Infrastructure Optimization

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Rouge cloud implementations can spell trouble for the economy, and should continue to be part of the federal government’s overall strategy, according to experts who in September testified before the U.S. House of Representatives’ Subcommittee on Technology and Innovation. Without it, we could be facing serious problems. Michael Capellas, a co-chair of the industry group TechAmerica’s cloud computing commission explained: “Cloud computing has the potential to shift the landscape and shift the wealth between nations.”

While this may be true in theory, the move to the cloud still has some technology professionals and executives stymied as users tap the cloud whenever they want to, circumventing the IT department and purchasing and installing their own applications. “This creates problems on multiple levels,” says David Gehringer, a principal with Dimensional Research based in Sunnyvale, Calif. “There are security and policy problems, but more it’s a problem of end-user support and knowing where an organization’s data resides.”

Uncovering the Rogues
There are two types of rogue implementations. The first is fairly straightforward: A user, not willing or able to make a request via the proper IT channels, creates a log-in for a cloud-based application, infrastructure, or storage implementation. This affects an organization’s security since the user may upload sensitive data. Sensitive or not, the data is also living outside the confines of IT, so it is not part of the organization’s regular backup and archiving schedule. In addition, it can impact the budget since there might be a similar application or resource already in use – and paid for – on premises or in the cloud.

The second implementation is what Gehringer classified as an unsupported project. “Users do this unknowingly,” he says. “Microsoft’s SharePoint is a good example. The person might want to add a new group, see the link, and then all of a sudden they have their own unsupported project outside of IT.”

The idea of rogue users isn’t new. There have always been people who circumvent IT. Five years ago, however, IT would find out that, for example, a developer had a server sitting under his or her desk or a human resources professional downloaded and installed a new productivity application when it was time for system upgrades. “Someone would then come to you sheepishly and tell you that they forgot to put a server into inventory,” says Lynda Stadtmueller, program director, Cloud Computing Services at Stratecast, a division of Frost & Sullivan. Today however, IT may never find out about the rogue cloud implementation unless the user has a problem and calls the help desk.

The Benefits of Policies
There are ways to block people from using unsupported and unsanctioned cloud applications and services, but a smart user is always going to figure out a way to get around those technology blocks, says Claude Baudoin, a senior consultant at research firm Cutter Consortium. “People who are creative and eager are not going to take no for an answer and will work their way around whatever you do,” he says.

Still, IT professionals can block access to specific cloud sites using very basic tools. You can analyze your organization’s Web traffic, looking for URLs that correspond to the cloud services that employees and contractors might be accessing. Once you compile a list, you can block access right at the Web server level, says Gehringer. “The problem is you have to find all the sites in order to block access, and the employee is going to already be using it once you find out.”

A better defense, he says, is creating and implementing good policies as well as providing a service catalog that users have constant, easy access to. Policies should include an educational aspect. “You need to teach people about the hidden costs of unapproved software both in the cloud and on premises,” says Baudoin. “Once they understand the security costs...
and management costs, and that they have alternatives through their own IT department, they will be less likely to go around IT completely.”

No matter what, says Stadtmueller, IT professionals should remember that users aren’t hitting the cloud to be malicious. “They’re just trying to get their jobs done,” she says. “When you find someone using an unapproved cloud service it should be seen as an opportunity and a gap – an opportunity to open up a dialog and a gap within your own IT department that needs to be remedied.”
When Robert J. Carey, the deputy assistant secretary of defense for information management, integration and technology spoke at the Arlington, Va.-based Defense Systems Summit 2011 on September 7, he brought up the fact that the Defense Department’s data centers are running at less than 15 percent of capacity. Carey, who is also the DOD’s deputy chief information officer, then discussed plans to increase that capacity to 75 percent. His keynote supported DOD CIO Teresa M. Takai’s announcement earlier this year that the organization is expected to shutter 44 data centers by the end of 2011.

While closing data centers definitely saves energy and money, this may not be a viable option for many organizations, especially those at the state and local level. In addition, even institutions like the DOD can and should continue to optimize the data centers that it keeps open. Technology, says Stuart Neumann, senior manager at London-based sustainability research and analysis firm Verdantix, can help drive efficiencies in the data center and across an enterprise.

“The low-hanging fruit is the data center and the desktop, and that’s being examined by the leading companies and organizations to reduce your carbon emissions and energy footprint,” he says. “And technology can be used to drive efficiencies in far more than just the data center.”

One of the first things that an organization must do is change the way they’ve looked at energy and power in the data center, says Konkana Khaund, Industry Manager-North America for Frost & Sullivan’s Environment & Building Technologies practice. “Computing demand is going to triple, and that’s going to keep pressurizing the data center so [IT managers] are going to have to find new ways to reduce energy use without getting rid of data centers.”

Khaund, along with Verdantix’s Neumann and San Murugesan, a senior consultant at Cutter Consortium have identified four ways that organizations can do just that.

Take advantage of free cooling. The data center gets hot, and in most areas of the country the outside temperature is considerably lower for a good portion of the year. Economizer systems take advantage of those cooler temperatures by bringing in outside air – as opposed to an air conditioner that cools the air inside -- effectively reducing energy use from heating, ventilation, and air conditioning (HVAC) systems by up to 50 percent. An even better option for those facilities located near water, says Khaund: Water chillers, which use water that circulates to absorb heat inside a data center and bring it outside where it can be dissipated. “Traditionally, you didn’t want water near machines. The fear was that it could lead to damages where you couldn’t retrieve data, but the perception is finally changing because the energy gains you’re going to see in the long run are large,” she says.

Use IT to tackle energy costs outside the data center and IT infrastructure. While servers and data centers do gobble their share of energy, they contribute only a fraction of an organization’s greenhouse gas emissions, says Cutter Consortium’s Murugesan, who is also the co-editor of Harnessing Green IT: Principles and Practices. In fact, IT is typically only responsible for between 2 and 3 percent of total emissions, with the rest originating elsewhere inside the business, says Murugesan.

There is software that can help reduce energy consumption across an organization by tracking energy usage, streamlining operations, and assessing environmental impact. “This software helps the business monitor energy usage, identify areas of savings, and launch new processes throughout the business.”
Consider container data centers. In a traditional data center, only 65 percent of space is being used, according to Khaund. This means an organization is spending money to heat, cool, and light space that’s not being used and never will be. She points to container data centers – also called modular unit supplementation – as a way to create a data center that is just big enough for what is needed today. “They’re stackable and you can supplement as you grow,” she explains. “You don’t have to plan and pay for the infrastructure costs you might need in three years, and if demand drops you can just pull the servers out and you’re done.”

Work with facilities to implement energy saving automation throughout the building. Two years ago building elements such as lighting or heating were exclusively under the tutelage of the facilities manager. “Installing control systems were all point solutions at single sites rather than enterprise wide, and as a result the CIO [or IT manager] wasn’t getting involved,” says Verdantix’s Neumann. “Now, we’re at the stage where these things need to be automated enterprise wide so you need collaboration between the two.” The IT department, with input from facilities, can put into place water management systems, intelligent transport software, building management systems, supply chain controls, and lifecycle assessment software. “Cost is the primary driver, but there are environmental benefits in the form of carbon and energy savings, too,” he says. ▲
Four things to know about moving to a virtual desktop

When a software or operating system upgrade takes place, the IT department spends hours or even days overseeing the project, eventually visiting every user’s workspace. With desktop virtualization, the paradigm changes, automating the installation, upgrade, and patch processes. And that’s not the only changes that desktop virtualization can affect in the enterprise. Security and compliance become easier because users only get access to the applications and data they are cleared to view and work with, says Curt Hall, a senior analyst and consultant at Cutter Consortium. This is why the government in particular has been a big user of virtualization and virtual desktop implementations, he says. Still, there are some things that even the most seasoned IT professionals are overlooking in their rush to move to the technology. Here are five things that experts say everyone should know about moving to a virtual desktop.

You can’t move to a virtual desktop interface (VDI) without a plan. There are some organizations that need the security and simplicity of a world where everything resides remotely and a desktop image is sent to a device with all the data sitting on the server. That’s why it’s very common, says Dan Kusnetzky, distinguished analyst and founder of the Kusnetzky Group LLC, for organizations to select a virtualization technology without thinking it through. When this happens, users often experience performance that is less than desired or needed, he says. An organization that has users all over the world should probably avoid the virtual access approach, but unless you stop and think about your users and where, how, and when they are connecting, this might not be apparent until it’s too late, says Kusnetzky, who is also the author of Virtualization: A Manager’s Guide (O’Reilly Media, June 2011). “The worst part is when performance is really awful, people will start working around it,” he says. Access virtualization works best when people are sitting in a facility where there is relatively high speed networking, and they have a fixed set of functions they need to do.

Going to a virtual desktop will impact your storage situation. If you’re shifting from a physical laptop or workstation to a virtual one, the I/Os are going over the network and being resolved by a server, and that process has an impact on the storage system. You’ve got to do the calculations ahead of time to make sure your storage infrastructure as well as your network can handle the strain, says Greg Schulz – a senior advisory consultant at The Server and StorageIO (StorageIO) Group. “There are a lot of myths out there relating to how VDI affects storage. You might think that you’re going to end up with one number of IO operations (IOPS) per second, but in reality, you’re going to see many, many more,” he says. “If you have 1,000 workers [all logging in at once] that could be 30,000 IOPS.”

There are going to be some users who complain. VDI works better than most people think it will, says David Gehringer, a principal with Dimensional Research, but it’s not foolproof, and for some people, it’s not workable at all. “The main problem is that your data isn’t accessible to you if you’re not connected to the network,” he says. “While there’s comfort in that for IT, the person who is set to stream-only mode is not going to be able to work on the train or in an airport, and that’s going to cause problems for people who are used to working anywhere and anytime.”

You may not save money – at least up front – using VDI. The biggest drivers to adopt VDI is to relieve IT of the hassle of managing and supporting desktops and the costs associated with having to constantly provision
and maintain large numbers of desktop machines,” says Curt Hall, senior analyst and consultant at Cutter Consortium. The problem, he says, is that most organizations won’t be able to roll out VDI on their existing infrastructure. “The reality is you might have to upgrade your hardware on the client and server side,” he says. “Especially if you’re running more complex applications such as statistical programs or streaming a lot of video or audio. Those things require more horse power. The good news, he says, is that once you do upgrade, the hardware has a longer life than what was installed previously. Hall adds: “Plus, because it’s a thin client you’re going to get some savings on energy use, too.” ▲
Managing software sprawl

Four years ago in 2007, the Lee County, Florida Sheriff’s office found itself in hot water. A local news outlet uncovered and reported the fact that the organization had purchased computer forensics software in 2007 at a cost of more than $704,000 and never used it. Adding in the yearly software maintenance of $100,000, Lee County had spent almost $1 million for software that had become shelfware. The public’s outcry is understandable.

Still Lee County’s experience is not unique, say experts. A study co-sponsored by the International Association of Information Technology Asset Managers found that IT managers spend more than $15.3 billion on software that will never be used. Another survey conducted in March 2011 by independent research company Opinion Matters found that more than half – 52 percent – of IT professionals still use spreadsheets to manage software licenses. Even more frightening, according to another survey by Ernst & Young: Only 20 percent of all companies have a formal software management and tracking program in place.

These conditions have led to software sprawl, with software being installed and never used or sitting idly on a shelf collecting dust. And just as significant, says Bob Laliberte, a senior analyst at Enterprise Strategy Group, is the “mad dash” toward virtualization that is contributing to a rapid proliferation of virtual machines that are commissioned and either never used or never decommissioned once their existence is no longer necessary.

“It’s become so easy to spin up a virtual machine that we’re seeing a problem with virtual machine sprawl, too,” he says. “Organizations have numerous virtual machines that are just sitting there abandoned, which means you’re paying for CPUs and the storage required to host them.”

What’s Behind the Sprawl?
The reasons behind this unfettered growth vary from organization to organization, but the main culprit is, as the Ernst & Young survey found, the lack of a formalized software management program. “It’s a historical and political problem, says Claude Baudoin, a senior consultant at Cutter Consortium, a research and consulting firm. “There’s no knowledge management about who uses what, what they are using it for, and how successful they are with the application.”

The problem also stems from bundling. Some software vendors charge almost as much or more for a single application than they do for multiple applications bundled together, says Dan Kusnetzky, distinguished analyst and founder of the Kusnetzky Group LLC. “It’s often cheaper to buy the whole suite up front, but that makes it more costly to use because it all needs to be maintained.”

The best way to mitigate and eliminate sprawl is to implement an application portfolio management program or a configuration management database (CMDB) and couple either one with an internal service catalog much like the one found at Apps.gov. The management products help you see what you have, while the service catalog gives users constant, easy access to a list of approved, supported, and installed software, which can eliminate redundancies.

“When you’ve got a software management program you can look at what you have in a central repository, track licenses, and see where your different applications reside,” says Kusnetzky. It may also let virtual machine users lower the number of software licenses they need, he says. “You can use it to show that although you have 300 people in a department, only 12 licenses are in use at any given time.” The caveat, says Kusnetzky, is that some vendors, for instance, require you to buy a license for every machine – virtual or not.

On the service catalog side, there are a number of steps that IT should take when designing its offering. First and foremost, says Baudoin, the service catalog has to include more than just enterprise applications. “It should also contain approved personal productivity software,” he says. All of the applications should be easily downloadable. In the case of cloud-based applications, users should be guaranteed a quick turn-around for new accounts and user names.
Once it is in place alongside the CMDB or portfolio management product, IT managers can run discovery to find similar programs that can be pared down.

“When you can scan the network and see the competing products you have, you can encourage people to migrate to the official version of whatever program you’ve selected for the company,” says Baudoin.

“It’s not easy, and doesn’t succeed 100 percent of the time, but if you tell people there’s a reason for doing so, you’re going to get some cooperation and going forward you can try to control any additions to your software catalog.” ▲
Five years ago, storage was fairly straightforward. A data center had spinning disks and tapes, and although data growth was exploding, the infrastructure itself was fairly manageable. Today, however, organizations are adopting new storage technologies and managing multiple tiers of storage—rotating media, SSD, DRAM memory, tape, for instance—while at the same time being challenged to reduce the overall footprint of the data center. Complexity, say experts, has increased exponentially. IT managers, looking to reduce complexity, cost, and carbon footprint are looking to several trends to help them do just that. Here are the top four trends for 2011 that are helping IT managers meet their storage goals and provide excellent end-user experience, too.

Storage optimization becomes a must. IT is using fewer-but-faster storage devices, so making sure that everything that they are using is optimized for both space and performance is a must, says Greg Schulz, a senior advisory consultant at the Server and StorageIO (StorageIO) Group, IT infrastructure technology advisors and consultancy. “For capacity, they are archiving, de-duping, and thin provisioning. They’re optimizing for performance, too,” he says. “They are striving to do more with less.” For example, IT has started creating and enforcing archive policies for the business instead of the other way around. “Users used to be far less willing to let data be archived, but now IT is telling the business, within reason, ‘This is what’s going to occur,’” says Schultz.

Solid-state disk (SSD) flash drive technology makes its way into the data center. A few years ago, storage professionals would have laughed at the thought of putting an SSD drive into the data center. Yes, they are very fast and have low latency, but they also have an inherent problem: They have a more limited life expectancy as compared with rotating media. “You can only read and write so many times before you get a failure, so it takes some intelligence to use flash intelligently,” explains Dan Kusnetzky, a distinguished analyst and founder of the Kusnetzky Group LLC. Still, when used correctly—for applications that are I/O-heavy—they can boost overall performance.

More data moves into the cloud. IT professionals are turning to the cloud for applications and infrastructure. In the coming months, infrastructure will mean more than processing power. Increasingly mean storage, says StorageIO’s Schultz. The reason is twofold: the cloud makes management easier and, according to an August 25, 2011 Forrester Research report, it costs less, too. “Our models reveal a significant cost difference, with the cloud-based model coming in 74% less expensive than I&O running it in-house,” according to the research firm. However, with security and compliance looming large for most government and public institutions, it remains to be seen whether those organizations will see the same cost benefit. Most will require a private cloud implementation, which comes with an added price, says Schultz. “Some people may be able to go the public route, but the majority of [organizations] will need a hybrid or private model,” he says. “It’s going to be up to each IT department to figure out how much it costs to provide storage internally so they can go to the cloud providers with data in hand and be able to talk about service objectives and price shopping.”

Security becomes even more important. Security has always been important, but now, as IT is being charged with securing disparate storage sources that are being accessed from inside and outside of the enterprise, the task becomes even more challenging—and crucial. “Data in the data center is being accessed not just by applications on a server or desktop but increasingly by a constellation of devices like tablets and smart phones,” explains Kusnetzky. “This creates more opportunity that malicious use will arise, and makes it more difficult since you’re retrofitting your network and infrastructure to deal with these challenges rather than having the security built into the original design.”

Top storage trends for 2011
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