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Courtney Munroe
Group Vice President, Worldwide Telecommunications Research

Matching Workloads to Cloud Platforms: Finding the Optimal Fit

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With cloud computing, organizations seek to transform the ways they pay and budget for staff and manage their technology assets while optimizing how they source and deploy their IT resources. To maximize the value from investments in cloud, organizations must be aware of the potential benefits and challenges of different types of applications and workloads.

The following questions were posed by CenturyLink to Courtney Munroe, group vice president of IDC's Worldwide Telecommunications research, on behalf of CenturyLink's customers.

Q. What should organizations consider when deciding what types of workloads and applications to migrate to the cloud?

A. Cloud helps improve time to market because the resources are there when you need them. You can get applications up and running right away while balancing demand and expenditure. You're also able to react faster to business changes. Given those specific advantages of cloud, you have to think about which workloads will benefit most. The best way to think about it is to look at the characteristics of the workloads you're thinking of moving to cloud. Keep in mind that not all workloads will necessarily derive the full benefits of cloud.

First, look at the usage profile of that application or workload. Does it have a static level of demand or a static level of users? Is it a more or less stable application or workload where you know how much usage there is as well as how many end users need to get to it? Those types of apps don't necessarily need cloud. If there's enough steady-state demand for that particular workload, another deployment model might work fine. Also consider the business case behind the workload or application and whether things like downtime are critical.

Another factor is whether there are even people using the application. Maybe the users are machines, such as Internet of Things (IoT) devices giving off information in response to events happening inside of a connected car or as part of a smart city. In that case, a very volatile or unpredictable resource requirement may be associated with that application. Cloud gives you the ability to scale up or scale down as needed in response to sudden demand.

Overall, the decision factors have a lot to do with how the application is being used, how often the app needs to be updated, and whether there is steady-state or constantly changing demand for the workload. Also, who will need to have access to that application? Is it a known, static set of users or something like an ecommerce site? If you don't know how many people at any given time will need the app, then you will likely have to scale up and down.

This raises the question of the right application architecture for the workload. Some enterprise apps have a scale-up architecture, where you need to add another middleware layer as more people use the application. However, the modern way of writing apps in a cloud-native environment is all about scaling out the application. So you need to think about architecture and performance requirements. Who is the target audience? What resources does the app require, and how often do those resource requirements change?

Q. What about legacy applications that don't fit into multitenant virtualization?

A. For companies with legacy applications, the best option is a hybrid-type architecture for apps not designed to run on a multitenant virtualized infrastructure, or in some cases for apps or data that shouldn't necessarily go in the cloud. For instance, you may not want the customer or operational data from some systems of record to be in the cloud, either for security reasons or simply because you don't want to incur the bandwidth expense of moving all that data into the cloud. You might want to leave it where it is and leverage the cloud in a way that integrates with your overall IT environment. There are different ways to do that, such as with a direct-connect network link between your existing enterprise datacenter and the cloud provider you choose.

Another way is to work with a cloud provider that also supports other IT deployment models for hosting. For instance, you can colocate the servers that your enterprise applications are running on, or the storage arrays where your customer data is located, in the service provider's datacenter, with everything running as a unified system. Another approach is to use cloud for the front end of your application, where end users are coming in to access the app because that's likely where you'll have the volatility in terms of usage load. You can scale that part up or down as needed. Then the requests can flow to the back end of the legacy infrastructure to access data or other parts of the app.

The thing to remember is there are many different ways to deal with legacy infrastructure and integrate it with the newer capabilities available in the cloud.

Q. What can organizations do to ensure a successful workload/application migration to the cloud?

A. As discussed, some of the prework involves having a clear sense of which applications would benefit most from being in the cloud and which applications are better suited to another deployment model or just keeping as is. The second thing related to ensuring a successful migration is making sure that you backed up the data as well as making sure that you have an application that's suited to run in the cloud. Certain apps can just be lifted and shifted as is to a multitenant virtual infrastructure in the cloud. But others need to be rewritten or refactored in some way to take full advantage and work properly in the cloud.

Overall, the short answer is that a successful migration is one that's been carefully thought out and planned in terms of the application characteristics. Test to see how that app performs in the cloud and whether its performance in the cloud is the same as or better than its performance in the traditional infrastructure. Also have a clear idea of security and compliance factors around the app. From a regulatory perspective, is it something that can run in the cloud? More importantly, is it something you're comfortable having in the cloud? Yes, using the cloud can reduce your overall cost of IT. But that cannot happen at the expense of security, performance, or regulatory compliance.

As with any type of app migration, careful assessment, planning, and testing are essential. You should also use a mirrored implementation. You need to be able to run the traditional infrastructure and cloud side by side until you're satisfied with the performance of the app in the cloud.

Q. How should organizations incorporate hybrid, multicloud, and managed cloud approaches into their IT environments?

A. Cloud-native/born-in-the-cloud companies' models can leapfrog into the cloud, but organizations with "legacy" IT infrastructure and deployment models typically cannot. Existing investments in equipment, software, personnel, and datacenter facilities cannot simply be written off in favor of wholesale migration to the cloud. Furthermore, many traditional IT organizations lack the internal skill sets needed to fully leverage the "infrastructure as code" development and deployment model of hyperscale clouds.

IDC's 2016 *CloudView Survey* found that 65% of North American companies have some form of hybrid cloud strategy in place, with the most common variations being multicloud (subscriptions to multiple public cloud services) and using a mix of different IT deployment models — multitenant public clouds, hosted private/dedicated clouds, traditional managed hosting, and/or self-managed dedicated infrastructure housed in internal datacenters or in third-party colocation facilities. Multicloud usage is on the rise. IDC's 2015 *Enterprise Cloud Connect Survey* found that companies with 100–999 employees are using on average two cloud infrastructure-as-a-service (IaaS) providers; that number is expected to rise to eight in the next two years. Larger companies anticipate even broader multicloud usage, with the number of cloud IaaS providers rising from five to nine in the next two years. Clearly, cloud-based solutions and third-party service providers are becoming an increasingly important component of companies' IT environments.

As organizations begin to approach the journey to cloud in a more holistic manner in which IT infrastructure serves to enable applications (and the overall business), "cloud" can no longer be viewed as a standalone IT sourcing and consumption model. Nor is cloud a strictly do-it-yourself approach to IT. The managed cloud services model represents a rapidly emerging alternative for organizations that require a range of pre- and post-deployment services around cloud migration, operations, and scaling. As hybrid and multicloud deployments becoming an increasingly common feature of the IT landscape, service providers that can provide managed services for their own cloud platforms, as well as support for other cloud providers' offerings, will be well-positioned to help organizations develop and sustain more dynamic IT environments.

Q. What should organizations look for in a cloud provider?

A. What to look for in a cloud provider often comes down to what kind of application you're running and what the overall IT culture is within your organization. If you're the type of company that want to be "all cloud all the time," you can look at so-called hyperscale providers. These are providers that don't have any hybrid IT capabilities, at least not directly. The feature sets in their clouds are geared toward very DevOps-oriented companies that are building applications in the cloud, not just running applications in the cloud.

Then there are cloud providers with cloud capabilities, but they're coming from a heritage of having offered other IT deployment models as well. So if you're the type of organization that's interested in having a hybrid IT environment managed by a single provider, with a single management and monitoring framework, you might want to look more at providers with a hosting colocation heritage. If you already have applications, particularly ecommerce sites and content, operating in a more traditional managed hosting environment, you can continue doing that with the same provider.

If you want to do new applications, or if you want a more scalable Web front end to your existing apps, then a comprehensive provider would also have that cloud part of things to accommodate the user demand. This provider could also accommodate the evolution of your

organization's IT infrastructure from traditional to colocation to managed hosting to public cloud. In some cases, the provider would have private cloud capabilities as well.

I think what organizations need in a cloud provider has a lot to do with what they expect to do with public cloud and the extent to which they need to incorporate legacy apps into that cloud environment. If you have a hybrid IT environment, it's probably better to go with a provider that can deliver the full range of those capabilities — from traditional enterprise legacy systems and colocated environments all the way up to cloud.

This is not to say that type of provider can't also accommodate some cloud-native or born-in-the-cloud applications. In particular, traditional organizations that were not born in the cloud need a provider that can take them on the journey to cloud in a way that lets them bring along all the systems currently running their business. Mostly, you want a provider to have all the capabilities in place to get you from traditional to cloud in stages.

ABOUT THIS ANALYST

Courtney Munroe is responsible for IDC's continuous research programs that focus on U.S. and worldwide telecommunications services trends. These include landline and mobile telecommunications, including the analysis and forecasting of demand-side trends and service provider transformation and segment dynamics. Mr. Munroe also works with IDC's regional analysts on IDC's Worldwide Telecommunications Services Database. In addition, he contributes to IDC's consulting program and has managed numerous consulting projects, presentations, and speaking engagements on industry trends around the world.