

How Cloud Computing Is Changing the World

A major shift in the way companies obtain software and computing capacity is under way as more companies tap into Web-based applications

By [Rachael King](#)

At first, just a handful of employees at Sanmina-SCI ([SANM](#)) began using [Google](#) Apps ([GOOG](#)) for tasks like e-mail, document creation, and appointment scheduling. Now, just six months later, almost 1,000 employees of the electronics manufacturing company go online to use Google Apps in place of the comparable [Microsoft](#) ([MSFT](#)) tools. "We have project teams working on a global basis and to help them collaborate effectively, we use Google Apps," says [Manesh Patel](#), chief information officer of Sanmina-SCI, a company with \$10.7 billion in annual revenue. In the next three years, the number of Google Apps users may rise to 10,000, or about 25% of the total, Patel estimates.

San Jose (Calif.)-based Sanmina and Google are at the forefront of a fundamental shift in the way companies obtain software and computing capacity. A host of providers including [Amazon](#) ([AMZN](#)), Salesforce.com ([CRM](#)), [IBM](#) ([IBM](#)), [Oracle](#) ([ORCL](#)), and Microsoft are helping corporate clients use the Internet to tap into everything from extra server space to software that helps manage customer relationships. Assigning these computing tasks to some remote location—rather than, say, a desktop computer, handheld machine, or a company's own servers—is [referred to collectively as cloud computing](#) (*BusinessWeek*, 4/24/08), and it's catching on across Corporate America.

The term "[cloud computing](#)" encompasses many areas of tech, including software as a service, a software distribution method pioneered by Salesforce.com about a decade ago. It also includes newer avenues such as hardware as a service, a way to order storage and server capacity on demand from Amazon and others. What all these cloud computing services have in common, though, is that they're all delivered over the Internet, on demand, from massive data centers.

A SEA CHANGE IN COMPUTING

Some analysts say cloud computing represents a sea change in the way computing is done in corporations. [Merrill Lynch](#) ([MER](#)) estimates that within the next five years, the annual global market for cloud computing will surge to \$95 billion. In a May 2008 report, Merrill Lynch estimated that 12% of the worldwide software market would go to the cloud in that period.

Those vendors that can adjust their product lines to meet the needs of large cloud computing providers stand to profit. Companies like IBM, [Dell](#) ([DELL](#)), and [Hewlett-Packard](#) ([HPQ](#)), for instance, are moving aggressively in this direction. On Aug. 1, IBM said it would spend \$360 million to build a cloud computing data center in Research Triangle Park, N.C., bringing to nine its total of cloud computing centers worldwide. Dell is also targeting this market. The computer maker supplies products to some of the largest cloud computing providers and Web 2.0 companies, including [Facebook](#), Microsoft, Amazon, and [Yahoo](#) ([YHOO](#)). "We created a whole new business just to build custom products for those customers," Dell CEO [Michael Dell](#) says. "Now it's a several-hundred-million-dollar business, and it will be a billion-dollar business in a couple of years—it's on a tear."

One of those customers, Microsoft, has made cloud computing one of five priorities for fiscal 2009, according to a recent memo from CEO [Steve Ballmer](#). Microsoft's version of cloud computing, Software-plus-Services, is designed to let customers choose whether they want traditional software, software services, or a combination of the two. In the memo, Ballmer promised that employees would hear more about the company's cloud computing platform initiatives in

the next version of its Live and Online technologies, scheduled to be unveiled in October. About 9% of IT managers who responded in a Goldman Sachs ([GS](#)) survey said they planned to use Microsoft for software services this year in addition to those they already use.

RELIABILITY IS A CONCERN

Many chief information officers remain concerned about the reliability and security of cloud-based services. Events like the six-hour outage on July 20 of Amazon's S3 service, designed for developers who want easy access to storage over the Internet, give CIOs reason for pause. "It's hard to turn a big ship very quickly," says Daryl Plummer, managing vice-president of consulting firm Gartner ([IT](#)). "You have technologies that are like cement in these businesses—they're hard to change and get rid of." Plummer says that about \$8 out of every \$10 spent on technology in corporations is for maintaining systems, rather than innovating.

At Sanmina, spurring innovation is one of the main motivations for investment in Google Apps, Patel says. "One of our strategies to be competitive on a global basis is to be innovative in terms of how we work with our different teams, with our customers, and our suppliers," he says, adding that his company operates in an extremely competitive industry. The price doesn't hurt, either. The enterprise version of Google Apps costs \$50 per user per year, while a license of Microsoft Office Professional retails for \$499.99. True, Google Apps lacks some of Office's features. But Google Apps compensates in that it's more adept at fostering collaboration among employees scattered across the globe, Patel says. "We see [cloud computing] as a very compelling proposition in the long term," he says.

As appealing as the prospect of cloud computing may be, many CIOs, analysts, and even vendors themselves, see it emerging only gradually in the enterprise. "It will be a draining of the pond," says [Dave Girouard](#), president of enterprise for Google. While more than 500,000 organizations of varying sizes use Google Apps, more than half use the free version, according to Girouard.

MOVING HR FUNCTIONS TO GOOGLE APPS

Now that he has let employees dabble in Google Apps, Patel is considering moving applications related to human resources, such as absence reporting and expense reporting, to cloud computing. He is also eyeing Amazon's Web services, which include both storage and server capacity. "Clearly from an enterprise standpoint we're going to take some baby steps first, try out some lower-priority applications to be sure it's a strong platform," Patel says.

In general, CIOs say cloud computing, whether it's software services or additional server or storage capacity, needs to improve a bit before enterprises will adopt on a larger scale. Security and reliability are big challenges. When Amazon's S3 storage service went down, many companies had trouble doing business. For smaller companies, the trade-off between the cost savings of using Amazon's service and the occasional hiccup in reliability is worth it. "With Amazon, the benefits of easy scalability and low price far outweigh the occasional downtime," says Peter Yared, CEO of [iWidgets](#) a small company, who estimates he spends four times less by using Amazon Web services vs. conventional server hosting. Although Yared's Web site worked on July 20, he had trouble for about six hours with some user-generated code that was stored on Amazon's S3 service. Still, larger companies typically require a higher degree of reliability.

Another issue that worries CIOs is the ability to comply with regulations, including Sarbanes-Oxley rules that govern corporate financial reporting, and the Health Insurance Portability & Accountability Act (HIPPA), which sets rules for security and privacy of health records. [iTricity](#), a European provider of cloud computing capacity, couldn't previously offer services to companies that required compliance with financial and health-care regulations. Currently, though, the company is installing what's known as a private cloud using IBM's Blue Cloud software and services, which turns a corporate data center into its own cloud. Since a private corporate cloud is blocked off from the Internet with firewalls, it provides a level of security that will make it possible for iTricity to offer services to the accounting, financial, and health-care markets.

FINDING A MIDDLE WAY

In the past six and a half months, iTricity has spent more than \$779,000 upgrading to IBM's new technology. That

technology promises to give iTricity much more agility in offering services to customers. Now, customers who want additional computing capacity must wait a week. IBM's approach will cut that lag time roughly to an hour or less, iTricity says. "Our new slogan with iTricity capacity in the market is power by the hour and power within the hour," says Robert Rosier, founder and CEO of iTricity.

Because companies have such a large investment in existing technology infrastructure, many people think there will be a hybrid approach where companies will do some of their computing internally, possibly in a private cloud, while other tasks will be offloaded to the public cloud. "One of the key challenges for corporate IT departments, in fact, lies in making the right decisions about what to hold onto and what to let go," writes Nicholas Carr in his book, *The Big Switch*.

Girouard at Google says he is confident more and more companies will get comfortable with letting go. "Over time as larger and larger businesses decide to use Google Apps, there will be an upswing in the revenue," he says. Right now, Google's strategy is to get as many people and companies as possible comfortable using Google Apps. To that end, the company is doing things like providing Google Apps for free to universities. "We're generating millions of users for life," he says.

Patel and a growing number of employees at Sanmina may well be among them.

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