

An interactive eBook

# CLOUD COMPUTING

From software-as-a-service to Web-based infrastructure solutions, cloud computing is changing the face of corporate IT. And no wonder: Early adopters are reporting lower costs and increased agility. In the following articles, InfoWorld magazine and its sister publications Computerworld and CIO offer in-depth coverage and expert perspectives from the front lines of this transformational IT trend.

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## QuickStudy: Cloud computing

Users can hook into the power of 'out there.'

## Cloud options for IT that IT will love

Bring cloud computing to your datacenter to extend your IT infrastructure while saving big bucks.

## SaaS still on the rise, despite IT spending slowdown

Some users think software as a service could cause long-term financial pain. But with the recession putting pressure on IT spending, the immediate savings gains promised by SaaS are trumping such fears now.

## 5 questions to ask before you say yes to SaaS or cloud computing

Do you know how to look before you leap into the cloud? Consider this five-step checklist.

## Cloud computing to the max

Companies are starting to consider moving most of their apps to the cloud. Here's how one did it.

## What SaaS means to the future of the IT department

As software-as-a-service offerings expand, IT jobs will change. Here's what the shift may mean to IT departments

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## QuickStudy

# QuickStudy: Cloud Computing

Users can hook into the power of ‘out there.’ **By Russell Kay • August 4, 2008**

## definition

**Cloud computing describes a system where users can connect to a vast network of computing resources, data and servers that reside somewhere “out there,” usually on the Internet, rather than on a local machine or a LAN or in a data center. Cloud computing can give on-demand access to supercomputer-level power, even from a thin client or mobile device such as a smart phone or laptop.**

Ask any five IT specialists what cloud computing is, and you’re likely to get five different answers. That’s partly because cloud computing is merely the latest, broadest development in a trend that’s been growing for years.

Cloud computing is the most recent successor to grid computing, utility computing, virtualization and clustering. Cloud computing overlaps those concepts but has its own meaning: the ability to connect to software and data on the Internet (the cloud) instead of on your hard drive or local network.

To do anything with a PC 10 years ago, you needed to buy and install software. Now, cloud computing allows users to access programs and resources across the Internet as if they were on their own machines.

### In the Beginning

First, there were mainframe computers, then minicomputers, PCs and servers. As computers became physically smaller and resources more distributed, problems sometimes arose when users needed more computing power.

IT pros tried clustering computers, allowing them to talk with one another and balance computing loads. Users didn’t care which CPU ran their program, and cluster software managed everything. But clustering proved to be difficult and expensive.

In the early 1990s, the grid concept emerged: Users could connect to a network, much as they plugged into the electrical power grid, and use service on a metered-utility basis. Thus, people began speaking of utility computing.

One problem was where

data was stored. Grid nodes could be located anywhere in the world, but there could be significant processing delays while data stored at other locations was transmitted.

Also, grid or cloud computing means users and businesses must migrate their applications and data to a third party or different platform. For enterprises with huge investments in existing software and operational procedures, this has been a real barrier to adoption of these shared technologies. Other significant concerns include data security

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# QuickStudy

## Why a cloud?

For years, in flow diagrams and PowerPoint presentations, people have represented the Internet as a fuzzy cloud with communications lines going in and out of it. Now that they're actually talking about using a remote, black-box approach to computing, the old familiar cloud seems an appropriate metaphor.

and confidentiality.

### Why It Works

Critical to the success of cloud computing has been the growth of virtualization, allowing one computer to act as if it were another – or many others. Server virtualization lets clouds support more applications than traditional computing grids, hosting various kinds of middleware on virtual machines throughout the cloud.

### Where It's Going

If cloud computing succeeds on a wide scale, it may well be

because of recent initiatives from Amazon, IBM and Google.

In 2007, IBM and Google Inc. teamed up to provide the hardware, software and services needed to teach computer science students large-scale distributed computing. Their Academic Cluster Computing Initiative began when a Google software engineer, Christophe Bisciglia, wanted to improve computer science curricula by teaching college students how to solve problems involving massive computer clusters and terabytes of data.

Google's CEO recruited his

counterpart at IBM to join the initiative. The two companies say they will dedicate hundreds of computers to it. Located in data centers at Google, IBM's Almaden Research Center and the University of Washington, these resources are expected to eventually include more than 1,600 processors.

Initially, six universities – the University of Washington, Stanford University, Carnegie Mellon University, MIT, the University of Maryland and the University of California, Berkeley – are participating in the Google-IBM program.

Meanwhile, Amazon.com

Inc. offers a couple of cloud services. Web service developers can use its Simple Storage Service (S3) to store any amount of data. And developers can use Amazon's Elastic Compute Cloud (EC2) to set up a virtual server in minutes, with none of the maintenance of buying and installing server hardware and software. Both services are offered on a pay-per-use basis. •

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## Analysis

# Cloud Options that IT Will Love

Bring cloud computing to your data-center to extend your IT infrastructure while saving big bucks.

By Mel Beckman  
February 16, 2009

Back in 1991, before the Internet was a big deal, Ohio State University technologist Jerry Martin signalled the nascent Internet's value with an official standards document entitled "There's gold in them thar networks!" (RFC1290) Although simmering as an academic tool for years, the Internet had not yet triggered a significant paradigm shift for commercial computing. Martin's formal proclamation was an early push to business, which eventually embraced Internet commerce wholeheartedly.

Cloud computing promises a similar, if not equivalent, kick in the paradigm, by shifting fundamental

IT infrastructure from on-site, hands-on servers, disks, and networks to off-site, ephemeral cycles, bits, and bandwidth. That transition hasn't happened yet, but many pundits see it as inevitable. The main barrier is the cloud's unproven reliability – IT is loathe to put all the corporate computational jewels in a vapor-lined basket.

If the cloud isn't yet ready to take on traditional business tasks, does it have value to IT? Yes, it turns out. The cloud is full of resources that IT can use for its own purposes, from help-desk ticketing to disaster recovery.

As with early Internet adopt-

ers, IT shops have found the nascent cloud full of golden nuggets worth mining. The three primary cloud services identified in InfoWorld's analysis of 2008 cloud developments – infrastructure services, software as a service (SaaS), and development platforms as a service – provide a slew of labor- and cost-saving options for harried IT managers.

## The cloud's many useful tools for use by IT itself

Many an IT project starts with a month-long equipment acquisition timeline, followed by another month of installation, configuration, and

setup. This front-end burden is often the kiss of death for smaller tasks. Two of the salient features of infrastructure cloud services – instant provisioning and scaling – head this problem off at the pass.

At its most basic level, infrastructure cloud providers sell the nuts and bolts of IT on a pay-as-you-go basis: server CPU cycles, storage gigabytes, and bandwidth megabits per second. These cloud services give customers the ability to launch self-contained application environments – servers, storage, and network connectivity – in minutes. Providers like Amazon.com, IBM, and Sun Microsystems deliver this

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# Analysis

## Why a cloud?

**Not all applications benefit from offsite hosting, but some definitely need it. Often the initial savings in time and labor are enough to justify even simple cloud-basing projects.**

utility-computing capability in the form of raw servers that you configure and manage yourself.

By themselves, these infrastructure components leave a lot to be desired. Yes, they save you the time and expense of capital equipment deployment, but you're stuck with the same configuration and integration chores as before. Worse, you have to perform these tasks remotely, and you carry the burden of bandwidth bottlenecks and strange new security risks. For steady-state workloads that can't take advantage of the cloud's rapid scaling capabilities, the effort

hardly seems worth the trouble.

But the cloud value proposition changes dramatically when you factor in preinstalled, pre-configured virtual appliances, supplied by an army of third-party developers and conveniently delivered as ready-to-boot virtual disk images. We're not talking about major line-of-business applications such as CRM here, but IT-centric tools that frequently fall off the budget due to deployment costs. Help-desk ticketing, network management, vulnerability assessment, and enterprise knowledge-bases are just a few of the ap-

plications you can spin up in the cloud in just minutes.

These applications fall into three broad categories: unsupported free open source software (FOSS), supported FOSS, and full commercial offerings. In the unsupported FOSS category are popular network administration tools such as Nagios, Cacti, and MediaWiki. Third-party cloud enablers such as JumpBox sell these same FOSS apps and dozens of others as support subscriptions for just a few hundred dollars a year. Virtual appliance migration tools such as Citrix's Kensho and

RPath's rBuilder provide physical-to-virtual (P2V) migration engines that let you move most any FOSS appliance to an infrastructure service such as Amazon's EC2.

Not all of these applications benefit from offsite hosting, but some definitely need it. For example, Tenable Network Security's Nessus vulnerability assessment tool by definition resides outside your network, where it simulates hacker attacks to ferret out any border security weaknesses. But often the initial savings in time and labour are enough to justify even simple cloud-basing projects.

A number of hybrid service products are appearing as well – a cross between FOSS and commercial software, offering both customer-managed cloud deployment and vendor-managed SaaS. Kayako offers its line of help-desk portal products as purchasable software – including the source code – and as a fully managed hosted service. Clients are free to move their data between items, and thus can start out with the managed service for less than \$50 per month and migrate to a self-managed cloud deployment when their needs warrant.

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# Analysis

## Gain cheaper emergency preparedness with cloud-based disaster recovery

A down economy and constricting budgets tend to force spending cuts in areas that don't contribute directly to the bottom line. One of the first cuts many organizations make is to expensive disaster recovery services. You might think such economies ill-advised, but the conventional wisdom is that your enterprise's existence trumps business continuity concerns. The \$5,000-per-month hot site that never gets used represents a job or two, and thus becomes an attractive target.

But it need not be that way. Infrastructure virtualization theoretically lets you replicate your

business processes in the cloud, where they can lie dormant at very low cost until you need them in a disaster. The emphasis here is on "theoretically." Moving physical applications to the cloud and keeping cloud-resident data reasonably up-to-date requires considerable skill and finesse. You trade "instant failover" for dramatically lower monthly costs, but keep the peace of mind that comes from knowing your business DNA is safely archived in a distant state or country.

The skills needed for cloud disaster-recovery implementation are within the abilities of most IT technologists, but if your company is small and consultant-dependent, you'll have to get outside

help. Consulting firms are stepping up to the plate, creating cloud-oriented disaster-recovery service packages that handle the headaches for less-sophisticated users, while still reaping the bulk of cloud economies of scale.

One constraint of such services is a client's local Internet connection speed. But speeds are increasing as costs plummet, especially as fiber connectivity options penetrate business markets; most are adequate for nighttime backup synchronization. One consultancy that offers a cloud-based disaster recovery service, CompuVision, uses a 100Mbps Internet service center to provide fast data transfers during an outage, for example.

## Run your app directly on a cloud to lose infrastructure hassles

A few cloud providers – Microsoft and Google among them – foresee application development moving straight to the cloud, bypassing the traditional server-OS-storage platform. Although not yet ready for prime time, Microsoft's Azure aims to leverage the skill set of existing .Net developers to let them code, test, and deploy applications without concern for the OS or hardware on which they run. InfoWorld's Test Center drive of Azure finds its architecture well conceived but concludes that it's too soon to predict its role as a major cloud offering.

Google's much more light-

weight App Engine, also only available in beta but slightly more baked than Azure, focuses on a much smaller audience: Python developers. Billed as a thin layer of Web-enabled Python with fat Internet connectivity and automatic performance scaling, this is an easier tool for most developers to get their arms around.

Software engineering consultant Denny Bollay has examined both Amazon's EC2 and App Engine: "EC2 is fine for what it is, but someone has to play system administrator, a chore that software engineers don't want. App Engine looks like a nice first cut at a streamlined cloud application platform environment, but it has issues like cost prediction and vendor lock-in. What I really am looking for

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## Why a cloud?

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is a cross between Amazon's non-proprietary cloud and Google's cloud compiler with BigTable database. And I'd like to see data providers in the mix, delivering real-time streams of weather, stocks, news, and the like that I can process on the fly in App Engine or its equivalent. Cloud-seeding, as it were."

Although Microsoft's Azure supports open Web application standards, such as REST and AJAX, App Engine has spawned a fledgling open source community with actual FOSS App Engine components. Many of these are variations on the Google-supplied (and FOSS)

Gaeutilities and provide various computational widgets that simplify App Engine development. Others, such as Nuages, cpdialog, and KGPL, are full-blown Web applications that you can run as is or use as a starting point for your own apps.

### Cloud computing's caveats emptor

Cloud computing has some attractive low-hanging fruit for IT shops, but you should take care to count the cost before deploying in today's cloud marketplace. Some cloud computing risks are easily discerned: reliability, security, and performance.

It's too soon to put mission-critical apps in the cloud unless you do the necessary homework to ensure adequate failover mechanisms, and that any sensitive data meets the ethical and legal standards for which you're accountable. Thoughtful preparation can keep you out of the cumulus-granite, but you should select applications that can tolerate a modicum of outages. Some will occur as a result of your own human error, but others will be disturbances in the clouds themselves.

A second potential pitfall is cost containment. Cloud providers are in the business of selling ser-

vices, not aiming to minimize your expenses. It's your responsibility to closely track costs, and if you don't keep an eye on metered services, you can find a hefty bill in your inbox. Cloud purveyors don't make cost tracking easy. Amazon, for example, provides an excruciatingly detailed log of every CPU minute consumed, data byte stored, and megabyte transferred, but it provides no cost calculations for those statistics. You get a lump sum bill for each Amazon service you use – EC2, S3, and so on – with no detailed explanation of charges.

The second driver of unexpect-

ed cloud expense is the cloud's own ease of use. Spinning up a server – or 10 – only takes a minute. But servers stay spinning, and clocking dollars, until you turn them off. Third-party cloud management services like Rightscale and Elastra can automate the cost accounting process, as well as set hard spending limits. But you pay for that convenience – a minimum of \$500 per month for Rightscale's auto-scaling cloud management console, for example.

As long as you keep these precautions in mind, there's no reason not to leverage cloud services to shorten your IT hit list today. •

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## Analysis

# SaaS still on the rise, despite IT spending

Some users think software as a service could cause long-term financial pain. But with the recession putting pressure on IT spending, the immediate savings gains promised by SaaS are trumping such fears now.

By **Patrick Thibodeau** • February 9, 2009

Overall IT spending has slowed down, forcing many IT vendors to lay off workers. But spending on software-as-a-service applications is growing at double-digit rates, as users look to take advantage of the relatively low cost of implementing SaaS technologies.

To be sure, SaaS is still very much a niche market from the standpoint of both revenue and user adoption levels. For instance, market research firm IDC expects \$12.4 billion in SaaS

spending worldwide this year — a drop in the bucket of the overall IT market.

But two weeks ago, IDC raised its projected SaaS growth rate for 2009 from 36% to 40.5%. The firm said recent surveys indicated that the recession would prompt more users to choose subscription-based services over on-premises applications. IDC also forecast that nearly 45% of U.S. companies will spend at least one-fourth of

their IT budgets on SaaS by next year, up from 23% in 2008.

“I think SaaS has an element of being recession-proof,” said Forrester Research Inc. analyst Ray Wang. Forrester last month released a report on the subscription revenue growth rates at Salesforce.com Inc. and nine other SaaS vendors; most reported year-to-year gains of more than 40% in the third quarter of 2008.

Wang did offer some caveats about the SaaS market, noting that many corporate users are proceeding cautiously, with

small deployments and short contracts — even month-to-month agreements. “People are likely to be commitment-phobic,” Wang said.

More often than not, users aren’t certain whether it would actually cost less to use a SaaS application than run an in-house one because they don’t have a good breakdown of the IT costs associated with supporting individual apps. In addition, developing precise cost comparisons can be difficult because the potential savings from SaaS

implementations often involve intangible items.

For example, when companies move to SaaS, they often shift control of applications to the business units that use them. A business unit may claim that it will get a time savings if it can deal directly with a software vendor instead of having to go through the IT department. But it isn’t easy to quantify such savings.

In addition, there’s the question of whether SaaS users are trading off the short-term benefits of no longer having to

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**IDC raised its projected SaaS growth rate for 2009 from 36% to 40.5%. The firm said recent surveys indicated that the recession would prompt more users to choose subscription-based services over on-premises applications.**

run applications internally in return for some potential long-term financial pain, in the form of ongoing subscription fees.

Despite such issues, SaaS technologies are now being adopted by some very large organizations, including the U.S. Army and Sonoco Products Co., a \$4 billion maker of packaging products in Hartsville, S.C.

Jennifer Roberts, Sonoco's supply systems manager, said she was able to make an apples-to-apples cost comparison of SaaS vs. in-house software. And in Sonoco's case, she thinks the

SaaS approach will cost less.

Sonoco is a longtime user of the on-premises version of Ariba Inc.'s procurement applications. But the company wanted to expand its use of the software, and Roberts said that installing another module in-house would have required new hardware and the likely addition of an IT worker to manage and monitor the system.

That would have pushed Sonoco's long-term costs above what it's paying Ariba for the SaaS deployment, according to Roberts, who declined to disclose

specific cost information.

Roberts also predicted that SaaS will increase her leverage with vendors such as Ariba by making it easier for Sonoco to switch to rival offerings if it decides that a change is needed. "When you're dissatisfied with a tool when it's in-house, the cost of switching is much higher than if it is software as a service," she said.

The Army last fall began using Salesforce.com's hosted CRM software as part of a pilot program aimed at modernizing the military branch's recruit-

## SaaS FUTURES

- **Market research firm IDC predicts that by the end of this year, 76% of U.S. companies will be using at least one SaaS application.**
- **Also by year's end, nearly 35% of worldwide SaaS revenue will come from outside the U.S., IDC says.**
- **Almost 90% of 258 organizations that responded to a Gartner Inc. survey last summer said they planned to increase or maintain their use of SaaS technologies.**

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# Analysis

ing efforts.

The program is centered around a facility in Philadelphia, called the Army Experience Center, that lets potential volunteers learn about military technology, explore career options, run battle simulators, play computer games and even sample military cooking. The Army collects basic contact and demographic information from visitors who register at the center, and it then uses the data to customize its recruiting pitches.

The data goes into the SaaS application, which has been integrated with an in-house system for processing recruits. That work was done for the Army

by systems integrator Acumen Solutions Inc. in Vienna, Va.

“This is a new model for the government to be using SaaS in this way,” said Maj. Larry Dillard, a marketing officer who is heading the Army Experience Center program. Dillard emphasized that it is still very much a pilot project, but he sees potential in SaaS.

“In about four months, we were able to take an off-the-shelf solution, configure it and deploy it,” Dillard said. That, he added, has given the Army “a very robust and very capable system for almost inconsequential cost and almost no [staff] time.”

The Army is sensitive to

IT security issues, for obvious reasons, and SaaS forces organizations to consider whether they want to store data on third-party systems. Dillard said the Army addressed the security issues to its satisfaction by limiting the amount of data it stores about potential recruits. No Social Security numbers or other personally identifiable information is ever entered into the Salesforce.com application, according to Dillard.

Mane USA Inc., a fragrance and flavorings maker in Wayne, N.J., adopted a SaaS version of Automatic Data Processing Inc.’s payroll and benefits software about a year ago. Employees now

have self-service capabilities for making benefits changes, freeing up Mane’s human resources staff to do other work, said Deborah Knighton, the company’s vice president of HR.

The SaaS system has also reduced the amount of work HR needs to do to process year-end tax data, shortening the time required from several weeks to a day. “The benefits we got far exceeded the cost, if you look at it from a soft-dollar standpoint,” Knighton said.

Also last year, Springs Valley Bank & Trust Co. in Jasper, Ind., switched from an in-house payroll system to SaaS software offered jointly by application developer

Unicorn HRO Inc. and development tools vendor Progress Software Corp.

Craig Buse, Springs Valley’s IT manager, said the in-house system was nearing the end of its life and wasn’t considered to be core to the bank’s business operations. With the SaaS system, Buse doesn’t have to worry about updating the software or dealing with hardware failures.

But he does think that SaaS may prove to be more costly than in-house applications over time. “In general,” Buse said, “you’re probably going to see a little bit of a cost increase because [SaaS vendors] are doing a little more for you.” •

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## Best Practices

# 5 Questions to Ask Before You Say Yes to SaaS

Do you know how to look before you leap into the cloud? Consider this five-step checklist.

By **Thomas Wailgum**  
October 27, 2008

Not surprisingly, SaaS vendors have decided there's no time like the present to make a full court sales press. In a down economy with slashed IT budgets, when there's no tolerance for 18-month software implementations and the price tags of on-premise software from Oracle and maintenance fees for SAP applications are not falling, software-as-a-service and cloud computing offerings become more attractive options for businesses.

Marc Benioff, the CEO of SaaS CRM vendor Salesforce.com, recently explained just why his flavor of the cloud computing model was best suited for today's troubled

economic times. Forget big contracts with Microsoft, Oracle or SAP, and get beyond outdated hardware and software solutions, Benioff told CNBC in early October. Benioff said that Salesforce.com's "pay-as-you-go, elastic model" offers clients much more flexibility.

Recent predictions on the SaaS market appear to bolster Benioff's optimism. Gartner noted that worldwide SaaS revenue in the enterprise application markets was on pace to surpass \$6.4 billion in 2008, which is a 27 percent increase from 2007 revenue of \$5.1 billion. By 2012, Gartner predicted, the market is expected to reach

\$14.8 billion.

But while there are elements of truth to Benioff's contentions and sound reasons that bolster Gartner's numbers, there is also a thicket of issues that those companies who rush into the cloud will soon discover. Here are five important considerations that business leaders and IT staffers must think about before they sign a SaaS contract.

## 1 Have You Prevented Against "Sticker Shock" Down the Road?

One of SaaS's biggest selling points is its simplified pricing model: those pay-as-you-go, per-user monthly fees.

The term "flat" usually stars in a SaaS vendor's marketing materials.

However, companies are still confused by uncertainties in pricing models and contract agreements, note Forrester analysts William Band and Peter Marston in the May 2008 "Best Practices: The Smart Way To Implement CRM" report.

"SaaS pricing models that seem simple and inexpensive (flat per-user monthly fees) can become costly and complex when users sign up for different pieces of functionality and support options," the analysts write. "Additional charges often apply for support, configuration services, additional functionality or

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going beyond a preset storage limit.”

In addition, business users and IT staffers can also be “unpleasantly surprised by difficult-to-enforce service-level agreements or onerous provisions that kick-in at the end of the contract term,” Band and Marston note.

## 2 Has IT Been Included in the Decision-Making Process?

It almost seems apocryphal that IT staffers wouldn’t be included at all in today’s SaaS decision-making processes. But the reality is that business stakeholders have become quite adept at navigating the software purchasing world: they know what they want and SaaS vendors

oftentimes go straight for the business side to sell their wares.

“SaaS makes it easy for firms to roll out solutions quickly and without IT involvement,” notes an April 2008 Forrester report, “SaaS Clients Face Growing Complexity.”

There’s a downside, however, to the business side’s new freedom. “This can also mean that firms rush into their deployment, using the point-and-click wizards to configure the solution without having a long-term vision or specific road map in place,” write Forrester analysts Liz Herbert and Bill Martorelli.

“Some SaaS buyers get into trouble by not thoroughly evaluating integration or customization capabilities at purchase time. They later

go to IT with requests that the application simply can’t support,” note Herbert and Martorelli. “Instead, make sure to involve IT upfront to ensure that the application can support your needs before you buy in.”

## 3 Is the SaaS Application Set Mature Enough?

Another reason for IT’s involvement: Vendor selection is of paramount importance right now, especially as startup SaaS vendors and others selling their applications under the cloud computing banner might be here today, but gone tomorrow. “As SaaS continues its fast-paced growth, providers are quick to jump into the market with new solutions,” write

the Forrester analysts Herbert and Martorelli. “However, this makes it difficult for firms to feel secure about the long-term stability of their application purchases.”

In the SaaS market for ERP software, for instance, the sheer complexity of the enterprise application suites makes it difficult for SaaS vendors to provide the necessary range of functionalities, notes Gartner analyst Denise Ganly, in the “SaaS Impact on ERP” report. Ganly writes that SaaS ERP suites—that combine HR, financial, operations, CRM and supply chain applications—won’t be viable options for most large enterprises during the next five years.

Ganly points out that many

companies today believe that SaaS ERP is “instant on,” which means that it can be implemented with little or no intervention. “You just turn it on,” she writes. “However, the business still must be re-engineered, processes redefined, integration points defined and so on.”

Even the mighty SAP and its ambitious Business ByDesign on-demand offering has run into technical and integration challenges, and its plans for an SaaS software offering have been drastically scaled back.

## 4 Have You Calculated Total Cost of Ownership?

A late 2007 Forrester



# Best Practices

Research survey of North American and European software IT decision-makers found that “total cost concerns” was the second-most cited reason for why companies were not interested in SaaS.

In the rush to adopt SaaS, some companies may forget about potentially conflicting total cost of ownership figures. For example, TCO of “SaaS ERP suites likely will be significant and may not compare favorably with on-premises solutions,” writes Ganly, in the Gartner report. This problem applies to vendors as well. SaaS vendors “often have unrealistic expectations of their operating costs,” she adds. “The multitenant architecture needed for SaaS ERP

suites results in high internal efforts and costs for the initial setup and the ongoing maintenance and upgrade of the system.”

Bottom line: If the SaaS deal seems good to be true and the TCO calculations too rosy, the overall deal may be just that: Too good to be true.

## **5** Have You Considered All of the Integration Issues?

While SaaS applications can be implemented much faster than on-premise apps, there are still lingering and tough integration issues that don’t magically disappear with SaaS applications (like, how does IT connect that new standalone SaaS CRM app to the

existing legacy infrastructure?).

The Forrester survey, for instance, found that “integration issues” was the top reason (66 percent) cited by companies that had said no to SaaS applications.

One critical integration challenge for companies is deciding just what kind of a SaaS integration provider they’re going to use. An October 2008 Gartner report on the topic noted that “no single approach to SaaS integration will meet the needs of all, or even most, SaaS customers,” writes analyst Benoit Lheureux, adding that “the range of choices can be overwhelming.”

The four choices, outlined by Lheureux, include: a SaaS

vendor’s application programming interfaces (APIs) and technology; a third-party vendor’s SaaS integration technology; an integration-as-a-service (IaaS) solution; and a professional services or a system integrator. “The challenge for customers is to know when to choose one approach over another,” he writes. “The answer depends heavily on each customer’s particular situation, including factors such as internal integration skills and overall B2B strategies.”

Of course, not all of this can be figured out by business stakeholders, eager as they may be. SaaS analysts note that an IT implementation team that takes the time to build a strong business

case for the SaaS application and implement it correctly will, in the end, deliver the most value to the business. •

# Case Study

## Cloud Computing to the Max

Companies are starting to consider moving most of their apps to the cloud. Here's how one did it.

By **Dave Rosenberg** • December 10, 2008

Cloud services claim to provide nearly everything you need without requiring you to run your own IT infrastructure. From e-mail and Web hosting to fully managed applications to vast on-demand computing resources, the cloud is shaping up to be one of the most important technology shifts in the last few years.

Sound too good to be true? Based on my experience over the last two years, I estimate that companies can easily offload 50 to 100 percent of their needs to

cloud-based services with minimal business impact and near zero risk – provided you follow the most basic best practices.

That said, not everything is easy, nor is the cloud right for everything. Certain technical requirements, such as very high performance with low latency, are challenging if not impossible. But there are a great many things that can be achieved at a lower cost and minimal risk.

There are three basic uses of the cloud's tech resources:

computing power on-demand, (such as Amazon Web Services EC2 and S3 and Google App Engine); SaaS (software as a service) applications delivered over the Internet, such as Salesforce.com and NetSuite; and PaaS (platform as a service) application development and provisioning delivered over the Internet, such as Force.com.

As cloud offerings continue to mature, I am sure we'll see multiple iterations of the offerings, as well as many permutations. For example, I don't yet know where storage as a service

fits, but there are multiple offerings for that, too.

### Why I entrusted my own business to the cloud

I recently worked for an open source software company that had employees all over the world. That made us extremely dependent on technology to manage interpersonal relationships, all business functions, communications, and software development mechanics.

Having a geographically dispersed team is not all it's cracked up to be. Even basic communica-

tions can be painfully difficult. If Skype were sketchy, development meetings could get set back an entire day. If e-mail were to go down, multiple business processes would require significant manual intervention. And if Salesforce.com was unavailable, we wouldn't have access to customer data for sales or support.

For the intrepid startup or IT department, the ability to outsource system operations to (theoretical) experts is very appealing, and most people are already comfortable with outsourcing certain elements such

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as Web servers and e-mail. And in companies with minimal IT staff, developers tend to help out with system administration.

Our goal was to not have to maintain physical machines or applications that weren't explicitly part of our development process. As a software company, we made the decision that our developers should be writing code, not performing system-administration tasks. But sadly, life isn't always that black and white. Our hosted systems and cloud services still required a modest amount of developer time, if for no other reason than the fact that they knew what they wanted the systems to do.

## Development services in the cloud

To keep development smooth and not have to spend a ton of money on hardware, we moved all our development applications to Contegix, a managed hosting provider that supported the range of commercial and custom products we used. Our team also had access to the boxes so that every change didn't have to go through a trouble-ticket process (unless we wanted it to).

Having our development systems hosted seemed a bit strange to some people. But most got over that when they realized most developers are working off their own code branches,

so they would simply merge the local and hosted pieces of code with the trunk that sits online.

We did run into a few hiccups. The integration of our development applications (Confluence, Jira, Bamboo, and custom code) was nonexistent, so there was a fair amount of work necessary for all the systems to interact properly. And somewhere down the line, one of our guys ordered some servers that we really didn't need. We ended up virtualizing them to the max for QA and testing.

## Business apps in the cloud

Most of the cloud apps we used

supported business needs, from hosting software for users to download to handling customer data. None of these were within our core competence, and we were glad to rely on someone else to manage them.

Web server and downloads. I remember an ugly day at work back in 1996 when someone kicked out the power-supply plug for the servers that ran all the Bell Labs and Lucent Web sites. People were running around the hallways in a panic. After that, I decided I never needed to host my own Web servers or DNS.

At my open source company, we stayed true to that conviction. We put our Web site and in-

tranet at Rackspace because we had to deal with software downloads and needed a dedicated machine and enough bandwidth for things not to choke.

We eventually moved our product downloads to Amazon S3, where we didn't worry about administration, bandwidth, or anything else. And we spent less than \$100 per month for 15,000-plus downloads. We did suffer once or twice when Amazon went down, but we were able to easily change our Web site to point to our main Web server to get the same file. If you have the luxury of occasional downtime, S3 can't be beat on price or performance.

We also started running

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## Why a cloud?

**There are three basic uses of the cloud's tech resources: computing power on-demand; SaaS (software as a service) applications delivered over the Internet, ; and PaaS (platform as a service) application development and provisioning delivered over the Internet.**

demos of our software on EC2 that would expire based on an allotted time frame.

**CRM.** We tried SugarCRM first but got stuck early on by the lack of a customer-support portal module (it's since been added), so we chose Salesforce.com.

Salesforce.com is relatively easy to use – but only after the initial three or so months of painful trial and error. In addition to the base functionality, we created a very simple customer portal and used the Salesforce.com APIs to pull the data into our look and feel. This was great until we

learned that we had exceeded the number of API calls and were forced to upgrade to a more expensive package. Nonetheless, in more than two years, we didn't experience any downtime of note, nor did we lose any information.

**E-MAIL.** We made the decision from day one that we never wanted to run our own mail server. E-mail is critical to most businesses these days, and it was critical in our case because we had a worldwide development and support team, continuous integration and build servers, forums, blogs, and so on. With all

that to handle, we simply didn't want to deal with the possibility of e-mail going down. Letting someone else handle our e-mail sounded great. And it was great – except when it wasn't.

We changed e-mail providers four times in less than two years and made multiple attempts with managed IMAP, Zimbra, and Gmail before we finally got it mostly right. It all started with Rackspace's managed IMAP, which was fine – except there was no calendaring, and as we grew, so did the need for shared calendars.

We switched to Zimbra in late 2006. But it ate several people's calendars and contacts. And although the Zimbra team was fantastic in helping us with our problems, it was becoming a bit too much to deal with. So we went back to IMAP at Rackspace but kept Zimbra running.

Later on, Rackspace began offering hosted Microsoft Exchange. I had been through the hosted Exchange nightmare at another company and refused to get involved in that ordeal again. Plus, for an open source company, it's weird to depend on

Microsoft.

Then, like a shining star came Google Apps for our domain. So we switched again. Our first test-drive with Google Apps was all well and good for the first few days. Everyone felt OK about using POP and the Gmail interface, and we were reasonably sure that it wouldn't eat calendars as Zimbra had. What could go wrong?

As it turned out, plenty could go wrong. This was before Gmail supported IMAP, and the POP implementation turned out to have a few very bizarre quirks,

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such as the fact that you couldn't POP down e-mail that you sent to yourself, including CCs. Messages would disappear into the ether. And user management was a total nightmare; we had something like 40 aliases for lists that had to be entered individually.

It took all of five minutes before our developers freaked out. So we flipped the switch back to Zimbra. Mail delivery was still way more important than calendars, and Zimbra had come out with a new version that synced better and had a slick new UI. But Gmail offered massive storage, and most of our team liked the interface, so the move back to Zimbra left some folks pin-

ing for Google. That's why when Google came out with Google Apps Premier Enterprise (GAPE), we gave that a whirl.

GAPE ended up working quite well – except for a few quirks (surprised?), such as the fact that if you use IMAP, you get this weird “All mail” folder that seems to never stop syncing on many versions of Mac Mail. But GAPE met all our requirements, including integration with Salesforce.com. Despite the occasional missing e-mail, we were sold.

I learned that e-mail and calendaring applications are the most personal apps people use, and thus the most difficult to unlearn or change. Your needs

here will be driven by more than functional requirements.

## **Why I'm doing it all again at my new company**

In the end, our jump to the cloud was based on a desire to avoid expensive, cumbersome infrastructure. While using cloud services was not without its challenges, I can absolutely say that I would do it again. And in fact, I already have: I'm running my new company in a very similar way with minimal capital expenditure for hardware and reliance on a variety of trustworthy providers to manage everything.

Yes, the cloud requires you to give up some control to get

benefits. But as far as I can tell, the positives far outweigh the negatives. •

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## Analysis

# What SaaS Means to the Future of the IT Department

As software-as-a-service offerings expand, IT jobs will change. Here's what the shift may mean to IT departments

By **C.G. Lynch**  
October 29, 2008

Tom Clement has reinvented his career before. In 1984, he realized that working in technology would suit him better than his job as a litigator in Texas. "I came home one day from work, and I was used to being really tense," he says. "But that day, my secretary's recorder had broken. I'd taken it apart, put it back together and somehow, it worked. I was whistling and in a good mood because of it, and my girlfriend heard me and said, 'Tom, maybe you were made for a different line of work.'"

After moving to California and taking a night class at the University

of California, Berkeley, in C-programming, he put his law ambitions aside and took a job at a C-compiler company, taking pieces of code and translating it into a language that could work on Motorola hardware.

Today, Clement, a senior developer at Serena Software, might be facing a bigger career test: software as a service (SaaS), the movement of software to the Web. SaaS, one flavor of today's hot buzzword, cloud computing, refers to applications that users access over the Web and which live on physical servers hosted by the software vendors or a third party,

not servers owned and cared for by an in-house IT department.

Today, most large companies use a mix of both traditional apps that they run on premise and some that are hosted offsite, such as Salesforce.com's sales and CRM-related apps. Enterprise adoption of SaaS applications has been aggressive. According to a CIO.com survey on cloud computing, 84 percent of respondents are currently running SaaS-type applications. Meanwhile, a survey published earlier this year by Kelton research found that 73 percent of large companies have already or plan to adopt SaaS tech-

nology in the next 18 months.

A shift away from on-premise apps has implications for how companies staff their IT departments in the future, according to CIOs and IT industry executives. Change is afoot for developers as well as the thousands of IT support and maintenance professionals taking care of traditional software at companies of all sizes, in all industries.

Case in point: Tim Davis, CIO of Popeyes Louisiana Kitchen, a national fast food chain based in Atlanta, only has six IT people on staff and not one production server on premise. With no production

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servers or apps to run, says Davis, “Three [people] are dedicated to making sure the restaurants have whatever technology they need. The rest are project managers and manage our relationships with vendors.”

## Vendors See a Radical Shift

In the future, say vendors, more IT professionals will be working for them, not for CIOs at end-user companies. And they’ll all need new skills. That goes for developers as well as support staff.

Developers have been through big transitions in computing before (remember the move from main-frame computers to the PC?). Within the IT industry, vendors are prepar-

ing for a new round of upheaval as CIOs roll out offerings from the likes of Google (with its Google Apps) and Salesforce.com that let users run applications via the Internet. Zoho, a SaaS vendor that does most of its development work in India, offers a plethora of applications, including word processing, spreadsheet and presentation software.

Along with the consumerization of IT—the idea that people expect applications at work to look like the Web technologies they use at home (such as Facebook and Google)—the SaaS trend will force many IT professionals to rethink their skills and the value they bring to their companies, says Jeffrey Kaplan, president of THINKstrategies,

a consultancy that helps companies adopt SaaS applications.

“Unfortunately, most developers have built enterprise applications to meet their current systems environment and the end user was very secondary,” Kaplan says. “Now, the end-user experience is the driving factor, because end users determine whether or not the application is considered successful.”

In addition, maintenance veterans who handle the plumbing of IT could see their job options start to recede as maintenance responsibility shifts to the vendors who supply the applications. That reality can be both a challenge and an opportunity for the IT industry, says Peter Coffee, director of platform

research at Salesforce.com.

“If you’re in the ecosystem of working on staple, on-premise software, you can take care of feeding and watering those systems,” Coffee says. But in a SaaS-based world, “those low-value tasks no longer need to be done [onsite],” he continues. Instead, he adds, you’ll want your IT staff “to be the IT equivalent of special forces.”

Ken Venner, senior VP and corporate services CIO at communications semiconductor company Broadcom, says such IT special forces might build new features that fit a company’s specific needs on top of SaaS apps, or manage the relationships between two or more SaaS vendors who each provide

technology to the same company, making sure their systems talk well with one another. “Working with vendors will really become ever more critical,” Venner says. “One of the skills that will start to reduce is core infrastructure skills.”

## The Post-Modern IT Department

At Popeyes, the idea of a SaaS-driven, plug-and-play IT department is more than a dream. Today, says Davis, not all of his apps are SaaS-based. A SaaS vendor, by his definition, is a company that provides the software over the Web, hosts it and charges a subscription fee (generally per user per month). Popeyes owns the licenses for some of its software,

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and worked out a contract with IBM to host and support the servers for those apps. The contract includes IBM's hosting of Popeyes' Microsoft Exchange e-mail system along with its Lawson ERP system, although the ERP app is managed by a business process outsourcing vendor, Convergys, which performs Popeyes' accounting.

The three developers on Davis's team who work on restaurant technology support the company's point-of-sale system and are currently leading the search for standard POS systems to be implemented by franchisees.

Davis notes that his contract with IBM will expire in 2009. When that happens, Davis admits he

could pursue more SaaS options, as these would likely cost him less money than outsourcing to Big Blue. Microsoft recently released a SaaS version of Exchange for a mere \$10 per user per year. Other SaaS applications Davis is eyeing include ERP, an intranet and extranet, and CRM.

But how quickly SaaS might change the staffing landscape for many companies is another story. A recent report by Gartner, for example, throws cold water on the concept of ERP as a hosted application.

"Because of the complexity of ERP suites, SaaS offerings for administrative and operational functions typically have provided functionality that is confined to one domain, such as sales-force auto-

mation or one business process, such as payroll," writes Gartner analyst Denise Ganly. She says it will be five years before SaaS ERP suites are viable options for large enterprises.

When it comes to SaaS ERP, Ganly continues, a big driver is the IT staff constraints faced by many organizations. The SaaS model "appeals to organizations because it can free up staff to concentrate on more-strategic, value-adding processes." Part of the appeal is a belief that SaaS ERP is "instant on," which means that it can be implemented with little or no intervention. "However," she writes, "the business still must be reengineered, processes redefined, integration points

defined and so on. The instant-on perception that drives adoption also makes it an inhibitor."

Nevertheless, IT staff are starting to adapt to the new environment. Developers, for instance, will have to embrace new programming languages and open Web standards when creating enterprise software. "I've got some learning to do in my 50s," says Serena Software's Clement. In some ways, he's already started, as his company has begun building SaaS applications alongside its traditional software development tools.

Clement says he has to learn more about Web 2.0 and Java programming, but feels ready for the challenge. "My experience has al-

ways been that programming is programming," he says. "The language is sort of a detail. The environment is changing, and while I have fears, there's nothing more thrilling than working on something that will be relevant for the future." Meanwhile, for IT support people who handle enterprise infrastructure and back-end support, future roles might include working in the data center of a SaaS vendor, or helping to ensure that a company can integrate various SaaS apps, says Fred Luddy, president and CEO of Service-Now, an IT service management company that runs on a SaaS model.

"Integration will be the main challenge," he says. "IT will be at a higher level." •

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# Resources

## Wall Street Systems Boosts SaaS Success with Help from Savvis

Wall Street Systems sought a world-class, managed infrastructure services provider to host its systems, databases, network, and security. By choosing Savvis as a provider for all its infrastructure, Wall Street Systems is succeeding in the fiercely competitive SaaS marketplace by delivering reliable, scalable, mission-critical solutions to its highly demanding client base.

[Learn more >](#)

**FINANCIAL / SaaS CASE STUDY**

**Company:** Wall Street Systems, Delaware Inc.

**Industry:** Technology

**Line of Business:** Provides corporate, bank and central bank treasury, FX trade processing and cross-asset back-office solutions.

**Target Market:** Corporations and banks with complex financial transaction processing requirements

**Location:** New York, London and Singapore

**Summary:** The Company wanted to offer its clients a SaaS delivery model, and sought a world-class, managed infrastructure services provider to host its systems, databases, network, and security. By choosing Savvis as a provider for all its infrastructure, Wall Street Systems is succeeding in the fiercely competitive SaaS marketplace by delivering reliable, scalable, mission-critical solutions to its highly demanding client base.

**Business Opportunity:** In 2006, Wall Street Systems made a strategic shift in direction. Previously, it had sold its products under a standard licensing model, with customers installing, managing, and maintaining the software at their own premises. Recognizing that the software industry as a whole was rapidly moving to the new Software-as-a-Service delivery model, Wall Street Systems decided to offer SaaS versions of its award-winning solutions. "We saw a market opportunity and felt we could better serve our clients and better managed solutions by going with the SaaS model," said Mark Trischew, Chief Technology Officer of Wall Street Systems.

Wall Street Systems had two choices: it could attempt to build and maintain an IT infrastructure capable of supporting the SaaS model itself, or it could outsource its infrastructure to a managed hosting services provider. "We didn't want to get into the infrastructure management business - that's not our

## Discovery Communications Continues Global Expansion with Help from Savvis Managed Services

Savvis delivers a complex, fully managed infrastructure for Discovery to support its real-time advertising deliverables, ad sales, scheduling, and programming for all its international operations. Savvis' solution allows Discovery to take advantage of a broad portfolio of managed services, including a robust and scalable infrastructure capable of supporting rapid growth of Discovery Communications' international business.

[Learn more >](#)

**FINANCIAL / SaaS CASE STUDY**

**Company:** Discovery Communications

**Industry:** Media

**Line of Business:** Nonfiction content

**Target Market:** Consumers

**Location:** Global

**Business Opportunity:** Build a robust and scalable infrastructure capable of supporting rapid growth of Discovery Communications' international business.

**Solution:** Savvis' managed hosting and managed network services to support its real-time advertising deliverables, ad sales, scheduling and programming for all its international operations.

**Summary:** Savvis delivers a complex, fully managed infrastructure for Discovery Communications to support its real-time advertising deliverables, ad sales, scheduling and programming for all its international operations.

**Business Opportunity:** Founded in 1985, Discovery Communications (Discovery) ran a highly decentralized IT operation with many sites in the United Kingdom, Europe, and the United States during its first few years of operation. Discovery needed to build a more centralized international infrastructure that would serve multiple regions more reliably and cost-effectively and enter its primary market at that time was in the United Kingdom. It made sense to locate it there. Discovery originally outsourced its IT infrastructure operations to its hosting unit in 2005. When Savvis purchased the hosting assets in 2002, Discovery decided to expand its infrastructure with Savvis, primarily for cost reasons. Discovery consistently analyzes its operations to make sure it is making the right decisions about what gets outsourced and what it can do themselves. Because outsourcing was working well, it was an easy decision to continue growing its infrastructure with Savvis.

Receiving high levels of customer service is of the utmost importance to Discovery's high-level customer support as well. Discovery has come to respect from Savvis and very close working relationships have been formed. "Savvis' expertise certainly touch-base with us, helping us know what the company is doing, and why. This transparency is something we have valued very highly since our relationship with Savvis began and indeed it has contrasted to the day," said Dale Todd, senior vice president, IT global production services for Discovery.

## Hallmark Helps People Connect Digitally With Help From Savvis Web Solutions

Savvis provides a broad range of managed infrastructure and professional services to support IT operations for Hallmark. In addition to keeping the Hallmark.com site up during huge traffic spikes experienced during critical business periods, Savvis is helping Hallmark stay on the leading edge by supporting initiatives to expand upon its line of innovative new digital products and services.

[Learn more >](#)

**FINANCIAL / SaaS CASE STUDY**

**Company:** Hallmark Cards, Inc.

**Industry:** Cards and gifts

**Line of Business:** Offers cards, gifts, wrapping paper, home decorations, and keepsakes for every occasion.

**Target Market:** Consumers worldwide

**Location:** Kansas City, MO

**Summary:** To meet its Web site up during annual holiday periods like Christmas, Valentine's Day, and Mother's Day, Hallmark Digital engaged Savvis to provide a broad range of managed infrastructure and professional services to support IT operations. In addition to keeping the Hallmark.com site up during huge traffic spikes experienced during critical business periods, Savvis is helping Hallmark stay on the industry leading edge by supporting initiatives to expand upon its line of innovative new digital products and services.

**Business Opportunity:** Two years ago, Hallmark began exploring for an infrastructure outsourcing vendor to host its growing online operations. "Our top priority was finding a managed services provider that could keep our Web site up during the huge spikes in traffic we'd see during holidays such as Christmas, Mother's Day, and Valentine's Day," said Greg Fink, director of technology at Hallmark Digital. "Being down for even a short period of time during these critical peak periods not only cost us significant revenues, but had the potential to hurt our brand."

Hallmark also needed an IT platform robust and scalable enough to support its forward-looking strategy of introducing a steady stream of innovative new digital products into the marketplace. "We're currently the brand leader in the gifting and gift card space, and we need to keep moving forward to attract new gifters," said Fink. Indeed, Hallmark has big plans for the digital space, having just formed a new division, Hallmark Digital, that will be responsible for developing new products and services to offer online. "We needed a platform high-performing and scalable enough to grow with the business," said Fink.

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