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MODERN INFRASTRUCTURE

VDI  
PERFORMANCE  
STILL FALLS  
SHORT OF PCS

MICROSOFT:  
EVERYTHING BUT  
THE KITCHEN SINK

BRIAN MADDEN:  
THE TRANS-  
FORMATION OF  
AN IT GUY

BOB PLANKERS:  
IT'LL ALL BE  
SOFTWARE SOON

## CLOUD COMPUTING: IF YOU CAN'T BEAT 'EM, JOIN 'EM

*IT teams are falling behind in the cloud adoption game—and that's bad for business.*

# The Times They Are a Changin'



By Alex Barrett  
Editor in Chief

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WELCOME TO *Modern Infrastructure*. This monthly e-zine is designed to help savvy IT professionals build enterprise data centers, while keeping an eye on shifts in trends like cloud computing and consumerization.

What's modern about *Modern Infrastructure*? As a tech journalist who's been talking to IT pros for years, I can't help but notice that lately IT has started doing things differently and faces new questions.

Traditionally, the role of enterprise technology publications has been to support IT pros as they make infrastructure purchasing decisions—decisions about which types of servers, operating systems, networks and storage are best suited to support an organization's workloads. But increasingly, IT professionals are grappling with another kind of decision: What infrastructure can I get away with not purchasing? We need a magazine that reflects this new world order.

As cloud computing becomes more pervasive and mature, I see IT pros who are evaluating their every move through the filter of cloud computing. Rather than buy a new server or make a new hire, they're asking, "Can I defray capital expenditures and maintain existing staff levels by outsourcing some portion of my infrastructure and operations?"

Before IT can say yes to cloud, there are countless other questions: How will this new, virtual infrastructure jibe with my

existing assets? How do I manage these off-site resources? What new skill sets do I need? How secure is the cloud, really? Will it cost more or less than the old way of doing business? What's my exit strategy if these new computing approaches are a miserable failure?

It is all tantalizing but terrifying, and *Modern Infrastructure's* goal is to help IT make informed, reasoned decisions about cloud strategy.

At the same time, enterprise IT is on a collision course with another key "threat": end users. Helping organizations survive—and thrive—in this era of consumerization, *Modern Infrastructure* has enlisted end-user computing experts like Brian Madden to weigh in with a regular column that lays out what IT needs to do to meet the needs of today's end users.

Infrastructure, meanwhile, is still infrastructure, forever complex and evolving. As such, *Modern Infrastructure* also hopes to help IT answer tough technical questions about platform selection, maximizing performance, minimizing management headaches and ensuring optimal availability.

The answers to the questions *Modern Infrastructure* seeks to answer don't lend themselves to a 140-character tweet or even an online forum. The tough questions never do. These questions warrant serious thought and research, expressed in reported features, columns and news analysis penned by leading editors and IT experts. We hope *Modern Infrastructure* provides value, and let us know how you think we're doing. Welcome, and thanks! ■

# Currents

{ all the news you can use about modern infrastructure }

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## ONE ON ONE

### The Cloud Standards War Is On

AS CLOUD COMPUTING lurches toward greater maturity, issues such as common standards and interoperability remain hurdles—even for users encouraged by the cloud's promise of better infrastructure management and reduced costs.

In this One on One interview, we sat down with **Randy Bias**, co-founder and chief technology officer of [Cloudscaling](#), an open source cloud infrastructure provider, to talk about the lack of standards among cloud providers and how today's patchwork will ultimately give way to a more uniform cloud universe.

*Many major cloud providers have application programming interfaces that aren't compatible with others' APIs. Will this change?*

What I've seen is that infrastructure that is important to the business ultimately drives toward standards and APIs and homogeneity, simply because without those things, it's difficult to create a plethora of standards and APIs higher up the stack.

*Which of the cloud players might win the battle for dominance?*

You can complain about whether Amazon or VMware is the right model, but we can say with great assurance that they both dominate their respective parts of the market, and that is driving a certain amount of customer perceptions.

Still, some people feel uncomfortable with [this] dominance ... and they have to make a case for there being other standards, platforms and APIs. But with 90% of public cloud capacity being on Amazon and 90% of enterprise virtualization clouds being on VMware, it's hard for me to believe that another standard is going to come out and clock those—that just doesn't make sense.

*Is it a problem that public and private cloud providers' APIs haven't been compatible with one another?*

There are two different architectural approaches. The VMware pattern is what we call *enterprise virtualization clouds*, which is the ability to take existing enterprise stovepipes—all the little silos of different hardware, software and network and storage architectures—and just recreating them and virtualizing them. But [with that approach], you don't get the economies of scale.

So this kind of cloud has been driven by the need for greater server consolidation, greater utilization rates.

The Amazon approach is more reminiscent of what the Internet giants have been doing. Instead of building stovepipes, they build layer cakes, where they have a whole stack of services that support each other, from the concrete to the software. And then at the software layer, they have a whole bunch of applications that leverage that whole stack. We refer to this as an *elastic infrastructure cloud*. It caters to greater scalability for the apps and the infrastructure,

and it's not trying to manage lots of stovepipes but to make the applications reflect the underlying infrastructure.

## How do these cloud models differ in practical terms?

There is a very big difference in the types of applications and workloads supported on each.

VMware customers have database servers like Oracle that are old and don't have any basic replication; they rely on the infrastructure to have high amounts of availability and

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## OVERHEARD | VMworld 2012 Edition

"We all owe a round of applause to Hyper-V 2012, because I think the competition in this space is really the reason that we're starting to see some licensing reform from VMware."

—DAN BRINKMANN, solutions architect at Lewan & Associates, on VMware's eliminating vRAM licensing

"Software-defined data centers are great, but we don't know what we don't know yet."

—KEITH NORBIE, VP at Nexus, a Stratos company, responding to Maritz's keynote

"It's not a post-PC world. The PC is alive and will be for a long time. It's a multi-device world."

—From VMware CTO STEVE HERROD's keynote speech

"Yes, this is an admission that we made things overly complex. Mea culpa."

—Outgoing VMware CEO PAUL MARITZ on the company's decision to roll back its vRAM licensing policy

"There's no place like 127.0.0.1"

—Spotted on an attendee's T-shirt

"There are technical things I want to learn, but a lot of it is, how do you sell this to the business, how do you get them to want it as opposed to you telling them they need to use this—on the desktop side? From the server side, I think they get it."

—JAKE PAWLAK, IT architect at CNO Financial, talking about why he attended VMworld

that the application is designed to assume that the infrastructure never goes down.

We see a very different [experience] for



customers that adopt Amazon, like Netflix, and they are redesigning their applications for the underlying assumption that servers always go down, and it's just a question of when. So the question is, how do you design

your application to handle that?

There is a sea change of perception, where people now see the value of being able to scale applications horizontally, as the large platforms like Facebook have done.

### *Will companies coalesce around a common standard?*

There is some amount of coalescing already. But customers are all over the place, frankly; it's still early days. And there is a disconnect between the understanding of these two fundamentally different patterns. Customers think they are recreating the Amazon environment when they create a VMware environment that allows you to turn on VMs on demand—except that it doesn't provide the scale, the elasticity. And they find out that it's not good enough for their application developers to be successful internally, who then continue to go to Amazon. People will continue to fail and, through the failures, learn the hard way.

The thing that we're really missing is a set of solution providers that can package

up and deliver an Amazon equivalent that is more than just an API.

### *What role, if any, does open source play in cloud standards?*

With this particular disruption, open source, open standards are leading the charge. If you look at a lot of those guys who are really big—the Googles and Facebooks—all of their systems largely use open source—yes, for cost economics, but in many ways, it's a control-your-own-destiny thing.

Simultaneously, you're starting to see a backlash among enterprises that have been beholden to hardware and software vendors and are starting to get sick of being locked into these vendors and then getting milked. Enterprises are starting to see that open source is at a maturity level where they can embrace it.

### *How is the cloud different from its predecessors?*

It's pretty much disrupting the de facto standard: the client/server and enterprise computing paradigm, which displaced the mainframe paradigm.

We've gone from a gigantic single iron box that everybody logs in to that runs one or a handful of applications to something that is more distributed, with shared responsibility between IT staff who run centralized servers and users running laptops or desktops, to an even more fully distributed model that is always on.

—LAUREN HORWITZ

FOR MORE on standards and the cloud, check out [SearchCloudComputing.com](http://SearchCloudComputing.com).

*“Cloud is pretty much disrupting the de facto standard.”*

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NEWS IN REVIEW

# Virtualization Vendors Move Beyond the Server

AS FEATURE GAPS close between competitors in the server virtualization market, vendors look to pull parts of the infrastructure beyond server CPU and memory under their control, while the IT community remains in wait-and-see mode about how it will all come together.

VMware Inc. has begun to refer to this data center infrastructure land grab as the software-defined data center, a concept that took center stage at its VMworld conference in San Francisco in late August.

In the software-defined data center, “all infrastructure is virtualized and delivered as a service, and automation is entirely controlled by software,” according to VMware execs in keynote speeches at the show.

VMware’s initial focus is on virtual networks, under its Virtual Extensible LAN (VXLAN) tunneling protocol and the Network Virtualization Platform (NVP) it acquired with Nicira Inc. in late July for \$1.26 billion.

VXLAN tunnels Layer 2 traffic over Layer 3, the goal of which is to extend virtual networks beyond traditional subnet boundaries. Nicira’s platform creates separate control and data planes in a data center network, with the goal of easier deployment of network services.

What previously took days or weeks of work from networking’s “high priests” at a company should now take a click of a mouse when setting up virtual networks, said outgoing VMware CEO Paul Maritz, who spoke at a press conference at VMworld.

Meanwhile, VMware’s server virtualization competitors share similar ideas about

branching into networking and storage virtualization as they begin to catch up on the server side.

Microsoft began to ship Windows Server 2012 with version 3.0 of Hyper-V in September; once System Center 2012 Service Pack 1 is released to manufacturers, this version of Hyper-V will boast a number of advanced features. These include scalability upgrades for virtual machines, hosts and clusters; redesigned live migration; and support for extensible virtual switches.

*What took days of work from networking’s “high priests” should now take a click of a mouse.*

Microsoft will also introduce its own protocol for network virtualization, dubbed Network Virtualization using Generic Routing Encapsulation (NVGRE), which, like VXLAN, can be used to overcome VLAN scalability limitations.

Elsewhere, Red Hat Inc. is focused on offering software-defined storage—scale-out NAS based on commodity server hardware—with its Red Hat Storage product, newly integrated into Red Hat Enterprise Virtualization (RHEV) 3.1, which is out in beta.

Other storage features include storage live migration as well as the ability to hot-plug and -unplug disks and create live snapshots of virtual machines from a guest agent capable of quiescing the file system. New networking features due in RHEV 3.1 include the ability to designate different networks for management, storage and VM traffic, UI support for Cisco’s UCS, and the ability to hot plug and unplug NICs.

Finally, Citrix Systems Inc. had remained

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so quiet on the XenServer front that speculation was beginning to crop up about the future of the product—until mid-July, when the company held a webinar divulging its roadmap for XenServer’s next two years.

While not focused on software-defined networking or storage per se, further releases of XenServer will focus on optimizing integrations with network and storage infrastructure by breaking up the hypervisor’s “domain zero” into its component parts in order to streamline services and improve I/O performance.

**SIZING UP “SOFTWARE DEFINED”**

IT pros attending VMworld said they are taking a cautiously optimistic approach to VMware’s software-defined data center.

“It would be nice to holistically add networking and storage as you add servers today, but it’s going to take a while before that vision comes to fruition,” predicted Joachim

Heppner, a senior manager of virtualization engineering for a large pharmaceutical company based in the Northeast.

Experts say they would like to see VMware articulate a more complete vision for the software-defined data center.

The definition given by VMware in its keynotes “doesn’t go far enough,” said Edward Haletky, CEO of The Virtualization Practice LLC. “That’s vCloud with today’s automation. It doesn’t show me a vision of what [the software-defined data center] could or should be.”

Haletky sees the endgame for software-defined data centers as the ability to translate a request from a business, such as, “I need to sell a million copies of a new product in the next six months,” into the data center capacity, security and compliance features required to meet that demand, he said.

In other words, imagine being able to say, “Siri, I need a data center;” Haletky said.

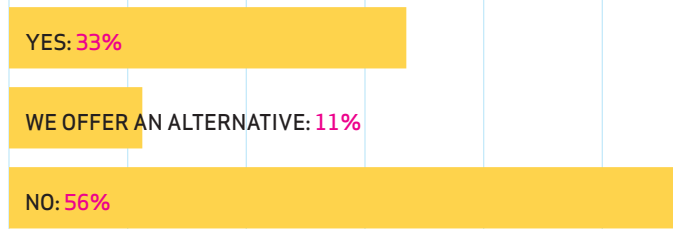
—BETH PARISEAU

**READER SNAPSHOT | *Cloud Applications***

➔ *Can deploying critical apps in the cloud help prevent system downtime?*



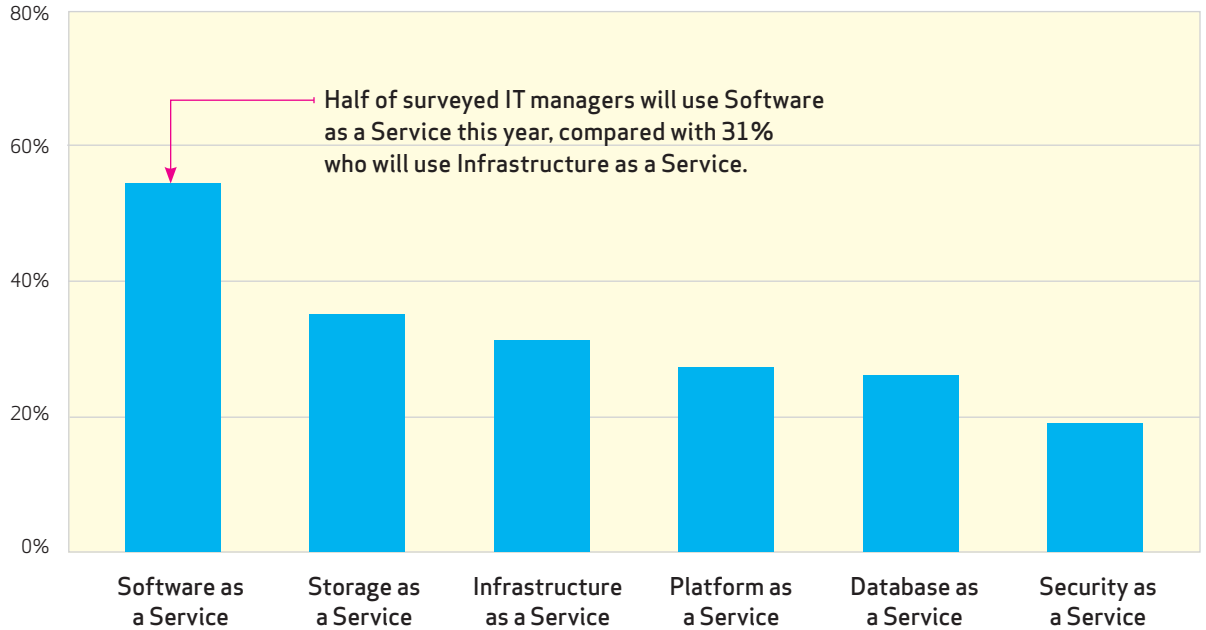
➔ *Does your organization support the use of Dropbox?*



“It’s just too risky to rely on another organization to keep your files secure. You’re better off developing an in-house solution—even if it utilizes cloud technology, at least you’re in control.”  
—SearchConsumerization.com reader

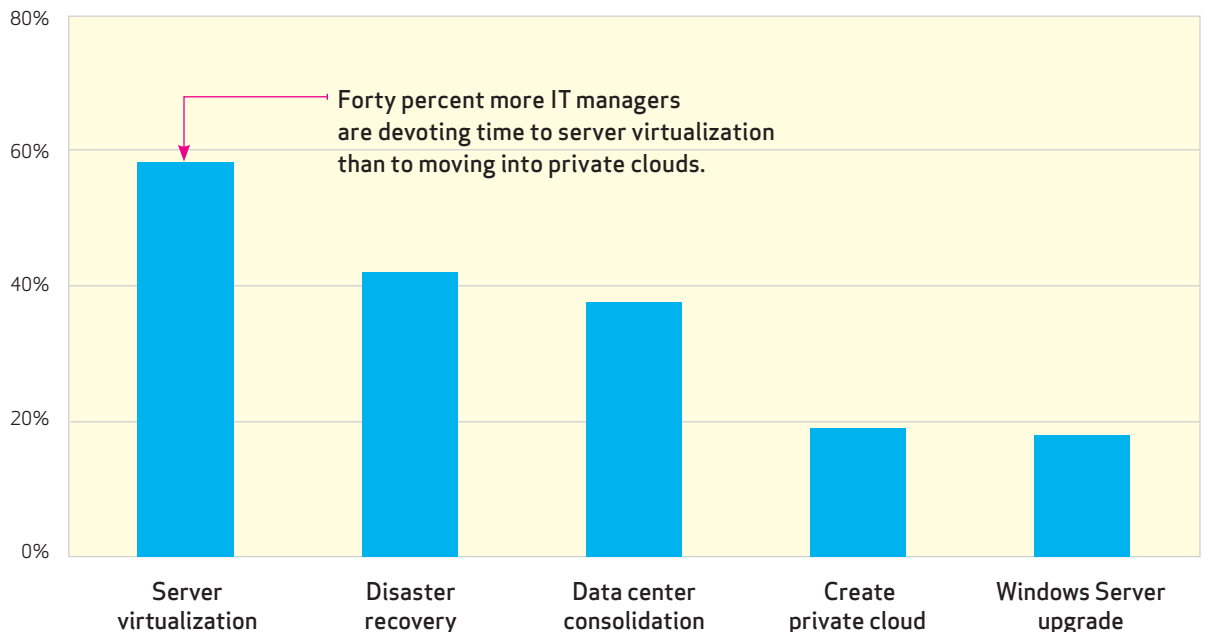
## SUMMING IT UP | *Cloud Services*

➔ Which of these external cloud services do you plan to use in 2012?



N=600 IT PROFESSIONALS; SOURCE: "2012 IT PRIORITIES SURVEY," TECHTARGET INC., NOVEMBER 2011

➔ Which of these infrastructure projects will your company implement, on some level, in 2012?



N = 1,272 IT PROFESSIONALS; SOURCE: "2012 IT PRIORITIES SURVEY," TECHTARGET INC., NOVEMBER 2011

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COUNTDOWN

# Pulling Back the Curtain on Vendor-Speak

AS A TECHNOLOGIST, you parse the vendor doublespeak, read the fine print and try to separate the wheat from the chaff on over-blown claims about a technology's capabilities. It's no surprise that vendors sometimes over-promise and under-deliver.

In this edition of Countdown, we highlight some recent gems that demonstrate vendors' marketing hype and missteps.

## 1 ORACLE

If you haven't already gotten word, Oracle Corp.'s latest claim is that its cloud computing platform is a "subscription-based (SaaS) deployment model [with easy, predictable pricing](#)."

But Oracle's cloud will likely cost more than the usual pay-as-you-go cloud plans, according to [SearchCloudComputing.com](#), and so far, information about availability and features seems to be anything but easy to follow.

## 2 CITRIX SYSTEMS INC.

After IT pros expressed concerns over Citrix Systems Inc.'s decision to move all versions of XenApp before version 6.5 to end-of-life status by July 2013, Citrix lengthened the XenApp lifecycle through the Extended Support Program, a technical support offering.

While it's true that Citrix extended XenApp support, the price is exorbitantly high. One large enterprise in Europe with 2,500 XenApp platinum seats was given an approximate quote of \$121,000 per six months by

its support provider, according to [SearchVirtualDataCentre.co.UK](#).

## 3 MICROSOFT

Microsoft introduced a new Windows 8 Metro-style touch interface that works on all form factors and allows end users to choose which input method to use when. "This is what we mean when we say Windows 8 provides a no-compromise experience," the company said.

But Metro certainly requires users to compromise their familiar, and user-friendly, Windows look and feel, which may affect productivity and desktop security, according to [SearchEnterpriseDesktop.com](#).

## 4 VMWARE INC.

VMware Inc. claims that rival Microsoft's Hyper-V server virtualization offering isn't cheaper than its vSphere product, while Microsoft asserts that VMware is far more expensive. So which is it?

Unfortunately for those shopping for virtual products, there is no black-and-white answer. In the recent report "[VMware vSphere vs. Microsoft Hyper-V: Which Is Cheaper?](#)" SearchServerVirtualization.com found that many factors play into the true cost of a virtualization environment. It's a complicated formula, but we'll likely hear plenty more claims of cost-effectiveness from the leading virtualization vendors.

## 5 HEWLETT-PACKARD CO.

Hewlett-Packard Co.'s service-level agreement (SLA) offers 99.95% availability and states that if it does not meet this commitment, it will apply a service credit to your account.

Beware the financial promises of the SLA.

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HP and other cloud vendors promise between 99.95% and 99.9% of uptime monthly, but pay out on an SLA only if the number dips far below those levels on several occasions. And, the way HP calculates availability isn't exactly straightforward. In fact, some experts think that cloud SLAs are nothing more than a [cheap marketing ploy](#).

—ADAM HUGHES

EXPLAINED

## Anything as a Service

CLOUD COMPUTING HAS spawned a new lexicon, with terms cropping up at a breakneck pace. Just consider *cloud bursting*, *cloudware* and *cloud-oriented architecture*.

One of the latest terms to emerge is XaaS, which can mean Anything as a Service or Everything as a Service, depending on whom you ask. XaaS is not a specific service model, but it recognizes the various service models that make up the public and private cloud computing industry.

The cloud industry has spawned the evolution of various Web-based service models, including *Software as a Service* (SaaS), *Platform as a Service* (PaaS) and *Infrastructure as a Service* (IaaS)—collectively known as the SPI model. Other services include *Storage as a Service* (SaaS), *Communications as a Service* (CaaS), *Network as a Service* (NaaS) and even *Monitoring as a Service* (MaaS).

XaaS and cloud computing have been a long time coming. The idea of cloud computing has been around for decades, even though it wasn't always called that. Technologists have long yearned for a world where rather than building, maintaining and staffing a corporate data center, a business would

use computing resources from independent providers. Businesses would pay only for the IT resources they actually used on a monthly basis—much like electricity or any other utility.

Back then, the problem was no one knew what cloud computing actually was, or how to deliver it to users.

Then the Internet burst onto the scene and flooded the marketplace with cheap, plentiful bandwidth. Web browsers provided a platform-independent means to deliver applications, and virtualization gave service providers the abstraction layer and dynamism necessary to build a multi-tenant IT utility. That's when the cloud started taking shape, and service providers found ways to cater to businesses eager to outsource at least parts of their complex and costly data centers.

*XaaS is not a specific service model, but it recognizes the various service models that make up the public and private cloud computing industry.*

Cloud's service models today are subdividing and becoming more granular (such as Identity Management as a Service) so the notion of XaaS is constantly being refined. Given this alphabet soup of acronyms, XaaS has appeared as an umbrella term that covers any (or every) service a company could provide via the Web. For all practical purposes, XaaS is simply another term for public and private cloud services. —STEPHEN J. BIGELOW

# The Transformation of an IT Guy



By *Brian Madden*

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I'VE BEEN AN IT guy my whole career, most of it focusing on end-user computing via technologies like SMS, terminal services and VDI. Along the way, I've enjoyed the stereotypes of end-user naïveté. I'd be the first to joke about how many users it takes to screw in a light bulb, RTFM errors and the "short between the keyboard and the floor." But four years ago, all that changed.

For a decade of my career, I worked on the IT side of the business, either directly in an IT department or as a consultant to one. But in November of 2008, TechTarget (the publisher of this magazine) acquired my small company.

While my day job didn't change—I was still responsible for writing and speaking about end-user computing—my role within the company changed drastically. I went from the guy who made every IT-related decision in the company to one of 700 employees overnight. At TechTarget, when I needed help, I was expected to call the help desk. When I needed a new service or piece of equipment, I had to get approval from my manager or fill out a form on the intranet.

## FROM IT GUY TO ADVOCATE

My first day on the job was my first day in "end-user land," and it foreshadowed my worst fears. I showed up at the office in San Francisco and introduced myself to Pete, the

local IT guy. Pete asked if I had a laptop, and I answered that I did and pulled it out of my backpack. When Pete saw that it was a Mac, he responded with an eye roll and a protracted sound that I would describe as a combination of a sigh and a groan.

In the subsequent four years, I've dealt with the triumph of finding amazing technologies like Dropbox, followed by the agony of learning that our IT department has blocked them. I've been the guy who has experimented with as many third-party cloud-based services as I can just because I don't like logging into the VPN. And I've challenged our IT management to explain what they mean when they say that Gmail isn't secure—while in the meantime, our West Coast Exchange server is in a closet, behind a door that doesn't close completely due to the exhaust duct from the portable air conditioner that was hastily installed one weekend to deal with random freezes.

Of course, I'm still writing about health care networks that deploy VDI to ensure HIPAA compliance, only to be foiled by doctors using iPads and Facebook. And I know of IT professionals who have lost their jobs because they couldn't "solve" the security risks posed by creative end users.

How do we solve the balance of end-user desires and corporate IT needs? I'll dig into that question in *Modern Infrastructure* every month—just as soon as I figure out how to print this column. Now where did Pete go? ■

**BRIAN MADDEN** is an opinionated, supertechnical, fiercely independent desktop virtualization and consumerization expert. Write to him at [bmadden@techtarg.com](mailto:bmadden@techtarg.com).

# It'll All Be Software Soon



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A FEW YEARS AGO, someone asked me what I thought about the future of storage in the data center. At the time, I quipped that we'd eventually just have giant piles of solid-state memory and software would differentiate vendors.

Look around the data center today and you see it happening, not only in storage but other areas as well. Custom ASICs in network switches are being replaced by “merchant silicon”: a fancy name for commodity processors from Intel and AMD. The core features of servers among vendors are becoming indistinguishable. And the storage arrays are really just Intel servers themselves, often running Linux or embedded Windows, with a lot of network interfaces and drives.

## IT'S THE SOFTWARE, STUPID

So what distinguishes one vendor from another? It's software. Software is what implements incredibly fast, low-latency networks on top of commodity processors as exemplified by companies like Arista Networks. Intelligent software is what enables storage vendors to eschew expensive “enterprise” solid-state disks in favor of inexpensive consumer-grade drives and still achieve high reliability and performance. Software on management controllers (which are themselves small PCs bolted inside servers)

is what separates one server vendor from another these days.

Putting hardware device functions in software is great for vendors. Commodity hardware not only drives down costs but also makes it easy to update a device. Hardware has bugs, too, just like software. When most of the functionality of a device is implemented in software, a fix is just a firmware update away. With custom hardware, custom

*I think it's safe to say that software is truly the most interesting part of hardware now.*

circuitry or custom ASICs, that task isn't as easy, and sometimes not even possible. Commodity hardware also allows a hardware developer to use pre-existing drivers, speeding development cycles and reducing costs. Less complex circuitry also leads to lower power consumption, which in turn leads to less heat and higher reliability. Everyone likes that.

Given all that, I think it's safe to say that software is truly the most interesting part of hardware now. Since commodity hardware saves so much time and money, could we take it a step further and just eliminate all custom hardware itself, like that in a network switch or storage controller? Vendors like Dell and HP do a great job of producing what is essentially inside storage arrays and network switches anyhow. They also

provide well-known monitoring interfaces and all manner of hardware support. What if the only thing that a traditional hardware vendor shipped was a software image? Can

### *What if all the tedious work was handled by the infrastructure so us humans could work on the interesting problems instead?*

we rely on the server vendors, and perhaps a hypervisor on top, to supply the rest?

It turns out that the answer is “Absolutely.” We can implement a network switch entirely with software, with nearly every feature as the hardware equivalent. We can implement a firewall, a load balancer or an intrusion detection system. We can implement distributed storage arrays, calling on the time-tested and fast local disks and controllers, high-bandwidth network interfaces, and well-known network protocols to

replace proprietary parallel storage networks. We can also rely on the availability features of a hypervisor to help us if there is a problem.

Once we let the server vendors do what they do best, we can refocus all the effort we used to spend on hardware design and support to problems like integration. What if, when a server was provisioned, the storage started replicating its data automatically? What if, when a server is decommissioned, the load balancer and firewalls automatically removed the rules and closed the ports? What if there were industry-standard application programming interfaces so that automation could occur no matter whose firewall or storage was in use? What if all the tedious, error-prone, repetitive work was handled by the infrastructure, so us humans could work on the hard and interesting problems instead?

That’s a data center future I look forward to, and one I’ll be talking about in this e-zine every month. ■

**BOB PLANKERS** is a virtualization and cloud architect at a major Midwestern university and author of [The Lone Sysadmin blog](#). Write to him at [moderninfrastructure@techtargget.com](mailto:moderninfrastructure@techtargget.com).

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# Tackling Cloud Concerns



By *Steve Gunderson*

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THEY SAY THAT a picture is worth a thousand words, but what if you want only 500? Working with many clients on a wide range of IT projects, I've had the opportunity to see what works in the real world, and what's more promise than reality. Sometimes a real-world story, can put things into perspective better than any 1,000-word essay. That's my intent over the next several paragraphs and in this column each month.

It seems like every year some new technology explodes onto the IT scene with huge potential, and frequently even greater hype. But tackling every one that comes along is usually both impractical and too expensive. So how do you choose the right ones for you and then integrate them successfully into your environment?

## CLOUD CONSTERNATION

One of our recent customer stories highlights the opportunity (and challenge) presented by the cloud. In this case, the story is about an advertiser, a website and the Super Bowl. The story begins with an advertiser and its ad agency planning to launch a major consumer ad campaign during the halftime show of the 2012 game in Indianapolis. The campaign was designed to drive enormous volumes of traffic to the company's website, so scaling short-term capacity up and down via a cloud offering was hugely attractive.

Frustrating prospective customers with a slow or unavailable website was a real concern, and the cloud offered an elegant solution that could eliminate that trepidation.

The project team had the foresight to perform pre-event load testing and simulation. As it turned out, the project team discovered that the website was doomed given its underlying architecture, which resulted in multiple bottlenecks that even the unlimited horsepower of the cloud would not be able to overcome. The hosting architecture was quickly redesigned, retested and successfully deployed, well in advance of Super Bowl Sunday. In this case, the cloud became not only the answer to scalability concerns but also the perfect testing ground to identify potential catastrophic failures well ahead of the company's website launch.

In this client engagement, the lesson we learned was never to abandon the disciplined procedures, processes and testing plans that have served IT so well over the decades. Sometimes choosing the right technology (cloud provider) is the easy part, but the real success comes from implementing solutions with the same continuity, testing and systematic approach that's delivered solid results in the past.

In the months to come, I'll be sharing more customer stories from the front lines of both enterprise and SMB engagements. With any luck, our stories will help paint a picture to assist you with your real-world decision making. ■

STEVE GUNDERSON is a principal at [Transitional Data Services](#).

## COVER STORY

# Cloud Computing: If You Can't Beat 'Em, Join 'Em

*IT teams are falling behind in the cloud adoption game—and that's bad for business.*

By Alex Barrett

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CLOUD COMPUTING IS here, and enterprises are increasingly taking advantage of the limitless pool of off-site resources that it provides. With few exceptions, though, IT isn't really leading the charge—even though it should be.

“The thing about the cloud, it's usually driven by not-IT,” namely the chief financial officer, individual business units and developers, said Jeff Ready, CEO at Scale Computing, an SMB storage and server provider in Indianapolis.

That not-IT crowd sees plenty of potential for cloud. The finance side of the house looks at the public cloud and sees an easy

way to avoid unnecessary capital expenditures, overhead and head count. Business units see Software as a Service (SaaS) versions of applications that are easy to get up and running and don't require any maintenance. Developers see a thriving community of their peers doing cool stuff and delivering new ideas.

Meanwhile, IT pros—who are most technologically equipped to take on the cloud—look at public cloud and see security holes, integration nightmares, a threat to job security and yet another thing to do.

That's a stark contrast to IT's attitude about virtualization. Back in the early 2000s,

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IT seized upon the nascent technology as an easy way to solve nagging capacity and power issues, reduce costs, and gain greater manageability and availability. IT adopted a “virtualization first” policy, and business owners were often the last to know that their applications were running in a virtual machine (VM). Early adopters of virtualization were hailed as modern-day IT heroes, saving the company money, laying the foundation for a workable disaster recovery plan—even saving the planet!

IT folks have a tendency to either dismiss or ignore cloud computing, however, while developers and application owners sally forth and reinvent the business. Not only are IT pros missing out on an opportunity to cover themselves in glory, they're also risking the possibility of becoming less relevant to their organizations.

## CLOUD ADVOCATES COME OUT OF THE SHADOWS

A few years ago, IT could still reasonably make the claim that cloud was a bunch of hot air that would soon blow over. But it's getting harder to make that claim.

Spending on public cloud services certainly isn't down. Stamford, Conn.-based research firm Gartner Inc. predicts that the market for public cloud services will swell to \$207 billion by 2016, up from \$109 billion today. It also predicts that in 2017, the chief marketing officer will spend more on IT than the chief information officer. At the top of the list of popular public cloud services are classic SaaS applications such as Salesforce.com for customer relationship management (CRM) or Workday for payroll services.

And there's an awful lot of IT happening behind IT's back, what's sometimes called “shadow IT,” said Ellen Rubin, vice president of cloud products at Terremark, a Ver-

*IT folks have a tendency to either dismiss or ignore cloud computing, while developers and application owners sally forth and reinvent the business.*

izon company that offers managed hosting and cloud services.

“I've been in some meetings between IT and the IT people attached to a business unit, and there will be this weird discussion where the business owners try to hide the fact that they're already doing [cloud],” Rubin said.

The problem is that when business owners go around IT, they almost always forget to ask the tough questions that experienced IT pros would ask a cloud provider: What are your uptime statistics? How do you achieve redundancy? How do you ensure security? What is your service-level agreement? Is running this workload in the cloud actually cheaper over the long run?

Failing to ask those tough questions up front has resulted in some well-publicized public cloud failures, such as the Los Angeles Police Department's move to partially pull the plug on a proposed Google Gmail deployment because of security concerns, or Web-based services going down because of an outage at a cloud provider.

In June, Amazon Web Services (AWS)—arguably the current top player for cloud developers—infamously suffered from a power outage at one of its data centers, followed by a bug in its Elastic Load Balancing service that caused some customers to be down



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for up to six hours. Some AWS customers begrudgingly acknowledged their role in the downtime.

"I think we found areas of the app that we thought we had engineered better for failure, that we hadn't," said Jim O'Neill, CIO of the hosted marketing software provider HubSpot, to SearchCloudComputing.com.

"It's easy for me to get mad at [Amazon]," he said, "but the truth is, our apps should have been built better."

## COULD PRIVATE CLOUD BE THE SOLUTION?

An obvious answer to the growth of public cloud is for IT to implement a private cloud and regain favor among developers and business owners.

Diplomatically put, implementing a private cloud "allows IT organizations to deliver higher service levels of the new cloud

business model and provide faster time to market," said Brett Adam, chief technology officer at rPath, whose image management software is often coupled with private cloud suites in support of self-service portals.

"IT runs on its own slow clock speed, and the business runs at hyper speed," said Scott Hammond, vice president of strategy and business development for intelligent automation products at Cisco Systems Inc. Private cloud can be a way to bring those groups in sync.

The Cisco Intelligent Automation for Cloud (CIAC) private cloud offering consists of the Cisco Unified Computing System server platform plus a self-service storefront, a service catalog, governance, provisioning and lifecycle-tracking software. The company has used CIAC internally to build out a private cloud called Cisco IT Elastic Infrastructure Services, or CITEIS. Hammond said that since the first CITEIS services

## IS IT RESIGNED TO A CLOUD FATE?

**A RECENT SURVEY** by security research firm Ponemon Institute suggests that enterprise IT knows that public cloud has infiltrated the organization—but that it's none too happy about it.

Just less than half of the 4,000-plus respondents to the Ponemon survey said they already transfer sensitive or confidential data to external cloud services, and another third will follow suit in the next two years. At first glance, that suggests that IT has put aside most, if not all, compunctions it may have had about cloud security.

But dig a little deeper, and the picture gets hazy. Of those already putting sensitive data in the cloud, a full 39% said doing so has decreased their security posture. Sixty-three percent admitted to not fully understanding what the cloud provider is doing to secure data, and a shocking 35% hand over their encryption keys to their cloud providers.

"There is a lot more data being transferred to the cloud than I would have expected, and I was surprised by the lack of confidence that enterprises have in the cloud," said Richard Moulds, vice president of strategy at Thales e-Security, which sponsored the survey.

"The only thing I can think of is that people are doing this because the economic benefits are so strong," Moulds said. ■

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went live last year, the range of “cycle time” needed to stand up a new environment has dropped from eight to 12 weeks down to anywhere from 15 minutes to two days, depending on workflow and governance processes.

The private cloud approach also dovetails with existing investments in virtualization software, said Lydia Leong, an analyst in Gartner’s technology and service provider group.

“The enterprise has big investments in virtualization,” Leong said. “With private cloud, you can extend those investments if you don’t have the appetite for looking at new solutions.”

Setting up a private cloud, however, isn’t exactly something you can do overnight.

EPAM Systems, a software development outsourcer, has a 6,000-core private cloud used by thousands of developers and quality assurance engineers in the U.S. and Europe. The company chose cloud computing software from Nimble in late 2010, and spent at least six months integrating it with its various development, continuous integration, change management, staging and QA systems, said Eli Feldman, vice president of cloud solutions and services at the Newton, Pa.-based firm.

Beyond implementation, cloud integration work is never really done.

The CITEIS initiative has taken several years, Hammond said. An early phase was to “replatform” the data center with UCS and virtualization. Then, an initial CITEIS Express offering debuted in June of last year that provided employees with up to two VMs. A more expansive CITEIS Virtual Data Center offering was released in January. The next step was to expand the offering to include rPath and Puppet image management. The company is currently looking into how to integrate CITEIS with external public clouds.

Despite those challenges, developing a private cloud can be worth the effort, practitioners say. EPAM’s private cloud, for example, helped it develop a new line of business: hosting the software it builds for customers in its own “Software as a Service service.”

Prior to building out the private cloud, “delivery of solutions into the customer premise was taking an enormous amount of time,” Feldman said. Now, rather than having to send engineers to the customer site to install software, EPAM can simply promote the stack to production and run it there.

## INFILTRATING THE PUBLIC CLOUD

Not everyone is convinced that private cloud is the answer.

Indeed, some people at IT organizations who have embarked on a traditional private cloud project are concerned that private cloud didn’t fix the problems it was supposed to solve, said Pat O’Day, CTO at Bluelock, a cloud provider based on VMware’s vCloud offering.

Many “implemented the private cloud, but it didn’t really turn them into a service organization,” O’Day said.

Nor does private cloud get you out of the infrastructure management game.

“Private cloud is hard and expensive, and at the end of the day, you still own the infrastructure and have to manage and integrate it. Yikes!” said Terremark’s Rubin.

To that end, hosting companies such as Terremark promote the cloud to customers as a seamless extension of their existing hosted environments. Stefanini, an IT services firm based in Brazil, recently extended private infrastructure located in Terremark’s Sao Paulo data center with Terremark’s Enterprise Cloud to take advantage of reduced costs and overhead.

Ailton Nascimento, vice president

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of global accounts at Stefanini, said that running its intelligent voice routing (IVR) application on Enterprise Cloud can save the company 40% over running it on dedicated infrastructure. Stefanini also runs its internal enterprise resource planning application from the cloud. "Everybody uses it, and nobody knows any different," he said.

Plus, for every workload that runs in Terremark's cloud, there's one less piece of infrastructure that Stefanini needs to update and maintain, Nascimento said, and the workload can be ramped up much faster.

Like many companies, Stefanini got a taste of cloud computing running Salesforce.com. "After we used that, we realized it was safe and that we could start looking at alternatives," Nascimento said. The CIO approved, and the organization now explores whether to run a workload in the cloud on a case-by-case basis. For example, while the IVR app makes a lot of sense, hosting a credit card processing application in the cloud might not, Nascimento said.

"It really depends on the kind of service," he said.

## ALL EYES ON AWS

Realistic IT admins should be prepared for AWS because that public cloud platform has captured developers' imaginations.

AWS developers have gotten spoiled by the community and the constant stream of new services available from the public cloud service, said one AWS user, a developer at a brand-name software company who asked not to be identified.

"Amazon is always giving us something new—some stuff we know that's coming and some stuff that's a surprise," he said. "It's like Christmas—you're like, 'What's next?'"

Popular add-on services for AWS include managed Domain Name System and object

blob storage, to name a few, and mark the provider's evolution from a simple Infrastructure as a Service (IaaS) to a higher-level Platform as a Service (PaaS) provider.

Meanwhile, internal IT "can barely keep up with current demand," said the AWS developer. "I have no hope of that additional functionality from them."

Nor are other public cloud players on his roadmap. "AWS is it for me, for now." To his mind, competitors like Rackspace don't offer enough PaaS services, and the developer still perceives Microsoft Azure as focused on Windows and the .NET development environment.

With that as the backdrop, IT folks need to acknowledge the public cloud-based applications running in their environment rather than trying to stop them, said Bluelock's O'Day. "They need to ask, 'Where do we go from here?'"

Building a private cloud can still be a valuable undertaking. "Self-service is a useful feature," said O'Day. Even so, he said, the real emphasis should be on enabling developers and business units to intelligently take advantage of cloud-based resources, wherever they may be.

"IT should be shifting from a gatekeeper role to an advanced services role," said James Urquhart, vice president of product strategy at enStratus Networks, a cloud management software provider in Minneapolis. "This means not striving to 'own' the company cloud—as in the case of most private clouds—but rather to make it easier to consume whatever cloud services best meet business needs."

"The more control you can give to developers without sacrificing control of operations, the better," he added. ■

**ALEX BARRETT** is the editor in chief of Modern Infrastructure.

## VDI PERFORMANCE

# VDI Performance Still Falls Short of PCs

*VDI advocates tout the benefits of virtual desktops over PCs and continue to call this the “post-PC era,” yet their ultimate goal is to deliver a PC experience.*

By Bridget Botelho

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VDI VENDORS CLAIM that virtual desktops trump Windows PCs, yet they have bent over backward in recent years to deliver a PC-like experience. IT pros want to know: Why not just use a PC?

Nearly every acquisition and improvement Citrix Systems Inc. and VMware Inc. have made to their [virtual desktop infrastructure](#) (VDI) offerings in recent years has been in the vein of delivering a full PC experience. They have yet to achieve that goal.

Citrix and VMware both added offline support to allow users to work on virtual desktops without an Internet connection. Both have acquired profile management

software that gives end users the type of personalized experience they get with PCs, and both vendors continually improve their remote desktop protocol technologies with the goal of delivering PC-like performance for virtual desktops. (Teradici, the vendor that delivers VMware's protocol, refers to PCoIP as the “protocol that enables a true PC experience for desktop virtualization.”)

The truth of the matter, though, is that while IT administrators can cobble together these and other technologies to deliver virtual desktops that look and act like PCs, virtual desktops still have a ways to go. Gartner Inc. predicts that hosted virtual desktop

capabilities won't provide a user experience comparable to that of PCs until 2014.

As a result, most companies continue to rely on PCs. Enterprises that have evaluated VDI use a mix of PCs and remote desktop technologies, including application virtualization, Microsoft's Terminal Services and workstation virtualization, according to the "Virtualization Decisions 2011" survey of more than 500 IT pros conducted by Search-ServerVirtualization.com.

But that doesn't mean IT pros should give up on VDI, which offers benefits over the status quo, said Todd Knapp, CEO of Envision Technology Advisors LCC, a virtualization consultancy based in Providence, R.I.

"The philosophy of virtual desktops surrounds not trying to teach new dogs old tricks," Knapp said. "We want to deliver something that is easier and more flexible than using a PC."

Server-hosted VDI offers IT administrators a way to centrally manage desktops, which is simpler than managing hundreds or thousands of individual PCs. Because virtual desktops aren't tied to hardware, VDI also affords flexibility, in that end users can access their desktops and apps from any Internet-connected device.

And as the technology becomes more mature, less expensive and less complex to deploy, we will see an increase in the speed of deployment of VDI—or what Gartner calls *hosted virtual desktops* (HVD)—over the next five years, according to the research firm.

By the end of 2016, 30% of large organizations (those with more than 1,000 users) will have deployed HVDs to 20% of their users or more. In all, HVDs will be used to deliver client computing capabilities to 77 million users by 2016, Gartner predicts.

Compared to the more than 87 million PCs that Gartner said were shipped world-

wide during the second quarter of 2012, that is a drop in the bucket, but it looks like desktop virtualization is finally on its way.

## VDI VENDORS EXTEND AN OLIVE BRANCH

Still, desktop virtualization remains an end-user computing niche, and vendors recognize this. Desktop virtualization vendors had ignored physical desktops in recent years under the belief that VDI would dominate the market, but the fantasy of virtual desktops displacing PCs is over.

Virtualization vendors have admitted that end-user computing encompasses far more than virtual desktops, and even VDI devotees are singing Kumbaya.

The prime example is [VMware's May acquisition of Wanova Inc.](#) to gain centralized image management for physical desktops. The virtualization pioneer, which for years has preached the virtues of desktop virtualization, has committed to use Wanova Mirage to provide customers with single image management for physical desktops.

"We do not see the world of end-user computing exclusively through the lenses of virtual machines, and I am very excited about this opportunity to redefine what desktop virtualization is and how it fits into our vision for EUC," said Vittorio Viarengo, VMware's vice president of marketing for end-user computing, in a July blog post.

Citrix also supports the philosophy that VDI isn't the be-all end-all through its Flex-Cast technology. [Citrix acquired Virtual Computer](#) earlier this year to integrate its NxTop client-side virtualization software into the Citrix desktop portfolio. NxTop allows IT to centralize PC management and it integrates with VDI.

Other desktop virtualization vendors have begun to expand their reach beyond

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virtual desktops. Liquidware Labs Inc. recently introduced a departmental application management feature that will extend to physical desktops.

PC support will help these vendors get out of the desktop virtualization box and into mainstream physical desktop environments. That's not to say they plan to abandon desktop virtualization; as Gartner's predictions show, there is business to be had.

But the end-user computing trend is that many companies will deploy a mix of virtual desktops and physical desktops, said Gabe Knuth, a desktop analyst and BrianMadden.com blogger. Cloud, Desktops as a Service and cloud-hosted applications will play into the equation as well.

"VDI has been slow, but at the end of the

day all we want to do is manage all of our desktops," Knuth said. "If companies like VMware don't give us a way to manage virtual desktops and physical desktops, we won't use them."

## VDI AIDS DESKTOP MANAGEMENT, FLEXIBILITY—FOR A PRICE

Simpler desktop management is one of the tenets of VDI, providing IT a way to centralize that function.

"I can have thousands of desktops run off a single central image," said Gunnar Berger, research director, desktop, applications and server virtualization for Gartner. "Other products can do this, but [HVD] works in more use cases."

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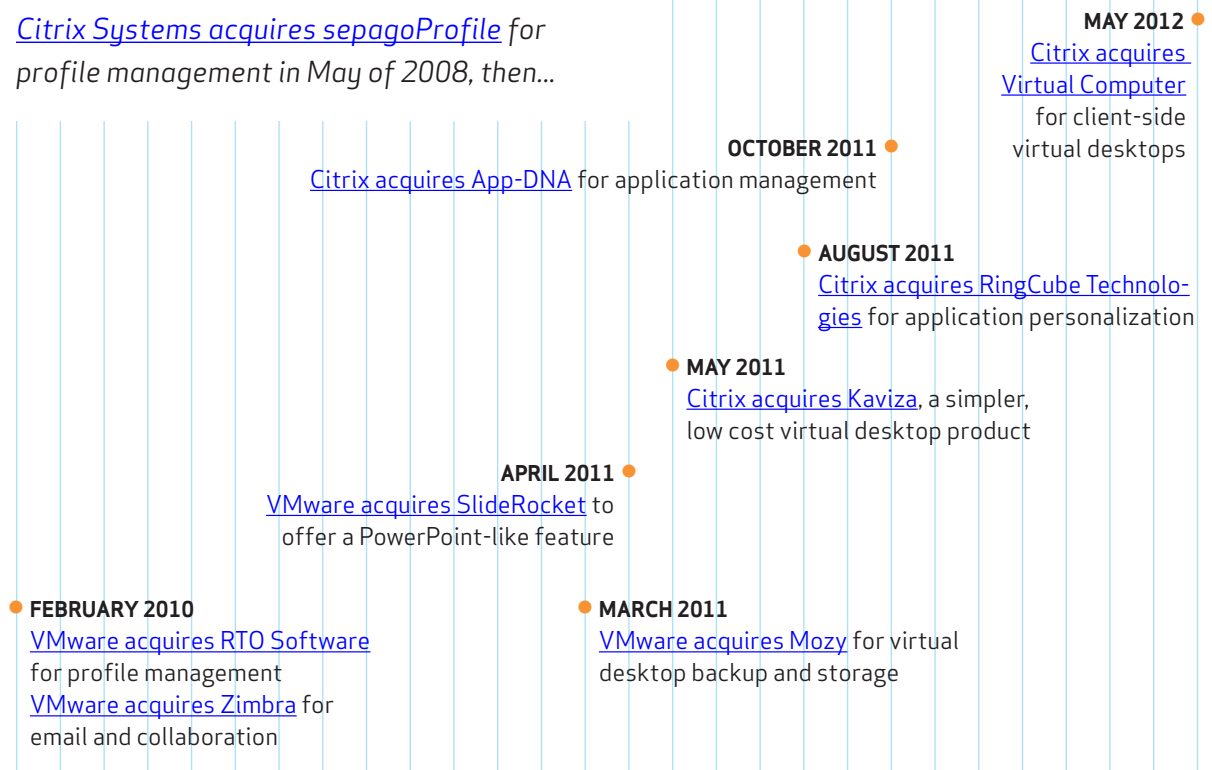
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## TIMELINE | *VDI Vendor Acquisition*

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The ability to access desktops and applications from anywhere and on any device is a big benefit for organizations with remote and mobile end users.

“You could argue that laptops do this, too. And you’d be right, but the ability to do this with follow-me desktop technologies means I don’t have to carry one device with me; any device is my access point,” Berger said.

Ease of management and flexibility were reasons for Phoenix Central School District in New York to adopt virtual desktops.

The school district’s IT team needed a way to deliver desktops and applications to the 3,000 users roaming between buildings and computer labs every day, so it deployed VMware View along with Liquidware Labs Profile Unity software. Now, IT supports a pool of about 120 nonpersistent virtual desktops (which don’t store any user data or settings) that end users can access from anywhere on campus, said Theodore Love, technology director for the school district.

While VDI has allowed the school to deliver desktops in a flexible way that is simple to manage, the cost is significant.

“VDI does not save money,” Love said. “Just look at the cost of storage on the back end and your budget is blown.”

Indeed, VDI is expensive. Customers tend to see only the benefits in terms of operational expenses, not capital expenses, Berger said, at least not for the first few years.

Gartner estimates that total cost of ownership reductions of up to 13% compared to well-managed desktops are likely beyond year three of a deployment. The firm expects hosted virtual desktop Capex will fall by 10% by 2014.

But companies that buy into VDI say the flexibility and management benefits are worth the expense.

VDI advocates also tout security benefits. Having data on the endpoint is a risk.

Industries that deal with sensitive data, such as protected health information, are better off with an HVD environment that keeps that information in the data center and off the endpoint device, said Berger.

In addition, with PCs, IT must protect data both in the data center and at the endpoint. Server-hosted virtual desktops eliminate the need to protect data in two locations.

That said, the security of virtual desktops is up for debate. Both PCs and virtualized desktops run the Windows OS, which would be identically secure whether virtual or physical, Gartner’s Berger said.

“If there is anything I learned in my college courses it’s that security is an illusion,” Berger said. “No matter how hard you try to secure something, there is always something that makes it insecure. Encryption products only delay the inevitable.”

Still, hosted virtual desktops make sense for some companies—but not all—and will be used alongside PCs, server-based computing, disk-streaming technologies and burgeoning cloud offerings.

“They each have their place. They each solve a problem,” Berger said. “No single technology is going to replace the need for all other technologies—at least not yet.” ■

**BRIDGET BOTELHO** is the senior news director in the Data Center and Virtualization Media Group. Email [bbotelho@techtarget.com](mailto:bbotelho@techtarget.com) or follow [@BridgetBotelho](https://twitter.com/BridgetBotelho) on Twitter.

# Microsoft: Everything but the Kitchen Sink

*Microsoft is throwing an assortment of new technologies into Windows Server 2012 in an attempt to prove its clout. But will this approach entice IT to upgrade sooner rather than later?*

By Ed Scannell

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WHEN MICROSOFT SHIPPED Windows Server 2012 last month, it could have put on the packaging: “includes the kitchen sink.”

By a wide margin, the company has crammed more critical core capabilities into this version of its flagship operating system than any previous incarnation. Several of these capabilities not only bolster basic operating system functions but also are designed to serve as building blocks for Microsoft's cloud, virtualization and storage strategies—each a market where it faces a handful of voracious competitors.

But whether this raft of new features and technologies—numbering more than 300

in all—can convince Microsoft corporate users to move out of the comfortable confines of Windows Server 2008 R2 anytime soon remains to be seen. While some are encouraged by what they see, others say they are still upgrading their servers to Windows Server 2008 R2 and that Server 2012 is out on the horizon.

“Windows Server 2012 is a pretty interesting proposition, but it forces me to evaluate not just what my next server OS needs are but my cloud and virtualization strategies as well. I am down the road with both of those, and so I need to investigate how [Windows Server 2012] will work with



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non-Windows environments and applications,” said Eugene Lee, a senior systems administrator with a large bank in Charlotte, N.C. “I’ll be with 2008 for a while.”

Some analysts believe that moving existing data and applications from older versions of Windows Server could, given the new version’s improved capabilities, cost less than porting applications to previous versions of Windows Server. Al Gillen, program vice president, system software for IDC, describes Windows Server 2012 as “sequential and nondisruptive from an installed application perspective.”

“The best way to get onto Win Server 2012 is to deploy it in the hypervisor role, which gives you the benefit of the new hypervisor, new storage management and the ability to roll your Windows Server 2003 apps forward onto the new infrastructure,” said Gillen. “You aren’t saddled with the typical costs and time of porting applications from older versions of Windows Server.”

One IT administrator agrees that initially deploying the product on an internal staging server in the hypervisor role was a fairly straightforward process.

“We set up our test server as a Hyper-V host and rebuilt the box, put in a new drive and enabled the Hyper-V role and installed

the OS to the main C partition. As long as the Hyper-V VHDs [Virtual Hard Drives] are in a totally separate partition where you aren’t touching them, you should be good,” said Susan Bradley, a Microsoft Most Valuable Professional (MVP) and a certified public accountant with Tamiyasu, Smith, Horn and Braun, in Fresno, Calif. “I recommend however, not to put any role on that box other than the Hyper-V role at this point.”

What might encourage some users to move to Server 2012 sooner rather than later, Gillen adds, is that Microsoft has discontinued mainstream, and will soon discontinue extended technical support of the aged Windows Server 2003, and will end mainstream technical support in July 2013 for all versions of Windows Server 2008.

“The timing could represent an interesting opportunity for Microsoft,” he said.

Industry projections point to 2014 as a potential breakthrough year for the new OS. IDC predicts that by 2013, Windows Server 2012 will represent 35% of all Windows Server shipments with Windows Server 2008 R2 still holding a commanding 64% share. But in 2014, Server 2012 zooms to 82% and Server 2008 R2 plummets to 18% (see chart below).

## BREAKDOWN OF PROJECTED WINDOWS SERVER SHIPMENTS

(Percentage of Projected Worldwide)

Server Operating Environments	2010	2011	2012	2013	2014	2016
Windows NT Server	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Windows 2000 Server	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Windows Server 2003	29.0%	8.2%	3.0%	0.6%	0.1%	0.0%
Windows Server 2008	71.0%	91.8%	94.1%	64.2%	18.6%	10.6%
Windows Server 2012	0.0%	0.0%	2.9%	35.2%	81.3%	89.4%

SOURCE: IDC

## MICROSOFT STRIVES FOR THE CLOUD, BUT WILL USERS FOLLOW?

Among the building blocks stitched into Windows Server 2012, perhaps the most strategically important is Azure, the company's [cloud computing platform](#) designed for developing, deploying and managing cloud applications and services. Microsoft officials trotted out the Server/Azure product combination publicly for the first time at its Build conference last year.

That announcement stated that three of the four core concepts Azure is built upon are directly aimed at cloud users and developers: the ability to allow IT shops to build private clouds that offer public cloud services; the ability to offer continuously available cloud services along with the ability to manage those services across multiple servers from a single server; and the ability to run any application from any cloud.

While most corporate and third-party developers haven't registered many complaints about Azure as a development platform, few larger corporations have deployed the cloud environment for meaningful applications or services that reach down to internal users or out to their customers. For Windows Server 2012 to be more widely perceived as the cloud operating system that Microsoft wants it to be, the company must do a better job than it has so far in demonstrating that vision, some observers believe.

"When Microsoft says [Windows Server] 2012 is a cloud OS, they are referring to Hyper-V being more robust and how System Center can manage it in an Infrastructure as a Service manner so you can set up a cloud data center. But there is no real coherent cloud story other than saying that IaaS is the cloud," said Mark Eisenberg, a director with Fino Consulting, specialists in advising IT shops on cloud and mobile platforms. "I am still waiting for them to articulate this

write-once and run-anywhere strategy for the cloud."

Even if Microsoft starts sending a clearer message about Server 2012 as a legitimate cloud OS, Eisenberg and others believe it will take corporate shops anywhere from six to 18 months to develop a standard server image for Windows Server 2012 and its many built-in technologies.

"Generally what I see my shops do with server OSes is to start with the process of building a certified image and then stand all their new servers up against that image," Eisenberg said. "And then you have to get corporate and third-party developers to create applications that need Server 2012 in order to run, and so far Microsoft is doing a fairly atrocious job at that."

For Windows Server shops that have spent some time working with Azure on private or public cloud projects, the tighter coupling of Server 2012 with the recently technically improved Azure may hold some appeal. But the Windows Server 2012/Azure combination won't be so attractive to those who have yet to launch their first cloud projects, or those who have but are using non-Microsoft technologies.

"If you are an Azure user, there is a lot to like with all the good hooks in there for connecting up products and services, so there is a clear case for upgrading," said Jonathan Hassell, an IT consultant with 82 Ventures. "But if you are wondering what direction to go in, there isn't anything in Win Server 2012 that answers that question for you. People won't be saying, 'Thank God it's arrived so now we can go to the cloud.'"

Some users aren't necessarily focusing on reasons not to deploy Server 2012, but neither do they see a compelling reason to do so. They say they will likely roll it out when it is time to refresh its server hardware base.

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“[Windows] Server 2012 looks solid and has more than enough new features or technologies to weigh, but I don’t see anything that tells me I need to deploy this now,” said Martin Kreig, a purchasing agent with a large transportation company in Jacksonville, Fla. “It looks like we can pretty much deploy this in the normal cycle, which means waiting for the first service pack.”

## VIRTUALIZATION INTEGRATION MAY OFFER A BOOST

Microsoft’s kitchen-sink approach may turn out to be a way to outflank the competition in jockeying for space in the data center—but there are substantial hurdles to overcome with customers who already have investments in virtualization infrastructure, such as VMware.

“I think Hyper-V has a bad rep and a lot of people just aren’t willing to try it,” said Sean McDermott, CEO of Windward IT Solutions, an IT service management firm based in Herndon, Va. “The virtualization train left the station a long time ago.”

However, Microsoft’s move to link Hyper-V with System Center’s management

tools could help trigger a major migration to Windows Server 2012. “It’ll be interesting if Microsoft can create its own ‘event,’” McDermott said. “We’re starting to work with how to build public and private clouds with Azure on one side and System Center on the other, [along with] the ability to transparently move .NET code.”

What might give the Standard version of Server 2012 a boost is Microsoft’s decision to allow shops to deploy two virtual instances of the operating system along with the physical copy. The company offered only one virtual instance with Windows Server 2008 R2. Some shops like the [new licensing’s financial and functional appeal](#).

Whether the raft of new technologies in Server 2012 entices corporate IT shops sooner rather than later remains to be seen. But given the watershed moment Microsoft faces—as it attempts the tricky business of ushering its corporate users from high-ticket server operating systems to cloud computing and low-end mobile devices—sooner might be better. ■

**ED SCANNELL** is a senior executive editor in the Data Center and Virtualization Media Group.

## WHAT’S NEW IN WINDOWS SERVER 2012?

There are several key new features in Windows Server 2012:

- PowerShell 3.0 new features include new cmdlets, bringing the total to 2,300 cmdlets
- Storage spaces: allows multiple drive types at different sizes to share one common storage pool
- Hyper-V Replica: host-based replication, used for mission-critical applications

Key features in Windows Server 2008 R2:

- Hyper-V virtualization built in
- Server Core, using a minimal server interface
- Overall security enhancements, including BitLocker

# The Meta Overdrive



By Jonathan Eunice

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FOR THE PAST 30 years, I've been there, done that with pretty much every part of distributed computing as it's marched from academic theory to workaday reality. I've learned that people, culture, organizational structures and economics are every bit as important as the technology.

Technology is a great tool, but how we use it determines our investments and our outcomes.

In this column every month, I'll be the nudge and gadfly. You may not agree with my every observation or exhortation. I'm good with that, as long as I can help you gain useful perspective on modern infrastructure.

## META META

IT was rigid and static; now it's flexible and dynamic. We routinely do things IT pros only dreamed about five years ago.

Until recently, if you fired up an application, you knew where it would run, where its data would reside and how it would connect to the rest of IT. But with virtualization, you may *not* know where it's running. It started here, but was dynamically shifted over yonder for maintenance or load balancing. *Poof!* Now it's somewhere else. It's even more extreme when apps don't run in-house.

We've changed basic assumptions about where and how IT is accomplished. That

in turn changes how we buy IT, write apps, deploy apps, secure data, audit compliance, ensure performance and plenty more.

To support that, everything in IT—how it's bought, consumed, managed and measured—must now be considered at a “meta” level—to work in the aggregate and with the abstractions.

Everyone has to move from instances to classes, from individual processes and run books to patterns and templates. Everyone must become an architect, or at least think about architectural concerns.

What about designers, architects and CTOs—people already thinking about blueprints and classes and patterns? *They* have to move on to even more rarefied territory: to metaclasses and macro patterns, to abstractions of abstractions.

If it sounds like we've moved from the language of operations into the language of programming, that's exactly right. This shift is about automation, about making the data center systematic and programmable.

## THE AUTOMATION IMPERATIVE

Setting up servers, storage arrays, network switches and whatnot by hand is labor-intensive, but doable at small scale. But when you have dozens, hundreds or thousands of devices and apps—and when you're adding and changing them all the time—forget doing it by hand. It's not scalable, and it's not sustainable.

This isn't entirely new. IT operations has always had methodical aspirations—just look at groups, policies, RBAC (role-based

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access control), models, deployment templates and lights-out operation.

But virtualization and cloud make automation an aspirin, not a vitamin. It's not just good for us; it fixes very real pains. When operating at scale and speed, a systematic, standardized, automated approach is essential for IT sanity and survival.

Happily, the standardized, modular, virtualized, API-ified platforms now available enable such higher-level operations. Previous decades had elegant systems management concepts—but no way to directly use them.

We can now directly program and execute our templates and policies, using tools like Puppet, Chef and Fabric, or application programming interfaces from Amazon Web Services, boto and OpenStack. These make management automation practical at scale.

## BEYOND AUTOMATION

I've described the shift needed in systems management, but it applies everywhere. Whereas once we might have thought about individual servers or apps, we now need to plan and buy across all apps and all infrastructure, over multiple generations.

This is a much bigger mandate. If you're a cloud service provider or a CTO on Wall Street, you're already thinking this way. But much of IT is just coming to this turn and hasn't fully absorbed it yet. High-scale, high-automation, high-abstraction, highly patterned operations—this is the future for *all IT*. Shops that don't get it right will see their functions outsourced to providers that do. ■

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