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1st Quarter 2012

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by Erin E. Harrison

Headed to the Cloud

If you ask the cloud evangelists, the will say cloud computing adoption is no longer a trend, it is now a business requirement. If you ask the cloud-reticent, they will say cloud is still in its infancy and the industry needs clear standards before they will make the leap from on-premise computing.

One thing we learned during the labor of love that gave birth to this premiere issue of Cloud Computing: cloud technologies are disrupting IT strategies as we know them – and the forecast for the foreseeable future is indeed "cloudy."

A great competitive equalizer, cloud computing provides immediate access to resources, saves time and money in developing new services and, more and more, addresses infrastructure, communications and software needs.

Despite what many cloud vendors will tell you, security is still very much a front-and-center concern for the C-suite around the globe, including risks like data breaches and cloud outages. Symantec's recent "State of Cloud" survey showed that organizations are conflicted about security – rating it both as a top goal and as a top concern with moving to the cloud.

But with new coalitions like the Cloud Security Alliance – a group comprised of industry practitioners, corporations and associations – which is promoting best practices for providing security assurance within cloud computing, steps are also being taken to help secure all other forms of computing.

In this inaugural issue, Cloud Computing takes in-depth look at the conceivable security risks by speaking with some of the industry's leading cloud and security experts on how to overcome these challenges, separating fact from fiction (see "Data Security: Barrier or Bridge to the Cloud?," page 28).

We've also made sure to cover other hot button topics and trends around the cloud, such as meeting regulatory compliance challenges, the evolution of IT in the cloud – and how small- to medium-size businesses are leveraging cloud-based services, in some cases, beating large corporations to the adoption finish line.

While it's not a race, many businesses are stalling on implementing cloud-based services primarily due to the perceived difficulty involved and security risks, yet SMBs are moving faster toward the cloud than many big companies are, according to recent industry research.

The latest findings from Gartner say SMBs are adopting the cloud at rates twice as fast as larger corporations, largely because they aren't as risk-averse or don't have to worry as much about integration with legacy systems (see "SMBs Leverage Enterprise-Class Cloud Solutions," page 24).

Another common SMB theme revealed is that the details of the economic argument for cloud communication adoption are quite complex – but the top line message is clear: Moving to cloud will have a positive ROI for almost all SMBs each and every year that they adopt.

Indeed, we have head our collective head "in the clouds" in producing this first issue of Cloud Computing – we hope you will find it as informative and engaging as we found in putting it together. If IT and cloud decisions are important to you or your organization, we'll be here to cover the most recent trends and deliver new ideas for your consideration. Keep an eye out for our next issue in April, and many more.

Erin E. Harrison
Executive Editor

P.S. We at Cloud Computing would love to hear from you – drop me a line at: eharrison@tmcnet.com.

by Rich Tehrani

Why a Cloud Computing Magazine? Why Now?

Cloud computing has emerged as one of the most important trends in tech along with virtualization, 4G/mobility and HTML5. Interestingly, they all grow in a symbiotic fashion. For example, the more powerful mobile devices become and the richer the media they can provide to users and the greater the growth of cloud-based services which feed these devices with information. Likewise, the greater the growth of cloud-based solutions, the greater the need for virtualized systems, which help deploy compute resources more effectively.

At this point, it is obvious the cloud is becoming a crucial part of the future of computing and to paraphrase Marc Benioff, chairman and CEO of Salesforce.com, even if many companies could afford the software alternative to cloud-based solutions, they may not be able to afford the hardware and operating system licenses that are associated with a customer premise software install.

Most of us know the benefits of cloud from an OPEX versus CAPEX perspective but what is sometimes lost in the move to cloud is companies are also benefitting by being able to focus more on their core competency. Are we in the business of building data centers is a question more and more CXO titles are asking themselves and, except for a handful of markets, the answer is "no." And by focusing on business instead of managing server farms and software licenses, companies are able to be more nimble – scaling their compute and bandwidth needs up and down as their business needs dictate.

The reason for a magazine on the topic is clear – there should be a crucial digest disseminating news, analysis and research which decision-makers need to stay up to date on cloud trends, happenings and benefits. TMC's Cloud Computing magazine is that resource.

Of course, as more and more people turn to the web for news, you can expect our companion site cc-mag.com to be a great place to turn for instant information on cloud computing and moreover, the vast majority of you will receive the magazine as an emailed PDF allowing you to read it on your tablets, smartphones and PC screens.

Some of the future challenges and opportunities for cloud computing are availability/uptime, data sharing across clouds, standards, security, compliance, analytics and management. Expect TMC's Cloud Computing magazine to cover all these topics and everything else IT decision-makers need to more effectively do their jobs.

I started my career by using the power of programming, which I learned on a Commodore 64 in the early 1980s to outsource my high school mailroom job and become a computer programmer and UNIX system administrator in the process. Cloud is the next step in the computing transformation and has opened my eyes once again. Sure it's not a new concept – it is really just a return in a way to centralized computing which was popular on mainframes and early UNIX systems. The difference though is we now have a single term today that encapsulates a massive computing shift where applications which used to have to live on servers in a local data center are being encapsulated through virtualization and multi-tenancy and relocated to remote, potentially redundant data centers.

Moreover, the buzz around the term "cloud" and popularized success stories directly translate into cloud-based solutions being more easily approved by CFOs. In the 1980s and 1990s, many companies sold customer contact management software but once the term "CRM" became agreed upon in the mid-90s, the industry exploded with growth. Terms matter and trends matter – expect Cloud Computing magazine to be the one resource critical to cloud-computing purchasing decisions. We hope you subscribe today.

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CiiNOW Raises $13 Million for Cloud Compute System

CiiNOW, a cloud compute platform developer, announced it has raised $13 million in Series-A funding from Foundation Capital, Alcatel-Lucent and a third investor.

"We are also discussing strategic investments with several partners as we build out the ecosystem our real time cloud compute platform," said Ron Haberman, CEO of CiiNOW, and a 15-year veteran of Internet services.

The Bottom Line: CiiNOW sounds like it has more up its sleeve for 2012, as it plans to change the way cloud infrastructure is built and how applications are developed and delivered across a variety of consumer devices.

http://tmcnet.com/59090.1

Twilio Lands $17 Million for Cloud Communications Platform

Cloud communications company Twilio has raised a $17 million Series C round of funding from returning investors Bessemer Venture Partners and Union Square Ventures. In total, Twilio has now raised $31.5 million, according to CNET.

The San Francisco-based company makes web-service APIs so developers can build their own scalable, reliable communications applications for voice and SMS. Twilio has grown from 25 employees to nearly 100 in 2011.

The Bottom Line: In 2011, Twilio grew its customer base by 400 percent to nearly 75,000 developers, expanded its offering overseas to Europe, and expanded its product line. CEO and Co-Founder Jeff Lawson says the new funding will help the company open the "black box" of telecom to developers and companies so they can innovate in this previously esoteric field.

http://tmcnet.com/59089.1

Xeround Secures $9 Million in Series C Funding

Xeround, a cloud database company, announced it has closed $9 million in a Series C round of financing led by their current investors including Benchmark Capital, Giza Venture Capital, Ignition Partners and Trilogy Partnership.

Xeround offers a database-as-a-service for MySQL-based applications, which are elastic, linearly scalable and always on for infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS) and software-as-a-service (SaaS) environments.

The Bottom Line: The company plans to support the growing popularity of its cloud database solution as well as expand its marketing and sales operations with the new funding.

http://tmcnet.com/59091.1

Cloud Testing Company SOASTA Secures $12 Million

SOASTA, Inc., a provider of cloud-based performance testing, has secured $12 million in funding. The round was led by The Entrepreneurs' Fund, with participation from prior investors Canaan Partners, Formative Ventures, and Pelion Venture Partners. Company officials said the funding will accelerate SOASTA's international expansion and support its technology leadership position in web and mobile testing through increased investments in the burgeoning mobile testing market.

The Bottom Line: SOASTA's previous investors are back for another round of funding, an indicator of confidence from Formative Ventures, Canaan Partners and The Entrepreneur's Fund, all of which contributed to the firm's $6.4 million in financing back in 2008.

http://tmcnet.com/59094.1

Cloud Driving M&A Activity

Cloud computing is a major driver for merger and acquisition activity, according to Ernst & Young's Global Technology M&A Update. The aggregate value of global technology mergers and acquisitions (M&A) increased 8 percent sequentially and 22 percent year-on-year to $56.4 billion in the third quarter of 2011, even as M&A value declined in other industries, according to the report.

Deals involving smart mobility and business analytics came on strong in Q311, driving two deals each with values above $10 billion, the first time two deals of that size occurred in the same quarter since Q1 2000. Hundreds more transactions were driven by cloud computing, information security, social networking, online and mobile games, health care IT and Internet and mobile video.

http://tmcnet.com/59092.1

IBM Buys Silicon Valley Cloud Company for $440 Million

As large software companies continue to look for entries into the cloud, Silicon Valley is cashing in. San Mateo-based cloud software company DemandTec was is among the latest to be acquired, as IBM agreed to pay about $440 million for the company.

IBM will pay $13.20 cents a share for DemandTec, a 57 percent premium over the company's then-share price of $8.43.

http://tmcnet.com/59093.1

SAP Bets Big on the Cloud, Agrees to Acquire SuccessFactors for $3.4 Billion

The battle between SAP and Oracle took another interesting step forward over the weekend when the German business software maker agreed to fork over $3.4 bil-

Did You Know?

Public cloud computing will make up $17.4 billion worth of IT purchases and be a $44 billion market by 2013.

Source: International Data Corporation

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lion in cash to acquire California-based SuccessFactors, a provider of cloud-based human resource management software.

SAP – a company that has so far struggled with its cloud strategy – paid quite a premium for SuccessFactors, which lost around $12.5 million on $205.9 million in revenue last year. The $40 per share offer represents a whopping 52 percent premium on a recent closing price of $26.25. — *Beecher Tuttle*

http://tmcnet.com/59095.1

CallidusCloud Acquires LeadFormix

Callidus Software Inc. announced it has acquired next-generation marketing automation and lead management company LeadFormix. LeadFormix has 200 SaaS customers, bringing the total number of Callidus subscription customers to over 1,100.

Pursuant to the terms of the agreement, the aggregate consideration to acquire LeadFormix consisted of approximately $9 million in cash, subject to final adjustments as set forth in the agreement. A portion of the consideration is subject to a holdback in respect of the LeadFormix shareholders' indemnity obligations to CallidusCloud.

http://tmcnet.com/59096.1

2011: Year of Cloud Acquisition

Looking back at 2011, Verizon's acquisition of Terremark Worldwide was one of the top cloud deals of the year. Verizon paid $1.4 billion for Terremark, which provides managed hosting and cloud services for large businesses and government offices. Another noteworthy deal was CenturyLink's acquisition of Savvis for $2.5 billion. Savvis is now part of CenturyLink's managed hosting unit.

Salesforce.com's deal for Radian6 was important, too. Salesforce.com purchased Radian6 for $326 million. Radian6's Engagement Console lets users find out what comments are being made about them on Facebook, Twitter and on blogs. Another important deal in 2011 singled out by Schwartz was when Oracle decided to purchase RightNow Technologies for $1.5 billion. – *Ed Silverstein*

by Erin E. Harrison

SPECIAL
Feature

TMC Announces
Cloud Computing Awards Winners

TMC, a global, integrated media company, announced the winners of the 2011 Cloud Computing Excellence Award, sponsored by Cloud Computing magazine.

The First Annual Cloud Computing Excellence Award recognizes companies that most effectively leverage cloud computing in efforts to bring new, differentiated offerings to market.

"The cloud delivery model has fueled a competitive spirit within the vendor, developer, and provider communities that has resulted in a wave of new products, services and applications being introduced at an unprecedented rate. I am pleased to recognize the companies that have exemplified innovation and excellence in the market by leveraging the latest technology trends to create an enriched user experience," said Erik Linask, group editorial director, TMC.

TMC received more than 200 entries in the first annual contest, of which only 30 were selected for their innovation and progress in advancement of the cloud.

"Recognizing the advancement of cloud communications, TMC is proud to announce 30 winners for the first Cloud Computing Excellence Award," said Rich Tehrani, CEO of TMC. "Awards were granted to the companies who demonstrate innovation as well as the ability to improve the cloud."

And the winner's are:

Company	Product
2X Software	2X ApplicationServer XG
Aerohive Networks	HiveManager Online
Aryaka	Aryaka Cloud-based WAN Optimization
Broadview Networks	Hosted Servers and Cloud Backup and Recovery
BT	BT IP Contact Center
Centrify Corporation	Centrify Cloud Tools
Coupa Software	Coupa Software
Dome9 Security, Inc.	Dome9
Eucalyptus Systems	Eucalyptus
FrontRange Solutions	FrontRange SaaS2 IT Service management
Gridstore Inc.	Gridstore Scale-out NAS Storage
Interactive Intelligence	CaaS Contact Center
Internap	Internap Private Cloud/ DTI Cloud
LiveOps	LiveOps Contact Center Cloud Platform
LiveVox, Inc	LiveVox, Inc
OrecX	Oreka TR

Company	Product
PAETEC	PAETEC Cloud Services
Platform Computing	Platform ISF
Rackspace Hosting	Rackspace Managed Cloud
Radware Inc.	ADC-VX
Red Hat	Red Hat Enterprise Virtualization
ScienceLogic	ScienceLogic EM7
SoftLayer Technologies	CloudLayer
Spirent Communications	Spirent TestCenter Virtual and Spirent Avalanche Virtual
Stoneware, Inc.	webNetwork 6
StorSimple	StorSimple 5000 and 7000 Series of Appliances
SunGard Availability Services	Enterprise Cloud Services
Telx	Telx cloudXchange
Virtela Technology Services Incorporated	Virtela Cloud-based Mobile Device Management Service
ZSL	SmartPrise Cloud

by Renny Shen, F5 Networks

When Does It **Make Sense** for Your **Business**?

Businesses are finding that they need to store more and more data for a variety of reasons. They may be converting boxes of paper files to a digital format, saving all their electronic communications to comply with eDiscovery requests, or simply dealing with the glut of files that naturally accumulate over years of doing business. But all that data is expensive to keep around. The more data a business keeps onsite, the more manpower, electricity and physical space is required to maintain it.

In light of the logistical challenges of increased data storage, organizations of all sizes are turning to cloud computing. As a managed service, cloud storage presents a set of unique benefits and challenges that businesses should consider as they look to reduce operational costs and improve employee access to resources.

Cloud vs. Traditional Storage

Cloud differs from traditional storage systems in the way the files are accessed and stored. Cloud-based information is stored at a central location, which may be on the premises or far removed geographically, and is accessed on demand by users. Broadly speaking, there are three different deployment models available when it comes to implementing cloud storage. A private cloud keeps the storage within the company, where it is managed by a central IT group. Different organizations within the company then access it as a service, on demand. A public cloud, on the other hand, involves a third party providing storage service for the organization, which is then accessed over the Internet. A hybrid cloud incorporates elements of both private and public platforms, keeping some storage in-house (typically sensitive or frequently accessed information) while relegating less vital data to the cloud.

Businesses considering the use of cloud storage should keep several things in mind as they prepare for the transition.

Costs – Cloud computing can help reduce both up-front and ongoing costs, as there may be no need for an initial investment in hardware, and maintenance costs are built into the cost of the service. Businesses should be aware, however, of the new costs to access data stored in the cloud as well as the need for sufficient bandwidth to accommodate the movement of additional data through the network.

Security – Implementing public or private cloud requires investigation into the security challenges involved with having files hosted remotely. Organizations need to carefully consider what information they are willing to place into the cloud, as well as how to secure data while moving it to the cloud. In addition, they need to select vendors that provide robust, comprehensive security and comply with government and industry regulations.

Tiering – As part of determining what data to move to the cloud, businesses should consider an automatic tiering solution which can determine the value of data as it accumulates. It should be able to identify multiple factors such as the age of a file and whether it constitutes sensitive data. It should then be able to automatically assign the data to a tier which will determine its ultimate storage place.

Accessibility – While less-critical information is often moved to cloud storage, it's important that users be able to access files whenever necessary without the need for IT assistance. Otherwise, the cost savings of cloud implementation will be offset by additional time and resources needed to utilize the files stored there.

Preparing Your File System for the Transition to the Cloud

Before adopting cloud technologies for storage needs, organizations will need to determine what information is suitable for cloud storage. The ideal storage system will provide the required performance and data availability, at the lowest cost. For information that is more vital, or higher-tiered, this may be higher-cost, on-premises storage that reduces potential network latency and keeps the data directly under their operational control. Meanwhile, less critical files such as archived information might be well suited to a lower-cost storage system such as the cloud, trading reduced capital and operational expenses for lower performance.

In order to make the most of the move to the cloud, businesses should look for several key features as they investigate providers. The ideal solution should integrate smoothly with in-house storage, allowing users to access all the information they need without difficulty and working with file storage systems from different vendors. It should also be able to dynamically move information between tiers as it changes in importance. In addition, a user-friendly file system should be implemented, through the creation of a global namespace. This allows users to access both locally stored and cloud-based files through a single interface, much as an endpoint's operating system allows users to access files on an internal hard drive or an externally connected device.

Correctly preparing for and implementing a cloud-based storage system provides businesses with a valuable tool that can increase operational efficiency while reducing IT expenses. By selecting the best platform, and implementing an effective classification system for files, organizations gain a powerful tool to address the growing need for data storage in today's business world.

Renny Shen is product marketing manager of F5 Networks.


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by Randy Bias, CloudScaling

The **Evolution** of IT Towards **Cloud Computing**

I've talked about this idea many times and it's been picked up and echoed by many in the mainstream media. The idea is this:

Cloud computing is a new paradigm for IT that displaces the current dominant paradigm, enterprise computing. This is in the same way that enterprise computing (or "client/server") displaced mainframe computing as the dominant paradigm. This is a powerful and important idea to understand and internalize. It sets some of the common misconceptions about cloud on their head such as it being about virtualization (incorrect), outsourcing (incorrect), or business models like "pay-as-you-go" (incorrect).

Cloud computing is a new paradigm for IT in the same way that robotics automation for automobile manufacturing transformed the car industry. It's completely disruptive and it has less to do with specific implementations than it does with vast and drastic changes to how we think about information technology.

This is why in many of my presentations I say:

While the terms "cloud" and "cloud computing" may be hotly debated, I have never once heard anyone credibly refute that these ideas were pioneered and implemented by today's web giants such as Amazon, Google, and Facebook.

This is where we get back to that first statement. I'm not throwing around words like "paradigm" because I feel like being a marketing drone. I'm talking about fundamental and deep changes to how the entire IT stack is designed, delivered, and managed. Try taking the Open Compute project hardware as-is and putting it in any modern enterprise datacenter. Try taking one of Google's custom Ethernet switches and doing the same. Or perhaps you could take a typical enterprise IT admin and give him a week to try and figure out how to administer Amazon EC2.

If you believe this is a fundamental shift in IT, as I do, then the No. 1 misconception (below), still being bandied about by technologists, pundits, and reporters needs to be taken out back and shot …

The No. 1 Cloud Misconception: Virtualization is fundamental to cloud computing.

Virtualization is not fundamental to cloud computing. Salesforce.com didn't use it for the first 10 years of its existence and still mostly doesn't. Google never used it. Amazon doesn't always use it. I doubt Facebook uses it except where necessary. I said it three years ago on my blog and I will say it again: virtualization is one, of many, multi-tenancy strategies.

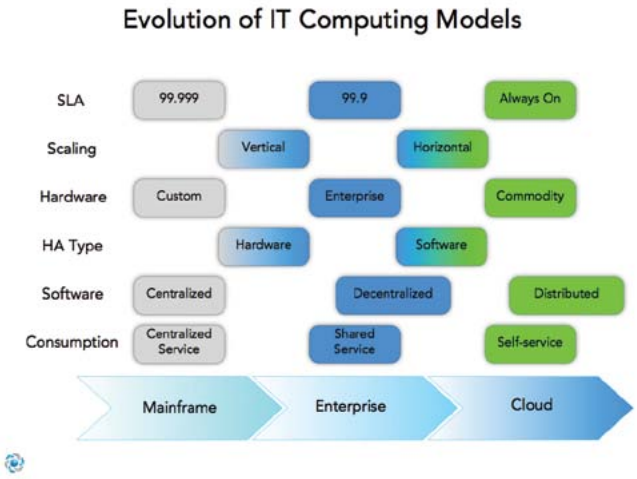
Even Paul Maritz, the CEO of VMware, "gets it," at least as much as is possible for a traditional enterprise vendor. Why did VMware acquire SlideRocket and Mozy? Because these teams have built web-scale and cloud-style hosted services. Other investments in vFabric and Cloud Foundry, very much next generation cloud-type technologies, are no accident. SlideRocket, Mozy, vFabric, and CloudFoundry have nothing to do with virtualization.

VMware's stated intention is to be a key "cloud" player and many of their recent investments are not core virtualization technology. That's a very smart recognition of the gaps that VMware needs to fill in its DNA and product portfolio to be a true cloud player.

Back to Cloud Computing's Promise

The confusion we see around virtualization and cloud computing is because the change is so big, it's hard for people to wrap their head around it. Folks struggle to find simple answers to a complex, multi-pronged, disruptive change. Ask yourself this: if cloud computing was as simple as delivering virtual servers on-demand, then wouldn't there be a credible competitor to Amazon Web Services by now?

We are on a continuum of change, moving from mainframes, to client/server (enterprise), and now to the cloud and post-PC era (more on that topic in another posting soon). The following diagram, which I use in a lot of presentations, helps with understanding what I mean:



This is a simplified diagram. You could pick a number of dimensions to show the continuum we are on. On the far left think Control Data Computers and on the far right, think Google. The transition and direction seem obvious when looked at like this.

Wrapping Up

If you want to build a "cloud," create new cloud technology, be competitive, or be part of the disruption, you have to get your head around the fact that what is important isn't evolving something as simple as virtualization, but evolving the entire IT stack. You need to watch the people and organizations that are part of the change. Watch Amazon. Watch Google. Watch OpenStack and Open Compute. Watch Cloudera and Hadoop. Watch Salesforce, Heroku, and Engine Yard. You can even watch VMware and what they do with CloudFoundry. Are you going to skate to where the hockey puck was … or is? Or are you going to skate to where it's headed? Because if you don't, you aren't going to score big in cloud computing. Period.

Randy Bias is co-founder and CTO of CloudScaling.

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by Peter Radizeski, RAD-INFO, Inc.

A **Force** in the **Telecom Industry**

There is so much talk about cloud that it might be confusing to the average technology buyer.

Not too long ago, there was simply hosting. A service provider would host not just your website, but the product catalog database like mySQL that was needed to provide complete information to your website visitors. Today, we call that "cloud."

Email is the best example of a cloud application, since users can access email from a variety of devices via Internet access. That is the basis for The Cloud: universal access to business data from any authorized Internet-enabled device.

Software is changing from being a static piece of software on a disc that you load on your computer, like anti-virus software. With all the updates needed for software to continue to operate securely – think about updates to your operating system, Adobe Flash or even anti-virus software makers have decided to change to a monthly service fee system to pay for the maintenance and upgrades.

With all of the various platforms – Android, Windows, Apple, Linux, WebOS – offering a web-based software application makes it easier for mass adoption with much less development overhead.

Two things have brought us to this point in cloud: ubiquitous broadband and mobility.

Now that we have broadband available most anywhere – via 3G, 4G, broadband, WiFi – utilizing that access has become an industry in and of itself. Price shopping, group chats, restaurant reviews and reservations, what's nearby, what's happening – all ways that consumers utilize the cloud apps and mobile websites. But anything consumer is inching its way into business.

As businesses become global, virtual and mobile – with employees, partners and customers spread throughout the city, state, country or world – communicating with them from anywhere, at any time, is normal. It is normal because of apps that exploit the devices available that can access the Internet.

Communications in the cloud is just one example of how businesses leverage the Internet. However, email, text, SMS, IM/chat, voice and even video – what is termed "unified communications" – are the first step in collaboration for businesses, their partners and their customers. It is this interaction, this participation, this combination that has termed a buzz word like cloud into such a force in the telecom industry.

Peter Radizeski is a telecom consultant and the owner of RAD-INFO, INC.

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by Josh Restivo, Hexagrid Computing

So, You Want to **Sell Cloud?**

Automobiles make it easy for an ordinary human to propel themselves forward at a relatively high velocity. Although they're easy to operate, the technology upon which they're built is incredibly complex. Cloud is no different in this respect.

Technology providers of every stripe are rushing to deliver a cloud solution. Some of these providers have historically limited their business models to the provision of tangibles (i.e., power, bandwidth, and/or rack space). Others have grown a sprawling hardware monoculture heavily reliant upon "lock-in" management tools and vendor-provided engineering support. When attempting to adopt cloud technology and offer cloud products / services, it seems that many expect to cleanly shift these existing business models onto the cloud.

However, the times are a-changin'. Here are a few key examples of "under-the-hood" complexity that turn traditional IT business models on their head:

1. Hardware: In the past, a typical server failure resulted in a fairly substantial repair exercise. A new server would have to be brought up using an appropriate OS image; the basic environment would require some tweaking to be production ready, data would have to be restored, connections to storage facilities manually rebuilt, etc. Ultimately this meant that expensive, high-end server platforms were critical to the success of any large deployment and therefore justifiable. Losing three to four servers a month in a large-scale deployment would endlessly tie up IT administration resources.

In cloud, the components of a compute environment are separated into pools. Losing part of a resource pool simply means that the corresponding load is shifted elsewhere. Since processing, memory, and storage move about freely within a cloud environment, hardware transience becomes significantly less detrimental to operations. Spending tens of thousands of dollars on high-uptime hardware with pricey service contracts just does not make any sense when hardware persistence is no longer an issue.

With smart players adopting commodity hardware strategies for their cloud offerings and nimbly adjusting to the resultant shift in support concerns, I am not sure how organizations dependent upon big-budget hardware platforms will effectively compete.

2. Software: Tight integration and streamlined management will win the game. Home computers were originally shipped as kits. Who, but die-hard hobbyists, bolts together their own PC's anymore? Originally, the only way to build a cloud was to bolt together various pieces of software (hypervisor, OS, management, monitoring, etc.). The home-brew approach is no longer necessary or advantageous—yet some continue to do it. If you intend to offer cloud services which require wrenching-together a dozen products from disparate vendors (each with a unique take on software licensing), you'd better tighten all the nuts securely because if one spring comes loose, the whole house of cards comes crashing down and you've just entered the twilight zone of vendor finger-pointing.

3. Monitoring/Support: What does your NOC currently monitor? Circuits? Layer 2/3 network devices? Infrastructure, storage, and host memory/CPU stats? Backup status? If your answer to all of these was "yes" then consider yourself prepared for this aspect of cloud delivery. If not, don't think for a second that clients will sign-up for cloud services with disjoint or partial monitoring. A nice pretty screen at the front of the NOC with network ping statistics just won't cut it any longer. Since cloud can envelope the client's whole infrastructure, you will be expected to not only deliver the goods but also monitor every aspect of the stack you're delivering.

Similarly, if your existing support staff has been trained to deal with power outages and telecom issues, don't be surprised when they're overwhelmed by the inevitable and painful "my (virtual) server seems to be running slow" calls. Yes, as a budding cloud provider, you now own all of that too.

4. Billing: Since you're now a ground-up infrastructure provider, your customer will quite reasonably expect to receive a single bill for services. Did you think you were going to just outsource the monitoring and support pieces? Perhaps you thought the customer would willingly carry separate hardware costs just for the privilege of using your cloud service? Maybe the crazy notion of signing customers up with a 3rd-party for network connectivity has crossed your mind?

Your cloud solution is not going to get a warm reception if you point your customers at peripheral service providers to fill the holes in your solution. Currently, customers equate cloud with comprehensive. Back-end processes are expected to be every bit as streamlined and integrated as the core technology. If you dare breach this expectation, you will watch your potential sales wither on the vine.

This is not to say that things cannot be outsourced or otherwise contracted but your vendors must understand the imperative in working together on a seamless and cohesive solution. Not everyone is going to get their name, fancy corporate logo, and whiz-bang GUI plastered in front of the end-client. Also, be prepared to spend some development dollars customizing a management portal for your customers. With all of this integration, some degree of custom development is inevitable.

Of course there are many other considerations when designing a cloud offering. Experience has shown that these items cause the most surprise and/or consternation amongst newcomers. Everyone benefits when these issues are addressed during the product development cycle and businesses arrive to market with mature, responsive cloud products.

Josh Restivo is a senior cloud integration specialist at Hexagrid Computing, Inc.

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by Jim Salviski, EarthLink Cloud

Starting with a **Hybrid Cloud Model**

The terms "cloud" and "cloud computing" are everywhere, but unless you're in the information technology business, you may not be sure what they mean. You should be.

Businesses large and small, in every sector, are moving their operations to the cloud – including your competitors. Let's start by defining what "cloud" means and the difference between public and private clouds.

Simply put, the cloud refers to highly available, mobile, and on-demand virtualized computing resources. It's an overarching term used to describe computing systems, data, and infrastructure all running internally on a private cloud, or externally on a public cloud.

Private clouds operate on a company's internally (owned) server infrastructure, and are virtualized environments built to reduce power consumption, hardware expense, and increase availability. They require highly specialized knowledge within a company's IT department.

Public clouds are purchased through a cloud provider and can replace or be an extension of a company's existing IT infrastructure. A public cloud can also add managed services, freeing an IT staff to focus their attention on strategic projects that are core to their company's business growth.

A company's IT employees are not the only ones who benefit from cloud computing – the company as a whole can benefit, whether using a private or a public cloud. With a private cloud, a company's carbon footprint is reduced, physical hardware can be used longer, and typically it's easier to scale than traditional hardware solutions in private IT environments.

These private clouds usually achieve greater uptime in comparison to physical systems that require their own hardware. Upgrading or replacing hardware does not have to impact the business anymore either. Capacity planning, backups, and storage are the most difficult hurdles for private clouds to overcome these days. Private clouds run well when managed correctly and skillsets are constantly improved upon. The underlying capital investment still exists though and growth always comes to a point where a significant investment is required again.

With a public cloud, IT infrastructure costs become more predictable. In fact, public cloud computing allows a company to increase capacity or add capabilities freely, without investing in new infrastructure, training new personnel, or licensing new software. Capital investments in hardware that eventually become obsolete cease to exist. Reliability and uptime improve tremendously, leading to better business efficiencies. Public cloud computing also allows employees to securely access data from anywhere, at anytime. The cloud runs 24 hours per day, 7 days per week, 365 days per year.

Though there are many advantages of moving to the cloud, many businesses still have questions about safety, security, reliability and accessibility of public clouds. Reputable cloud providers take great pride in providing highly secure and fault-tolerant environments to ensure that proprietary business information is safe.

Cloud providers offer data centers that are specially designed, private environments for public clouds which securely house business data, to which no one else has access. Security at data centers is significantly higher than in most business environments and reputable cloud providers conduct regular audits to maintain a highly secure environment.

Lately, there have been numerous reports of entire corporate servers being stolen, flooded, and compromised in a proprietary business environment. When this happens, statistics have shown that it is extremely difficult for companies to survive after losing their data. In essence, as you trust your bank with your money, you should be able to trust your cloud provider with your data.

Summary of benefits of public cloud computing:

- Zero capital expense for hardware and software;
- Predictable expense model that grows (scales) with your business;
- More reliable/greater uptime;
- Increased security/additional features not available in house;
- No prior cloud experience needed;
- Allows for a distributed workforce;
- Typically lower cost of network services; and
- Cloud providers can often provide mange managed services (extension of your IT department).

Still have reservations? One suggestion is to start with a hybrid model, whereby a company's older, archived information is stored in the cloud and its most current data is stored on its own private server or servers. Becoming more familiar with the concept via hybrid cloud computing will help build comfort, as well as help define which model may work best for a company.

All in all, the cloud offers greater agility, less frustration, better cash flow and more time to do what you do best – grow your business.

Jim Salviski is the vice president of Data Center Services for EarthLink Cloud. For more information, go to www.earthlinkcloud.com.

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by Martin May, Enterasys Networks

Meeting **Regulatory Compliance Challenges** in the Cloud

With more companies moving their networks into the cloud, a number of questions remain unanswered concerning corporate governance and regulatory compliance issues in cloud computing applications.

How safe is cloud computing for companies with sensitive data to protect?

Is it possible for companies to meet regular corporate governance standards in the cloud when many regulatory compliance specifications require data segregation which is seemingly at odds with cloud computing infrastructures?

How true is the generally held belief that because the Internet is unsafe, cloud computing is unsafe? And are there regulatory principles in place targeted at cloud computing users?

Among the drivers for this debate are the best practices recommendations and requirements of the King III Code of Governance Principles for South Africa, the Health Insurance Portability and Accountability Act (HIPAA), the Payment Card Industry (PCI) standard and Sarbanes-Oxley (SOX) and other standards in the U.S.

Undoubtedly, the cloud computing environment places no less a premium on solid management and the maintenance of a culture of integrity-driven performance than any other corporate IT environment of the past.

The Compliance Challenge

It therefore presents similar governance and compliance challenges not only for companies, but also for governments, investors and many other stakeholders in the corporate world.

Unfortunately, there are those who believe compliance will be impossible to achieve within the cloud as companies cannot take responsibility for who accesses their data, who views it, and where (and how) it is stored since a basic tenant of cloud computing is that data can be held and stored "anywhere."

They also point to the security challenges associated with insecure interfaces and APIs relied upon by cloud service providers for many of the management functions. As cloud customers continue to build on these APIs the complexities and risk continues to increase. And they highlight the risks associated with the high volumes of interactions associated with shared services in the cloud.

Cloud computing protagonists, on the other hand, say a key premise of regulatory compliance and good corporate governance is the integrity of the audit process. It's a process required to keep track of all data components – whether they're located in multiple corporate data centers or somewhere in the cloud.

They acknowledge that it's a demanding process and special care is required to achieve success. There is no shortcut – no silver bullet – when it comes to ascertaining where a company's data is stored and what networks it has passed through.

Probably the best route to security compliance is the hire of a third-party auditing firm capable of identifying cloud computing weaknesses through detailed observation of processes through "penetration testing." This will help to provide a platform from which to interrogate data repositories to meet compliance objectives such as the regular appraisal of management performance and accountability and the identification of incidents of administrative failures.

Auditing and Breaches

There is also a need to address breaches of legislation and internal processes while achieving greater value for compliance spend which, in turn, will improve stakeholder and regulator relationships and build more open communication channels between the two camps.

The first steps to be taken before attempting to meet these and other targets include a definition of the type of cloud computing services employed and the cloud infrastructure models involved.

Significantly, there is no "one size fits all" approach when it comes to compliance issues in the cloud. The corporate cloud computing environment must be clearly understood so that a comprehensive, best practices approach can be designed and adopted.

Essentially there are three cloud service types: Infrastructure-as-a-Service (IaaS); Platform-as-a-Service (PaaS); and Software-as-a-Service (SaaS). And there are basically two deployment models – the private cloud and public cloud (ignoring any hybrid combinations).

Public, Private or Hybrid?

Within these types and models, the levels of control afforded the user differ greatly. So does the auditor's ability to effectively and accurately track data. For instance, in private clouds, the number and type of controls are placed at the prerogative of the user and can vary from super-efficient to non-existent.

In a public cloud, while the user organization does not have much say over the controls in place, service provider reputations are at stake which generally help ensure a professional approach – limiting the risks associated with unauthorized access to intellectual property and customer information.

When it comes to service types, it's accepted that greater control – and therefore regulatory compliance - is possible within an

IaaS model compared to SaaS or even PaaS models. This is due to the ability of the user to deliver the key compliance requirement – data segregation – should the entire corporate computing infrastructure be offered as a cloud-based service (IaaS), preferably within the scope of a private cloud.

Why a private cloud? Because a private cloud makes use of dedicated hardware, it is comparatively simpler to segregate the data on separate servers and in separate virtual machines (VM). This allows businesses to maintain regulatory compliance while benefiting from cloud computing.

Significantly, many regulatory compliance specifications, while maintaining data segregation as a core requirement, do not specifically address how it is to be achieved within the cloud; either private or public.

Fortunately, the technology driving cloud computing is constantly evolving. As it advances, so many of the compliance and corporate governance concerns are being tackled and eliminated by global specialists.

For example, the SAS 70 compliance environment (Statement on Auditing Standards 70) issued by the Auditing Standards Board of the American Institute of Certified Public Accountants (AICPA) can be made applicable to cloud computing environments.

In addition, a feature called File Classification Infrastructure (FCI) has been introduced on IBM's Windows Server 2008 (Release 2) designed to tag files carrying personal or financial information and other increasingly regulated data. All that's needed is a workflow program to allow developers to use the data in cloud applications.

These and other imminent breakthroughs point to a future in which an organization opting for a cloud computing solution will have access to secure, fully compliant clouds featuring technology innovation and sustainable business ecosystem development with full regulatory compliance.

Martin May is regional director (Africa) of Enterasys Networks.

The Future of CLOUD

by Thomas Bailey, Interactive Intelligence

Where Will the **Cloud Take Us?**

Welcome, Cloud Computing magazine issue No. 1! Our compliments to TMC for taking us all into the cloud, wherever it leads…

Considering business communications once revolved around the PBX, the cloud is mind-boggling. In companies of all kinds, applications for productivity and customer care are now being optimized to address the web, social media, speech analytics, mobility and huge amounts of data. Many of these optimizations, in fact, are delivering similar functionality in creative new ways.

In technology terms, this makes the cloud all the more astounding. After a decade of concepts and early adoption, the cloud is, essentially, still in its infancy. Futuristically, its possibilities and capabilities seem endless.

So what will cloud computing look like in three years? Five years? Ten years? To this point, consumer cloud services have been instrumental in changing how companies interact with customers, introducing things such as chat and presence and social networks. Optimizations in the future will fundamentally change the way a business cares for its customers. Equipped with new hi-powered devices, the same forces of today's consumer cloud services will severely disrupt the way value is delivered to the next generation of customers – or perhaps more accurately, how the cloud's value will be discovered and executed by such customers. Ultimately, the power of the cloud will put consumers in total control.

In the future, cloud computing will finally and completely remove the barriers of hardware by standardizing the worldwide communications and services infrastructure. Then as companies discover the newfound freedom to generate global markets with cloud technologies, they'll look back and be amazed.

They'll be amazed that on-premise was ever an option. That integration issues no longer exist. And that what used to take months to deploy with systems like a PBX can be deployed in minutes in the cloud.

Technology is constantly evolving, and the cloud is the future. TMC introduced Cloud Computing to keep us informed of the cloud's every advancement, whenever advancements and the future happen. Take advantage.

Thomas Bailey is with the Marketing Services Group at Interactive Intelligence. For information on the cloud-based contact center and unified communications solutions from Interactive Intelligence, visit www.inin.com.

Feature STORY

by Erin E. Harrison

SMBs Leverage Enterprise-Class Cloud Solutions

True or false: Small and medium-sized businesses (SMBs) can leverage cloud-based services to shed costs and IT complexity by implementing enterprise-class services at a price they can afford.

It's true – cloud is not only meant for larger enterprises. But many businesses are stalling on implementing cloud-based services primarily due to the perceived difficulty involved, yet SMBs are moving faster toward the cloud than many big companies are, according to recent industry research.

Microsoft Corp.'s global "SMB Cloud Adoption Study 2011" investigated how cloud computing will impact small and midsize businesses (SMBs) in the next three years. According to the research, 39 percent of SMBs expect to be paying for one or more cloud services within three years, an increase of 34 percent from the current 29 percent. It also finds that the number of cloud services SMBs pay for will nearly double in most countries over the next three years.

Although cloud adoption among SMBs will be gradual, smaller businesses will continue to operate in a hybrid model with an increasing blend between off-premises and traditional on-premises infrastructure, for the foreseeable future, according to Marco Limena, vice president, Business Channels, Worldwide Communications Sector at Microsoft.

"As cloud computing becomes more ubiquitous and SMBs' existing IT becomes outdated, adoption will grow rapidly," Limena said. "Hosting service providers should consider the appropriate sales, delivery and support models to target larger SMB customers that are more likely to pay for cloud services."

The 2011 study also indicates that in most countries, cloud service adoption is not limited to SMBs that see themselves as fast growers. The study showed little difference in adoption rates between SMBs that expect to grow in the next three years (42 percent) and those solely focused on profitability (40 percent).

Compare this to Gartner's findings that say SMBs are adopting the cloud at rates twice as fast as larger corporations, largely because they aren't as risk-averse or don't have to worry as much about integration with legacy systems.

Yet let's consider the other nearly 60 percent of SMBs that do not have plans to pay for cloud services in the next three years. If you ask industry experts and analysts, many of those businesses are misguided based on ignorance by default because they lack IT resources, or the fact that cloud is still so "new" that it's uncharted territory for most companies this size.

Cost-Savings, Automation…and The Right Vendor

There are many cloud services available to the SMB market today: cloud communications in the form of software-as-a-service, infrastructure-as-a-service, as well as cloud storage and cloud backup, among others.

Consider cloud communications as an example since this is a likely place SMBs would make their foray into cloud services. One of the biggest misperceptions about cloud-based services for small to medium-sized businesses is that cloud communications is not about rebranding old centralized voice services, according to Martin Northend, marketing director for OpenScape Cloud Services at Siemens Enterprise Communications.

"The biggest misnomer about cloud communications for small to medium-sized businesses is IP Centrex. Voice is a key part of it, but cloud communications is about overlaying integrated Unified Communications and collaboration capabilities that blend with your existing IT applications and reduce the cost of doing business. Cloud communications is about letting your people access these capabilities from anywhere on any device of their choosing," says Northend.

For example, cloud communications can allow a sales rep to hold virtual meetings with their clients and prospects using voice conferencing or video, with the ability to create an informal desktop sharing session with as many people required. This allows the reps to make more customer calls with a higher level of intimacy than can be achieved with just a phone call, Northend explains.

But many small to medium-sized companies are under the impression that cloud is only for larger enterprises, according to Louis Hayner, executive vice president of WVT Communications Group, Alteva and USA Datanet.

"What we see is that both small businesses and large enterprises are seeing the benefits, such as scalability, disaster recovery, increased security, and delivering applications seamlessly from the cloud at a lower total cost of ownership," says Hayner. "The most significant benefits are that the cloud delivers all the same capabilities normally reserved for Fortune 500 companies and brings that down to the small individual business."

Northend notes some of the most significant benefits cloud services bring to SMBs, citing research recently commissioned by Siemens.

"The results debunked the myth that firms move to cloud communications just because it is cheaper or because they want to avoid capital expenditure," he says. "While both of these are true statements for cloud communications, the key reasons we identified as to the most significant benefits that SMBs derive from cloud communications are because it is more flexible, it's faster to implement, it's feature rich and it enables SMBs to instantly support multiple locations."

Given that cloud is actually often a more affordable option for SMB communications, ROI results and operational efficiencies are other considerations SMBs need to evaluate, in addition to the ability to leverage applications that were previously limited to large enterprises.

"The great news for SMBs is that the cloud enables them to get on demand access to the same enterprise class communications applications that have previously been the preserve of large organizations," says Northend. "Key to this is the automation of provisioning because this really tips the economies of scale in favor of the SMB. In a sense the large organizations bore the costs of the sometimes painful lessons of working out how to deploy UCC applications, unified communications and collaboration, in the private cloud and all that knowledge has now been coded into automated provisioning systems, leveling the UCC deployment playing field for SMBs."

The details of the economic argument for cloud communication adoption are quite complex – but the top line message is clear, he adds.

"Moving to cloud communications will have a positive ROI for almost all SMBs each and every year that they adopt," says Northend. "Behind this statement is a complex set of maths that tracks the changes in call costs, user productivity improvements and operational investments that occur when an organization moves to the cloud."

When it comes down to a successful cloud deployment, it's all about picking the right vendor, according to Hayner.

"Where cloud communications and services are perceived as new, the best practices in selecting vendors have not changed. It's important for SMBs to research and understand which vendors appeal to their industry and get good recommendations through third parties, such as analyst industry sources," he says, adding that the current economy has actually enabled cloud communications and cloud services to take off.

"The key questions is, 'what will happen to the cloud momentum when the economy changes?' I personally believe that once the SMB community in particular adopts the cloud and sees the benefits, it's only going to gain further market share," says Hayner.

For those SMBs already engaged in a cloud deployment, many also fear the idea of having to switch cloud providers if they decide over time that a particular service isn't right for their organization.

Jamie Brenzel, CEO of cloud backup company KineticD

"Although technically there are ways of switching data between one cloud provider and another, few vendors have come up with formalized procedures or guarantees about how they will do it, which is a major concern if customers decide a given service is not right for them," says Jamie Brenzel, CEO of cloud backup company KineticD.

Sustainability of the vendor is also a critical factor for SMBs – or any size organization, for that matter – in choosing a cloud services provider. Brenzel points out fly-by-night vendors like Backify that offered 512 GB for free and then closed shop overnight.

Backify, a LiveDrive-powered cloud backup and recovery vendor, announced free storage of up to 512 GB with an option to "upgrade" to "unlimited space." But then soon after, LiveDrive announced that it was blacklisting Backify and withdrawing support because the firm was "a fly-by-night" operation and had not paid the fees due to the parent company, according to LiveDrive's Andrew Michael.

"A situation like this gives any SMB reason to pause before deciding to engage in a cloud deployment," says Brenzel. "Do your homework to ensure you are working with a legitimate vendor."

Security Concerns for SMBs

Security remains one of the most significant concerns held by C-level executives globally (see "Data Security: Barrier or Bridge to the Cloud?," page 28), and perhaps even more pervasive among smaller organizations since they often don't have the IT resources found in larger companies.

But a properly implemented cloud communications solution is probably more secure than the on-premise systems that many SMBs currently use, maintains Northend.

"The key for SMBs is to satisfy themselves that the vendor they are considering operates from a TIA level 4 secure data center (this is

the highest security level in the commercial sector), is implementing ISO 27001 for the back office IT management systems, that they have 'hardened' their servers and that they perform regular penetration testing," advises Northend. "After that the single biggest risk to security is likely to be an SMB's own users."

Siemens Enterprise Communications provides customers with different deployment choices, allowing customers to choose between public cloud services and private cloud solutions.

"Our 'public' cloud services are provided from secure commercial data centers at the heart of the internet over multiple public IP and ISDN networks," explains Northend, which include OpenScape Secure Cloud provides Voice, Unified Communications and Collaboration and Contact Center Services.

OpenScape Secure Cloud is an on-demand service with a modular "functionality packaging" concept and automated provisioning that allows customers to tailor the service to the needs of individual users.

"For customers that prefer to create their own private cloud solution we have packaged our core technology as OpenScape UC Server Express. Using their own data center organizations can have complete control over the deployment and functionality of their own private cloud solution," adds Northend.

Just because an application runs in your office doesn't mean it is secure, adds Brenzel, making the point that moving your data and applications to the cloud makes it no more vulnerable there than it is on premise.

"The question is what security measures and controls does the cloud service provider have in place. Is their data center SSAE 16 certified? Is their web portal daily scanned by a seal provider (e.g. McAfee)? How is the data encrypted? Is there a master key? Who has access to this master key? All these are questions technical evaluators should ask when evaluating a cloud service. Chances are that any serious cloud application is substantially more secure than any SMB could afford to implement for an internal solution."

Security is always a concern when any new technology is introduced into any enterprise, Hayner continues.

"Security is only as good as the underlying infrastructure that is put into place. The cloud could be much more secure because the resources that the service provider has are much greater than the individual small business," Hayner says. "However, it is critical that the small business takes all of the best practices in place whether it deploys a premise based solution or a cloud based solution. Best practices are best practices when security is taken into account."

The normal risks that small businesses need to take into account when choosing any vendor apply. SMBs should be asking questions such as:

- How is that vendor going to support them both today and long term?
- What is the vendor's strategy for making its cloud more relevant?
- How long have they been in business?
- What is their long-term growth plan and product roadmap?

"All of this needs to be taken into consideration when selecting a cloud vendor," Hayner says.

The Future of Cloud for SMBs

Despite growth predictions by Gartner and Microsoft, among other, the market for cloud communications is still very much in what Northend calls the "embryonic stage."

"In the next 12 months will see a lot of new entrants to the market, and because cloud is a hot topic there will be a degree of confusion as lots of different offerings get given the label 'cloud' in an effort to enhance their customer appeal," predicts Northend.

He also sees cloud communications market offerings falling into a number of different categories, such as point services offering a specific type of application (i.e. web conferencing, video conferencing); integrated services offering a range of applications as an integrated package or packages; basic voice services or IP Centrex services sprinkled with a little cloud stardust to make them more appealing; and hosted/managed on-premise solutions.

"In time these offerings will come to be seen as an alternative service wrap for existing CPE offerings – rather than part of the cloud communications market," he adds. "Looking beyond the 12-month timeframe we see the emergence of a demand for closer integration between cloud communications services and on site applications, and eventually as more of these applications move to the cloud, integration between different cloud services.

In line with current industry research, Hayner also predicts wider-spread cloud adoption among SMBs.

"We see cloud adoption increasing. However, as that adoption continues, so does confusion. One of the major challenges in the cloud, like any new technology, is education as well as standardization. What does the cloud mean and how can it best impact my business?

SMBs Climb Toward Cloud Adoption

Research company Techaisle recently completed a survey of SMBs, which reveals that while use of cloud services varies by size of business, the pattern of adoption appears to follow a previously observed pattern related to adoption of outsourcing.

In both cases, rather than seeing greater adoption with business size, adoption rises and falls as businesses first use cloud services then as they grow they attempt to bring solutions in-house and use cloud services again in order to support growth.

The survey also found that the inflection point for adoption occurs at 20 employees. Small businesses with 20-99 employees typically expand their use of cloud services and appear to maintain that level of usage until they hit 250 employees. At this level, SMBs begin to bring services back in-house as IT investments rise. Adoption of cloud services rises sharply again as SMBs exceed 500 employees.

by Erin E. Harrison

Data Security: Barrier or Bridge to the Cloud?

Cloud has opened up several IT strategy considerations for businesses, with security top of mind for chief information officers as they evaluate the potential benefits of shifting to the cloud for their computing needs. Cloud Computing has taken an in-depth look at the conceivable risks involved by speaking with some of the industry's leading cloud and security experts on how to overcome these challenges, separating fact from fiction.

But first, a little history to provide some context for today's security concerns: When the term "cloud" first made its appearance in the tech industry several years ago, skeptics brought up a valid point: Is shifting data to the cloud – off premise, into another location – at all safe? How could it really be? "Cloud security" sounded like an oxymoron, and for some, it still does. Certainly, we know that cloud computing is imposing change to IT strategies, but is security in the cloud a real or perceived threat?

Despite the traction that cloud has gained in the past year, a recent Ovum study concluded that business barriers to using cloud computing and communications services remain. Fifty-eight percent of respondents claimed security was a critical barrier to adoption, and this is strongly reinforced by their next most significant concerns: data governance (54 percent), use of public internet infrastructure (40 percent), and loss of control (39 percent).

It's safe to say that the C-suite still needs to get comfortable with the idea of placing their most critical information, into the cloud – especially taking into account some of the more high-profile security breaches that have been so well-publicized, perpetuating the underlying fears that many senior-level decision makers still have about cloud.

"When we look back on a year riddled with high-profile data breaches, it's fair to say that the C-suite is still very concerned about the security of their corporate data wherever it is stored and used including in the cloud," says Dave Elliott of the Global Cloud Marketing division at security firm Symantec.

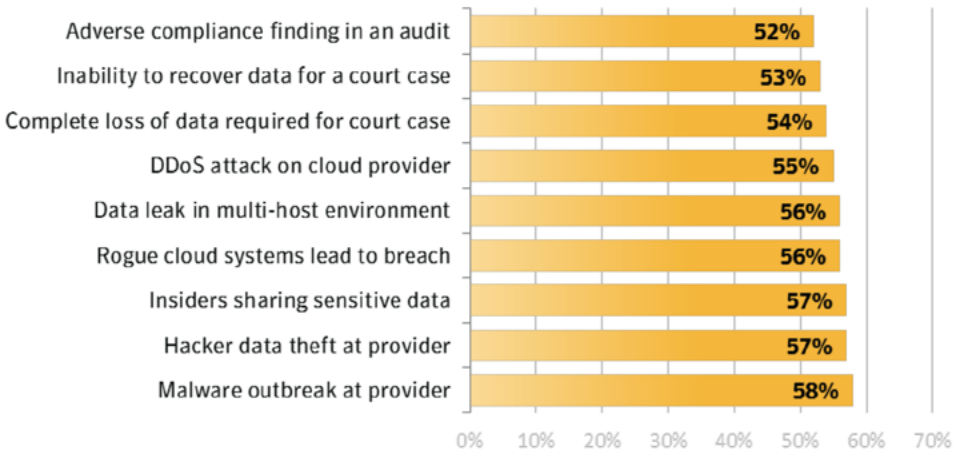
In fact, Symantec's recent "State of Cloud" survey showed that organizations are conflicted about security – rating it both as a top goal and as a top concern with moving to the cloud.

"Eighty-seven percent of respondents are confident that moving to the cloud will not impact or will actually improve their security," notes Elliott. "However, achieving security for cloud environments is also a top concern for these organizations, which cited potential risks, including malware, hacker-based theft and loss of confidential data."

Senior-level executives on the whole are concerned about a myriad of potential risks, including malware, hacker-based theft, data leakage and other risks. In fact, when asked to list their

Biggest Concerns

Of the concerns discussed, all were rated as somewhat or completely significant by 52 to 58 percent of respondents.



Source: Symantec's 2011 State of the Cloud survey

biggest concerns, the real finding was not which fears topped the list, but that so many fears made the list, according to Symantec.

Of the concerns discussed in the survey, all were rated as somewhat or completely significant by 52 to 58 percent of respondents. It's become apparent that organizations are crossing the cloud chasm with both anticipation and trepidation.

"Organizations continue to be concerned with security in the cloud and security for the cloud. This year, customers have told us their top cloud concerns are data breaches and cloud outages," says Elliott. "There is a growing recognition that moving to the cloud still requires good data governance and at the end of the day, the enterprise is responsible for protecting and securing information regardless of where it resides. We expect for that maturing to continue in the future."

The top threats, according to Symantec's cloud report, are as follows:

- Mass malware outbreak at your cloud provider;
- Hacker-based data theft from your cloud provider;
- Sharing sensitive data insecurely via the cloud;
- Rogue use of cloud leading to a data breach; and
- Data spillage in a multi-hosted environment.

"In addition to these concerns, customers tell us they are primarily concerned with visibility and control of information in the cloud," explains Elliott. "Emerging use cases that concern IT include 'rogue' or 'shadow IT' in the cloud, and there is need for IT governance for the public and private cloud, as well as unified information and identity security across cloud providers."

In reality, security is the only substantive concern when it comes to cloud computing, according to Simon Crosby, the former CTO of the Data Center and Cloud Division at Citrix and current CTO and co-founder of Bromium, a cloud security company.

"In the last year there have been a number of unnerving security exploits, not to do with the public cloud, I ought to add, that have merely reemphasized the fragile state of enterprise security overall. So until we address the broader concerns of application and data security, it will be difficult to get enterprise CIOs to trust third-party clouds," says Crosby.

While real threats show that security risks are at hand, at the core of security apprehension is the mindset senior-level executives have about giving up control of their data.

"I ought to be clear here: I don't see any profound security challenges from a technology perspective. The vendors are moving down the right path, and the service providers whose business depends upon security and delivering against SLAs are all embracing and actively pursuing relevant

certifications," explains Crosby. "The challenge that we face is a human belief system which one might imagine a CIO stating like this: 'My own enterprise infrastructure is barely secure, and that's only because I have a team that knows the needs of my enterprise users and my apps and data. They tell me that they can't trust the cloud, because they won't be in control, so clearly I can't.'"

The cost benefits of cloud computing are so significant that even if a company is not in the implementation phase, they are talking about it. This puts company's IT team in a tough situation in that they must balance their fears – whether those are perceived or real – while grasping a solid understanding of the various cloud technologies available.

"The enterprise IT team are between a rock and a hard place: They need to prove compliance with regulations that mandate practices that are extraordinarily difficult to accomplish in a cloud environment," says Crosby. "Add to that the rational fears resulting from loss of control, and a lack of understanding of many new technologies, and you see the difficulty of enterprise adoption of anything other than a private cloud."

Another wrinkle in the security factor is the fact that cloud environments are not necessarily conducive to compliance with many regulatory standards, according to Chris Richter, vice president of security products and services at Savvis, a cloud services provider.

"It's a growing concern, not because cloud-computing environments are inherently becoming less secure, but because they are being adopted at a much faster pace, and are being used to increasingly process critical data," says Richter. "Cloud computing's cost model is extremely appealing, so CIOs are compelled to seriously evaluate it for applications that a year ago would have been considered unsuitable to migrate to that type of virtualized, shared platform. Many of these applications require compliance with various industry and regulatory standards, many of which were not written for cloud environments, which adds to security concerns."

Cloud Standards – Where Are We?

As the standardization of cloud computing evolves, it's likely that more enterprises will pave the way for using a cloud model, whether it's a public, private or hybrid one. Symantec's Elliott notes several efforts that are underway that will help the cloud landscape mature, and therefore alleviate many of the security concerns held by CIOs today.

"There are many great standards efforts in cloud such as NIST and FedRAMP for public sector cloud initiatives. One of the most mature standards efforts which Symantec has been involved is the Cloud Security Alliance which has published 13 domain area recommendations for cloud computing," says Elliott. "These robust standards are part of the maturing cloud landscape that helps enterprises figure out how to keep their clouds secures and available."

The Cloud Security Alliance – a group comprised of industry professionals, corporations and associations – seeks to promote the use of best practices for providing security assurance within cloud computing, and provide education on the uses of cloud computing to help secure all other forms of computing.

But Bromium's Crosby says the industry has a long way to go in implementing cloud standards and says that what is needed is a thorough reformulation of the regulatory frameworks in a "technology agnostic" fashion.

"It's difficult to be compliant with data control regulations unless you can point to the hard disk containing the data. That's not going to fly in the cloud world. We need to evolve our regulatory frameworks just as we evolve our technology base. From a technology standardization perspective, I think there are some key needs in the areas of instrumentation of clouds, SLA management and security management," Crosby says.

Since standardization of the cloud is still very much in its infancy, many service providers are taking advantage of this interim period to develop better platforms and capitalize on their respective positions in the market.

"What's interesting is that there isn't a cloud standards forum in which this work can be done, and much of the thinking is happening in smaller groups within traditional standards groups who don't really get the big picture," Crosby says. "And to be honest, the service providers are not strongly pushing standardization at the moment, since their own best interests are served by developing better platforms for themselves. I give the industry a B here."

However, in June 2011, the PCI Security Standard Council's Virtualization Special Interest Group issued an information supplement titled "PCI Virtualization Guidelines," a step forward for the development of industry standards.

"This information supplement discusses cloud computing and, although it does not augment or alter PCI DSS 2.0, it does provide valuable guidance for enterprises considering building or migrating to a cloud-based platform," points out Richter. "In addition, NIST issued its guidelines for cloud computing security – Special Publication 800-144. The Cloud Security Alliance has also done a lot to align cloud computing to existing security standards."

Not All Cloud Providers Are Created Equal

Concerns about cloud security are not simply a case of mind over matter: While some concerns are grounded in reality, others are sheer mindset. But cloud is no longer an "if" for decision makers seeking to reap the many benefits of cloud computing. By 2012, International Data Corporation predicts that IT spending on cloud services will grow almost threefold to $42 billion.

Industry experts contend that to not adopt cloud because of fears is an even bigger risk. Organizations need to closely evaluate potential cloud service models and providers; they must also insist that cloud service providers grant visibility into security processes and controls.

"The biggest risk occurs when humans are running around your data, not when your data is in the cloud. There are top-secret certified public clouds today, so there is no reason not to adopt. So perhaps the biggest risk is not adopting cloud because of your fears. Cloud-based technologies dramatically change IT," says Bromium's Crosby. "Service-centric, cost and metrics focused, agile, and dynamically scalable IT infrastructure that is also secure, is available today, for rent. Enterprises should begin to adopt cloud wherever they legally can do so, and where they cannot, they should use private cloud infrastructure."

The biggest cloud computing security risks for enterprises, concurs Richter, will come when the decision makers fail to ask the right questions or jump in too quickly simply to save costs.

"I believe the biggest cloud computing security risks stem from enterprises not asking the right questions of their service providers regarding security controls. In the rush to lower IT costs, too many try to adapt to a one-size-fits-all approach, assuming that, for example, the level of security that is in place for an informational website is sufficient for highly confidential, or protected, data that is also hosted in the cloud," advises Richter. "The level of security applied must be in line with the importance of the data. Not all clouds are created equal, and different cloud providers can have vastly different approaches to delivering a secure service. Again, a good place to start is with the list of vendor questions on the CSAs website."

The biggest cloud security myth, Richter says, is that data stored and processed in the cloud is inherently more at risk than data located in an enterprise's own data center.

"Many, if not most, cloud computing environments are more secure than those of companies that operate their own, dedicated infrastructures. The reason for this is that most reputable cloud computing providers are held to a very high standard for security controls, and are scrutinized by a multitude of customers who must also adhere to a variety of compliance standards," he explains. "Again, not all clouds are created equal, so evaluate your requirements, and ask your prospective provider for as much detail as possible about their approach to securing your data."

Cloudy with a Chance of Greater Transparency

As noted earlier, there are several industry groups working toward standardization of cloud security. Richter predicts greater transparency from cloud services providers, a discourse preached by members of the growing Cloud Security Alliance.

"I think there has been significant progress made in cloud security over the past year. The Cloud Security Alliance has grown its membership tremendously during that time, and has developed a number of programs designed to raise the awareness of cloud security requirements, and has provided a list of questions that every enterprise should ask of their cloud service provider regarding their approach to securing their offerings," says Richter.

He also notes that many security technology vendors have modified existing, or developed new products such that they work specifically in cloud environments.

"In the next 12 months, I believe we're going to see much more transparency from cloud services providers with regard to their security controls. Cloud security is growing as a vital concern, so much so that service providers can no longer get away with simply handing a prospective customer a white paper that does nothing but provide a high-level overview of their approach to security," says Richter. "Customers want, and deserve, full-disclosure describing how everything from the way APIs are secured, to knowing exactly where their data is located. 'In the cloud' will increasingly not be an acceptable answer."

by Erin E. Harrison

Interactive Intelligence Helps Contact Centers Navigate Their Way Into the Cloud

In technology, foresight is everything. Several years ago, Don Brown, the founder and CEO of Interactive Intelligence, saw a major market shift when he realized that companies were moving many parts of their technology to the cloud, with the potential for communications to be a core part of that shift.

Although Interactive Intelligence had been selling hosted contact center services since 2005, Brown had the vision for this cloud shift in the market, causing the company to re-architect and relaunch its hosted services in early 2009.

As Interactive's chief marketing officer, Joe Staples, explained in a recent interview with Cloud Computing, the company is seeing more evidence of this change based on hard data.

To provide some perspective on just how dramatically the market has shifted, consider these numbers: In 2009, the cloud made up 5 percent of Interactive's total orders; a year later, the cloud comprised 10 percent, and at press time, cloud services made up 24 percent, nearly a quarter of its business, in the first nine months of 2011.

Initially, Staples says the global economic tumble in 2008 caused companies to tighten their belts and focus much more on expense control.

"The economic situation in 2008 and 2009 caused people to look more to the cloud for financial reasons," Staples says. "The financial reasons are still part of the equation, but other factors like flexibility, time to deploy, and efficiency are now playing a bigger role."

To further illustrate the movement toward cloud communications, Staples cites recent analyst statistics. "Over the next five years most analysts predict the world-wide compound annual growth rate (CAGR) of premise-based contact center agent positions to remain relatively flat at below about 2 percent," he says. "For hosted contact centers, however, analysts are painting a much more positive picture with projections of a CAGR from 2009 to 2016 of up to 19 percent for hosted agent positions."

Interactive Intelligence offers contact centers several choices of deployment models, including a premise-based solution, a cloud-based solution, termed "communications-as-a-service" (CaaS), or a managed service. Customers can migrate their CaaS solution to their own site at any time, seamlessly, without incurring downtime or losing applications.

Today, Interactive has more than 4,000 customers in 90 countries, according to Staples.

But the company didn't achieve such success overnight. The Indianapolis-based company, now with more than 1,000 employees and anticipated sales in 2011 of more than $200 million, shipped the first version of its contact center software in 1997 and its cloud rebranding was a multi-million dollar effort.

"We had had a hosted offering on the market for several years, but this was Don Brown being visionary and saying 'I think the market is going to make a hard shift to the cloud and we need to be in a position to take advantage of that shift,'" explains Staples.

The company then began its three-year foray into opening up global data centers – about to open its seventh – and rearchitecting its cloud-based business model.

"In 2009, we did a re-launch; we rearchitected our offering, adjusted pricing, and put a considerable amount of marketing and brand-building effort behind our cloud offering," says Staples.

He credits Brown with recognizing a heightened level of interest in cloud not only from Interactive's own customers, but also in witnessing the success of other cloud computing companies, not to mention the media traction cloud was getting.

"There was a lot of noise around the cloud and a significant groundswell that we were able to get out in front of. Credit Don's vision for getting us into a strong cloud position several years ago – really before many others were considering cloud-based communications as a mainstream offering," Staples says.

A major advantage for Interactive Intelligence is the fact that its contact center and unified communications software has been deployed by thousands of companies, adds Staples.

"This software base is the same offering we deliver via CaaS," he says. "So instead of the risk buyers have with smaller, less proven vendors, with Interactive they are dealing with a proven industry leader.

"For a customer, that simply provides a reduced amount of risk in the fact that they are buying something that is proven and tested," continues Staples.

"As evidence of the value customers are finding in moving communications to the cloud, our CaaS offering is the fastest growing segment of our business – up one-hundred-and-thirty-four percent through the first nine months of 2011," Staples says. But it's not just numbers that prove Interactive Intelligence is a leader in the contact center space.

"If you look beyond how many installations we have, analysts like Gartner and Frost & Sullivan have categorized us in a very small group of leaders," Staples says. "We've been doing this for seventeen years. That experience provides some nice benefits to our customers."

Joe Staples, chief marketing officer, Interactive Intelligence

Scalability and Flexibility in the Mid- to High-End Market

If you segment the market, Interactive Intelligence clearly has its sights set on the mid to high end of the contact center and unified communications markets. Its software scales extremely well and offers the more advanced applications that those larger companies require, according to Staples.

"We don't believe there is a 'one size fits all' in the cloud space, so a product that you would design and focus on for five agents is going to be significantly different than a product you design for thousands or tens of thousands of agents," explains Staples."

There is no doubt that Interactive's objective is to be the leading provider of mid- and high-end cloud-based contact center and unified communications solutions.

"Where we've succeeded the most is with the mid- to large-size contact centers. The scalability we deliver, the breadth of applications, our strong investment in R&D and continued innovation has made us really appealing to some of the largest companies in the world," says Staples.

As part of its cloud expansion, Interactive is preparing to open its seventh data center. The company currently operates two in the U.S., with the others in the U.K., Germany, Australia, and Japan – all of them monitored 24/7 from a central network operations center (NOC). Interactive's latest data center in Brazil is planned to be in place in the first half of 2012.

From a cultural standpoint, customers are often looking for the service to be provided from a data center within their country or their region, Staples points out.

"That kind of coverage is important to global companies. A lot of the objections go away if you are in the country with a local presence. We think it better serves our customers that way and shows we are committed to investing in our cloud-based services," says Staples.

Interactive has seen hosted success with global cloud deployments of its CaaS Contact Center at Philips Healthcare, Eli Lilly and Company, Public Storage, Nissan, Brightpoint, and others among the Fortune 1000.

"The large number of data centers that Interactive has rolled out is an important part of the company's strategy," says Staples. "With operations closer to the customer, we are in a better position to service their unique needs and privacy requirements for specific regions of the world."

Another unique characteristic of the Interactive Intelligence offering is the ability to move from the cloud to premise, or the opposite direction.

"Business needs change over time," Staples says. "What might have been a good decision today, might not make sense tomor-

row. We makes it easy for companies to make this transition if the need arises. This gives our customers an increased level of flexibility. We don't have a competitor that can easily make that transition for a customer.

"These are big purchase decision for customers. This safety net that says you can at any time easily move from cloud to premise, or premise to cloud gives customers a whole lot of comfort,," he says.

Staples also raises another important point: Moving to the cloud doesn't mean you should lose functionality.

"If you're giving up functionality simply to get to the cloud, you're selecting the wrong vendor," he says. "Availability of a broad portfolio of feature-rich communications applications should be at the top of a customer's checklist as they select a cloud-based communications provider."

Mitigating Security Concerns

When a company of any size considers moving its communications to the cloud, security issues are often top of mind. But what was once a debilitating factor for IT decision makers is no longer as weighty a concern, according to Staples.

"The security question still gets asked in every cloud deal we're in," he says. "However, it's a lot less worrisome for customers than it was say three years ago. Security was at the top of the list before, but now it's less of an issue as we've taken steps to mitigate risk."

In the case of Interactive Intelligence, its data centers where information is stored, and where it serves the applications, are SAS 70, type II-certified, closely monitored 24/7.

"These are very secure environments," Staples says. "When customers see the security of our data center locations and compare them with the security of their own server rooms, they quickly begin to feel comfortable about the physical security issue," "Additionally, we have a hosted deployment option where all the voice traffic and call recordings remain on the customer's network, inside their firewall, never needing to traverse the network up to the data center. Only SIP messages are passing between the customer's site and the data center. These are examples of the measures we've taken to address customer security requirements.."

Further reducing security concerns and improving flexibility – and one of the benefits Interactive's cloud customers cite most – is the fact that every CaaS Contact Center customer runs an isolated software instance on their own virtual machine in the cloud.

"So by not running the same instance of software mixed in a multitenant environment, our customers have a higher ability to customize their solution, plus there is an innately increased level of security," Staples says.

> Over the next 12 to 18 months, the biggest drivers of change in the cloud ecosystem will be mobility, open source, open and transparent APIs, the customer's desire for lack of vendor lock-in, the shift to PaaS and increasing industry consolidation.

Consider, for example, Naviss LLC, which uses Interactive's CaaS Contact Center for approximately 120 total users. Of those, about 100 are contact center agents and about 20 are business users. Naviss offers vehicle protection plans that protect consumers from costly repairs above and beyond their standard manufacturer's auto warranty, so you can imagine how vital a reliable cloud communications system is to the company's success.

Although Naviss had previously deployed a cloud communications solution from another vendor, the company was dissatisfied with the service overall and its consensus of the phone system was that it was "less than satisfactory," according to Art Pender, chief operations officer at Naviss.

Naviss, which is located in St. Louis, Mo., currently uses several Interactive Intelligence CaaS Contact Center applications. including supervisory monitoring and its desktop softphone with call control. The company is also in the midst of deploying the Interactive Intelligence cloud-based dialer application for outbound and blended contact centers.

"Selecting Interactive's CaaS Contact Center was a no-brainer for us," says Pender. "The information was kept in another place, so if something tragic happened, we were still protected. We had no reservations whatsoever. And the level of support is second to none. I've been in the service industry

for 25 years and I've never seen anything close to what we're getting with Interactive's cloud-based solution."

The Benefits of Cloud Communications

Despite such success stories, there are still those IT leaders and other C-suite executives who are cautious to make the move from premise-based to cloud communications. But Staples advises executives to consider and balance out the benefits versus the risks.

"C-suite executives are wise to consider all the costs associated as they make a decision to go with premise or cloud," Staples say. "So many costs can either be reduced or eliminated with a move to the cloud, but it's important to look closely to ensure that all the costs are being considered, not simply the purchase price vs. the monthly charge."

Interactive has also seen that successfully moving communications to the cloud is best realized if it's part of a bigger strategic cloud decision. He notes that many of the companies transitioning to a cloud communications solution are also those who have already moved other applications to the cloud. Other important bits of wisdom Staples dispenses are as follows:

- Look at what other applications can be moved to the cloud and how all of those applications will be integrated.
- Examine the size of deployments the vendor typically does and see if it's a match for your organization's size. If you're looking for the ability to customize the offering, be sure that can be done with the service you select and evaluate how good the vendor is at providing those customization services and dealing with sophisticated applications.
- Long term, if you want to add predictive dialing, workforce management, screen recording, or unified communications capabilities, be sure your CaaS vendor can deliver those services without undue complexity.
- Know exactly what security measures the prospective vendor has taken – both infrastructure and processes – to ensure your cloud deployment exposes you to minimum risk.
- Ask the vendor if they provide the option to migrate from a cloud deployment to premise should you decide to change models down the road; and if they do, be sure you understand the implications, like application rewrites, etc.
- Finally, consider the financial stability of the vendor. Be sure they will be there to support you for the long run.

Still not sure about this cloud communications business? Interactive Intelligence recently introduced a trial program called Quick Spin that enables organizations to sample for free the company's communications-as-a-service offering.

"By its very nature the cloud offers an easier way for customers to quickly trial the communication service," Staples says. "We created Quick Spin to let our prospective customers kick the tires, with set up of a trial number of users, workgroups, and skills taking less than an hour. Then for a 14-day trial customers can get a live experience of the contact center routing and queuing, use of the agent desktop, view reports, see how straightforward the system is to administer, and even trial some of our more sophisticated applications such as real-time speech analytics. While Quick Spin is brand new, the interest level has been very strong."

"Availability of a broad portfolio of feature-rich communications applications should be at the top of a customer's checklist as they select a cloud-based communications provider."

– Joe Staples, chief marketing officer, Interactive Intelligence

Based on current figures and trends at Interactive, Staples predicts the company could eventually see more than 50 percent of customers opting for a cloud-based contact center.

Looking ahead to the next 12 months, Staples says he believes that cloud communications will continue to replace older, premise-based systems since the benefits of shifting to the cloud are vast and quantifiable.

"We see cloud communications continuing to replace existing premise-based systems at a pretty fast clip," Staples says. "Most industry analysts show the annual growth rates for cloud communications to be eight to ten times the pace of premise offerings. The benefits of moving to the cloud are just too compelling for CIOs, CFOs and other decision-makers to ignore. And those benefits of increased flexibility, faster deployment time, reduced IT staff requirements, and lower overall costs are what's driving the market shift to the cloud."

by Erik Linask

A Business Case That's Hard to Ignore

The past year has seen the use of cloud-based services and applications increase faster than many would have expected. While there's no shortage of consumer usage (see iCloud, GoogleApps, etc.), the same combination of ubiquitous access and ease of management/use offers a business case that is hard to ignore. In fact, the suggestion from International Data Corporation that by next year, three-quarters of the U.S. workforce will be mobile will only fuel the fire, as the current growth in mobile data usage will only continue. If businesses can mobilize more of their workforces – either by putting them on the road or allowing more flexibility in terms of work environment – because they are no longer restricted by physical network limitations, why wouldn't they?

The question is, what will businesses look for in the cloud to help drive business, how will they implement, and how will it impact their existing assets and staff? Not to mention what will the innovation that is an indelible part of the technology industry bring next? But that's why we launched Cloud Computing magazine – to identify, discuss and analyze the latest trends and tendencies.

The natural place to start is with storage as a backup facility and disaster recovery mechanism. Also common are virtual cloud servers that can be turned up as needed, either for peak computing periods or as a business continuity solution. Neither is particularly risky from an operational perspective, nor do they place a great management burden in IT staff.

But demand for more flexibility in access to resources will significantly extend the growth of cloud from infrastructure (IaaS) to cloud platforms (PaaS) and services (SaaS). Thanks goes partially to Salesforce.com, with its combination of SaaS and PaaS offerings, but also to the success of mobile applications stores, like Apple's App Store and Google's Android Market (underscoring the benefit of cloud platforms, both also provide access via fixed networks),

What we'll see in the next year is even more adoption of similar enterprise solutions, bringing the App Store concept to corporate users, leveraging the IaaS investments businesses have already made and extending their ability to address redundancy and mobility needs, while relieving IT groups of the burden of having to manage additional infrastructure.

Whether it's cloud-based CRM like SugarCRM or Netsuite, enterprise-wide communications platforms like 8x8 or Interactive Intelligence, or cloud security, which should experience significant growth considering security management requirements, enterprise services deployed in a cloud environment are growing faster than ever.

Importantly, this isn't a negative for IaaS providers. While SaaS and PaaS vendors will see more new customers, cloud infrastructure providers will be called upon by cloud services providers for more resources as demand for their services increases, especially in industries with periods of fluctuating demand. Not only will platform and vendors need flexible infrastructure, but mobile operators will need the capacity to roll out new apps and services quickly without having to take the time to build out data centers. Today's is a time to market environment and not having to build or manage infrastructure is a tremendous benefit.

In addition, existing IaaS customers are likely to see their needs increase as they expand capabilities. That's one of the huge benefits of cloud – it's easily and quickly scalable to meet evolving needs.

Apps and services are not going to require fewer resources. There isn't going to be a decline in the number of them available, either in business or consumer contexts. Cloud usage in all flavors is going to continue to climb.

Should IT managers be worried? Not likely. Businesses will always have infrastructure that needs to be managed, and outsourcing of infrastructure or certain network-related tasks will only allow IT staff to focus on those internal duties, further extending the benefits of cloud, as staff will have more attentive and reliable IT staff at their disposal.

Ironically, it may be other corporate staff that may be more in danger. As more services and applications move to the cloud, the result will be a need for increased knowledge of cloud computing to effectively manage corporate teams and projects. Whether its customer service, HR, marketing, or sales, multiple groups within the organizational structure are now starting to leverage cloud computing, which means they need a level of understanding and expertise.

Look up at the sky. The cloud, you will see, is constantly changing. Likewise, cloud computing is in a state of constant flux, with the only certainty being it will continue to grow. I hope you enjoy Cloud Computing magazine and welcome your feedback and commentary.

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