FORECAST: CLOUDY WITH A CHANCE OF VIRTUALIZATION

Is cloud computing or in-house virtualization the answer to your scalability challenges? Maybe both.

Just about everything your organization does these days generates a data trail. Multiply millions of interactions times daily or weekly backups times years of history and—well, you get the picture. Your data is never going to shrink. In fact, chances are that you'll be managing hundreds of terabytes within just a few years. And as your volume of information grows, the computing power required by the systems leveraging that information will likely expand as well.

Scaling your data center to handle increasingly intensive computing requirements is no mean feat. If you wait until your servers and storage systems are bursting at the seams, the chances of ad hoc expansion and unnecessary infrastructure complexity are high. But by thinking ahead, you can lay the foundation to scale with ease.

UNDERSTANDING THE ENVIRONMENT

A variety of strategies can help manage the data growth headed your way. Two strategies in particular—cloud computing and in-house virtualization—can provide a one-two punch that helps you simultaneously lighten your computing workload and pack more processing power into your existing data center footprint.

Cloud computing allows enterprises to extend the power of their data centers by providing access to computing infrastructure and application platforms as a service over the Internet. But while the term *cloud computing* is relatively new, the technologies behind it are not.

Way back when, in the middle of the twentieth century, organizations that could not fit all their work onto a single mainframe began networking servers together to form clusters; clustering techniques that have been refined over the years now form the basis for cloud computing. Large clusters like the ones offered by cloud computing providers can offer virtually unlimited scalability—so whether your workload sees steady growth or the occasional spike in demand, the cloud can keep up. Alternatively, large enterprises may establish an internal computing cloud when that approach is suitable to specific organizational requirements.

Virtualization is also a major enabler of the cloud. Because it allows providers to partition large servers into many smaller virtual servers that have been rightsized for their assigned tasks, virtualization is the key to the flexibility and cost advantages of cloud computing.

The delivery of software as a service (SaaS) forms the third critical technological component of the cloud computing model. Because both hardware resources and business software platforms are available from cloud providers, you may be able to outsource large portions of your organization's workload to the cloud—which could potentially allow you to reclaim significant data center space or redeploy your in-house infrastructure to handle different tasks.

The final critical component of cloud computing is not a technology at all—it's a payment model. Processing power and other resources are allocated dynamically according to the demands of your workload, then billed like a utility. The utility payment model can be a game-changer in two ways. First, you pay only for the resources you actually use. Instead of funding servers that sit idle in your data center most of the time, cloud computing helps ensure that your IT dollars go toward getting actual work done. Second, the utility model means that computing speed can scale up too. You are not limited to resources that you've purchased and installed in your data center—so you can run large jobs in parallel on

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many servers at the same time, at the same cost as if you'd spent much longer running the same job on a single server.

DETERMINING SUITABILITY TO TASK

However, cloud computing probably isn't the answer to all your scalability challenges. The jobs you run in the cloud must run on whatever software the provider offers—so any applications your IT team has developed to meet unique organizational requirements have to stay in-house. If any software customization is available—which is rare—it will likely be limited. The best candidates for migration to an external cloud may include heavy-duty batch jobs and standard processes that rely on generic business software.

One caveat: Before you commit to a cloud computing provider, review its policies and procedures as closely, just as you would examine those in your own data center. Review the provider's disaster recovery plan and security documents. Check to ensure that your data will be encrypted at every stage, and make sure the facility will undergo security certifications and external audits. Cloud providers are professional data center operators, and therefore they typically have outstanding levels of resilience and security—but don't skimp on your due diligence.

For the tasks you choose to perform in-house instead of outsourcing to an external cloud, virtualization technologies can help you get more out of the server and storage resources in your data center. The same techniques used in cloud computing can deliver benefits by enabling you to use servers at peak efficiency—leaving fewer idle resources and therefore helping to reduce the cost for a given amount of work.

Virtualization also goes a long way toward helping you pack more computing power into your existing data center footprint. Floor space, power, and cooling make up a significant portion of the cost of running any data center, so it is to your advantage to use your available space as efficiently as possible. Virtualization technologies can't actually help you do more work with less computing power—but they can help you get more computing power into a given space.

There is no single answer to the question of how best to scale your data center as computing demands grow. However, cloud computing and in-house virtualization offer a wide range of complementary capabilities that can help your organization not only scale smoothly, but also simplify your IT infrastructure, reduce data center complexity, and cut costs.⏻

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