Cloud Computing Hits the Mainstream

Promises of low costs for IT and agility for business

It was only a few years ago that the potential of cloud computing was the subject of considerable doubt and debate. Today there are still debates about cloud computing, but the subject has changed from "Does cloud computing make sense?" to "How can we most effectively add cloud computing to our IT strategy, and what technology and business benefits can we realize through that effort?"

Although skeptics remain, conventional IT and business wisdom now accepts that cloud computing is not only useful but might also be seen as a requirement. Properly implemented and leveraged, cloud infrastructures can give companies greater efficiency, flexibility and scalability in their IT operations, compared to traditional fixed-function computing silos and platforms. The advantages conferred by the cloud can include low capital and operational expenses and—ultimately—the possibility for improved profitability and business competitiveness.

Because of cloud computing's significant impact across both IT and the business sphere, it's important that financial managers as well as IT managers become involved in their companies' cloud strategies. Among the issues that teams of IT and financial managers need to address: which form of cloud computing to use, which applications to deploy to the cloud, how to ensure cloud security and what costs and benefits to expect in the early and later stages of their cloud journeys.

To assess current cloud perceptions and plans at play across today's corporate landscape, IDG Research Services recently conducted an AMD-sponsored cloud computing survey that drew responses from 100 IT managers and 106 finance managers.[1] The respondents work at companies in more than a dozen industry sectors, although nearly half are financial services, real estate or insurance firms. Of the represented companies, 39 percent have revenues of less than $250 million and 10 percent have revenues of $30 billion or more. The online survey was conducted from mid-December 2011 through early January 2012.

CLOUD COMPUTING DEFINITIONS AND VARIATIONS

Although *cloud computing* has become a pervasive term, its definition seems to be quite malleable. Most industry participants would agree that cloud infrastructures share some common traits. Among the most fundamental of these characteristics is the cloud's use of a virtualized server infrastructure, which can make it easy for companies to create pools of processing, storage and networking resources. These resource pools, in turn, can be dynamically allocated to support application workloads on an as-needed basis. Other common cloud characteristics: Users can tap cloud resources on demand, and companies or cloud service providers can charge for that access via monthly subscriptions, usage- or capacity-based fees or some other metered model.

As suggested by its name, the first instances of cloud computing appeared as "Internet cloud" services offered by third-party service providers. This original form of cloud computing, today labeled the "public cloud," has since been joined by "private" and "hybrid" cloud variants. Simply put:

Public clouds include Internet-based offerings including software as a service (SaaS), platform as a service (PaaS), infrastructure as a service (IaaS) and other offerings provided by commercial service providers including Microsoft, Amazon, salesforce.com and many others.

Private clouds are inside-the-firewall IT deployments at companies seeking to mimic the efficiency, virtualization, scalability, flexibility and on-demand access capabilities demonstrated by public cloud infrastructures.

Hybrid clouds represent a strategic blending of private and public cloud infrastructures, with each element chosen to perform the tasks best suited to its performance, scalability and security profile.

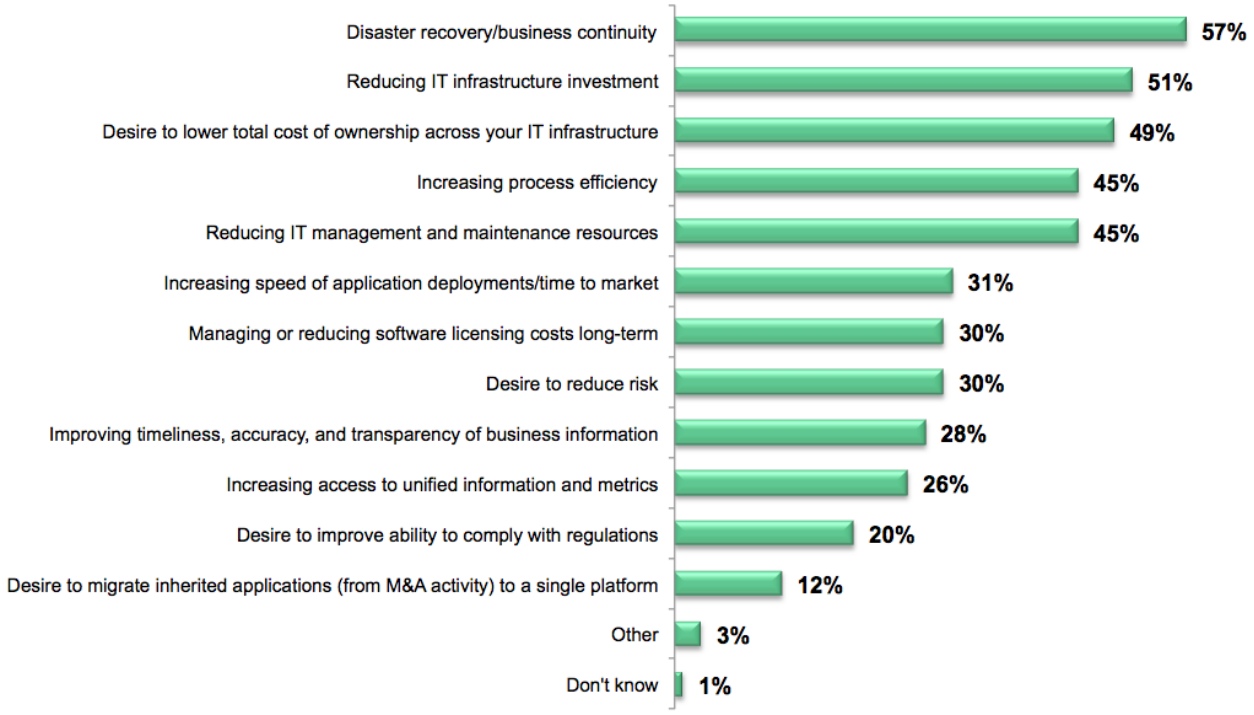
The IDG Research survey indicates that finance managers and, especially, IT managers are most familiar with the public cloud and private cloud variants. Among the survey respondents, 98 percent said they were "very familiar" or "somewhat familiar" with private clouds and 96 percent said the same about the public cloud. The respondents' awareness of hybrid clouds was lower, but still a respectable 72 percent.

The survey also sought to gauge the proliferation of private/hybrid cloud deployments (with the latter, by definition, including a private infrastructure element). The results show that the adoption of private/hybrid cloud infrastructure is well under way. More than one-third of the respondents said their organizations have already deployed clouds either enterprise-wide (19 percent) or department-wide (16 percent). Another 11 percent are currently piloting private/hybrid cloud deployments, and 17 percent are planning such deployments. That left just over one-third of the respondents saying they were still at the stage of either evaluating (16 percent) or considering (20 percent) private/hybrid clouds.

CLOUD COMPUTING DRIVERS, APPLICATIONS AND OUTLOOK

The IT and finance managers surveyed cited a variety of drivers behind their adoption of cloud computing. Most of these drivers either explicitly or implicitly involve lowering the total cost of ownership (TCO) of the IT infrastructure. As shown in Figure 1, five drivers were each cited by at least 45 percent of the survey respondents, led by disaster recovery/business continuity, which played a role in the cloud investment decisions of 57 percent of the respondents.

FIGURE 1 DRIVERS BEHIND RECENT CLOUD INVESTMENTS



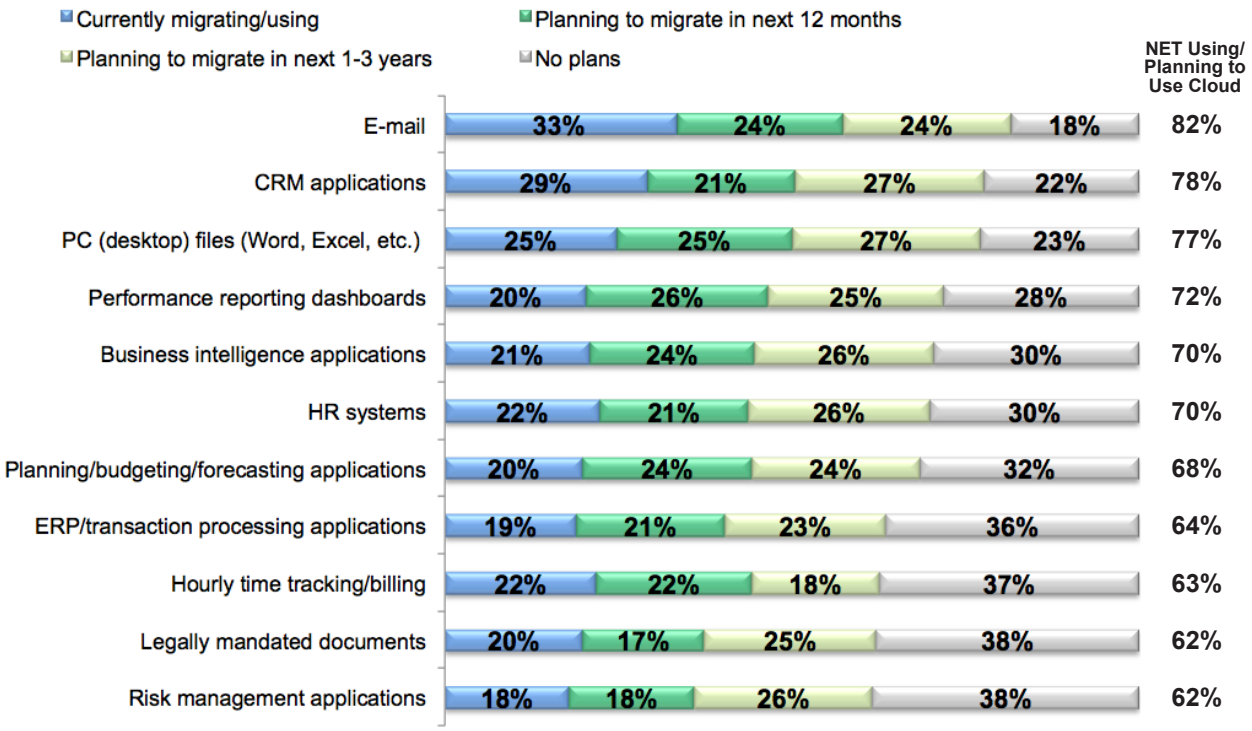
SOURCE: "Cloud Computing: Viewpoints of IT and Finance Executives," IDG Research Services, January, 2012

Despite the many incentives to move to the cloud, respondents did mention some concerns. As has been the case in most previous cloud computing surveys, the security of data and applications residing in the cloud ranked as the top concern, with 68 percent of the IDG Research survey respondents citing this issue. Diving deeper into the cloud security issue, however, this survey demonstrated that this perennial concern is no longer as worrisome as it was in the early days of cloud computing. Nearly 90 percent of the respondents said they are either very confident (23 percent) or somewhat confident (64 percent) in the security of the data their organization has placed in the cloud.

This mitigation of the security concern makes sense to one of the IDG survey respondents, Mike Lemire, director of Information Security at Burlington, Mass.–based Acquia, Inc. Acquia is both a user of cloud services and a cloud service provider itself, offering cloud-based PaaS and SaaS solutions based on the open source Drupal content management platform. Acquia uses the public cloud Amazon Web Services (AWS) infrastructure for its own corporate IT needs as well as for hosting the Drupal-based content management system service it sells. The Acquia cloud infrastructure, on which it hosts thousands of customer Websites, is manageable for the company to secure, given that it is a common and consistent platform for all of those customers, rather than a multitude of separate and distinct environments with divergent technologies. The security of the Acquia environment is also managed by Lemire and other security professionals devoted specifically to that task. "We can more efficiently keep up with security updates and other needs than can enterprises—regardless of their size—that are running a distinct environment on their own," Lemire says.

Based on survey results, business are poised to embrace the incentives of cloud computing over any cloud concerns. Survey respondents indicated that they plan to deploy a broad range of applications to the cloud. More than 60 percent identified nearly one dozen critical application workloads they expect to be cloud-based within three years (see Figure 2). E-mail led the way in this ranking, with 33 percent saying they are already using cloud-based e-mail or currently migrating to it, 24 percent planning to migrate in the next 12 months and another 24 percent saying they will migrate to cloud-based e-mail in the next one to three years.

FIGURE 2 CLOUD USAGE/PLANS BY APPLICATION



SOURCE: "Cloud Computing: Viewpoints of IT and Finance Executives," IDG Research Services, January, 2012

On average, the survey respondents anticipate that more than half of their organizations' business applications will be cloud-based within five years.

TECHNICAL AND COST BENEFITS REALIZED FROM EXISTING CLOUD DEPLOYMENTS

Many of the survey respondents have had enough experience with their own cloud deployments to be able identify the main benefits they're realizing from this computing and service delivery model. The technical paybacks obtained were led by two benefits, each cited by 39 percent of the respondents:

- Improved ability to access data from anywhere
- Simplification of the infrastructure

Four other technical benefits were cited by at least 30 percent of the respondents: more efficient and scalable application delivery (36 percent), improved data management ability (35 percent), improved ability to manage applications (33 percent) and increased agility in bringing in new business applications (31 percent).

Beyond these technical benefits, most—but not all—of the respondents also saw clear cost benefits accruing from their cloud deployments. More than half (54 percent) said they had seen either significantly or somewhat reduced hardware costs, whereas just 15 percent said they had experienced significantly or somewhat increased hardware costs. Also, 46 percent said they had realized significantly or somewhat reduced software costs, with just 13 percent saying those costs had significantly or somewhat increased. In a similar fashion, there were many more respondents reporting cost reductions in real estate/physical space, IT services and IT staffing than there were respondents citing cost increases in these areas.

William Woods University, based in Fulton, Mo., is an example of an organization that has realized many of the technical and cost benefits commonly identified in the survey. "One of my first IT goals when I arrived at the university was to remove location from every problem," says Jim Long, IT director at the school. That led Long to replace the personal computers in the campus labs with either thin clients or kiosk computers, using a desktop virtualization model to shift all the processing and data storage to a central private cloud environment. This model enables students and staff to access needed applications and their own data from any location, using the school's client machines and/or their own devices, be they PCs, tablets or smartphones.

In addition to helping improve the computing experience of students and other IT users, the virtualized private cloud model can help pay big dividends to the university and its IT department. "The biggest driver for me is TCO," Long says, noting that he has saved nearly $30,000 just by swapping out the school's PCs for less expensive thin-client devices. The centralized cloud model has also enabled Long to stop overpurchasing software licenses (since he can support more students with fewer application licenses by using the shared, virtualized cloud model) and has reduced other expenses such as the maintenance costs formerly associated with servicing distributed PCs.

Not all the survey respondents are tracking the return on investment (ROI) of their cloud computing investments—only 42 percent say they are doing so—but those measuring ROI expect relatively rapid payback. Of those who say they are tracking ROI, 41 percent expect to achieve it within 12 months or less, 28 percent expect ROI in 12 to 24 months and 22 percent expect ROI in 24 months or more.

OPTIMAL CLOUD INFRASTRUCTURE DELIVERS OPTIMAL CLOUD BENEFITS

Companies seem to be recognizing that the underlying infrastructure is critical if they hope to achieve the maximum TCO and technical benefits of their cloud investments as well the fastest ROI. Many elements go into creating a state-of-the-art virtualized cloud infrastructure, but perhaps no variable is more critical than the microprocessors at the heart of the servers powering the cloud. Although they are sometimes overlooked, the servers' microprocessors can make the difference between high-performing and cost-efficient cloud environments versus sluggish, unduly expensive cloud deployments.

One microprocessor supplier, AMD, has designed features and capabilities into its devices with an eye toward making them ideal engines for powering virtualized cloud environments. The AMD Opteron™ 6200 Series processor is the industry's first x86 processor with as many as 16 cores[2] and, as such, is perfectly suited to meet the demanding needs of private as well as public clouds. Combined with AMD's embedded AMD-V™ virtualization features, the AMD Opteron 6200 Series processor is able to use its 16 cores to help reduce virtualization overhead and minimize latency. To enable more-robust virtual machines (VMs)[3], some users might dedicate one or more of the 16 cores to each VM, whereas other applications, including virtual desktops, might permit users to place four or more VMs on each core.

Servers based on the AMD Opteron Series processors also include large amounts of high-speed memory and channel bandwidth, a combination that can enable clouds to handle more transactions simultaneously and to help provide shorter response times. Having more cores also helps cloud operators scale their operations more easily during peak workloads and reduces energy consumption and cooling demands.

As the IDG Research survey makes clear, cloud computing initiatives are well under way at many companies, large and small, and these initiatives are poised to deliver significant technical and business dividends. That said, cloud deployments require careful planning and purchasing—and should include the involvement of IT as well as financial managers—if they are to deliver optimal results. As part of their journey to the cloud, it is critical that these managers consider how each and every infrastructure element will affect the success of their cloud initiatives. When they perform these assessments, the managers are likely to discover that a critical and top consideration of the cloud puzzle is the microprocessor running at its core.

[1] Cloud Computing: Viewpoints of Finance and IT Executives. IDG Research Services. January 2012. For this AMD-funded research, IDG interviewed a total of 206 IT managers and finance executives between December 2011 and January 2012.
[2] Comparison of 16-core AMD Opteron 6200 Series processor with 6-core Intel Xeon 5600 Series processor and 10-core Intel Xeon E7 Series processors as of November, 2011. **SVR-30**
[3] Intel Xeon 5600 Series = 504 cores per rack ((2x6-core) * 42U), AMD Opteron™ 6200 Series = 1344 cores per rack ((2x16-core) * 42U). AMD could achieve 504 cores in only 16 nodes, taking up 61% less rack space. In a 2P Intel-based server, each core has 11 other cores to poll for low-latency data before having to reach out to the cluster fabric; AMD has 31 other cores to poll for 180% greater likelihood of finding low latency data at the node level. **SVR-55**

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