premises, or in an Infrastructure as a Service (IaaS) or Platform as a Service (PaaS) environment? And finally, what role can a third-party provider play in better IT decision-making?

At face value, cloud computing promises to eliminate the large capital expenditures required to build and maintain a sprawling data center. Others prefer the flexibility and scalability of on-demand IT. But not all organizations are sold on migrating to a cloud-only IT environment. Case in point: businesses operating in heavily regulated industries, such as finance, typically prefer the security of on-premises systems.

In response to these varying needs, many companies have embraced a hybrid approach to IT architecture. By combining cloud services with on-premises IT, organizations can determine which workloads belong in the public or private cloud, or an off-premises environment, and where to move specific workloads to maximize performance and efficiency. In this way, organizations can use the elasticity, nimbleness and scalability of the cloud as needed but also keep more sensitive data and workloads on-premises.

In an effort to assess how organizations are adopting hybrid IT and the impact of this on business, CDW partnered with IDG Research in March 2018 to survey 400 senior-level IT and non-IT professionals. All survey respondents are involved in the purchasing process for data center and/or cloud technology, including IaaS and PaaS. (For more details on the study, see Page 25.)

Key Research Findings

The study covered a wide range of topics, from understanding the extent to which organizations are moving toward a hybrid IT environment to the challenges that might cause a company to reel applications back from the cloud. Among the more revelatory findings:

- **Hybrid IT environments are here to stay:** Nearly half (49%) of all respondents report that their IT environment is a hybrid environment today ("to a great extent"), and another 39% are beginning to head in this direction.

- **Most organizations are governed by the same business objectives:** Survey respondents cite enhancing data security (59%), improving productivity (54%), reducing infrastructure costs (51%) and increasing business agility (50%) as business objectives that have increased in importance over the past two years. Among respondents, senior-level executives are significantly more likely to cite these goals as important.

- **Transformation trumps transactions:** Transformative purchases — or buying decisions that enable innovation — represent more than 40% of all IT investments. Respondents indicate that the proportion of IT dollars dedicated to transformative purchases has remained consistent over the past two years.

- **Data analytics is the top technology area targeted for increased investment over the next 24 months:** Respondents also expect that spending on IaaS and PaaS will increase. Respondents who describe their IT environment as a hybrid environment are more likely to plan additional investment in mobile, software-defined storage (SDS), software-defined networking (SDN), microservices/containers and bots.

- **Cloud dominates today's IT environments:** On average, respondents report a 70%/30% split between cloud and non-cloud delivery models in use. More than half expect Software as a Service (SaaS) and IaaS deployments to increase over the next 24 months.

- **IT organizations carefully weigh the risks and rewards when deciding between potential deployment models for an application:** Top considerations among survey respondents when choosing among deployment options include security requirements (59%), the cost of running the application in the environment (50%) and application performance needs (38%). In fact, cost and security concerns are top reasons why more than one-third (38%) have brought a workload back on-premises after PaaS or IaaS deployment.

- **Hybrid IT impacts enterprises in numerous ways, from security to IT talent:** According to survey respondents, adopting hybrid IT requires addressing issues around increased security risks (35%), increased bandwidth needs (35%), increased infrastructure complexity (33%) and IT skills gaps (32%). And those who currently have a hybrid IT environment are significantly more

likely than others to report increased IT complexity (39%) and a lack of complete visibility into infrastructure health (27%) as a result.

- **A mix of cloud and non-cloud assets can add layers of complexity to an IT environment:** Respondents report a number of complex challenges in managing a hybrid IT infrastructure, including upgrades, dependency mapping, information silos, vendor management and cultural change management.

- **Companies that have started the move toward hybrid IT are seeing results:** Top benefits include improved agility and scalability, productivity improvements and cost savings. Respondents at companies who are more fully entrenched in a hybrid IT environment also have the highest degree of confidence in their ability to support IT strategy over the next two years.

- **Developing the right IT investment strategy to meet business objectives is a challenge for many organizations:** Fifty-eight percent of respondents find it highly challenging to align IT strategy with corporate goals. This perception is especially strong among those managing a hybrid IT environment today: 68% of organizations with extensive hybrid IT environments find alignment extremely or very challenging, compared to 51% of those with some hybrid elements and 37% with few to no hybrid elements.

- **Organizations recognize the value of third-party guidance:** Nine in ten respondents' companies will turn to a third-party partner for help over the next 12 months. The most sought-after capabilities include cloud monitoring/management, IT cost management, technology upgrades and IT strategy development.

This report delves into these key findings to determine the challenges and benefits of running a hybrid IT environment, as well as the obstacles for which companies are most likely to turn to a third party for support over the next year.

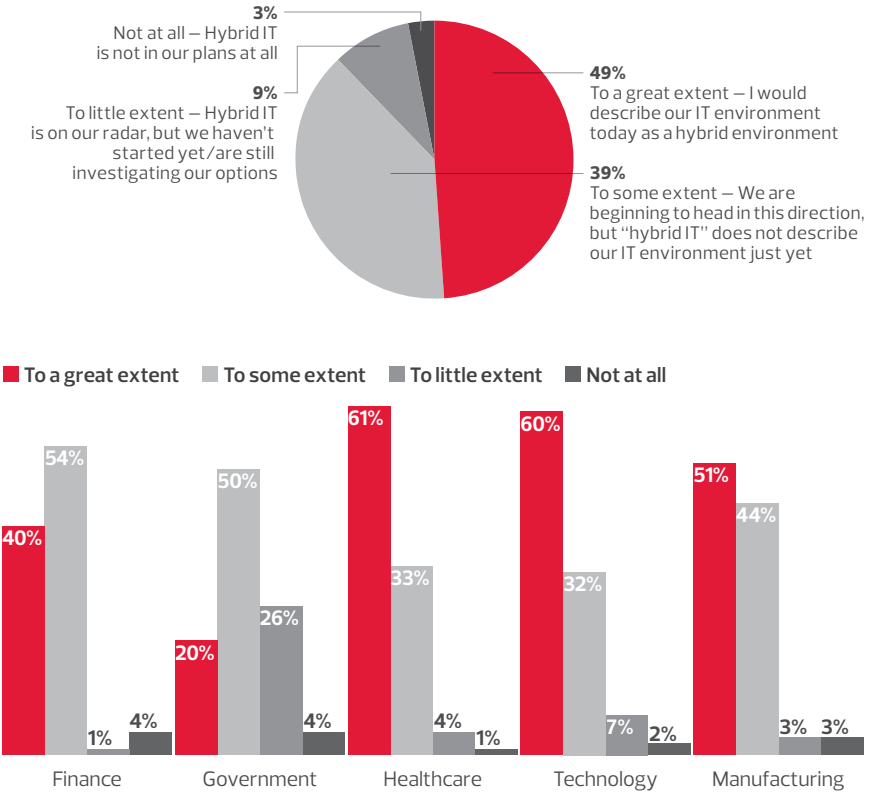
Hybrid IT — The Answer for Some but Not All Industries

Long gone are the days when cloud was the hot new IT trend with promises of enormous cost savings and greater scalability. These days, organizations are rethinking their approach to IT infrastructure. Rather than move all workloads to the public cloud, many are taking inventory of their applications and carefully deciding which ones should be in the public cloud, and which should remain on-premises or reside in a private cloud.

There's no one definitive answer. While hybrid IT environments are increasing in popularity in some sectors, they are still struggling to gain traction in others. According to the IDG survey, nearly half (49%) of organizations report that their IT environment is a hybrid environment. Another 39% of respondents identify with the concept of hybrid IT to "some extent."

The majority of organizations that identify with the concept of hybrid IT to "a great extent" are in the healthcare (61%) and technology sectors (60%); the least likely sectors to embrace hybrid IT are government agencies (20%) and financial services companies (40%).

Hybrid IT



Source: IDG Research in partnership with CDW

It's easy to understand why. Technology workloads, such as financial transactions, require high-compute capabilities. For example, a fluctuating stock price of even a fraction of a point can make a huge difference in the total cost of a trade or transaction. Fortunately, an on-premises system can deliver the massive computing power and extremely low latency needed to guarantee accurate and speedy transactions – something cloud providers can't always deliver. Government agencies are also less likely to embrace hybrid IT because of security concerns and the prevalence of legacy systems.

Common IT Goals Across Disparate Sectors

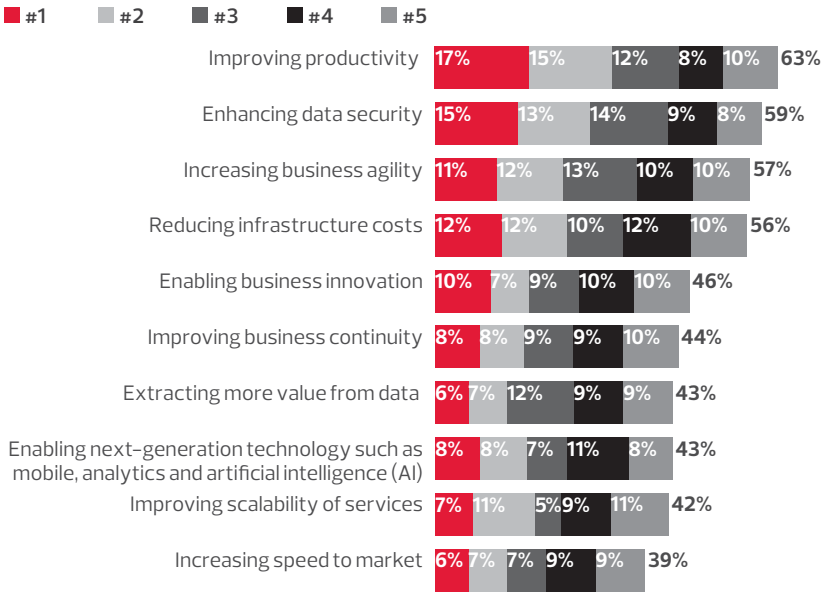
Although computing requirements may differ among industries, most companies are looking to achieve the same goals with their IT investments: increased productivity, data security and business agility. Nearly two-thirds (63%) of organizations cite improving productivity as a top-five

business objective to support with IT investments. More than half (59%) of organizations cite enhancing data security as a top-five business objective. Fifty-seven percent are looking to increase business agility with IT investments. And 56% of organizations plan to reduce infrastructure costs with the right mix of IT investments.

These priorities have increased in importance over the past two years for several key reasons. Global competition, an on-demand economy, the breakneck pace of innovation — they're all factors requiring greater productivity from employees. Security threats are on the rise as attacks increase in maliciousness and the threat landscape becomes more diverse, forcing organizations to take the necessary precautions. In fact, Symantec reports a 600% increase in overall Internet of Things (IoT) attacks alone in 2017. And as market trends and consumer demands fluctuate, agility is fast becoming a key component to success.

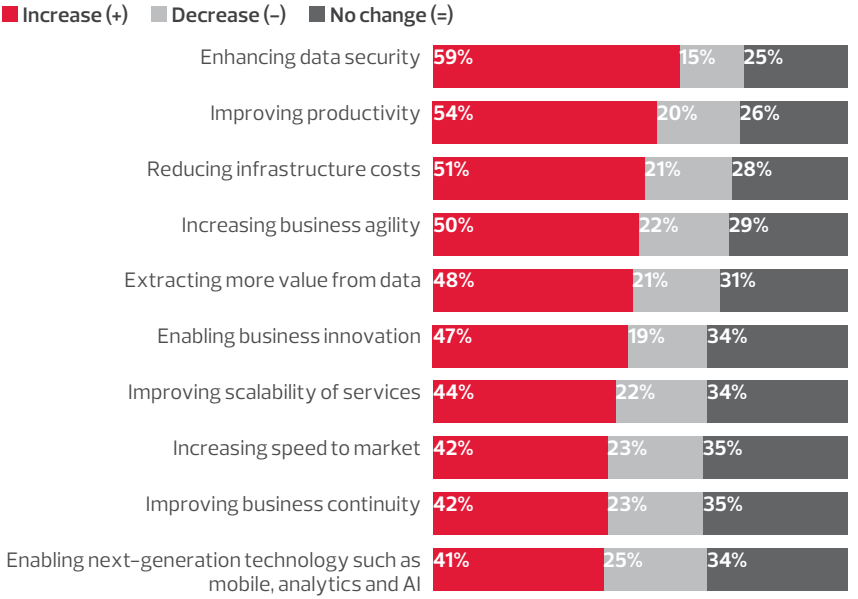
Indeed, survey respondents cite enhancing data security (59%), improving productivity (54%), reducing infrastructure costs (51%) and increased business agility (50%) as business objectives that have increased in importance over the past two years. Among respondents, senior-level executives are significantly more likely to indicate the importance of each of these goals.

Improving Productivity Top Objective for IT Investments



Source: IDG Research in partnership with CDW

Change in Importance of Business Objectives — Past 24 Months



VP+ titles are significantly more likely to describe the importance of each of these objectives as having increased over the past 24 months.

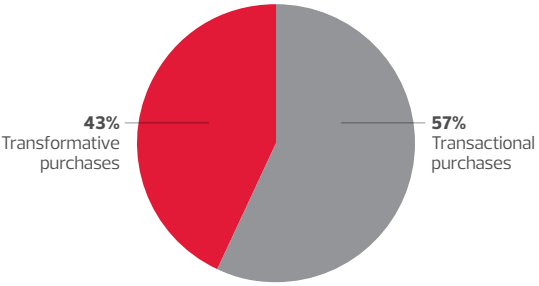
Source: IDG Research in partnership with CDW

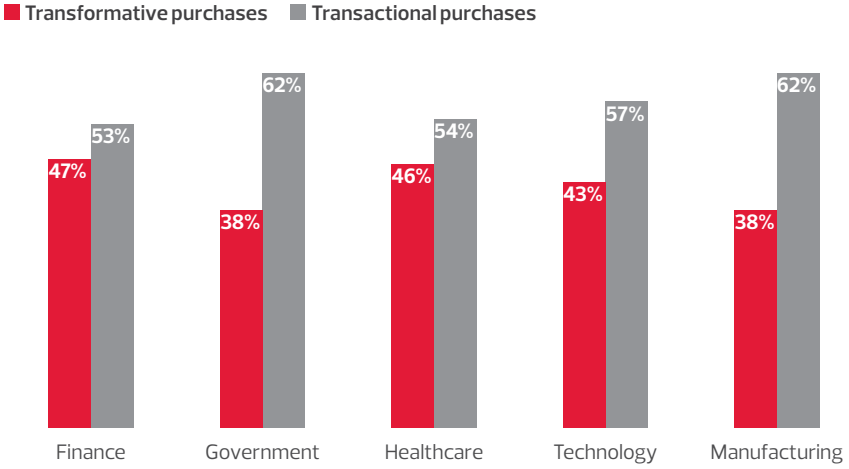
Looking Beyond Maintaining Operations with IT Investments

The good news is organizations are allocating significant IT investments not only to transactional purchases but to transformative purchases that support innovation, such as infrastructure and cloud. Price and ease of deployment still drive many IT purchasing decisions. But in this era of digital transformation, companies want to do more with their IT investments than simply maintain operations and keep the lights on. For example, flexible infrastructure and cloud create greater opportunity for enterprises to experiment with new technologies, expand their mobile workforce and design more customer-focused services.

Highlighting this shift toward more impactful IT investments is the fact that 57% of respondents' purchases over the next 24 months will be allocated to transactional purchases and 42% dedicated to transformative purchases. The focus on IT investments for transformative purchases is particularly strong among finance organizations (47%), healthcare companies (46%) and technology companies (43%). That's because these industries face unprecedented pressure to engage customers in new and exciting ways — a challenge that requires greater use of more innovative technologies such as data analytics.

IT Investments Shift to Fuel Innovation



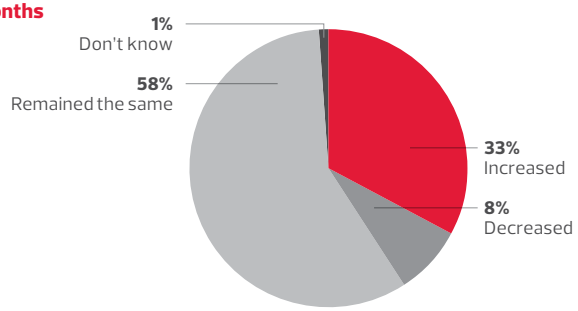


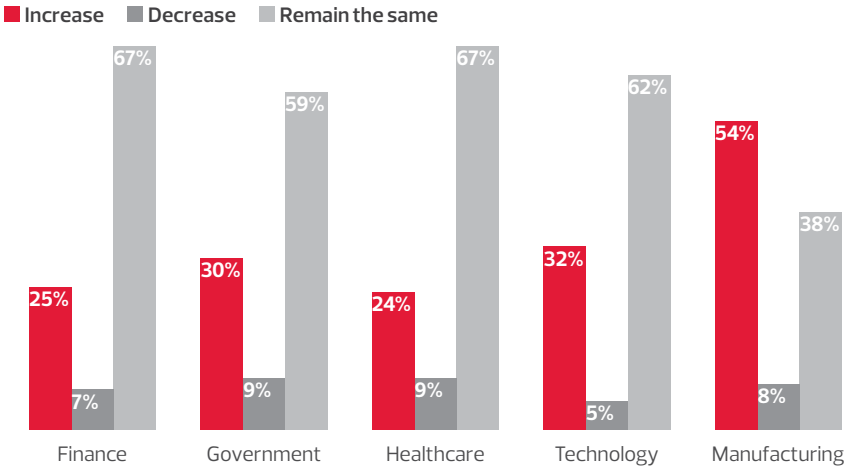
Source: IDG Research in partnership with CDW

Government agencies and manufacturing organizations, on the other hand, are more likely to allot IT budget to transactional purchases — only 38% is allocated to transformation. One possible explanation for this disparity is that government agencies are typically constrained by legacy systems, tight budgets and traditional workflows — factors that can delay investment in more innovative technologies.

But there are signs of change. While the proportion of IT purchases dedicated to transformation (58%) has remained consistent over the past two years across most industries, manufacturing companies are the exception. More than half — 54% — of IT investments dedicated to transformative purchases among manufacturers have increased over the past two years.

Change in the Percent of IT Investments Dedicated to Transformative Purchases – Past 24 Months



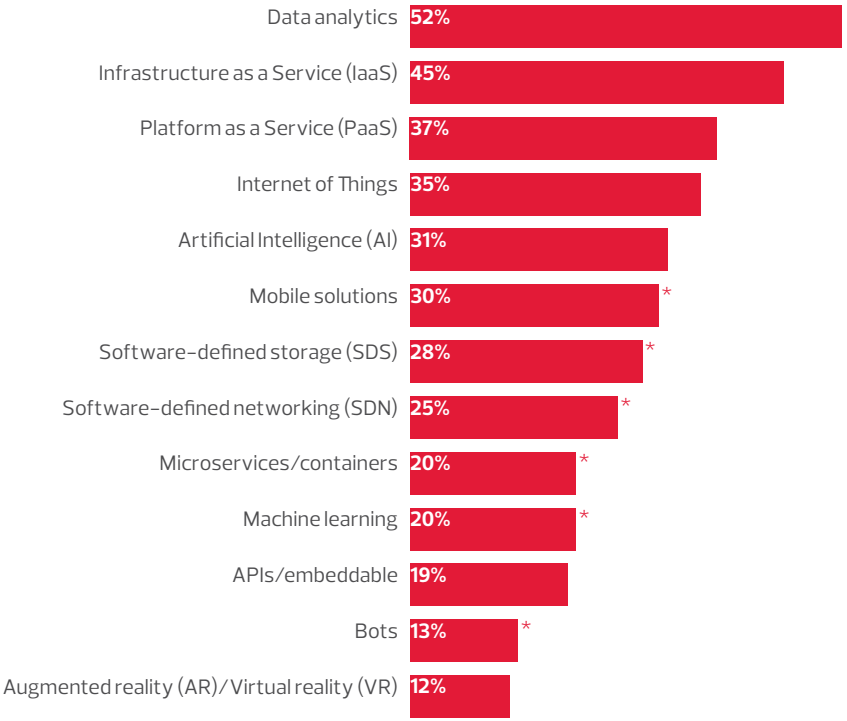


Source: IDG Research in partnership with CDW

Contributing to this uptick is manufacturers' attempt to play catch-up with other, more forward-facing industries. Another possible driver: IoT. An increasing number of manufacturers are investing in transformative IoT technologies – embedded sensors, advanced analytics, artificial intelligence (AI) and cognitive computing – to generate data and glean digital intelligence across the entire value chain. Take Daimler for example. The auto manufacturer outfitted its trucks with devices that offer proximity control, emergency brake assistance and 3D maps to keep drivers safe.

In fact, IDC forecasts that worldwide spending on IoT will grow from $737 billion in 2016 to a staggering $1.29 trillion in 2020 as companies invest in IoT-related hardware, software, services and connectivity. And more than one third – 35% – of survey respondents will increase or continue investment in IoT over the next 24 months to help meet business objectives.

Technologies Earmarked for Increased Investment – Next 24 Months



*Respondents who describe their IT environment as a hybrid environment are more likely to plan increased investment in these technologies.

Source: IDG Research in partnership with CDW

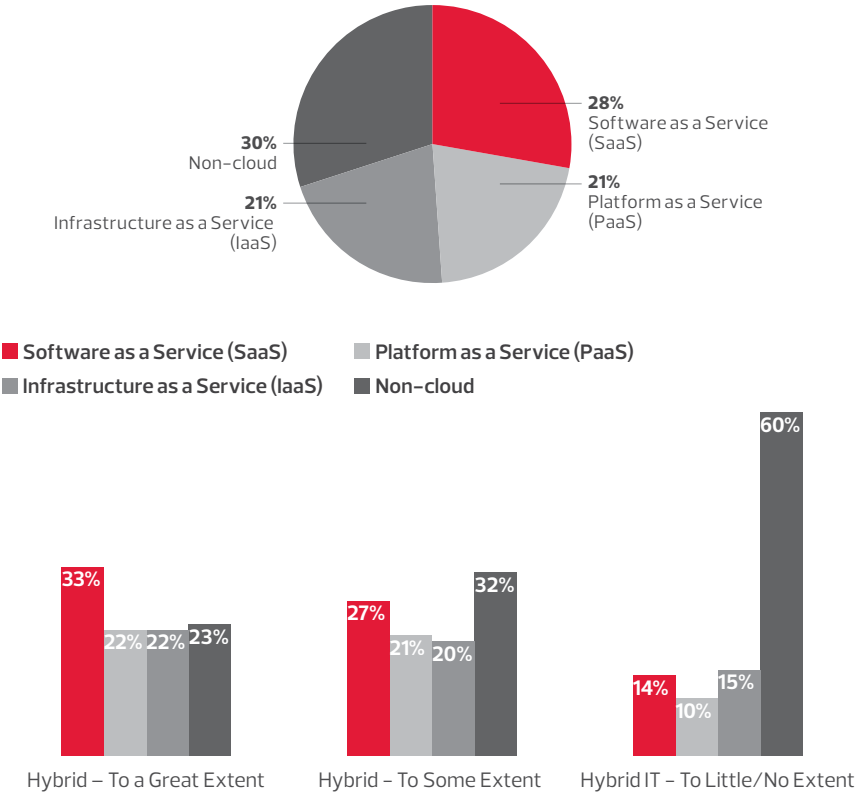
Data analytics tops the list of technologies earmarked for increased investment over the next two years (52% of respondents). Organizations, from beverage companies to banks, utilize data analytics tools to predict consumer behavior, anticipate market trends, refine product development and recruit top talent. The Chicago Bulls now rely on data analytics to better understand their fans and determine how to engage them via ticketing transactions, compelling content and social media channels. And yogurt manufacturer Dannon crunches data to forecast consumer demand for its products.

Other technology areas targeted for greater investment include AI (31%) and mobile solutions (30%).

Cloud Is King as Organizations Look to Cut Costs and Ease Operations

With promises of greater flexibility, cost savings and faster speed to market, organizations are also increasingly turning their investments to the cloud. Nearly half — 45% — of organizations plan to increase or continue investment in IaaS over the next two years, while 37% are committed to investing in PaaS.

Use of IT Service Delivery Models



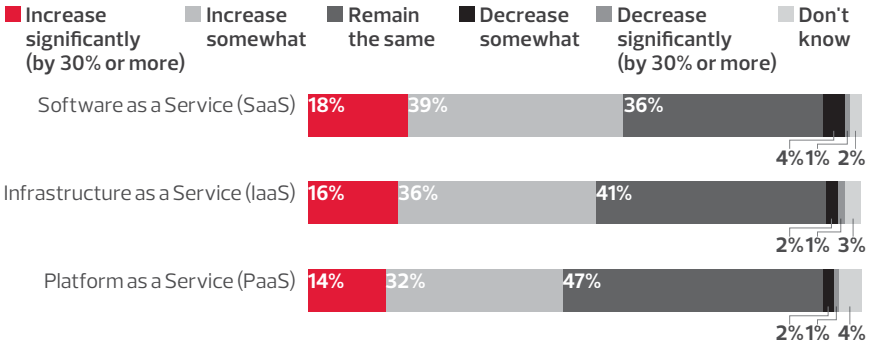
Source: IDG Research in partnership with CDW

Cloud already dominates today's IT environments. Survey respondents report a 70%/30% split between cloud and non-cloud delivery models in current use. The breakdown of respondents' total IT environment is as follows:

- 28% Software as a Service (SaaS)
- 21% Platform as a Service (PaaS)
- 21% Infrastructure as a Service (IaaS)
- 30% Non-cloud

A closer look reveals that SaaS solutions are among the most popular cloud-based technologies in use in hybrid environments. Of organizations that describe their IT environment as hybrid "to a great extent," 33% are invested in SaaS and 22% in PaaS. These figures drop among respondents that describe their environment as hybrid "to some extent": only 27% are invested in SaaS and 21% in PaaS. And 60% of respondents whose IT environments have few to no hybrid elements invest in non-cloud technologies instead.

Expected Change in Use of Cloud Deployment Models



Source: IDG Research in partnership with CDW

But that stands to change as an increasing number of organizations recognize the multiple benefits of cloud deployments, such as SaaS, IaaS and PaaS. Here is a breakdown of each cloud solution's key advantages:

The flexibility of SaaS

- Service provider hosts applications, freeing IT teams to focus on mission-critical tasks
- Users access apps through a browser or mobile app, reducing time and money spent on installing apps on devices
- Fast and easy deployment
- Delivers greater scalability, enabling organizations to rapidly increase or decrease deployment based on current needs

The ease of IaaS

- Provides a pool of virtual machines hosted offsite for reduced total infrastructure costs
- Supports greater scaling of servers, storage, networking and load balancing to meet current needs
- Reduces upfront costs and capital IT investment expenditures

The perks of PaaS

- A hybrid option between SaaS and IaaS that consists of an OS, a programming language environment, a database and a web server
- Provides IT infrastructure for hosting applications and building and deploying cloud applications
- Eliminates need to buy and manage costly underlying hardware and/or software

Enticed by these benefits, more than half — 57% — of respondents expect an increase in SaaS deployments; 52% expect an increase in IaaS deployments; and 46% expect an increase in PaaS deployments over the next 24 months.

Better yet, when these technologies are deployed in a hybrid IT environment, organizations can reap significant returns around lower total cost of ownership and improved operational efficiencies while driving innovation and satisfying emerging customer demands.

Another advantage: the ability to scale. Developers expect their development and test environments to withstand fluctuating demands and workload peaks. However, on-premises resources can't always support this activity, particularly when workloads approach maximum utilization. Fortunately, cloud can scale to provide greater computing resources when needed, and shut down cloud servers when workloads wane, for increased efficiency and reduced investment in on-premises infrastructure.

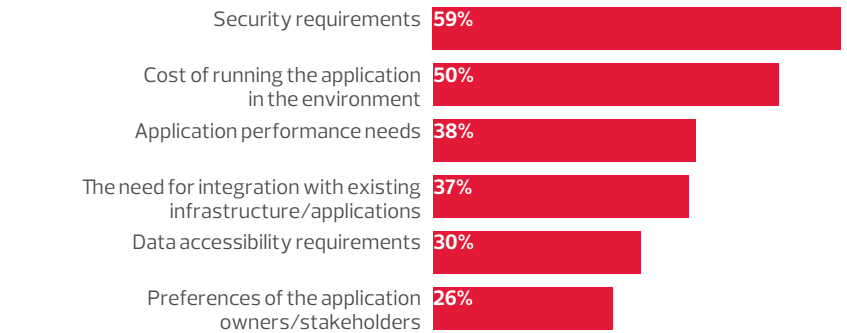
Weighing the Advantages While Dispelling the Myths

For all the flexibility, scalability and reliability of the cloud, deciding whether to deploy business-critical applications and workloads on-premises, or in a PaaS or IaaS environment, is a decision that requires thought and planning. For example, despite increasing public cloud adoption, some organizations prefer the security and control inherent in on-premises solutions.

Top considerations among survey respondents when choosing among deployment options include security requirements (59%), the cost of running the application in the environment (50%), and application performance needs (38%).

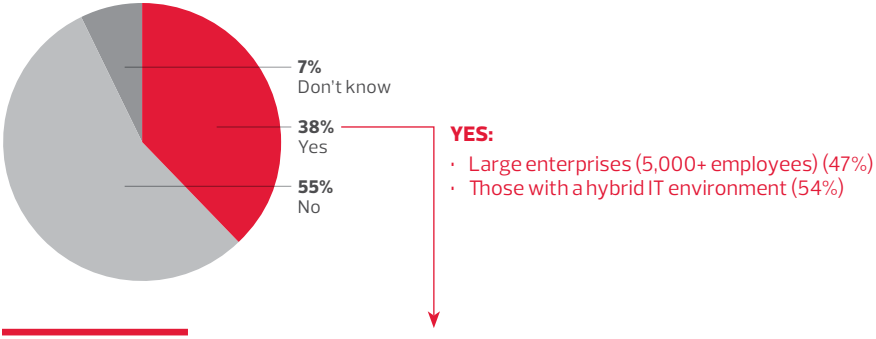
Sometimes adding to this decision-making is a lack of education and experience with cloud. As a result, common misconceptions can delay cloud adoption. Some question how complicated it is to deploy cloud, whether cloud compromises security and if it takes control away from IT teams. The reality is cloud can be deployed in minutes without requiring in-house software and/or hardware installations. Today's cloud providers must use advanced, enterprise-level servers employing dependable technologies to deliver high levels of uptime, as well as incorporate security infrastructure. And while application and process customization may differ in the cloud, vendors regularly measure user activity to find ways to improve applications and processes.

Factors Considered When Deciding between On-Premises, PaaS or IaaS Deployment

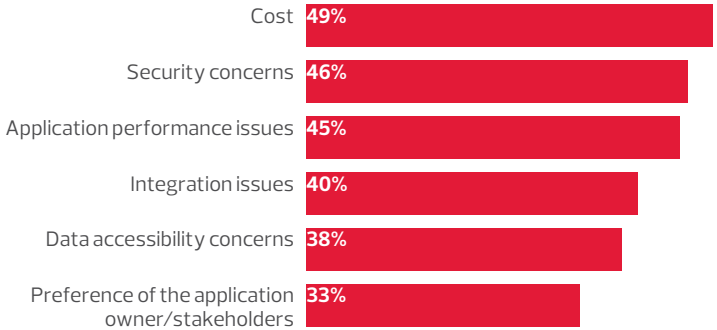


Source: IDG Research in partnership with CDW

Whether Organization Brought a Workload Back On-Premises After Deploying in a PaaS/IaaS Environment



Reasons for Bringing Workload Back On-Premises

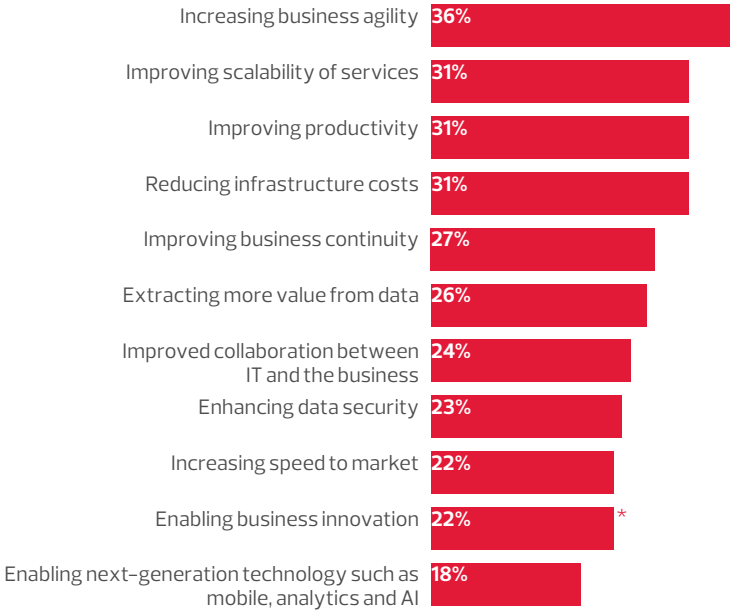


Source: IDG Research in partnership with CDW

Yet more than one-third of survey respondents have brought a workload back on-premises after a PaaS or IaaS deployment. Cost and security concerns are top reasons for the moves. Thirty-eight percent of organizations have brought an app or workload completely back on-premises. A higher percentage — 47% — of large enterprises have brought assets back on-premises, while 54% of those with a hybrid IT environment have made the same decision.

Among the top reasons for returning to an on-premises environment are cost (49%), security concerns (46%), and application performance issues (45%) — factors that align perfectly with an organization's top IT priorities.

Early Hybrid Cloud Adopters See Measurable Return



*Those who currently have a **hybrid IT environment** are significantly more likely than others to cite the **enablement of business innovation** (26%).

Source: IDG Research in partnership with CDW

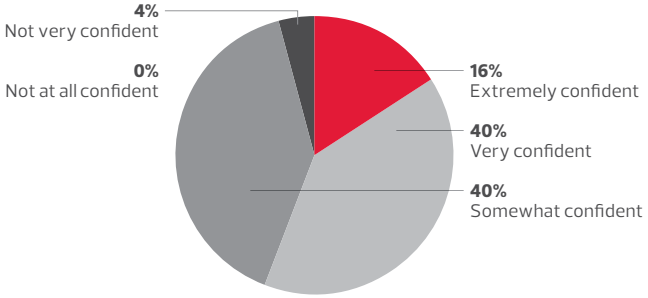
Hybrid IT Delivers Results — and Challenges Organizations Must Learn to Overcome

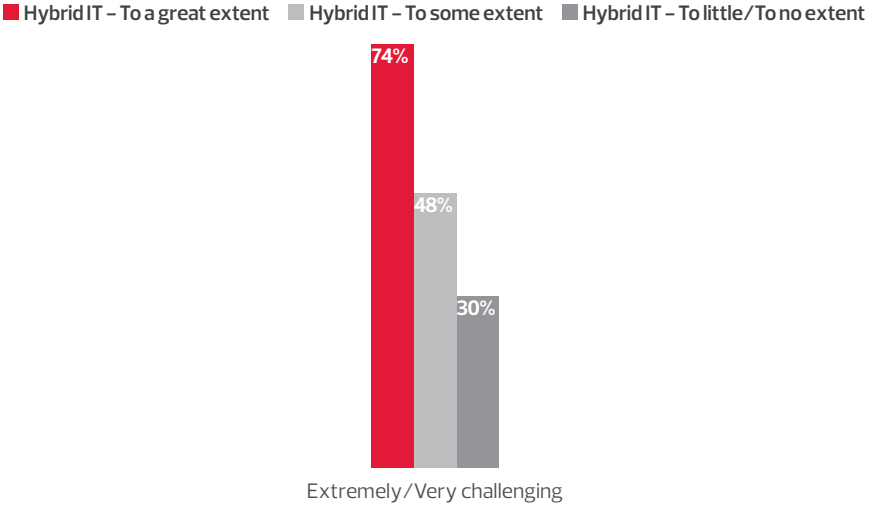
Nevertheless, first-hand accounts from respondents with hybrid IT environments make a strong case for incorporating an organization's own on-premises computing capabilities and colocated assets with private and public cloud resources.

In fact, organizations that have started the move toward hybrid IT realize impressive results, including increased agility (36%), improved scalability of services as a business benefit (31%), and improved productivity as a business benefit (31%). Respondents that currently have a hybrid IT environment are also significantly more likely than others to cite the enablement of business innovation as a business result (26% vs. 22%). That's key given that digital transformation can help organizations discover new revenue streams, meet emerging customer demands and keep pace with global competitors.

At the same time, organizations believe hybrid IT is the right move to make. More than simply an approach to managing applications and workloads, respondents at companies that are more fully entrenched in a hybrid IT environment have the highest degree of confidence in their ability to support IT strategy over the next two years.

Confidence in Preparedness to Support IT Strategy — Next 24 Months



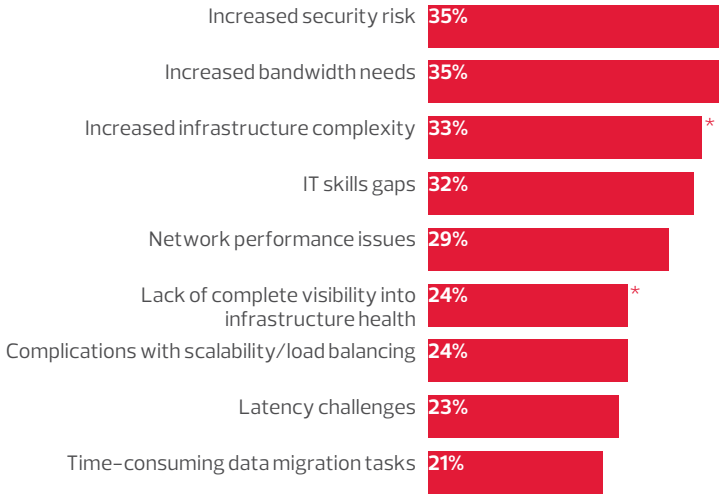


Source: IDG Research in partnership with CDW

Overall, nearly half — 40% — of respondents are very confident in their organization's preparedness to support IT strategy, and 40% are somewhat confident. However, the greater the hybrid environment, the greater the confidence: 74% of organizations with extensive hybrid IT environments are extremely confident. That compares with a mere 30% of organizations with little to no hybrid IT. Clearly, organizations view hybrid IT as critical to digital transformation, and essential to designing innovative IT strategies.

Impact of Moving Toward Hybrid IT

(Among those that at least have hybrid IT on their radar)



*Those who currently have a **hybrid IT environment** are significantly more likely than others to report **increased IT complexity** (39%) and a **lack of complete visibility into infrastructure health** (27%).

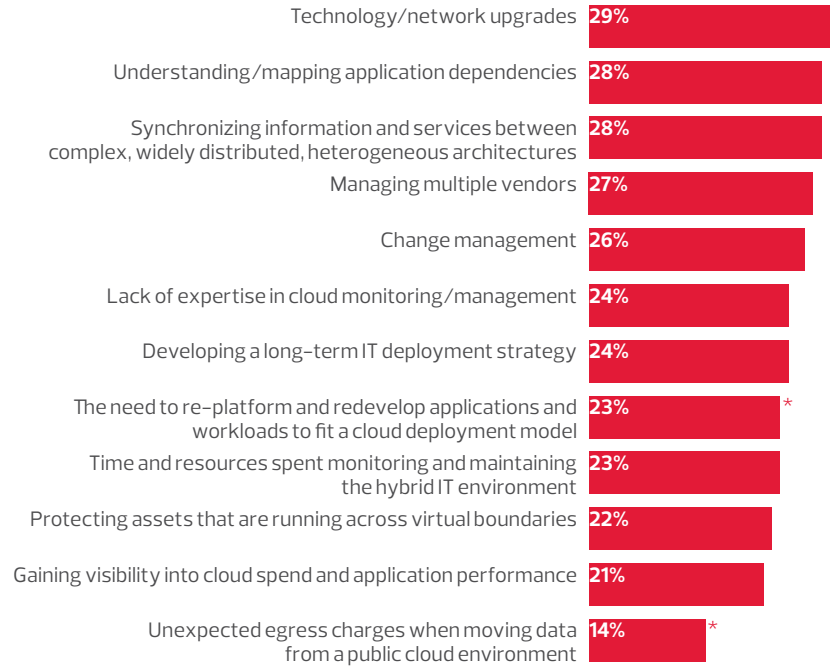
Source: IDG Research in partnership with CDW

Although hybrid IT offers advantages, adoption isn't as simple as it may appear. According to survey respondents, moving toward hybrid IT requires organizations to address issues around increased security risks (35%), increased bandwidth needs (35%), increased infrastructure complexity (33%) and IT skills gaps (32%). And those who currently have a hybrid IT environment are significantly more likely than others to report increased IT complexity (39%) and a lack of complete visibility into infrastructure health (27%) as a result.

Part of the challenge is that hybrid infrastructure creates new security demands as data flows across multiple and disparate computing resources, from private clouds to on-premises systems. Another consideration is that a hybrid environment requires a potent mix of cloud and non-cloud expertise — sometimes a tall order for most internal IT teams. And adding private cloud, public cloud and on-premises assets to an IT environment without proper integration can make it difficult for IT leaders to detect anomalies and flag problem areas.

Biggest Challenges Deploying/Managing Infrastructure in a Hybrid IT Environment

(Among those that at least have hybrid IT on their radar – Select up to five)



*Those who currently have a **hybrid IT environment** are significantly more likely than others to report the **need to re-platform applications** (28%) and pay **unexpected egress charges** (18%).

Source: IDG Research in partnership with CDW

Managing a hybrid IT environment also creates challenges, including technology/network upgrades (29%); understanding/mapping application dependencies (28%); synchronizing information and services between complex, widely distributed, heterogeneous architectures (28%); and managing multiple vendors (27%). That's because, if not deployed properly, hybrid IT can add a layer of complexity to IT operations. In fact, respondents that currently have a hybrid IT environment are more likely than others to report the need to re-platform applications (28%) and pay unexpected egress charges (18%).

Developing the right IT investment strategy to meet business objectives is another obstacle facing organizations. Fifty-eight percent of respondents find it highly challenging to align IT strategy with corporate goals. Interestingly, this perception is especially strong among those managing a hybrid IT environment today: 68% of organizations with extensive hybrid IT environments find alignment extremely or very challenging compared to 51% of those with some hybrid elements, and 37% with few to no hybrid elements.

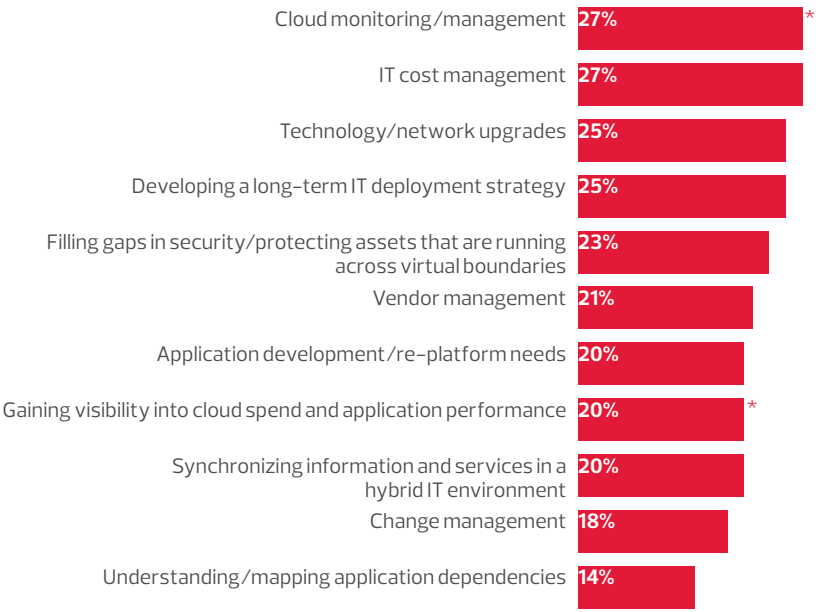
The Positive Impact of a Third-Party Provider

Fortunately, many organizations — 9 out of 10 respondents — will turn to a third-party provider to help improve their hybrid IT environment over the next year. And for good reason: Today's IT leaders must manage sprawling IT assets, safeguard systems against malicious threats, meet stringent compliance regulations and regularly roll out new technologies, from mobile apps to artificial intelligence tools.

At the same time, the role of IT is changing significantly. No longer considered a cost center, IT is now a strategic player, responsible for generating revenue, engaging consumers and driving innovation, all while stretching precious IT resources. A third-party provider can help IT teams move from just keeping the lights on to using multiple cloud and on-premises deployments to drive digital transformation.

The key is finding the right provider. According to survey respondents, the most sought-after capabilities in a third-party provider are cloud monitoring/management (27%), IT cost management (27%), technology upgrades (25%) and IT strategy development. Similarly, respondents with a hybrid IT environment are more likely than others to turn to a third party for help with cloud monitoring/management (29%) and gaining visibility into cloud spend and application performance (23%).

Challenges for Which Organizations Are Likely to Turn to a Third-Party for Help



*Those companies who currently have a **hybrid IT environment** are significantly more likely than others to turn to a third party for help with **cloud monitoring/management** (29%) and **gaining visibility into cloud spend and application performance** (23%).

Source: IDG Research in partnership with CDW

On a practical level, a third party can help organizations seamlessly migrate apps and workloads to a hybrid cloud by providing workshops, assessments and consulting services. But it can also help companies build a strong business case for moving some assets to the cloud and leaving others on-premises. That's critical, given that determining how on-premises, private and public assets contribute to costs can be difficult in a hybrid IT environment. Moreover, IT budgeting has changed, requiring leaders to make a compelling case to justify infrastructure investments. A third-party provider can address these issues by carefully calculating the costs associated with hybrid IT based on years of client engagements.

Brain trust is another advantage of a third-party partnership. Vast knowledge and unique expertise are needed to help build, deploy and manage a public, private or hybrid cloud model — skills that are rarely found entirely in-house. A third-party provider, on the other hand, employs trained and certified experts that can create custom cloud solutions for a wide variety of scenarios.

Third-party providers can also help organizations carefully assess the technical risks and rewards of moving to a hybrid IT environment. This includes determining if it makes sense to run an application in the cloud. After all, applications, such as core banking systems, contain sensitive data, are bound by stringent industry regulations and are highly customized — characteristics that can render them a poor choice for a cloud model.

Finally, a third-party provider can gauge the overall impact of migrating to the cloud. For instance, moving a compute-intensive application to the cloud may compromise its performance. Integrating cloud and on-premises assets can also impact performance, data and users — consequences that should be carefully considered before moving assets.

Conclusion

Although survey respondents are most likely to look to vendors for capabilities such as cloud monitoring, cost management and technology upgrades, no two vendors are the same. For this reason, evaluating third-party providers should also involve determining a vendor's business and financial stability, its handling of data and its ability to adhere to compliance frameworks.

Advances in technology are allowing organizations to more easily move between clouds, whether they are public clouds, private clouds run by a service provider or an on-premises data center. But the IDG survey findings indicate that when it comes to moving applications and workloads within a hybrid IT environment, a third-party provider can play a significant role.

LESSONS LEARNED

Nearly half — 49% — of survey respondents report that their IT environment is a hybrid environment today "to a great extent," and another 39% are beginning to head in this direction. The reasons are clear: while on-premises systems promise to safeguard highly sensitive and custom applications, a cloud model offers several benefits, including:

- Increased speed of development of products and services
- Greater support for disaster recovery and business continuity
- Cost savings on hardware and networking equipment
- Reduced burden on IT teams with simplified operations
- Low-risk product and app development
- Vast computing, storage and networking functionality
- Centralized administration and governance

Overall, a hybrid IT environment can enable business growth while allowing time-strapped IT leaders to focus on core competencies. But it's not enough for organizations to simply combine their own on-premises computing capabilities and colocated assets with private, hosted and public cloud assets. Rather, savvy companies take carefully considered steps to build an effective hybrid IT environment. Here's how.

1. Plan extensively.

Building a hybrid IT environment requires considerable time and effort. In fact, hasty decision-making can result in having to reel applications back on-premises from the cloud. More than one-third (38%) of survey respondents have brought an app or workload completely back on-premises after a PaaS or IaaS deployment. An even higher percentage — 47% — of large enterprises have brought assets back on-premises, while 54% of those with a hybrid IT environment have made the same decision. Among the top reasons for returning to an on-premises environment are cost (49%), security concerns (46%) and application performance issues (45%).

The good news is careful planning can prevent IT from having to reverse costly decisions. Says one survey respondent: "Think long term and baby steps; things cannot happen overnight unless you're doing something seriously wrong."

For this reason, organizations considering locating new or existing services in the cloud should carefully catalog their needs and plan for the transition. Here's a breakdown of each step of the planning process:

Before moving an asset:
- Conduct a cloud readiness assessment
- Set business goals for each move
- Consult with a third-party provider
- Carefully design a migration plan
- Set strict timelines and budgetary constraints

The actual move:
- Establish a clear migration path
- Begin to integrate assets to ensure greater visibility into infrastructure health
- Determine risks and downtime on an ongoing basis
- Immediately address legal and regulatory concerns
- Ensure knowledge transfer via training and mentorship programs

After moving an asset:
- Regularly monitor and maintain assets
- Consider outsourcing the management of cloud assets to reduce IT burden
- Take advantage of pay-per-use billing and subscription services
- Ensure 24/7 issue resolution
- Deliver ongoing optimization of assets

2. Take an ongoing inventory of your workload and application needs.

Not all assets are a fit for the cloud. Workloads and applications that are regulation-sensitive, involved, complex processes, contain sensitive data or are highly customized are typically better suited for on-premises systems. In fact, deploying an application in a public cloud may require relinquishing control over protecting sensitive data.

Warns one survey respondent: "Careful thought and decision must be considered in leveraging the cloud. Putting all your eggs in one basket can set the business up for a catastrophic failure. Diversity among cloud storage and redundancy (or survivability) must be taken into consideration to sustain business operations."

Luckily, carefully selecting which workloads are right for the cloud can minimize security risks while improving IT efficiencies.

3. Strive to maintain and improve your security posture.

No IT environment is entirely risk-free, but there are ways to take advantage of various cloud and on-premises models without compromising the stability and security of workloads and applications.

For instance, a hybrid IT infrastructure diversifies workload placement, thereby minimizing the potential impact of a security breach or outage. Building redundancy into a cloud strategy with multitiered architecture across public cloud providers can also mitigate risks while ensuring a successful hybrid cloud deployment. And one survey respondent recommends investing in cybersecurity: "There are too

many threats out there that are a lot costlier than investing in cybersecurity tools and infrastructure."

Together, these precautionary measures make it possible for organizations to reap the cost savings of a cloud model while protecting highly sensitive data.

4. Communicate your vision.

More than half — 58% — of respondents find it highly challenging to align IT strategy with corporate goals. This perception is especially strong among those managing a hybrid IT environment today: 68% of organizations with extensive hybrid IT environments find alignment extremely or very challenging compared to 51% of those with some hybrid elements, and 37% with few to no hybrid elements.

Part of the problem is that many IT teams fail to communicate their goals with business line leaders. As a result, the decision to move an application to the cloud, or back on-premises, may not reflect an organization's best corporate interests.

To reverse this trend, IT leaders must communicate their vision of hybrid IT with various IT teams and the C-suite alike. Says one survey respondent: "Have clear and concise communications with those you depend on to execute your vision; honesty and openness about changing requirements upfront."

This can be accomplished through weekly meetings with C-level executives, or establishing a Center of Excellence where representatives from all business units meet to encourage senior-level buy-in on upcoming projects and gather feedback.

5. Invest in your people and fill talent gaps.

Despite the benefits of hybrid IT, survey respondents cite addressing issues around IT skills gaps (35%) as critical to moving toward a more innovative IT environment. At the same time, those who currently have a hybrid IT environment are significantly more likely than others to report increased IT complexity (39%).

With IT talent at a premium, and hybrid infrastructure adding new levels of complexity, organizations must begin to invest more heavily in their internal talent and look to third-party providers for assistance. After all, a hybrid environment requires a potent mix of cloud and non-cloud expertise — a tall order for most internal IT teams. A third party can offer the knowledge and experience needed while leaving internal IT teams to focus on business operations.

Advises one survey respondent: "Invest in new ideas and people who can breathe fresh ideas into the organization. If containerization is important, bring in people who have some containerization experience to help get the rest of the team up to speed."

6. Choose vendors carefully.

Many organizations find it beneficial to work with a third-party provider when maintaining a hybrid IT environment. But not all vendors are created equal. How can an organization select the right partner? "Don't fall in love with a brand," warns one survey respondent. "Seek instead to see who has the most innovative solutions." Another respondent warns organizations not to "rely solely on infrastructure vendors for advice."

Before signing on the dotted line, organizations should also look into a vendor's business and financial stability, its handling of data and its ability to adhere to compliance frameworks. In addition, it's important to ask cloud providers a series of key questions, including:

1. How quickly will my cloud services be up and running?
2. How often will downtime occur for scheduled maintenance, and how will disruptions be handled?
3. How quickly can cloud services adjust to accommodate fluctuating demands?
4. How will the cloud be monitored for regulatory compliance?

Conclusion

Moving infrastructure away from a physical IT environment to the cloud can be challenging. What's more, a hybrid IT environment can create new layers of complexity, limit visibility into infrastructure and demand greater monitoring of assets. Fortunately, by following these simple steps, organizations can determine which apps and workloads should and shouldn't be moved to the cloud for significant cost savings and optimal efficiency.

ABOUT THE IDG RESEARCH STUDY

To qualify for the March 2018 IDG Research/ CDW survey, The Modern IT Infrastructure Insight Report, respondents had to be involved in the purchase process for data center and/or cloud technology (IaaS, PaaS).

Qualified respondents work in an IT-related function at the Manager level or above or a non-IT role at the Director level or above, at a company with 250 or more employees.

The average company size was 6,681 employees.

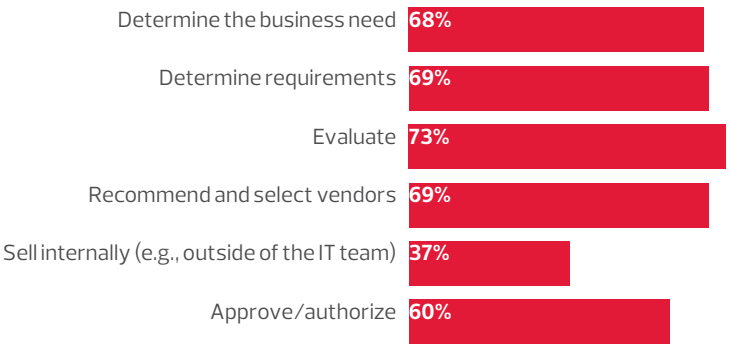
Respondent Profile – Job Title and Purchasing Responsibilities

Job Title

IT-Related (Net)	81%
CIO	12%
CTO	5%
CSO/CISO	2%
Chief Architect	1%
Executive VP/Senior VP/VP	5%
Executive Director/ Managing Director	3%
Director	29%
Manager	25%

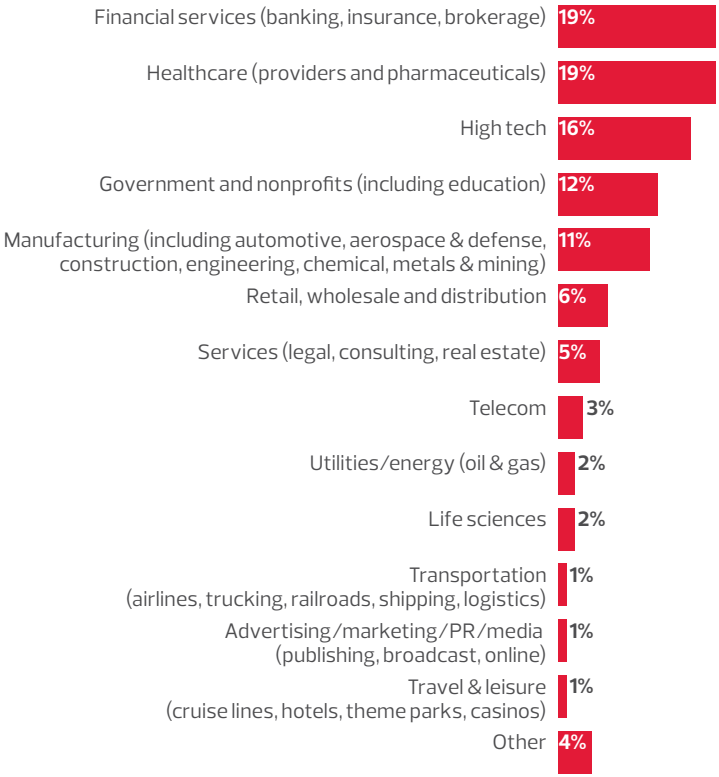
Non IT-Related (Net)	19%
CEO/COO/Chairman/President	14%
CFO/Treasurer/Controller	1%
Executive VP/Senior VP/VP/ General Manager	3%
Director	1%

Involvement in the Purchase of Data Center and/or Cloud Technology (IaaS/PaaS)



Respondent Profile – Industry

Top Represented Industries



Respondent Profile – Company Size

Company Size	
15,000 employees or more	25%
10,000 – 14,999	6%
5,000 – 9,999	16%
2,500 – 4,999	13%
1,000 – 2,499	19%
500 – 999	11%
250 – 499	10%
Fewer than 250	–

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