



S1

Ahead in the Cloud

Cloud computing's lofty concept has started a high-performance, cost-saving revolution

You probably did some cloud computing this week. The last time you posted a photo on Facebook, sent an email with your Google account or bought something on Amazon.com, you put a finger in the cloud.

Once you upload that photo, you ensure that it no longer solely exists on your laptop. A copy is now living elsewhere—maybe multiple elsewhere. And the physical computer servers that hold your data could be continents away.

IN PARTNERSHIP WITH
 **Cloud Slam'11**
Cloud Computing Virtual Conference
April 18 - 22, 2011 Mountain View, CA and Virtual



ACCELERATE THE JOURNEY TO YOUR CLOUD

EMC²

1 ZETABYTE (ZB) EQUALS
1,000,000,000,000 MEGABYTES (MB)

2020: **35 ZB**

By now, the advantages to this are too commonplace to excite. You can amble into an Internet café halfway around the globe and instantly inform 90 friends that you just did so. You don't need to buy any software or hardware, or really anything at all—except a few minutes of Internet access, and maybe an overpriced coffee. If you have a smartphone, you don't even need a 'Net café.

What's more, if you dropped your laptop and smartphone into a volcano, your Facebook photos and Google emails would remain unscathed. The precious data on your laptop or the phone's memory card? It would be gone, of course—like the pricey software you bought and loaded onto those gadgets.

You'd get over it. But what if your laptop was, instead, a fleet of essential servers that allowed your midsized business to connect with employees, clients and prospects? The healing time would be much longer.

Convenience and peace of mind are important motivators. But when you add drastic cost savings and increases in efficiency, it's clear to see why implementing a cloud strategy is becoming a no-brainer for business leaders and CIOs across the world.

The perks of pay-as-you-go

"In most enterprises today, 70 percent of the IT budget is consumed by keeping existing systems running," says Josh Kahn, vice president of cloud computing at EMC Corp., a global information technology company. In addition to the fixed costs, new investments must be made to maintain pace with exploding data needs. "Corporate data needs are projected to increase 44 times by 2020," says Kahn. "This will be an astounding blow to companies who have built a rigid and silo-ed infrastructure that can't expand to meet those demands."

It can cost tens of millions to construct and manage an on-site data center that can meet such data needs and keep a business operational. On-demand business computing, via cloud technology, can drastically slash those costs.

"Enterprises now have the option of investing the time and money to build additional servers or getting a new server from a cloud provider in minutes. All they need is a credit card and a cloud provider they trust," says Kahn. You can buy more virtual storage and processing power during peak times, and then—unlike onsite hardware—jettison the excess in slow times. That flexibility offers new market opportunities to businesses that lack enough capital to carry peak storage space and processing power all year round.

S3

The Sky Is No Limit

\$10

estimated cost per hour of HPC data on demand, according to Cloudcor



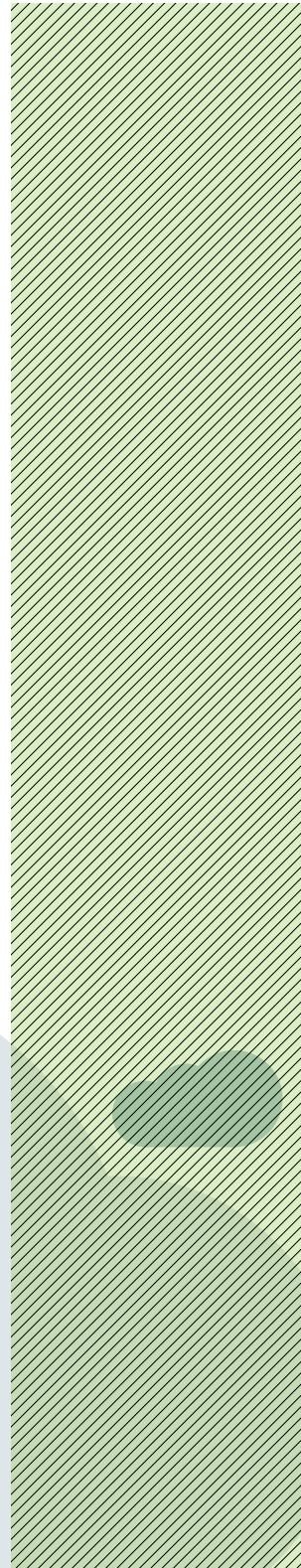
It is estimated that the digital sector will comprise 23% of the U.S. GDP by 2020

SOURCE: GARTNER

Corporate data needs are projected to increase 44 times by 2020

SOURCE: IDC

2009: **0.8 ZB**



Beats the

*“my forecast calls for more clouds,
and more clouds calls for more cores”*

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The conversation has changed from just virtualization...



Where Does the Cloud Revolution Stand?

“Right now, cloud computing is in the ‘slope of enlightenment’ phase of the hype cycle,” says Khazret Sapenov—the founder and CEO of Toronto-based Cloudcor Inc.

The state of the cloud will be among the topics

discussed at Cloud Slam '11 (cloudslam.org)—Cloudcor’s third annual industry conference—April 18–22 in Mountain View, Calif. Cloudcor expects more than 10,000 participants from around the world, both in person and virtually. There’s an expo showcase, and a live event on April 18 in Silicon Valley, but, fittingly, most of the presenters and attendees will participate virtually.

Those wishing to attend in person and/or online can do so by purchasing a conference ticket (\$99–\$299). Bloomberg Businessweek readers can take

“Cloud computing provides a level playing field across all business types,” says Khazret Sapenov, founder and CEO of Cloudcor. A small bank, for example, can leverage the power of the cloud to gain pay-as-you-go access to extremely advanced apps and services. “It doesn’t need to have a multibillion-dollar budget to compete,” says Sapenov.

Cloud technology can be just as democratizing to professionals who need access to high-performance computing (HPC) to solve scientific problems, says Sapenov. “Before cloud computing, HPC was a very elite and closed market. Now, there’s HPC on demand; instead of needing tens of millions of dollars to build a data center, the cloud puts an HPC data center at your fingertips for \$10,” says Sapenov.

Leaner and greener

Obviously, tapping resources from the cloud allows businesses to have much less expensive (and energy-devouring) equipment on-site, which can make an operation more

streamlined and environmentally sound while increasing its output. For example, after Cisco Systems Inc. implemented a cloud strategy for a Pittsburgh, Pa. trucking company, the business was able to reduce its 35 racks of servers and networking equipment to just five. The new technology requires just six server connections, down from 40. (Cisco says that, on average, the businesses it helps switch to cloud-based platforms and delivery systems see physical server counts reduced by 50 to 60 percent.)

Implementing cloud technology at the trucking company created vast increases in the speed of backups and other business-critical operations. Restoring a downed server previously took more than a day and involved several employees; since the company adopted the Cisco Unified Computing System, restoring a 15-gigabyte server via cloud technology takes only five minutes. The trucking business estimates that the Cisco cloud implementation has resulted in a 20-fold increase in productivity.



Cloud Power

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"As with years previous, this enables global, senior level executives to meet in a secure, convenient, efficient and reliable capacity to discuss the future direction and vision of the cloud," says Sapenov.

Leading players like Microsoft Corp., PwC, Verizon, Fujitsu, Fabasoft, AMD and others will be featured in full force, "but you'll also see a number of smaller and start-up companies with new solutions to debut," says Sapenov.

"Participants will see the next wave of cloud technology—and very prominent presenters."

Cloud Slam's robust attendance and significant growth of their cloud computing community on LinkedIn (over 60,000 members in www.cloudslam.org/li) are signs that the sun is shining on the cloud. "The disillusionment is fading, and businesses are starting to understand the benefits and practical applications of the cloud," says Sapenov. That is leading to greater investment: Surveys by International Data Corporation (IDC) have predicted that, by

2014, the revenue from cloud computing services in the U.S. alone will increase from \$11.1 billion to \$29.5 billion in the public sector, and by about 60 percent (from \$7.3 billion to \$11.8 billion) in the private sector. Worldwide, the projected growth in revenue shows how borderless the cloud revolution is: Cloud revenue could climb from about \$58 billion in 2009 to as much as \$149 billion by 2013, according to Gartner Research. ●



(Cloud) power to the people

Increasingly, you can keep the power of the cloud at your fingertips. "Cloud computing can deliver access to applications and data for a broad range of client and mobile devices," says Patrick Patla, vice president and general manager of the Server and Embedded Division at AMD, a global technology company. "This means people can now choose the type of client devices that work the best for them—smartphones, ultra-thin notebooks, tablets, thin clients or standard desktops."

Interestingly, the mobile and social networking aspects of cloud technology can do more than solve a scientific problem—they can change the course of history. "We saw some of the power of social and mobile cloud computing in Egypt this past winter," says Sapenov, noting how protesters used social networking sites and mobile devices to communicate and organize. "Cloud computing allows social and mobile technologies to be more robust, more elastic and more available, and this can help societies

transform themselves."

Given that the cloud first began as a medium for individuals to interact, much of what you'll find stored or processed in the cloud is videos, photos and music. "We think that an integral part of the cloud is the delivery of visual and audio data, whether it's videoconferencing or the soundtrack for your movie," says Margaret Lewis, director of software solutions at AMD. "We just introduced a client technology that puts CPU and GPU [graphics processing unit] cores on the same processor, so that you're getting all that function with one piece of silicon. Technologies like this can help the cloud deliver high-quality visual and audio content, with a fidelity that's similar to the television or stereo in your home."

Lingering obstacles

The cloud computing industry must overcome certain issues before the model gains widespread acceptance, and none are greater than concerns about security.

...to private cloud.

See the back cover to find out how Windows Server is changing the conversation.



“People still have to overcome a psychological barrier to trust their data to the cloud,” says Sapenov. “The fear largely stems from past instances where outsourced solutions were breached—even though the breaches were not related to cloud technology. Going forward, security-oriented concerns will naturally become less prohibiting. We only have to look at the age of e-commerce to see that evolution and efficiency realities will ultimately prevail.”

While every IT professional knows that online security is a moving target, many believe that the fears that data can be more easily compromised in the cloud are overblown. “Ironically, companies looking to public cloud offerings are often demanding a greater level of security from these cloud models than they actually provided for themselves in their own data center,” says Lewis. “People think that something is more secure because it’s on their own premises, but that’s not always the case.”

“As cloud technology matures, hardware and software will have greater interoperability to take advantage of security features that already exist,” adds Patla. “In the cloud, security needs to happen at all levels,” he explains. “We might have solid, hard hooks in our processors to help make virtualization environments more secure, for example, but you need the hypervisors and/or management software to use these hooks.”

Creating your cloud strategy

“There’s a great deal of confusion among businesses about the best way to move to cloud computing, and what the different options are,” says EMC’s Kahn. It’s important to remember that you can take baby steps; moving toward cloud technology is not an all-or-nothing proposition.

Cloud experts overwhelmingly agree that “virtualization” is the first step to developing a cloud. “Every business should consider moving to virtualization today for the flexibility and cost savings it can bring,” says Patla. Basically, virtualization uses a centralized server to provide multiple virtual environments over a network, with each environment running different operating systems and applications simultaneously with little or no loss of server throughput.

When cloud computing providers say, “SaaS,” “Pass” and “I as,” they’re referring to the three most typical deployment models of cloud technology. This is what they mean:

SaaS: Pronounced “sass,” it’s an acronym for a cloud deployment strategy known as software as a service. Also called “software on demand,” it’s the simplest and most common form of cloud computing. You tap software from the cloud (rather than buying it outright and loading it onto your computer), often paying for usage in time increments.

PaaS: Pronounced “pass,” it’s an acronym for platform as a service. Rather than just renting individual Web-based applications

when you need them, you’re tapping an operating system that your applications will use; a network; and a service provider that will perform basic maintenance of this network when necessary.

IaaS: Pronounced “I as,” this is an acronym for infrastructure as a service. IaaS is closer to the full monty of cloud computing services. You rent just about everything as you need it: virtual servers and storage space, virtual routers and other hardware, networking capabilities, an operating system and applications. Your host (cloud provider) will offer more extensive services and maintenance with an IaaS model. You still pay as you go (usually hourly or monthly), and you can scale up or down. ●

The next step for most businesses is to establish a private cloud. “At EMC, our view is that a private cloud is the best place to start,” says Kahn. “It combines the simplicity and flexibility of public clouds with the reliability and control of enterprise IT.” With a private cloud, a company’s internal IT staff can design, build, manage and control every aspect. It’s a customized product for the organization’s use only, and offers the greatest security and control.

Many businesses will choose to move their less business-critical data and applications—such as human resources processes, rather than product ordering and shipping—to the private cloud first. “This allows you to virtualize some of your IT needs in low-risk ways, gaining experience and early wins without creating undue risk to the business,” Kahn explains. “The next step in the journey is virtualizing the mission-critical applications, and now the organization has the technology skills and best practices needed to take on these critical applications with less risk.”

Eventually, many businesses will want a more flexible and fully optimized “hybrid” cloud, says Kahn. “The hybrid cloud will be the dominant cloud model,” he predicts. “Hybrid clouds give companies an opportunity to pick which applications and IT services they want to provide and which they want to purchase from a public cloud provider. These decisions will be based on costs, information risk and the functionality available from cloud providers on a workload-by-workload basis.” In this model, your IT staff can keep internal control of data and processes, but you can also tap a public cloud for pay-as-you-go use of applications, computing power and scaleable storage.

“For IT managers, cloud computing achieves the flexibility they need to solve their unique challenges—whether it’s providing more comprehensive support for a mobile workforce, offering 24/7 access to business-critical data and applications or achieving a more cost-effective IT strategy for the company,” says Patla. With thousands of early adopters learning daily how to better use cloud technology to gain competitive advantages, waiting to develop a cloud strategy for your organization could become an increasingly costly mistake. ●

“There’s a great deal of confusion among businesses about the best way to move to cloud computing, and what the different options are.”

—Josh Kahn, VP of Cloud Computing at EMC

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