HYBRID CLOUDS DELIVER THE BEST OF BOTH WORLDS

In a hybrid cloud model, organizations can preserve central IT management while gaining the agility of the public cloud.

EXECUTIVE SUMMARY

Private clouds give organizations control over and visibility into their resources, along with the opportunity to leverage existing infrastructure and facilities. Public cloud providers, meanwhile, give enterprises the ability to quickly scale resources up and down, providing unprecedented levels of flexibility and agility.

A hybrid cloud model offers both.

Despite the benefits of hybrid clouds, many organizations have yet to fully embrace the model. In some cases, business or IT leaders may still harbor security concerns about placing resources in the public cloud, even though the cloud often delivers a greater level of security. Others may be using the public cloud for some applications but have not done the work of fully integrating cloud infrastructure with on-premises resources. Still others may *think* they have developed a hybrid cloud model, but don't fully understand what that entails.

In adopting a hybrid cloud model, organizations should evaluate their readiness by assessing their existing needs and objectives in several areas, including infrastructure and resource demands. If an organization does implement a hybrid cloud, the transition may require a cultural shift and a new approach to IT management.

Transition to a Hybrid Cloud

For as much attention as it has received in recent years, cloud computing is still shrouded in a fog of misunderstanding.

Even among IT leaders, it is somewhat common for people to mention their "private cloud" in reference to any on-premises IT resources, while using the term "public cloud" to refer to any outsourced resources. Using these definitions, practically every organization of any size is already operating in a hybrid cloud environment. But in fact, these definitions are slippery and imprecise, and they fail to address the factors that set cloud computing apart from traditional IT operations.

The cloud, really, isn't a "thing" at all. Rather, it is a methodology — a way of provisioning IT resources, whether those resources live in a central, on-premises data center or are owned and maintained by a large public cloud provider in a shared data center several states away from an organization's headquarters. When people casually refer to their organization's "hybrid cloud," they often fail to consider whether the on-premises resources in what they're calling a "private cloud" are truly being delivered in a cloud model. Typically, this will mean that resources are 100 percent virtualized and highly automated, with capabilities for user self-service and metering. In other words, if on-premises infrastructure is still running in traditional ways — rather than being available to users on the same "as a service" basis that public cloud resources are — then it isn't a private cloud at all; it's just on-premises infrastructure.

This distinction isn't merely a matter of semantics. Organizations evaluating different approaches to building out effective, nimble IT environments have an array of options open to them, and it's vital that IT leaders understand, with pinpoint precision, exactly what these options are. Occasionally utilizing public cloud resources alongside on-premises resources is one strategy. A true hybrid cloud is something else, and the increasingly popular multicloud model (see sidebar, "What's Next: Moving to a Multicloud") is something else again.

Of these options, organizations often opt for a hybrid cloud approach as a way to continue to take advantage of existing IT resources, quickly scale out new resources, maintain a higher level of control over and visibility into certain workloads, and tie various systems together for a seamless end-user experience.

Business Factors Behind the Move

Organizations may move to a hybrid cloud for a variety of reasons, but most often they are motivated by a desire to achieve one or more of the following potential benefits:

Flexibility: When organizations tie private and public clouds together in a hybrid model, they can place applications in one or the other depending on specific resource requirements. For example, when workloads are in the testing phase, enterprises might opt to place these in the public cloud, where it is fast and simple to scale up resources if necessary. However, steady-state applications might be a better fit for an organization's private cloud, especially if on-premises infrastructure is readily available and if resource needs are reasonably predictable.

On-Demand Resources: During the early days of the public cloud, it was common to hear people cite cost savings as a surefire benefit of migrating resources. In fact, as IT leaders at many organizations have discovered, utilizing public cloud resources won't necessarily reduce infrastructure expenses. Rather, the public cloud can help organizations optimize IT spending by giving them the option of scaling up on-demand resources almost instantaneously. The on-demand processing power of the public cloud lets organizations run their day-to-day workloads in their private clouds (which very well may cost less over time), and then spill over workloads into the public cloud during periods of peak demand.

Workload Management: Some workload types are more or less equally well suited to private or public clouds. In these cases, organizations can make decisions about where to run them based on preference, cost, existing resources and other factors.

What's Next: Moving to a Multicloud

Typically, the term "multicloud" refers to organizations using two or more public cloud providers — and, often, their own private cloud — to deliver IT resources. The model is growing as enterprises continue to push more resources to the public cloud. Often, such a move arises from an attempt to prevent overreliance on any one public cloud provider. As with the hybrid cloud, orchestration and automation are vital to a true multicloud strategy.

In early 2018, DatacenterDynamics[1] offered these tips for multicloud deployment, stressing the importance of building a careful business case for a multicloud before adopting the model:

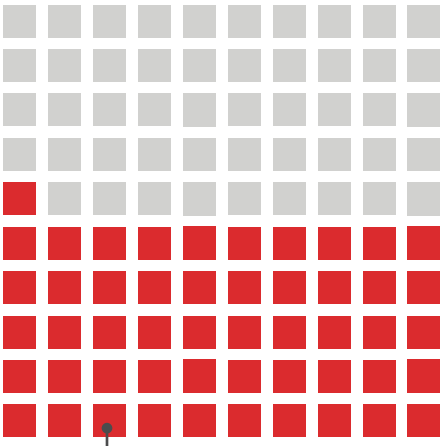
- Use a "single pane of glass" management layer to manage across multiple clouds. This simplifies IT management and ensures that IT stakeholders have a unified view of an organization's multiple clouds at any given time.
- Don't forget about the performance requirements of moving data between the clouds.
- Carefully consider the impact of latency on applications for in-house use and cloud users.
- Remember that data must be encrypted as it flows between clouds, something that is difficult to achieve with traditional WAN optimization tools.

Source: [1]DatacenterDynamics, "Multi-Cloud: The Next Step in Cloud Computing?" February 2018

But for certain workloads, either the private or public cloud is inherently a better fit. For instance, large workloads that have the potential to monopolize resources will typically be a better fit for the public cloud. Meanwhile, workloads that are subject to heavy regulatory scrutiny, such as e-commerce payment processing, might be better suited for the private cloud.

Why Organizations Are Embracing Hybrid Cloud Environments

In some cases, organizations adopt a hybrid cloud model to facilitate a specific use case. One prominent example is disaster recovery and high availability. Setting up a highly available, redundant backup in a private cloud can require an organization to double its capital expenses. By contrast, a hybrid cloud model allows an organization to keep its production environment in a private cloud, with a recovery environment ready to spin up in the public cloud if needed.



51% The percentage of enterprises employing a hybrid cloud strategy[2]

In such a setup, data is replicated to the public cloud, but all other resources remain dormant until they become necessary. A hybrid-cloud disaster recovery solution can help organizations achieve significant cost savings while simultaneously improving their application availability, making it a natural early step for businesses adopting hybrid cloud solutions.

In addition to disaster recovery, the following use cases and benefits are leading organizations to embrace hybrid clouds:

Faster Service Delivery: Procuring a physical server takes time. The expense must be approved, the purchase made, the server delivered and the hardware installed and configured. The process may take several weeks or more to complete. By tying resources to the public cloud, organizations give themselves the option of provisioning new infrastructure perhaps in a matter of minutes rather than weeks or months. This is especially important for companies that are growing quickly or experiencing unpredictable spikes in resource demand.

Move from CAPEX to OPEX: Traditional IT resource provisioning can create serious headaches around cash flow. Investments must be planned and budgeted years in advance, and companies must either set aside funds for large purchases or else pay off their infrastructure over a period of years. Cloud resources let organizations shift their IT spend from a capital expense (CAPEX) model to an operating expense (OPEX) model. Many business and IT leaders prefer a manageable and predictable monthly expense, which can free up capital for other investments and free up time for management to focus on pressing problems beyond paying for their infrastructure.

Reduced Administrative Burden: The cost of on-premises infrastructure isn't tied to hardware alone. In addition to utilities and facilities, the total cost of physical resources includes the staff who "care for and feed" servers and storage infrastructure. When more resources are placed in the public cloud, this frees up IT staff for other projects. Rather than spending their time on patching and hardware refreshes, they can pursue the organization's IT strategic goals.

Collaboration: By moving all file servers — and, therefore, all documents — to a cloud-based collaboration system, organizations empower staff to edit, share and collaborate on any document, on any device, from anywhere. By making

Getting a Complete View of Applications

In Riverbed Technology's 2017 guide "7 Common Pitfalls to Avoid When Migrating Applications to the Cloud," the first item on the list is "Having an Incomplete or Outdated View of the Infrastructure."

Migrating on-premises applications to the cloud, the report notes, is a complex task requiring proper design and mapping. Most often, the applications being migrated do not exist in a vacuum. They may consist of hundreds of dependencies, make calls to multiple databases and even integrate with components from several third parties. If IT leaders lack a firm understanding of these variables, the application delivery chain can break, leading to downtime or performance issues.

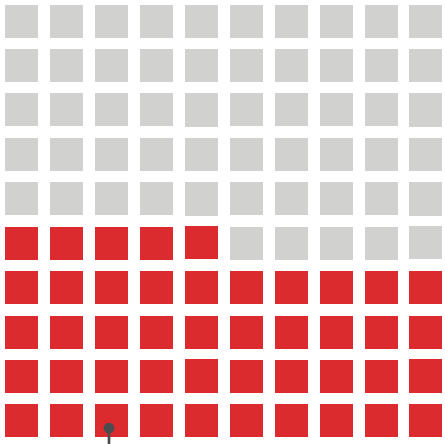
Many organizations today have sprawling environments in which they are constantly adding, modifying and replacing applications, services and infrastructure. As a result, many IT shops lack a current view of their application architectures.

To solve this problem, Riverbed recommends that organizations introduce application mapping software. This kind of tool, which many enterprises have already used for data center migrations and consolidation efforts, can streamline the discovery and planning phase of migrating applications to the cloud.

Source: [2]Kaspersky Lab, "Threat Landscape for Industrial Automation Systems in the Second Half of 2016," March 2017

this move, IT no longer needs to be concerned with backups and recovery from unstructured data.

In addition, separating documents from endpoints greatly simplifies the process of refreshing devices. As more employees work remotely, collaboration solutions are becoming increasingly important. Alongside facilitating collaboration on documents, spreadsheets and presentations, the public cloud also gives organizations a path to adopt video collaboration solutions without making significant capital investments for new hardware.



45% The percentage of workloads that enterprises run in private clouds[3]

Security: For a long time, security concerns held organizations back from pushing resources to the public cloud, but attitudes are quickly changing (see sidebar, "Confidence in Cloud Security Rising"). In fact, there are ways in which a hybrid cloud model can actually help organizations keep sensitive data *more* secure.

For instance, lost laptops are a $1 billion business problem. Potentially greater than the loss of an expensive piece of computing equipment, however, is the loss of the sensitive data inside it, which may include personnel records, financial information and valuable intellectual property. For organizations operating within a hybrid cloud model, however, a lost laptop does not typically create an all-hands-on-deck emergency. With data backed up in the cloud, employees can recover it no matter what happens to their machines, and IT can remotely wipe data from lost laptops and mobile devices so that it doesn't get into the wrong hands.

Global Reach: Back in the days when practically all IT services were accessed locally, local storage and processing made a lot of sense. Today, most services need to be available anywhere in the world to accommodate remote and traveling employees. Running services that must be accessible around the globe is a good reason to move a service to the cloud.

Reduced Costs: This is a tricky one. Although cost reductions have, historically, been a significant driver of enterprises' moves to push resources to the public cloud, some organizations have seen mixed results. This doesn't mean that adopting a hybrid cloud model won't drive down expenses, only that organizations must carefully evaluate their specific use cases and run the numbers, rather than simply assume that cost benefits will materialize on their own.

Without knowing specifics, it is impossible to say which cost reductions may arise from adopting Software as a Service (SaaS) solutions, developing services for the cloud or moving current services from a private data center to the public cloud. The answer depends on the nature of the specific application and its associated dependencies.

Competitiveness/Agility: Moving to the cloud gives everyone access to enterprise-class technology. It also lets smaller businesses keep up with — or even move faster than — larger, more established competitors. Pay-as-you-go services and cloud business applications make it possible for small organizations to "run with the big boys" while staying lean

Confidence in Cloud Security Rising

Only a few years ago, security concerns kept many organizations from pushing resources to the cloud, but attitudes are evolving quickly. According to a fall 2017 report from MIT's *Sloan Management Review*, 74 percent of executives at large and midsize enterprises have become more confident in the security of cloud applications and infrastructure.

This change corresponds with a significant uptick in overall cloud use. Respondents said that 44 percent of their applications, data and infrastructure are now hosted in the public cloud, compared to just 24 percent two years earlier.

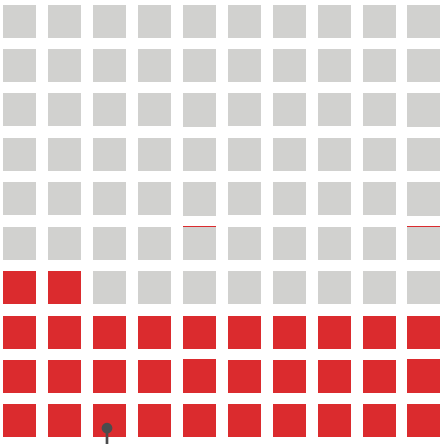
While data security remains a top-of-mind concern for executives considering a move to the public cloud, security is actually becoming a *driver* of the move in some instances. In the survey, 71 percent of executives said that protecting data from compromise or unauthorized access was a "very important" cloud security requirement. However, "increased confidence in cloud security" was the No. 2 reason that organizations had increased cloud adoption (ranking behind only agility and ranking higher than factors such as cost savings).

In their conclusion, the report's authors write that lingering security concerns are "more significantly due to a lack of education and awareness than to actual gaps in cloud security." They add that, when it comes to the cloud, security concerns are part of "yesterday's conversations."

Source: [3]RightScale, "2018 State of the Cloud Report," 2018

and nimble, even as they attempt to disrupt the marketplace. In the past, it was virtually impossible for a small startup to invest in the same types of technology that large enterprises maintained in their corporate data centers. The cloud helps to even the playing field.

Simplicity: The cloud helps organizations simplify service delivery and reduce support and administration. It may even allow them to eventually get out of the data center business entirely, if that is their aim. This level of simplicity is particularly attractive to startups. In Silicon Valley, most new companies are opting not to build their own data centers, reasoning that they can create one in the cloud with a few clicks of a mouse.



32% The percentage of workloads that enterprises run in public clouds[4]

Points to Consider: Thinking Through the Hybrid Cloud Transition

Although moving to a hybrid cloud model can help organizations achieve significant benefits, business and IT leaders must consider potential challenges. Organizations that have yet to make significant investments in the cloud have perhaps missed out on some early benefits, but they have the advantage of being able to learn from others' experiences.

When considering a move to a hybrid cloud model, IT decision-makers should think through the following considerations and determine what impact they may have on their own organizations:

Unpredictable Cost Savings: Every organization is different, a fact that renders broad proclamations such as "the cloud saves organizations money" almost meaningless. While it is true that some organizations end up paying less when they start delivering IT resources via a cloud model, some end up paying more. Pushing resources to the public cloud will certainly reduce on-premises infrastructure costs, but these costs are sometimes replaced or even exceeded by new networking expenses, different administrative burdens and a proliferation of shadow IT. Putting significant resources into the public cloud can stretch an organization's WAN infrastructure, and some organizations have difficulty coming up with the funds necessary for upgrades that will provide the required level of network redundancy.

Loss of Control: Organizations that take advantage of cloud platform services run a risk of locking themselves into a single provider — thus removing one of the main potential benefits (flexibility) of a move to the cloud. Additionally, other types of cloud services are typically architected quite differently depending on the vendor, making it difficult or even impossible to "forklift" infrastructure back out of the public cloud.

Several early cloud adopters experienced this problem, and some of them are understandably reluctant to give the public cloud another try. Other organizations may have highly specific performance or availability requirements (such as "five nines" availability), which may make it difficult to find a public cloud solution that meets their standards.

Multiple Service-Level Agreements: Is the cloud SLA compatible with your network providers? With your internal customers? With *their* customers? These are the questions IT decision-makers must ask themselves when evaluating public cloud providers and their SLAs. Things get even more complicated when organizations are juggling multiple SLAs from any number of cloud software solutions. This is not an insurmountable problem, but it can create headaches for IT staff who aren't prepared for it, so it should be considered during any strategic planning around cloud deployments.

License Compatibility: Managing enterprise software licenses for traditional software can create significant management hurdles for large organizations. Even cloud software licenses can create compliance issues for organizations that don't properly manage and monitor their environments. But trying to navigate licensing and cost restrictions while moving applications to the public cloud can quickly move the needle from "headache" to "nightmare." Businesses attempting to push their on-premises software out to the cloud while maintaining compliance with vendor licensing agreements may want to consult with a third-party expert to ensure they do not inadvertently violate rules and open themselves up to audits and fines.

Unexpected Complexity: For those who have never undertaken a major move to the cloud, it might at first seem simple. After all, the thinking goes, the cloud is meant to simplify life for IT and end users: removing management burdens, creating instant scalability and adding flexibility.

However, managing a hybrid cloud environment requires a different skill set from managing traditional on-premises infrastructure. If an IT team's skills lie primarily in the latter department, that can result in a rocky transition. Some cloud use cases have matured to the point where they really are fairly simple. These include SaaS migration of infrastructure applications (such as moving on-premises Exchange to hosted Exchange), which are so well documented and well understood that they're widely considered to be slam dunks. Moving business-value applications to the cloud, however, is typically a more stressful experience, with an accompanying level of risk, complexity and expense that might cause some organizations to hesitate.

Comfort and Security: For some organizations, such as government agencies or military contractors, data regulations may prohibit the placement of workloads into the public cloud or require data to stay within the organization's state or country. At other organizations, business leaders may simply be uncomfortable with the idea of placing resources outside

Source: [4]RightScale, "2018 State of the Cloud Report," 2018

the enterprise security perimeter — whether these fears are legitimate or not. Finally, cultural concerns within the IT department may slow down organizations' journeys to the cloud. Some corporate data centers are staffed by the same workers who have "kept the lights on" for years or decades, and a move to the cloud will force system administrators into the new roles of cloud service managers and brokers. For some, these new roles are either unappealing or simply don't align with their skill sets.

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SaaS on Demand: CDW's curated cloud subscription marketplace gives businesses instant access to backup, security and collaboration apps.

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The CDW Approach

ASSESS

Evaluate business objectives, technology environments and processes; identify opportunities for performance improvements and cost savings.

DESIGN

Recommend relevant technologies and services, as well as document technical architecture, deployment plans, "measures of success," budgets and timelines.

DEPLOY

Assist with product fulfillment, configuration, broad-scale implementation, integration and training.

MANAGE

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