WHITE PAPER

MANAGING CLOUD CONSUMPTION FOR OPTIMAL RESULTS

Effective management of cloud resources improves performance and efficiency.

EXECUTIVE SUMMARY

The public cloud can simplify IT environments. But what happens when an enterprise's cloud environment itself becomes maddeningly complex?

As organizations across industries have increased their cloud spending and made the public cloud a more integral part of their operations, a number of inefficiencies have cropped up. The sources of these complications range from poor design to a lack of governance, and these inefficiencies can lead to negative outcomes that include cost overruns, lack of visibility into the environment and security vulnerabilities.

An effective cloud management strategy can help organizations to manage their environments more efficiently. Such a strategy should include plans to control costs and optimize application performance, as well as to detail who is responsible for which aspects of cloud security.

A variety of solutions and services can help organizations to implement and manage this strategy over time. These solutions include cloud management platforms, application and performance monitoring, backup and recovery, and other tools. Many organizations find it helpful to work closely with a third-party cloud management partner with broad and deep expertise managing cloud environments.

The Increasingly Complex Cloud Landscape

Cloud adoption has exploded over the past decade. As the cloud has evolved, organizations have moved beyond simple Software as a Service (SaaS) deployments, with more and more enterprises feeling comfortable with (and finding value in) cloud infrastructure and platforms. According to IDG, 89 percent of companies use SaaS somewhere in their environments, while 73 percent utilize Infrastructure as a Service (IaaS) and 61 percent use Platform as a Service (PaaS).

Hybrid cloud approaches, in which organizations place some workloads in private cloud environments and others in the public cloud, have also become increasingly popular. In fact, the vast majority of cloud users have now adopted a hybrid model. And many have already moved on to a multicloud model (incorporating resources from multiple public cloud vendors) or are planning to do so in the near future.

As their cloud environments grow larger and more complex, IT teams must account for a wider variety of interdependencies. Typical areas of concern include networking, security and interactions between applications.

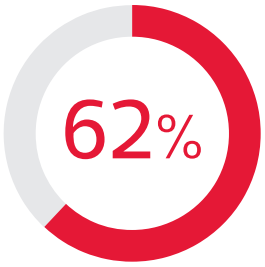
According to a 2019 survey by Deloitte, nearly half of responding companies say the cloud is more complex than they expected. However, organizations are split on the chief causes of this complexity. Twenty percent of respondents point to a lack of staff training, while 19 percent identify a lack of understanding on the part of leadership, and 13 percent blame poor planning.

One of the key benefits of the public cloud is quick and easy scalability. There are a number of situations requiring scalability, including expanding IT resources to develop or test a new application, accommodating rapid growth or meeting the needs of peak demand periods. These resources can be spun up in a public cloud vendor's environment — without delay or upfront capital costs.

There's a downside, however, to this ease of expansion: As an enterprise grows its consumption of cloud resources, small inefficiencies also scale up, until problems that were once only minor issues grow into areas of critical concern.

These inefficiencies can pop up in different ways. Some organizations fail to rightsize their cloud environments, opting to do simple "lift and shift" migrations instead of optimizing their designs. In such a scenario, an organization assumes that its current environment is designed in a perfectly efficient manner, and then literally takes the existing architecture and resources currently running on-premises and replicates that environment in the public cloud. It's easy to see how this can quickly lead to massive overspending.

For instance, if an organization replicates an environment designed for peak (rather than routine) resource demands — and then pays to run those resources around the clock in the public cloud, even when they're not being used — the resulting expenses will quickly add up. This was an especially common mistake in the early days of the cloud, when many people still assumed that the public cloud was an automatic money saver. Today, thankfully, many organizations have woken up to the reality that inefficient cloud investments can result in cost overruns, rather than cost savings.



The percentage of cloud professionals and senior executives who say that the best time to address cloud complexity is before migration[1]

Failing to decommission unused resources is another obvious — but often overlooked — source of wasteful spending. The cause of this problem is somewhat different from when organizations fail to rightsize their environments from the beginning, but the end result is the same. When users spin up public cloud resources for temporary projects, these resources are often left running long after the projects are complete. And, since many IT teams lack visibility into their cloud environments, they often don't even realize that their organizations have unused resources

Source: [1]Deloitte, Cloud Complexity Management Survey, May 2019

spun up in the public cloud, with the meter running around the clock.

This source of inefficiency is especially common in organizations where users have permission to spin up public cloud resources across multiple departments with little in the way of oversight — particularly enterprises that operate in multiple public cloud environments without integrating those environments in a way that enables centralized visibility and control.

The Need for Cloud Optimization

Even if an organization is using all of the resources it pays for, it is critically important that cloud deployments are designed in such a way that workloads are matched with the appropriate cloud infrastructure. Storage is a prime example of an area where things can go wrong, as organizations often fail to distinguish between "hot" and "cold" data — which require different levels of availability (and which, in turn, can be had at very different price points). For instance, a hospital might be required to keep certain types of records for a period of 18 to 25 years but may never (or only rarely) access this data. By placing the data in a cool storage environment that is optimized for cost rather than performance, an organization can substantially lower its monthly cloud storage costs.

Finally, many inefficiencies are introduced into cloud environments due to a simple lack of good governance. Too often, the policies and procedures that will govern the growth of an organization's cloud environment are an afterthought. This, in turn, means that IT and business leaders are constantly in a reactive position. Rather than being able to proactively monitor the growth of their environment and steer away from problems, they are forced to put out one fire after another, with little ability to predict what new problems might be headed their way. When organizations lack good governance rules, this often results in too many individuals having the "keys to the kingdom," meaning they have the ability to spin up whatever resources they want — with no one to tell them "no."

Cost overruns are perhaps the most obvious outcome of an inefficient cloud environment, but they're far from the only negative result. A lack of governance, for example, can introduce shadow IT into an organization — which, in turn, can create security vulnerabilities, compliance issues and a lack of application visibility. To prevent these problems, organizations must develop an effective cloud management strategy and implement the right mix of tools, policies and partnerships to implement it.

An Effective Cloud Management Strategy

While nearly all organizations grapple with some level of cloud complexity as their public cloud environments grow larger and more diverse, an effective cloud management strategy can help to simplify cloud investments where possible — and help to minimize problems when some level of complexity is unavoidable. Without such a strategy in place, organizations will find that they miss out on many of the benefits that drew them to the public cloud in the first place.

A successful cloud strategy will enable effective management of resources and workloads to optimize cost and performance. This strategy should take several key considerations into account:

Cost controls: Competition among several large public cloud vendors (in addition, of course, to the competition provided by the availability of on-premises infrastructure) has kept the cost of cloud resources relatively reasonable. But as an organization increases its cloud investments, costs will inevitably rise, and cloud complexity can lead to wasteful spending. An effective cloud strategy should spell out specific tools and tactics for controlling costs. For instance, organizations should commit to seeking out and leveraging all discounts available to them. Business and IT leaders should also embrace automation of policies that control costs, such as shutdown of workloads after hours, elimination of inactive storage and automatic use of the lowest-cost cloud resources available.

Security: Cloud security should not be a case-by-case consideration. Instead, standardized processes should be baked into an organization's cloud strategy. Elements of a cloud security strategy may include uniform identity and access

The State of the Cloud: By the Numbers

An extensive survey of corporate cloud users across industries reveals that cloud spending is still growing quickly, and many organizations are struggling to manage costs and complexity:[2]

- **Sixty-four percent** of organizations say that optimizing existing cloud use for cost savings is their top initiative, up from 58 percent the year before.
- Plans for enterprise public cloud spending were up **24 percent** in 2019 compared with 2018, with half of organizations spending more than $1.2 million annually.
- Organizations tend to underestimate wasted cloud spending. While users estimate their **waste at 27 percent**, actual measured waste is **closer to 35 percent**.
- Respondents identify optimizing cloud costs and cloud governance as top challenges, with **84 percent** citing each factor as a major hurdle.
- **Fifty-two percent** of respondents say that managing software licenses is a top challenge.
- Well over half (**58 percent**) of enterprises now employ a hybrid strategy that combines public and private clouds.
- On average, organizations are already running applications in 3.4 clouds, both public and private — and experimenting with an average of 1.5 more — for a total average of nearly **five clouds per organization**.

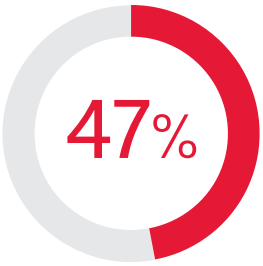
Source: [2]Flexera, "RightScale 2019 State of the Cloud Report," February 2019

management (IAM) protocols across hybrid environments, the adoption of cloud management systems that ensure adequate visibility across hybrid environments, and an approach that treats cloud security as a shared responsibility between organizations and their cloud service providers. Because conventional, perimeter-based protections don't work in an environment with significant cloud resources, organizations should adopt a "never trust, always verify" approach to all computing resources, ensuring protection for each virtual asset and data source.

Compliance: To ensure compliance with software licenses, organizations should restrict user software download permissions, log all downloads and sync all license renewals. It's also important to negotiate the best possible deal with vendors, as this can extend the amount of time an organization has to get into compliance without adding costs. Finally, organizations should conduct internal software audits of their ecosystems before their vendors conduct their own audits. These self-audits can be conducted via an internally written script, with applications that explore the system, or through a third-party consultant. Internal audits are easy to put off, but conducting them regularly is typically less expensive (and less painful) than being found out of compliance during an external audit.

Workload controls and application performance: Defining service level agreements (SLAs) and minimum performance requirements early on will prevent scenarios where cloud resources are failing to meet an organization's business needs.

Simply outlining a cloud strategy is not enough. As the saying goes, "Culture eats strategy for breakfast." Ideally, a cloud strategy will become baked into the culture of an organization, with all relevant stakeholders understanding that they must rely on the strategy to guide cloud investments, as opposed to defaulting to hot industry trends or gut feelings. When a cloud management strategy is internalized, teams will often be able to complete previously complicated decision-making processes in a matter of hours or even minutes. Instead of reacting to a misinformed stakeholder making a bold declaration (for instance: "We need to move our entire environment to the cloud within 18 months"), teams can take a practical, strategy-driven approach to problem-solving.



The percentage of senior executives who identify cloud complexity as the factor that will have the largest negative impact on cloud computing ROI over the next five years[1]

Key Cloud Strategy Elements

As organizations plan their cloud strategies, they should take care to do the following:

- **Establish goals:** A cloud strategy should begin with the end in mind. If stakeholders within an organization don't know what business outcomes they're trying to achieve, they won't be able to craft an effective strategy.
- **Propose the time frame:** There should be some urgency behind the implementation of a cloud strategy, but proposed time frames should also be realistic. It's common for organizations to divide the implementation of their cloud strategies into phases, with the most urgent tasks coming first.
- **Identify expected results and benefits:** Specific targets for factors such as cost and performance will help organizations to evaluate how well their cloud strategies are working.
- **Apply the five R's:** Several years ago, Gartner identified the five R's of cloud migration — **rehosting** (redeploying an

The Cloud Skills Shortage

When the public cloud first emerged as an IT resource, many technology professionals worried that it would mean the end of their jobs. But in fact, IT workers who have put in the time and effort to pick up cloud-related skills are now a hot commodity, and many organizations are having trouble finding the expertise they need.

There are three main ways organizations can fill the gap they often experience in cloud expertise:

- **FIND:** There are skilled IT workers with deep cloud knowledge out there, but they're expensive. Large enterprises with big budgets in attractive cities will have a deeper talent pool than small and midsize organizations in sleepier markets.
- **GROW:** Motivated internal employees can often quickly pick up new cloud-related skills, and vendors offer high-quality training opportunities. However, many organizations struggle to free up internal staff from their daily duties long enough for them to truly learn and implement new skills. Also, there's always the chance that employees will leave for greener pastures once they've expanded their skill sets.
- **BUY:** Many organizations have determined that working with a trusted external cloud partner is the most cost-effective, reliable option for maintaining a steady source of on-demand cloud expertise.

Source: [1]Deloitte, Cloud Complexity Management Survey, May 2019

application in a new hardware environment), **refactoring** (running an application on a cloud provider's infrastructure), **revising** (modifying code so an application can be rehosted or refactored), **rebuilding** (discarding a legacy application and developing a new version using cloud services and features) and **replacing** (swapping out an existing app for a cloud-based commercial app). For each of their legacy applications, organizations should determine which approach makes the most sense.

Solutions and Services to Improve Cloud Management

Developing an effective strategy to streamline cloud management is necessary, but an organization still has steps left to take to effectively manage its resources. Without tools and services that assist with the implementation of this strategy, organizations will be left scrambling to tend to each component of their cloud environment and will never be able to achieve the efficiency and simplicity they seek.

Solutions

Cloud management platforms: Likely the single most important tool to help organizations manage cloud complexity, a cloud management platform helps to automate routine tasks — and promote central visibility into and control over a cloud environment. These platforms are offered by a number of vendors and typically include reporting and cost management features, in addition to automation. They also support management for multicloud environments.

Through a consolidated central dashboard, organizations are able to achieve visibility into their entire environment in a single view. When implemented appropriately, the benefits of a cloud management platform can include significant cost savings, increased adoption of cloud resources across the enterprise and future proofing to enable ongoing growth and evolution of cloud environments. Paired with an effective strategy, a cloud management platform can be a truly game-changing solution for organizations with substantial resources in the public cloud.

Application performance monitoring: The ability to monitor application performance is critical to cloud management, as it allows organizations to determine whether they are meeting the business goals of their cloud strategies and providing adequate levels of service to end users. Application performance monitoring tools will help IT administrators gain a holistic view into both cloud and on-premises applications, map interdependencies between applications and other resources, seamlessly track the health of applications and troubleshoot. This enables IT admins to drill down to root causes of issues and analyze performance metrics.

Backup and recovery: Many organizations have found that the public cloud helps to simplify their backup and recovery functions. In a cloud backup model, an organization's data and applications are backed up and stored on a remote server, kept readily available in case they are needed due to an outage or disaster. According to one recent survey, 62 percent of enterprises use the public cloud for file backup and disaster recovery, making it one of the most popular public cloud use cases. The benefits of using the public cloud for backup and recovery include the safeguarding of data and apps, flexible storage and rapid and reliable recovery.

Identity and access management (IAM): Cloud IAM tools enable organizations to create and manage permissions for public cloud resources, helping to boost cloud security and simplify access for users who need it. Cloud-hosted IAM solutions are sometimes called Identity as a Service, or IDaaS. By providing simpler access to IT resources, IDaaS can help businesses to adopt new technologies more quickly, speeding up their time to value. Like other cloud solutions, IDaaS tools are flexible and scalable, allowing enterprises to organically grow their investments over time.

Cloud access security broker (CASB): A CASB is a software tool that sits between an organization's environment and public cloud providers to enforce security, compliance and governance policies for cloud applications. These tools help to provide visibility into shadow IT, address cyberthreats and data leaks, and enable management of privileged accounts. They also help IT administrators to exert control over external file sharing.

Services

Managed services: In a managed services model, a trusted third-party partner handles the day-to-day management of cloud-based services and technical support. This is, perhaps, the simplest of all cloud management solutions, as managed services allow an

Creating a Cloud Center of Excellence

Establishing a cloud center of excellence (CCoE) is a powerful step in the right direction for cloud optimization. According to the RightScale 2019 State of the Cloud Report from Flexera, 66 percent of enterprises already have a central cloud team or CCoE to focus on cloud governance, and another 21 percent have one planned.

A CCoE should comprise a cross-functional team of individuals, including employees from IT, security, finance, legal and other departments. This team should be responsible for developing cloud strategy and implementing good governance rules and procedures at the outset. But perhaps even more important, a cloud center of excellence is responsible for keeping an organization on course as time goes by, preventing people from taking shortcuts that result in unwarranted complexity and unnecessary inefficiencies.

After building out the team, an organization should provide it with a clear scope. Often, this will start with basics such as roles and permissions, cost governance, monitoring, incident management, hybrid architecture and security. Over time, a CCoE's responsibilities may evolve to include such things as multicloud architecture, managing golden images, asset management, business unit charge-backs and reusable reference architectures.

organization to rely on the service provider for the vast majority of cloud-related tasks, while internal staffers and leadership can keep their focus on the business. Managed services can help organizations to tackle cloud management without adding full-time IT staffers, which may help to lower overall costs. The model also lends itself to more predictable costs, as cloud management becomes a recurring, budget-friendly expense. Managed services are a particularly attractive option for organizations that have trouble attracting cloud-knowledgeable IT staffers due to their size or location. Quick response times are another key feature of managed services. When dealing with a reputable managed service provider, organizations can expect speedy responses through enterprise-level monitoring and remote cloud services. While many issues can be resolved remotely, organizations can typically have a technician onsite within one business day if necessary.

Consulting services: Some organizations have an IT staff that can handle the bulk of cloud management tasks but may need occasional help incorporating new resources, redesigning cloud environments or handling specific challenges. For these organizations, cloud consulting services may be a fit. This model gives organizations the flexibility to rely on a partner only when needed, while handling day-to-day management on their own. By leveraging cloud consulting services, organizations can ensure that they always have the expertise they need. Also, they will benefit from the enhanced collaboration that comes with having fresh eyes evaluate their cloud management strategies and solutions. Even when internal IT leaders and staffers have deep cloud expertise, outside consultants may see opportunities that would otherwise be missed.

Health checks: In a health check engagement, a third party ensures that the cloud customer is leveraging best practices to optimize cloud maturity. While a health check is less intensive than ongoing cloud consulting services or full managed services, it does provide an opportunity for organizations to spot hidden inefficiencies and sources of complexity. By catching wasteful spending, cumbersome architectures and security vulnerabilities, a health check can help an organization to save money and optimize performance, ensuring that it is achieving all of the benefits that the public cloud has to offer.

CDW: We Get Cloud Management

From one-day workshops to ongoing partnerships, CDW's solution architects can provide organizations with the expertise needed to plan, deploy and manage cloud solutions that help them achieve their business objectives.

- **Cloud 101 Workshop:** This onsite event gives an overview of cloud services — including data center, application and security strategies — and helps organizations identify opportunities to achieve new efficiencies through the cloud.
- **Cloud Health Check:** With a highly detailed diagnostic checkup, CDW's experts help organizations make sure they're getting the most out of their existing cloud deployments.
- **Cloud Consulting Engagements:** Over a period of weeks, CDW's experts assist enterprises with building a cloud roadmap, migrating and replatforming existing workloads, financial modeling and validation for various cloud options, and other customizable offerings.
- **Managed Cloud Services:** As a managed services provider, CDW can offer ongoing help with application migration, infrastructure planning and design, use of public and private cloud, performance tuning, resource controls, consumption reporting and best practices for ensuring compliance and security.

The CDW AMPLIFIED™ Services

CDW Amplified™ Infrastructure services can help you bridge gaps in expertise, tools and resources to scale and future proof your IT infrastructure, whether on-premises, in the cloud or in a hybrid environment.

DESIGN: Hybrid cloud environments can be complex, but careful planning can create optimal business impact. CDW Amplified™ Infrastructure experts help you build and deploy hybrid systems based on best practices.

ORCHESTRATE: CDW Amplified™ Infrastructure services assist with complex deployments, bolstering cloud security and ensuring smooth operation. We also help set the foundation for business innovation by creating support for cross-functional IT teams.

MANAGE: CDW Amplified™ Infrastructure offers fully managed migration and upgrade services to help you make the most of your hybrid cloud applications. Ensure consistent uptime and reliability with fully managed operation of your hybrid environment and get support whenever you need it.

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Learn more about how CDW can help you better manage your cloud resources.

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