Private cloud or public cloud?

Strategies for effectively apportioning workloads and orchestrating and automating cloud management

Cloud
April 2017

DXC.technology
The differences that drive cloud decisions

Should an enterprise employ public or private cloud platforms? Most companies these days aren’t going to choose one or the other. Depending on their needs, they are likely to embrace a mix of the two. What matters most in the decision is understanding which environment is best suited for which workloads and how to tie the two together effectively.

This paper explains the differences between public and private clouds, explores how to effectively apportion workloads, and examines the orchestration and automation that lie at the center of a successful hybrid cloud strategy.

Head to head

First, we’ll address the real and perceived differences between public and private clouds.

Provisioning speed

An oft-cited advantage of public clouds is how quickly they can be provisioned. Key in your credit card and spin up an instance or application in minutes. The cloud is already there and self-service. In reality, however, there’s no technical reason why it should be more difficult to provision services on a properly configured private cloud. Often the stumbling block in private cloud deployments is in adopting a cloud operating model — one with the people and process changes necessary to support the time-to-provision speeds seen in public clouds.

Security and isolation

Data held in some workloads needs to be more secure than others. Private cloud environments offer the same types of assurance as with other IT infrastructure you own and manage, where you have exclusive physical and virtual access to the system and its components.

Recently, many have started to realize that public clouds are secure, too. In fact, public cloud providers make the case that their best practices, strict policies and redundancies result in systems that are more secure and robust than private cloud environments.

However, public clouds differ significantly from private clouds in the variety, source and vetting of workloads they handle. With a click-through license and payment method, public cloud providers will spin up an environment for just about anyone.

DDOS attacks and other cyberattacks persistently threaten workloads, typically probing for vulnerabilities to access critical corporate information or intellectual property. Public cloud providers are often perceived as being more vulnerable to attacks, but significant investments in automated detection and remediation have alleviated those concerns. Nothing is 100% guaranteed, of course, but public cloud providers provide significant coverage to overcome the lack of firewalls and DMZs often found in private clouds.
Because hosted infrastructure is abstracted from the user and the application, during performance or “noisy neighbor” problems, public cloud providers can automatically shift workloads to optimize for compute, disk, and memory usage. The last frontier is network performance optimization. Private clouds – with proper monitoring, implementation and configuration – can also automate the shifting of workloads if a noisy neighbor is detected. However, appropriate space can often be limited in a private cloud – due to VLAN or network segmentation, manual firewall or load balancer changes. That can mean workloads have to “suffer it out” until performance can be remediated manually.

Stack visibility

Control over and visibility into the stack are additional areas where the two differ. Private cloud environments provide visibility into the full stack, which enables an IT manager to monitor the infrastructure, virtualization layers and applications. Public clouds don’t offer access to the infrastructure or virtualization layers. You can start monitoring only at the OS level up through the application level. This isn’t necessarily a bad thing, but it runs counter to the expectations of most IT departments. They’re accustomed to full stack visibility. In addition, the tools they use on a daily basis are geared toward that model.

The private cloud can provide much more flexibility in storage, compute and other resources for expansion. By contrast, standard stacks are the norm for public clouds, and the number of options is intentionally limited. Some organizations stumble in implementing private clouds because they don’t standardize on cloud IaaS and offer too many customization options. That flexibility can create significantly higher overhead with less cost savings, but it allows for a lot more flexibility. Organizations must be diligent in performance monitoring and resource allocation, and they must manage resources at a higher degree of certainty, as it takes time and effort to add storage and other resources.

SLAs

Service-level guarantees are another matter. Private clouds offer the greatest possible control through SLAs, with some vendors able to guarantee SLAs of up to 99.99 percent availability. Public clouds offer certain levels of assurance in the way workloads are distributed or the way data is housed. For example, workloads can be guaranteed not to share racks or servers, and data may be guaranteed to be maintained in multiple copies across a specified number of data centers. However, these architectural characteristics are not tied to performance or financial guarantees as a true SLA is. This may be a factor to consider if a workload’s performance is critical. Many enterprises put dev/test workloads on the public cloud as SLAs, and uptime is not as critical to their business as production services.

For legacy apps, SLAs can be critical to the success of the application service. In a public cloud environment, organizations migrate or refactor their applications to support a public cloud model, with workloads distributed across multiple regions to ensure application service delivery isn’t affected by a single point of failure, similar to the high-availability/disaster-recovery work guaranteed by SLAs in a private cloud.
Industry Perspective

stack. But organizations need to consider whether the cost to refactor applications will be worth it. We recommend looking at your application profile to understand whether refactoring is warranted. Otherwise, moving to a private cloud can provide the most benefit and stay within the SLA requirements for the service.

Cost

Another area of confusion relates to cost. Many people are led to believe that private cloud is always more expensive to operate than public cloud, but this is not true in many situations.

Yes, public cloud is less expensive to operate when workloads are dynamic. In fact, seasonal retail business was one of the main drivers in the development of Amazon Web Services. After building infrastructure to meet peak seasonal demand, Amazon began selling its excess capacity during the rest of the year.

Seasonal bursts, short-term needs for a campaign and end-of-day reports are examples of transient demand that requires immediate resources. But, when the workload has finished, you want to be able to shrink back down to your steady run rate. Public cloud is well suited for these use cases. This will also result in the greatest financial benefit.

On the other hand, a few hundred or a few thousand well-understood workloads that operate on a continuous basis often run more cost-effectively on private cloud.

Orchestration adds value, agility and security

With their differences, public and private clouds are highly complementary but suited for significantly different workloads. What makes an effective marriage of public and private clouds? What do organizations need to put the right workload on the right infrastructure at the right time while meeting all business, cost, performance and security requirements?

A hybrid cloud strategy gives IT managers pause if they have hundreds or thousands of workloads to manage. It might seem easier for the enterprise to put only simple, non-mission-critical workloads on public clouds. Or, it might choose only private cloud infrastructure to avoid having to make decisions about apportioning loads or safeguarding data.

These differences highlight the importance of brokering workloads between these different environments and ensuring that workloads end up in the right environment based on both their technical requirements and their unique business, governance and compliance needs.

Orchestration is a critical element of today’s hybrid cloud solutions, allowing an enterprise to move into the digital realm, putting workloads in exactly the right place at the right time, and substantially automating a company’s business processes. Cloud orchestration enables a company to focus on its central purpose, its customers. That is, companies that employ a true hybrid cloud strategy with orchestration can focus on the services and products that generate value for their customers.
The combination of a self-service catalog with orchestrated blueprints for IaaS, PaaS, and IT as a Service makes everything available as a service. This hybrid cloud environments helps to reduce the cost, complexity and time to market for IT services. This enables central IT to transform its role into that of a hybrid cloud service broker, and allows development and IT operations teams to increase the speed and frequency of software releases without sacrificing the quality of software in production. Solutions for cloud orchestration, such as the DXC Agility Platform, create a virtual infrastructure that's capable of automatically provisioning and destroying resources for workloads; apportioning the needed compute, memory and storage requirements; and applying consistent security and governance controls.

Vendor neutrality is an important distinction of the DXC Agility Platform. Its technology impartiality enables DXC’s orchestration solution to coordinate workloads across a range of public cloud providers as well as privately operate cloud architectures from leading solution providers. The ability to transparently and deftly move workloads among clouds of any type gives the enterprise an important edge in negotiations. A company no longer has to feel obligated to commit to a proprietary cloud solution and has the freedom to open negotiations for services among multiple cloud and solution providers. The only constant in the cloud landscape is change. By having a cloud management platform, organizations are buying into a future that allows them to be in the driver’s seat as new clouds and features become available, accelerating their time to market and ROI.

The best of both

The distinct difference between public and private cloud architectures makes them suited to a wide range of use cases. Some workloads will require the security and isolation that only a private cloud can provide. Other workloads, especially those with dynamic demand curves, can benefit from the nearly limitless capacity of public cloud.

What’s critical for today’s enterprise is the solution that unites the two, creating a seamless environment of compute, memory and storage that can satisfy the immediate demands of a business in the most secure and cost-effective manner. Orchestration is the solution that ties these two together, providing the enterprise with IT as a Service.

About the author

Kyle Falkenhagen, director of Brokerage & Integration Solutions at DXC, is project management leader for DXC Agility Platform and related solutions. He has spent the last decade focused on helping the world’s largest organizations realize the full potential of the cloud by addressing the technology, people and process issues that often stand in the way of enterprise adoption. Prior to DXC, Kyle led product management for the Agility Platform at ServiceMesh, where he helped shape the nascent cloud management market. He was also co-founder of ExoCloud, an early-stage cloud computing company. A graduate of Texas A&M University in Computer Science and Business, he previously served as a software developer and worked on a number of large software products for Microsoft, NetQoS and ExoCloud.
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