Perspective

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The Cloud Is Ready for You *Are You Ready For the Cloud?*

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EXECUTIVE SUMMARY

Now that the hype stage is over, it is time for every CIO to take a serious look at cloud computing—what it offers today, and what it will offer in the long term. To that end, we provide a realistic assessment of cloud computing—the companies that are already migrating applications to the cloud, and the vendors that are aiding in the process. Many companies continue to take a cautious approach, using cloud computing primarily to provision their less strategic applications; even so, they are already reaping benefits in the form of variable cost, faster speed to production, and ubiquitous availability to end users. Others are pondering the future of the cloud—its potential to improve flexibility, to free up internal resources for more strategic tasks, and to tie together more tightly the extended enterprise. Meanwhile, the vendors we profile are actively engaged in helping their clients set up private clouds and working to integrate those efforts with their own public cloud offerings.

Cloud computing isn't perfect, and CIOs are right to worry about security, business continuity, data availability, and cost. We propose ways to overcome these concerns, by paying proper attention to vendor reputation, service-level agreements, and pricing schemes. Approaching the cloud as a serious alternative will be well worth the effort—especially at a time when every CIO is looking to cut costs.

DUE DILIGENCE

Despite the hype, the risks, and the doubts, cloud computing is real. Is it perfect? No. Is it the answer to every IT problem? No. But all CIOs should be performing a realistic assessment of cloud computing—its virtues and pitfalls—and working to understand how it can benefit their companies now and in the future.

And the time is ripe: The current economic downturn has put pressure on many corporations to cut costs, to do more with less. Cloud computing's typical pay-as-you-go model offers the immediate opportunity to gain some easy wins by moving a variety of commodity business applications to the cloud. Over time, as cloud computing becomes more sophisticated, it has the potential to host more strategic applications, as well as significant portions of the IT infrastructure. And by paying only for the computing resources used, companies can reap significant gains in utilization, while converting onerous capital expenditures to operating expenditures *(see Exhibit 1)*.

Cloud computing offers immediate cost savings today, even as it promises a future of greater agility, speed, and reach. And it can be implemented in phases, without the need to "rip and replace" applications across the enterprise. An intelligent, carefully timed transition to the cloud can be a significant competitive advantage for early movers.

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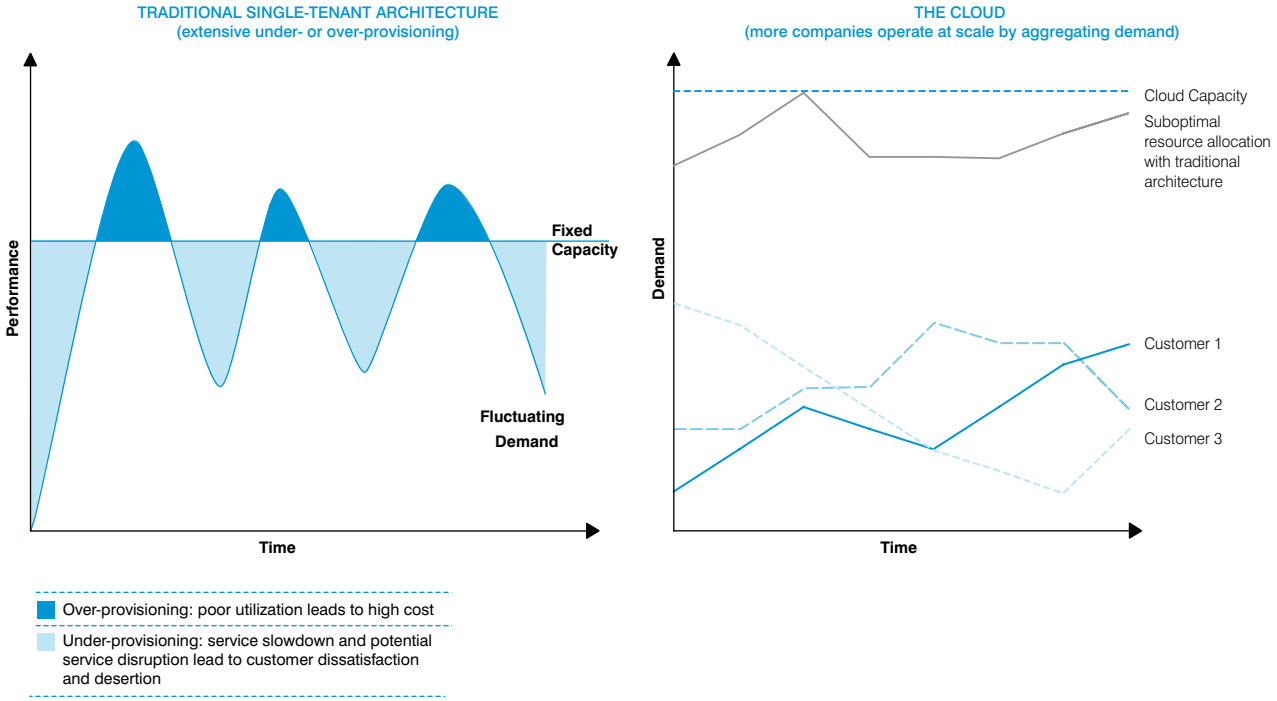
Yet cloud computing has its risks. Security remains a concern among many CIOs, as does the fear of data being permanently captured by vendors. And will the promise of virtually infinite scalability really hold up under actual production conditions? All of these issues, both positive and negative, demand serious due diligence on the part of CIOs before they commit to cloud computing.

Exhibit 1
Cloud Computing Helps Companies Resolve Utilization Issues by Aggregating Demand



Source: Booz & Company analysis

THE CLOUD IS HERE

What is cloud computing? At its heart, the concept is relatively simple. In our view, it consists of two primary parts:

- *Utility computing:* The variety of infrastructure services, including storage, network services, and computing power, offered by third-party providers on an on-demand, as-needed basis

- *Software as a service (SaaS):* Any application, from Google Apps to e-mail to ERP to customer relationship management system, that is hosted by a third party and provisioned on a scalable, as-needed basis[1]

Neither of these elements is especially new. Utility computing, a concept that dates back to mainframe time-sharing of the 1960s, sprang to life again in the early 2000s, with such offerings as IBM's On Demand computing. And SaaS began life as the application service providers (ASPs) of the late 1990s. So why is cloud computing suddenly popular?

Much of the reason lies in the sheer increase in computing and communications speed, on several levels. Pervasive, cheap broadband has made a difference, as have richer user interfaces such as Ajax and other emerging Flash-like applications. Meanwhile, the number of applications and the amount of content in the cloud available to both consumers and corporations have grown to a critical mass.

Despite these advances, however, cloud computing isn't perfect. Currently, the cloud can accommodate a variety of important, if straightforward, business applications such as e-mail, calendars, and CRM. More complex applications responsible for managing, say, a company's core financials or its supply chain present a bigger challenge. What factors should influence the decision to move to the cloud, now or in the future, and how should CIOs time the move, given both the risks and the benefits?

The number of applications and the amount of content in the cloud now available to both consumers and corporations have grown to a critical mass.

A CASE FOR THE CLOUD

John Kalka, vice president of core systems deployment at Ingersoll Rand, faced a critical decision. His company, a US$17 billion manufacturer of diversified products, had long used IBM's Lotus Notes as its e-mail and collaboration platform. While the company was not entirely satisfied with Notes, every time the option of changing platforms came around, the cost of switching to Microsoft Exchange prompted further delays.

Two years ago, when the choice came up again, a big change had occurred, Kalka notes. "Microsoft was launching a new cloud computing service for Exchange. That entirely changed the cost structure, from a fixed cost to a variable cost, and IBM could not match that." Since then, Ingersoll Rand has incorporated other Microsoft products, including Live Meeting and Forefront antivirus software, into its application portfolio. The next step: moving the company's SharePoint collaboration and social networking environment onto Microsoft's cloud.

While Kalka concedes the technological risk in making the move to the cloud, he notes that the biggest motivator for Ingersoll Rand lay in the fact that the company is a shared services organization. "Our philosophy in shared services," he says, "is that because we don't sell our services back directly to the business units, we are always trying to make our costs both variable and transparent. The goal is to give the businesses the levers to control their own costs. That's always good business."

Kalka estimates that his company's fixed cost for support of Notes worldwide was about $5 million a year. By moving to Exchange in the cloud, he can now offer his business units e-mail for $10.50 a month per user—if they want the fully functional package. The costs go down from there, to $7.50 without mobile connectivity, and even lower for versions with fewer features. "Not only do I now have a variable cost, but I've created a menu of options," Kalka says. "I've given the business the ability to

reduce costs even more. They can take it down to $5 per user if they want to, and with the current economic environment, many are willing to do that."

Of course, moving to the cloud for Exchange and SharePoint is one thing; moving more complex, business-critical applications, such as warehouse management, is another. Kalka points to two factors that limit his company's willingness to begin a more widespread transformation. The first is economic: Despite the attractive long-term savings, moving more applications to the cloud requires a significant initial investment, one that will have to wait for better economic times. The second involves security, and that depends on the organization's willingness to accept the risk of lost data, the commingling of data with other companies' data, and the risk of sharing infrastructure with other companies. Kalka likens it to standard infrastructure outsourcing, but with less control over the details.

Despite his reservations, Kalka continues to plan for a future in the cloud. To a significant degree, those plans depend on when Ingersoll Rand's strategic partners, such as Oracle, create the opportunity. But even before that happens, Kalka says, his company has to be ready. The transition to Exchange in the cloud would never have been possible back when Ingersoll Rand was running five or more e-mail systems across the enterprise; only by standardizing on Lotus Notes could it then make the move to Exchange. Kalka's future investment plans center on creating similar environments for other, more strategic applications. Says Kalka: "We will look at moving applications to the cloud that, first, are compartmentalized so that we can easily understand them and, second, have already been standardized across the company."

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WHAT TO WATCH FOR

Like any other technological frontier, the cloud has its pitfalls. Every enterprise that plans to trust applications and other computing services to a cloud computing environment needs to address the following issues before the first service contract is signed:

- *Security:* Few companies are comfortable allowing sensitive data to reside outside their firewalls, and trusting vendors to provide adequate security is equally difficult, especially when there is a chance that the cloud environment may include other organizations' data as well. When evaluating a cloud vendor, enterprises should look carefully at its track record with other customers' data and its security infrastructure, including network and server access, data backup, and encryption and authentication policies.

- *Vendor reputation:* Don't be the test case for the vendor's competence. Most cloud vendors quickly build a reputation (positive or negative) around their service uptime and performance, customer service, and technology infrastructure. Get references from other customers, discuss with colleagues, and read reviews on the blogosphere.

- *Iron-clad service-level agreements:* As with any infrastructure contract, an SLA governing service uptime, response time, and troubleshooting escalation paths needs to be clear and consistent with your enterprise's business objectives.

- *Business continuity plans:* The 24/7 uptime of cloud computing vendors can be a major attraction. Still, because vendors keep critical data outside customers' firewalls, their business continuity plans, including data protection and backup and disaster recovery policies, must be examined closely.

- *Exit path:* What happens when the customer decides to terminate a cloud computing agreement? Will the data be available immediately? Will the vendor keep any of it? Are there any financial penalties? What happens if a vendor goes bankrupt or is acquired by another company?

- *Vendor pricing model:* While subscription-pricing models for cloud-provisioned applications and services are generally simpler than licensed models, it is critical to understand the many variations. Some models are based on the amount of traffic and storage needed, others on the number of users, and still others on CPU time. In choosing the best pricing scheme, CIOs must understand how the cloud service will be used and how frequently the terms of the subscription can be changed.

The Vendor Perspective

The number of vendors offering cloud services is increasing rapidly. Here, two major Indian outsourcing firms, Wipro Technologies and HCL Technologies, offer their thoughts on the cloud and what it will mean to their enterprise clients.

Wipro began its cloud computing efforts by building a private cloud for its own internal purposes. Now it is offering its expertise in building private clouds and hybrid public–private infrastructures to existing customers to optimize the computing power of their data centers. "Instead of moving right to public cloud offerings, we see more and more organizations leveraging cloud computing principles, tools, and techniques in-house by setting up private clouds behind their firewalls," says Nitin Narkhede, general manager for technology strategy and innovation at Wipro.

The firm is also building what it calls the "enterprise cloud," a capability it plans to offer clients who have already outsourced or plan to outsource their hosting or infrastructure management activities with Wipro. Wipro also plans to use this cloud to host its own SaaS offerings, such as document management as a service and electronic data interchange as a service.

What are customers looking for? Currently, infrastructure-as-a-service technologies are the most commercially mature. Companies are showing great interest in public clouds for applications performing one-time tasks, such as pharmaceutical research applications requiring large amounts of computing power, as well as other short-term infrastructure needs such as development and test environments and disaster recovery. However, Narkhede believes that in the future, SaaS will provide the cloud's greatest value.

Like his counterpart at Wipro, Kalyan Kumar, HCL's global practice director for Internet technology services and architecture and technology group, believes that much of the early action among large enterprises is coming in the form of private clouds, which take advantage of increasing levels of virtualization and data center consolidation but have the benefit of remaining inside the company's firewall. "They may not have the scale benefits of public clouds," he notes, "but they keep data within the company's control."

Despite the growing sophistication of the cloud, Kumar notes that cloud vendors must overcome organizations' concerns around three key challenges: reliability, portability, and security. Only by firming up service-level agreements with regard to these three critical concerns will large enterprises grow more willing to turn to public clouds for critical computing functions.

THE COST OF APATHY

The virtues of cloud computing are many, but so are the risks, especially for large enterprises. Yet the cloud is now sufficiently viable that it should be on every CIO's radar. Its pay-as-you-go model for application provisioning offers clear advantages, especially during tough economic times. Smart and aggressive CIOs will take advantage of cloud computing to lower costs and manage risk now, while preparing for more extensive use of the cloud in the coming upturn. Those who choose to wait out the recession before venturing into the cloud will find themselves at a competitive disadvantage.

Endnotes:

[1] In their definition of cloud computing, many commentators also include third-party platforms designed for application development, sometimes called "platform as a service." Valuable as that service may be to many organizations, we have excluded it from our definition of cloud computing, and from the scope of this Perspective.

About the Authors

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