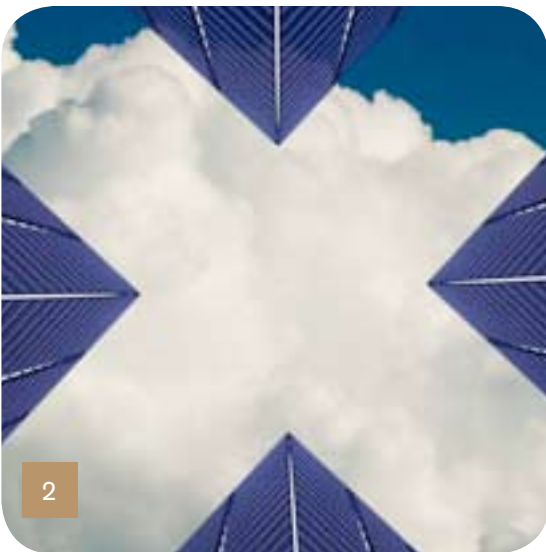


# What to Expect from Cloud Computing



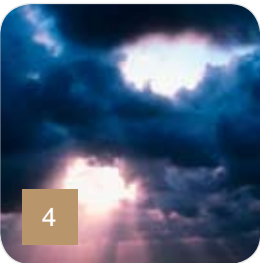
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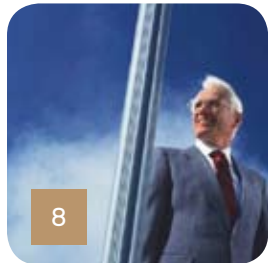


*This content was adapted from Internet.com's ServerWatch, Datamation, and CIO Update Web sites. Contributors: Paul Rubens, Pam Baker, Robert McGarvey, and Jeffrey Kaplan.*

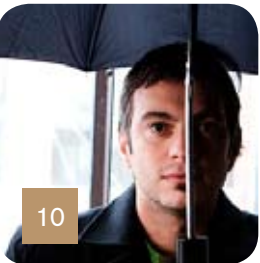
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# Cloud Computing: Hot Air or Killer App?

By Paul Rubens

**C**loud computing has become a huge buzz-phrase in the past year, but you'd be forgiven for not knowing what the term really means. Different people interpret "cloud computing" in different ways. That's a problem because computing "in the cloud" may be important for you and your organization, but if it's not clear what it actually means, how will you know?

## Cloud vs. Grid

What, for example, is the difference between "cloud computing" and "grid computing"? Both imply data centers filled with computing resources available over the network, so are they, in fact, the same thing?

Actually, no. Grid computing implies the provision of computing resources as a utility that can be turned on or off as required. Computing on tap, so to speak. You pay for what you consume, without worrying about how where it comes from or how much is available.

A good example of this is Amazon's Elastic Compute Cloud (EC2) offering. Customers create their own Amazon Machine Images (AMIs) containing an operating system, applications and data, and they control how many instances of each AMI run at any given time. They pay for the instance-hours (and bandwidth) they use, adding computing resources at peak times and removing them when they are no longer required. Amazon calls this a cloud, but really it's a grid. The cost of this utility? 10 cents an hour for 1.7 GB of memory, one virtual core, and 160 GB of instance storage, plus data transfer costs.

Cloud computing is slightly different. It implies the supply of applications to end users, rather than just computer cycles. "Cloud-based computing is a type of IT service usually

delivered over the Internet, but the defining characteristic is scale — the ability to service millions of users," said Matt Cain, a research vice president at Gartner. Cloud computing also implies quick and easy provisioning and a simple cost structure, generally on a per-user, per-month basis, if it is billed at all, he said.

Microsoft's Live Hotmail is a perfect example of an application run in the cloud: It is supplied over the Internet from one or more data centers who-knows-where; it has millions of users; easy self-provisioning; and a very simple cost structure (of no charge per month).

## Is It Really All That New?

If some of this sounds familiar, it's because, apart from the scale, it is an almost perfect description of the application service provider (ASP) model that was in vogue briefly eight or nine years ago. ASPs, you'll recall, were supposed to manage data centers and use their expertise to run and maintain

all sorts of applications for customers, who accessed these applications down the wire. New applications were written or existing applications were "ASP-enabled," and these were either shared by multiple customers or hosted on a separate server for each customer.

The problem was that very few ASPs managed to get many, and in some cases any, customers. Most disappeared as quickly as they arrived. There were a few successes: Hosted Exchange was a popular offering, and Salesforce.com successfully promoted the idea of software as a service — a low-cost solution to fill a particular need, a commodity rather than a differentiator.

So what's the difference between the ASP model and computing in the clouds? You could argue that the cloud is just a





fancy 21st-century way of talking about back-end systems that supply software as a service. “The difference is scale,” said Cain. “ASPs never got millions of customers.”

It's interesting to note that just as ASPs discovered hosted Exchange was one of the few things for which customers were willing to pay, it's also an application that runs well in the cloud. “E-mail is the poster child of cloud computing,” said Cain.

ASPs had very little luck offering productivity apps like Office down the wire to customers. That was partly for technical reasons, and partly because very few enterprises wanted their confidential documents and spreadsheets stored offsite. Besides, what was the benefit of not running Office on your own local machine, and who knew whether the ASP would even be in business in a few months' time?

This hasn't stopped Google offering its Google Docs suite of productivity and collaboration applications from the cloud. Companies, including IBM and Microsoft, have announced plans to give the cloud increased attention. It's likely other large organizations, such as Oracle, will join the fray. Cain suggests hardware vendors like Dell and HP may also be looking to get in on the act.

### A New View From the Cloud

What's different today is that although most of the players in the ASP market were startups, the companies getting involved in cloud computing are all very big. They have the resources to build enormous data centers with the vast amounts of storage and computing capacity required to service millions of customers reliably. Cost of entry is high, but it will be worth it to the likes of Google if companies can get their hands on a sizeable proportion of the money enterprises are currently spending on mass market applications like Office.

But they will find customers only if they can demonstrate real benefits from taking applications from the cloud. The question remains: Why would anyone want Office (or other applications such as e-mail) as a service rather than simply installing software on a computer or getting it from the corporate data center?

The answer to this question may also be familiar. The ASP model promised a much simpler way of accessing applications, with a very short provisioning time, a predictable per-user, per-month fee, and lower overall costs due to economies of scale and the harnessing of expertise provided by specialists.

This is precisely what computing in the cloud offers but with less choice of applications and more economy of scale. Google, Dell, Amazon, IBM, and others of similar ilk can build data centers all over the world, in places that have inexpensive and plentiful power supplies. They can offer applications, such as productivity tools and e-mail, to millions of end users with vast economies of scale, so that the cost per-user, per-month is almost nothing. And the customers, or users, are already there.

Users will likely be more receptive to the idea since the old knee-jerk worries about security and allowing third parties to run applications are less prevalent these days. And let's face it — Google is not likely to run out of money any time soon and is probably far more likely to be around in 10 years time than many of its potential cloud computing customers.

When put like that, cloud computing starts to make sense. After all, e-mail and productivity apps are commodities everyone uses. They are not strategic apps that give a company a competitive advantage. Therefore, why not let a handful of mega-corporations like Google run and maintain them from data centers built near hydro-electric facilities offering unlimited free power for a fraction of the price now spent to license, install, maintain, and run them yourself?

It may not give you a competitive advantage if everyone else is getting their commodity apps from the cloud as well, but it sure does reduce costs. Or, to paraphrase Yossarian from Joseph Heller's classic novel *Catch-22*, “if everyone else is getting their apps from the cloud, you'd certainly be a damned fool to get yours any other way ...” ■

# The Cloud: Saving Grace or Empty Thunder?

By Pam Baker

In the groundswell of economic pressures, companies big and small are looking to the cloud for relief. The buzz is everywhere: cloud computing can cut costs, speed implementations, and scale quickly. The buzz, however, may be slightly off-the mark -- at least in product pitches.

"Just like SOA hype was vendor fueled and thus became more a marketing term than an architecture description, the same will happen in 2009 with the 'cloud,'" said Ross Mason, co-founder and CTO of open source SOA provider MuleSource. "It's all about buzz and not as much about pragmatism."

That is not to say, however, that the cloud is a total rain-out.

"Right now, the 'cloud' is the most over-hyped Web-based buzzword when it comes to how business gets done," said EchoSign's CEO, Jason Lemkin. "Having said that, I would argue that the cloud is still in fact under-hyped because Cloud computing is really shorthand for what third-generation web services can do, and this is something that radically shifts online business dynamics."

## Drivers and Answers

The main driver behind cloud computing is basic economics. It significantly lowers up-front capital expenses and allows companies to only pay for what they actually use. "Plus, the cloud model dramatically lowers operating expenses over time by increasing standardization and automation and delivering applications and services more efficiently," said Dennis Quan, IBM director of Autonomic Computing.

It is a bit mystifying that while everyone agrees on the benefits of cloud computing, many have trouble defining what truly does, and does not, fit under the cloud umbrella. Perhaps this explains why Peter Fingar's book, *Dot.Cloud*, was a top seller on Amazon before it was even published. In fact, several books on cloud computing are selling in record numbers as demand for definitive answers swells. Fingar admits that definitions of Cloud computing vary widely, but said he has pegged the concept to two parts:



For geeks, he said, cloud computing means grid computing, utility computing, software as a service (SaaS), virtualization, Internet-based applications, autonomic computing, peer-to-peer computing, on-demand and remote processing—and various combinations of these terms. These are all areas Fingar calls "information factories."

For non-geeks, cloud computing is simply a platform where individuals and companies use the Internet to access endless hardware, software, and data resources for most of their computing needs,

"leaving the mess to their Cloud Service Providers (CSPs)," as Fingar puts it.

In any case, it isn't the geek or non-geek struggling with the cloud issue: it's the CIO. "The big thrill of the cloud is not having to care who, where, or how something is being done," said Miko Matsumura, author of *SOA Adoption for Dummies* and deputy CTO of Software AG. "Unfortunately, that thrill does not extend to the CIO, whose job it is to ensure that it's done properly."

### Worries at the Top

CIOs are not the only C-level executives worrying over the cloud issue. "The key findings of our study showed that despite a mandate to reduce costs, most businesses are not adopting cloud computing even though they recognize it as a viable option to reduce up-front and ongoing costs," said Larry Beck, senior director of Cloud Strategy at Avanade. "Fear over security and loss of control of data and systems is hindering adoption."

There is another matter proving troublesome: regulatory issues.

"If you want to use cloud computing and post data covered by Health Insurance Portability and Accounting Act (HIPAA) on it, you need to carefully consider whether or not it is in compliance," said Anthony Velte, co-author of McGraw-Hills book *Cloud Computing, A Practical Approach*. "The fact that HIPAA data could comeingle on a server with another organization's data will likely get the attention of an observant HIPAA auditor."

"If you have data that is regulated like HIPPA or Sarbanes-Oxley you are well advised to be very careful in your plans to place data on a cloud," adds Velte. "After all, if you have posted a customer's financial data and there's a breach, will they go after the cloud provider, or you?"

It turns out that the cloud, as worldly as the premise is, is restrained by earthly borders. It may simply be illegal to post your information on a cloud. "If you are in Canada, for example, and you want to post your data on an American cloud, you may run afoul of Canadian law," said Velte.

The Canadian government has declared that government IT workers may not use network services that are operating within U.S. borders. "The reason is that the Canadian data stored on those servers could be negatively impacted based on the Patriot Act," he said. "And the same can be said of clouds operating outside the United States. You probably don't know the laws, if any, governing your privacy and protection in a foreign country."

### What's in a Name?

In practice, enterprises are facing an onslaught of cloud products. While some vendors are fudging, even outright misrepresenting, most are not. Confusion reigns for now. "The terminology and ontology for cloud computing is still evolving," said Michael Salsburg, spokesperson for the worldwide non-profit organization, Computer Measurement Group, and chief architect of Real-Time Infrastructures at Unisys. But

## Cloud Computing: Beyond Buy vs. Lease

By Jeffrey Kaplan

Despite growing evidence that Software-as-a-Service (SaaS) solutions can produce meaningful cost-savings and provide important new functionality, there are still IT/business decision-makers and industry observers who are unconvinced that these benefits are for real.

THINKstrategies and Cutter Consortium teamed up to conduct a series of annual customer surveys over the past four years aimed at gauging SaaS acceptance, adoption, and satisfaction. We were the first to uncover widespread interest and substantial adoption (32 percent) of SaaS in 2005.

Last year, the proportion jumped to 62 percent, with well over 90 percent of the SaaS users satisfied with their Web-based software solutions, ready to renew and expand their use of the SaaS solutions, and willing to recommend SaaS to their peers. There are few legacy software vendors who can boast these satisfaction, renewal and referral rates.

Thirty percent of the SaaS users said the greatest benefit they gained from using SaaS solutions was lowering their infrastructure costs. Another 17 percent said they were able to obtain greater functional capabilities. Thirteen percent said their SaaS providers improved application reliability and performance, while 10 percent were happiest with the systematic software updates and upgrades.

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there are some definite characteristics of a cloud that can be identified now:

**Elasticity:** Enterprises will take advantage of cloud computing when they require a high variability on compute power. For example, assume a company requires double the number of Web and application servers a few times a month. They do not want to pay for the capital expense of having dormant servers on the floor most of the time. In the cloud, compute power can grow and shrink. The enterprise pays on a usage basis.

**Offloading “Context”:** About 80 percent of the IT budget is dedicated to keeping the current infrastructure running. This leaves little time or money to work on new, strategic directions. Moving the “standard” computing environments/tasks to the cloud offloads the up-front capital expenses as well as the operational expenses. For small companies, a cloud can provide efficient enterprise-class best practices.

**Anything as a Service:** Imagine, through a Web browser, requesting a set of servers and storage devices to be provisioned and configured to run a large-scale application. This can be requested and managed as a set of service requests that can be made from any browser, including a cell phone. It is this lightweight, service-oriented approach that is the hallmark of cloud computing.

### Parting the Clouds

Lemkin said the number of SaaS services has mushroomed in sync with the Web’s growth as the preferred channel to do business. However, he warns that many SaaS services are not truly cloud services. “While we are seeing the introduction of strong SaaS offerings in CRM, finance, contract management and e-signatures, what we are not seeing is the integration of these services on the Web,” he said. “Instead of being completely siloed, the cloud enables services to be completely, 100 percent integrated on the Web, with no install, no IT, and no headaches.”

What were called “mash-ups” in Web 2.0, he said, will swell in significance as the cloud enables data, applications, and core business processes to follow Internet users anywhere, anytime, in any application.

“The challenges of cloud computing is that only a few applications are truly built for the Cloud, as Web 2.0 solutions,” said Robert Klotz, vice president of Technology at Akibia. “Software as a service solutions come close, but they are not truly Web 2.0.”

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The proportion of survey respondents who said they were not considering SaaS dropped from 32 percent in 2007 to only 9 percent in 2008. Of that group, 37 percent said they were primarily concerned about the cost-savings SaaS would bring them.

A recent Gartner opinion piece tried to appeal to this segment of the market by using the tired old argument that subscribing to a SaaS service is akin to leasing a car and would cost users more over an extended period of time. The research firm suggested that if an organization plans to use an application for more than three years, it isn’t cost-effective to subscribe to a SaaS solution, just like it isn’t a good idea to lease a car for more than three years.

While Gartner’s argument is certainly true for simple applications that require little effort to deploy and maintain, it doesn’t apply for more complex enterprise applications that demand considerable time and expense to implement and keep up and running. In these cases, subscribing to a SaaS solution isn’t the same as leasing a car.

First of all, leasing a car simply enables drivers to reduce their upfront payments for the vehicle itself. When you drive the leased vehicle off the lot it immediately starts to depreciate. The dealer and manufacturer do not provide any updates or upgrades, with the exception of an occasional recall and maybe a free oil change. And, they certainly don’t pick up the costs of housing the vehicle and making sure it will be able to start up every time you need to get somewhere.

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Just as some believe the technology isn't quite up to speed, many see the current performance of the cloud easily matched on-premise; including scalability. "Critics point out that well-managed company data centers also provide economies of scale," said Paco Nathan, principal scientist at ShareThis, a social network-sharing tool. "The dirty little secret is that company data centers rely on purchasing rack space and power feeds in advance and buying equipment, which amortizes over years and tends to fail and requires repair and replacement plus large staffing and training. The cloud does not."

Conversely, there are dirty little secrets in the cloud too. "Multi-tenancy remains the characteristic that delivers the greatest economic advantage so caveat emptor: just because an app. is hosted in the cloud doesn't necessarily mean it's SaaS," explains Bob Moul, CEO of Boomi, an on-demand integration vendor. "How do you know if it's true SaaS? Try to trial and/or implement the application today without human intervention by the vendor."

At the end of the day, the decision to move to the cloud, stay firmly on the ground, or move to hybrids somewhere in between, will be made based on a company's specific needs. For now, it's just another set of tools to use or not.

"The concept of cloud computing, at its core, represents major shifts for companies and service providers from internally to externally, from tethered to portable, from physical security to virtual security, from siloed to pooled," explains Don Norbeck, director of Product Strategy at SunGard. ■

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Subscribing to a SaaS solution eliminates more than just the upfront perpetual license fee. The SaaS subscription also eliminates additional hardware, staff, facilities and other software costs required to deploy, customize, maintain, and manage the application at optimal levels. So the total cost of ownership (TCO) is substantially reduced over the entire life of the application, as the respondents to THINKstrategies/Cutter's most recent SaaS survey stated.

While there may be additional consulting costs to ensure proper deployment, integration, and training for a SaaS solution, these costs are generally offset by the faster implementation times, higher utilization levels and lower failure rates which ensure a quicker time to value and greater return on investment (ROI).

Don't forget that the best argument against leasing a car is that you don't have an asset you can trade in or resell when you want to at the end of the term. While the same holds true for a SaaS solution, when was the last time you heard about an organization trading in or reselling its legacy application.

Don't let bad analysis play to your worst fears if you are still uncomfortable going down the SaaS path. Instead, talk to the growing number of your peers who are adopting and benefiting from a widening array of SaaS solutions. ■



# Internal vs. External Cloud

By Paul Rubens

**T**here's no getting away from it: Cloud computing has many potential benefits, but it has a number of drawbacks as well.

On the positive side, having applications provided from the cloud offers enterprises the possibility of low-cost compute resources that are almost infinitely scalable. There's the ability to pay "by the hour" for resources only when they are needed, and for sudden surges in demand for resources to be accommodated very easily. Cloud computing also frees up capital that would otherwise be tied up in hardware and data center bricks and mortar, and it frees up IT staffers who would otherwise be tending to servers so they can work on more productive IT endeavors.

But it's not all sunshine and roses: The drawbacks revolve around issues about data security and how sensible it is to store it with a third party (assuming regulatory requirements permit it); portability and the possibility of being locked in to one cloud provider; reliability; data logging; speed and the inevitable latency when dealing with servers in the cloud half a continent away; and geo-political worries — where in the world is the cloud data center running your apps, and do you want it there? This last is less of an issue for U.S.-based enterprises, but it is a very real concern for businesses in many other countries.

But for some organizations there's one real show stopper when it comes to getting the benefits of cloud computing: heterogeneity. Many corporate data centers have many different generations of servers from a variety of vendors running different operating systems on different processors — Windows, AIX, Solaris, Linux, Intel, PowerPC, SPARC, and so on. In contrast, most cloud services offer a limited choice of operating systems running on a narrow range of hardware.

This leaves heterogeneous enterprises in a bit of a quandary. It may be possible to offload some applications into the cloud, but the remainder still must be managed and run in-house. If this is the case, then there may be some efficiency benefits, but a smaller data center could actually mean that many economies of scale are lost. What remains is a hodgepodge of different systems that need a great deal of time and many different skill sets to manage, while the easier-to-manage systems would be gone. Efficiency actually goes down.

One solution is to operate a cloud environment in-house: a so-called "internal cloud," said Steve Oberlin, chief scientist at Cassatt, a San Jose, Calif.-based IT infrastructure management software vendor. "Internal clouds help you to pool your computing resources into a cloud and manage it, applying server resources dynamically on the fly in response to demand," he says. "What you end up with is higher utilization and efficiency."

Many organizations have already embarked on virtualization programs to boost server utilization rates and reduce power and space requirements in the data center, but Oberlin says an internal cloud goes beyond this. It enables applications that are not suitable for virtualization (such as those that require the resources of an entire server at peak times) to run more efficiently, and it includes virtualized servers anyway: virtualization, in other words, is part of an internal cloud solution, he says.

## Which to Choose?

But here's an important question: Which is better, implementing an internal cloud or using a public cloud? The answer, according to James Staten, a principal analyst at Forrester, is that both have their advantages and disadvantages. "Internal



clouds are good because you can follow all of your workflow and security guidelines, and ensure that you are running the right code. The trade-off is that you can't reach the economies of scale that public cloud providers achieve," he said.

"On the other hand, if you use a public cloud provider you end up having to do lots of work like license management and adapting to the processes of the public cloud. You have to work with what is on offer. But you do get the benefits of economies of scale."

So what does it mean to run an internal cloud? At the most basic level it means using products like Cassatt's Active Response software, which simply manages power by monitoring usage and applying policies to shut down servers at non-peak times when they are not required, such as on weekends. "You can get pretty dramatic savings on your power bill from this," said Oberlin. "We see significant energy savings, and an ROI of just nine months."

But this in itself is not cloud computing in the normal sense of the word. To achieve this, Cassatt uses a database of server images, a set of rules that define the service levels that applications must achieve, and management software that controls the whole setup. Put simply, the management software monitors each application, and when necessary it boots appropriate servers with the correct image over the network to add resources to the applications.

At less busy periods, unneeded resources are shut down so they can remain idle or reallocate to other applications that need them. There is still some inefficiency in heterogeneous environments because some hardware can run only some, but not all, server images; however, resources can still be pooled among compatible applications. "In terms of cost savings, a

typical data center with low double-digit efficiency can see 40 percent to 50 percent reduction in the number of servers required to provide the same sort of service level, and still have better headroom and agility," said Oberlin.

In fact, enterprises aren't necessarily restricted to a single data center when it comes to running an internal cloud. Cassatt is soon to release an "Enterprise Edition" of its Active Response software, which pools resources across different data centers. And it doesn't end there. The software will allow an enterprise to extend its resource pool by including resources that come from an external cloud provider as well. "You could have a fixed amount of resources available to you locally or at another data center, and deal with unplanned peaks in demand by using resources from an external cloud provider," Oberlin said.

This practice of using an external public cloud provider for extra capacity will become increasingly common, Forrester's Staten said. "At the moment, we are seeing companies using isolated internal clouds, but we certainly think they will end up adopting a 'hybrid cloud' or 'cloud bursting' approach." IBM demonstrated a system that enables companies to move application processing from an internal cloud to a public cloud facility, while keeping all data stored within the private cloud. This type of hybrid cloud approach could prove popular with companies that can't otherwise use a public cloud for security or regulatory reasons.

It's still the early days for cloud computing, but if efficiency gains in the order of 40 percent to 50 percent are possible, then enterprises unwilling or unable to use a public cloud provider will have to give internal clouds a very long, hard look. ■

# Three Steps to Secure Cloud Computing

By Robert McGarvey

**Y**ou can close your eyes and pretend it is not happening—many CIOs are doing exactly that—but face this reality: “Cloud computing is with us to stay. Everybody will soon be using it.”

At least this is the prediction of Jim Haskin, CIO at Websense, a San Diego-based data security provider, and others.

A scary thought? For many CIOs, yes. “They are panicking about this,” said Kirill Sheynkman, CEO of San Francisco-based Elastra, a developer of applications currently deployed in association with Amazon’s cloud computing offering. The panic is well-founded, isn’t it? Because of the security concerns that come with jumping the firewall?

Sheynkman snorts: “Security is not the issue. Do you think your IT department knows more about data security than Amazon does?”

Reality check: “Data security in the cloud is no different than data security at a remote data center,” said John Lytle, a senior consultant with IT consulting firm Compass in Chicago.

In many cases, data at most companies “are more at risk in their own environment than in a well-managed cloud,” said Mike Eaton, CEO of Cloudworks, a Thousand Oaks, Calif.-based provider of cloud-based services, primarily to small and mid-sized businesses.

## Capable Hands?

The big cloud players—Amazon, Google, Sun Microsystems, Salesforce.com—know more than a little about maintaining

online security and, considered in that context, worries about outsiders knocking down the security walls and having their way with your data indeed seem over-wrought. “There’s been a lot of over-reaction,” said Sheynkman.

“The question should not be about data security in the cloud,” elaborates Haskin. We need to be asking other questions that probe exactly why we are afraid of cloud computing and certainly, as a group, CIOs are resisting it. But just maybe that has to end because time to dither may be running out for CIOs.



Bill Appleton, chief technical officer at Mountain View, Calif.-based Dreamfactory, a developer of cloud-based applications, ominously warns: “The cloud may skip IT and sell directly to end users. It might simply bypass the command and control system of IT.”

And that may be the legitimate worry. That’s because a CIO nightmare revolves around unauthorized use of public cloud resources by employees who may be putting sensitive internal data online at Web-based spreadsheets or into

slide shows.

“Most CIOs worry a lot about employees putting data that shouldn’t be public in public places,” said Christopher Day, senior vice president of security services at Terremark Worldwide, a global provider of IT infrastructure. That fear is justified. What would the board of directors say if it discovered the company’s strategic plan was accessible in a public cloud? But Day also suggests that CIOs can snuff out this potential firestorm simply by taking a direct approach.

"Just put into place clear policies, then educate employees about them," said Day.

Pull your head out of sand (or clouds as the case may be) and directly attack this concern. That is how to make it vanish. Understand too that employees who upload sensitive data usually mean well. They are just looking for better ways to work. Look for other, more secure ways to let them do exactly that, adds Day. Take those two steps and most likely cloud-based shadow IT will diminish in your organization.

### Securing the Logon

Another, lingering worry about cloud computing is that – with many providers – log-ons are too primitive. "Large enterprise will not embrace the cloud until security significantly improves," flatly predicts John Gunn, general manager at Chicago-based Aladdin, a developer of digital security tools. The worry here is that when barebones log-ons are in use, old-fashioned social engineering techniques will let hackers learn employee log-ons and, watch out, data leakage will be at flood stage.

But, said Gunn, the solution is simple: enterprises should only permit data to migrate to the cloud where two-factor, strong authentication is in use and, right there, hackers probably are kept at bay. Take just that step, suggests Gunn, and consider-

able big company opposition to cloud computing would instantly evaporate. Most mainstream cloud providers are hanging back on this but, suggests Gunn, when enough users cry out for safeguards the cloud companies will respond.

### Here Today...

A last, big worry, particularly in today's unstable economy, is how durable is the cloud provider, said Raimund Genes, CTO at Trend Micro, the global security company. "You need a provider that will be in business three years from now. When you give up your IT infrastructure, you need a reliable service provider." When a cloud provider goes bankrupt how accessible is your info, by whom? Better not to deal with such questions at all by instead going with cloud providers that have the wherewithal for a long-haul contest.

Parting advice for CIOs who are still wringing their hands in worry over data in the cloud comes from Elastra's Sheynkman who reminds us: "It's not all or nothing. It does not have to be. Put only the data you are comfortable with on the cloud. That is what most companies seem to be doing. We are still in an era of experimentation."

Take it in little steps but start taking some steps, that's the smart way to embrace the cloud. ■