

*As midmarket organizations move to centralize and consolidate computing environments, server virtualization is a natural fit.*

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*Learn how midmarket CIOs are re-examining computer infrastructure and realizing a return on their investment, while grappling with new challenges.*

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# Capacity Planning Eases Path to Virtualization

*By figuring out what it had, one midmarket firm determined precisely what it needed. The result? A 16-to-1 server consolidation ratio.* BY ELISABETH HORWITT

**KRONOS INC. WAS** suffering from a serious case of server sprawl. Some 330 boxes had pretty much used up the space, power and cooling resources at the workforce management software company's Chelmsford, Mass., data center. The problem became acute around July 2006, when the company acquired another firm—and 80 more servers.

"We literally had nowhere to put them or plug them in," says IT manager Raymond DeMartini. "That pushed us over the edge," into taking the virtualization plunge.

By deploying multiple applications across virtual machines on a single server box, the company was able to significantly improve resource utilization and achieve a 16-to-1 server consolidation ratio. This, in turn, decreased power consumption by 20% and eliminated 25 racks from the data center. Virtualization has also reduced unplanned downtime by 88% and resulted in 97% faster server deployment, according to Michael Moran, senior IT systems manager at Kronos.

Moran credits the project's success

in large part to a rigorous upfront capacity planning process his team performed with the help of Bedford, N.H.-based systems integrator Expert Server Group. First, his team used PowerRecon from Novell Inc. subsidiary PlateSpin to track application workloads on existing physical servers, over a complete activity cycle.

"We found that we had a lot of single-application systems in the data center, whose load utilization, even during peak times, wasn't more than 30% or 40%," Moran notes. About 150 servers were tapped as viable virtualization candidates.

## PLANNING PAYS OFF

Other midmarket companies would do well to take a page from Kronos' book, industry sources agree.

As midmarket IT budgets continue to tighten, "overprovisioning is a luxury midmarket companies can't afford," notes Audrey Rasmussen, a principal analyst at Ptak, Noel & Associates LLC. More and more CIOs are turning to virtualization as a

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means of getting more bang for their server bucks. Up-front capacity planning is critical to such projects, to ensure that efficiencies don't come at the expense of performance and reliability, she adds.

Even so, too many firms are still

## An EMA study found that less than 50% of virtualization management tools support cross-discipline integration.

managing capacity by waiting until problems occur, "and then allocating more resources (and more, and more) until they go away," Enterprise Management Associates (EMA) noted in its April report "Virtualization and Management: Trends, Forecasts and Recommendations." The report goes on to state: "Enterprises ... need to look for sophisticated tools that understand resource allocation and usage across the physical and virtual ecosystems, and across the full range of the virtual environment (hosts, guests, hypervisors, clients, storage systems, network components, etc.)."

IT managers need to measure not just overall server performance during peak usage times, but also different applications' demands on specific resources, like I/O ports and memory, at different times of the day and month, says Andi Mann, research

director at Boulder, Colo.-based EMA. This enables them to make optimal use of server resources by colocating, for example, a financial application that makes heavy use of the CPU during the day, with an I/O-intensive backup application that does its heavy work at night. It also ensures that "a server's CPU doesn't get instantaneously saturated by multiple workloads making calls simultaneously," Mann notes.

According to Rasmussen, companies also need to monitor performance and manage capacity on an ongoing basis. This is true of any data center installation, but particularly critical for a virtualized environment, where workloads keep shifting among virtual machines (VMs), and VMs among servers.

### A MARKET FOR MANAGEMENT

The good news is vendors are stepping up to the plate. Leading management platform vendors like IBM, Hewlett-Packard Co. and BMC Software Inc. have aggressively targeted the virtualized space, often through acquisition. Cirba Inc., Novell/PlateSpin, Akorri Inc. and, of course, VMware Inc. offer virtualized capacity management tools.

The not-so-good news is the market remains highly fragmented. Ideally, software tools across key IT Infrastructure Library disciplines like performance and utilization monitoring and capacity and storage management would all feed into and access a

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common configuration management database, Mann says. However, an EMA study found that less than 50% of virtualization management tools support cross-discipline integration, he explains.

Still, savvy IT executives are figuring out ways to harness complementary management tools, often with the help of systems integrators and the vendors themselves. Kronos, for example, is using Akorri's Balance-

Point to monitor utilization and proactively manage performance across a virtualized infrastructure. "When users start complaining about response time, it helps us pinpoint whether the problem is with the FC switch, storage array or VM processes," DeMartini says. ■

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## Virtual Server Issues: Running the Numbers

RESEARCH SUGGESTS THAT AS MORE IT executives implement virtual servers, they're learning that managing those virtualized environments is a lot more difficult and complex than they anticipated.

Consider an Enterprise Management Associates Inc. survey of 627 corporate IT decision makers, published last April. It found that:

- ▶ Only 24% of respondents said virtualization makes security administration easier—as compared with 42% in 2006.
- ▶ Just 32% said software control and distribution is easier in a virtualized environment, down from 58% two years ago.
- ▶ Configuration management numbers plummeted from 58% to 32%.
- ▶ Only 31% of respondents to EMA's survey said they definitely have enough skills to manage virtualization deployment.

The total percentage of respondents who said virtualized servers in the data center actually make management tasks more difficult was in the teens or single digits. However, EMA research director Andi Mann, who authored the survey report, suggested that respondents underestimate the difficulties, and are likely to change their tune in the next year or so. —ELISABETH HORWITT

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# Consolidation Via Virtualization Can Offer Quick ROI

*Virtual servers and consolidated disaster recovery facilities mean better energy efficiency and payback in less than a year for one midmarket organization.* BY MICHAEL YBARRA

**WHEN VEECO INSTRUMENTS** Inc. decided to consolidate its corporate office with a manufacturing facility about a mile away in Plainview, N.Y., senior IT director Linda Chan took the opportunity to do a little consolidating of her own: revamping the company's data center.

Since the midmarket company went public in 1994, Veeco has grown rapidly, with revenue jumping from \$30 million to \$402 million in 2007. There have been a dozen acquisitions, including five in a single year.

All of which made for a mishmash of IT systems and legacy data centers. The company, which makes equipment for high-tech manufacturing, runs plants in six states and maintains offices in 20 countries, from Europe to Japan. Each manufacturing locale had its own data center and at one point the company was running 10 enterprise resource planning (ERP) systems.

Earlier this year, Chan consolidated most data center functions to the new location—and at the same time reduced the number of servers. The size of the IT department has

dropped from 34 people to 22.

"We've been able to do more with less," Chan says.

## THE OBVIOUS CHOICE

The impetus for change came when the CEO decided to combine facilities.

"My first thought was 'just move the physical servers,'" Chan says. "Then virtualization occurred to me. I said, 'Let's think out of the box.' Dell did an ROI analysis for us. Not all servers can be virtualized."

The Plainview plant already had a data center, but it was too small to accommodate all of the company's servers. The room would have to be physically expanded and a new air conditioning system installed. But dozens of servers could be virtualized onto two, which to Chan became the obvious choice. The new data center runs 50 servers, including the virtualized ones.

"We were able to prove that it made sense," Chan says. "It wasn't a hard sell. We were really planning to invest more than we did. We didn't

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have to put in a 10-ton air conditioning unit. We're expecting payback in less than a year."

Veeco decided to remake the data center in two phases. The first, which involved virtualizing less important servers, took place in March. Veeco purchased equipment from Dell Inc. and hired consultants to run the first week of the changeover.

"The biggest challenge was just the time [it took] to move the servers," Chan says. "We were bringing Japan live with SAP at the same time. We had a 12-hour window to move the servers. Everything worked out well. I've built data centers from scratch and moved servers around before, but this had a lot more involved."

Chan is now working on an ROI assessment for a second phase that would virtualize mission-critical servers in 2009. All ERP, financial and sales applications will be located at Plainview, while a few remote servers will handle local tasks. Email servers will also be virtualized.

### ADDITIONAL BENEFITS

Veeco has also consolidated its disaster recovery facilities, turning a legacy data center in Tucson, Ariz., into a full-scale failover site.

"We've made it much more redundant," Chan says. "We really needed to create a 24-by-7 operation. We're supporting apps for sites worldwide."

Consolidating the data center also allowed the company to make it more

green.

"We did an airflow study using a Dell model," Chan says. "The old system we were using just pushed hot and cold air around. The study helped with the proper placement

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—LINDA CHAN, SENIOR IT DIRECTOR,  
VEECO INSTRUMENTS INC.

of the ducts and where the servers are situated."

For the next round of data center improvements, Chan is looking at deploying Riverbed Technology Inc.'s wide-area data services product as another way to avoid having to purchase more servers.

"Our overall goal is to centralize as much as possible," she says.

Like many CIOs, Chan said the economic slowdown has reinforced the need to keep expenses controlled.

"We've been asked to look at ways to save, such as using Skype and internalized conference servers," she says. "Even before the economic crisis I had to prove and ROI everything." ■

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# Four Strategies for Compliance In a Virtualized Data Center

*Virtualized data centers can open you up to legal risks involving apps, third-party hosts, power disruptions and vendors. But there are steps you can take to protect your organization.*

**DATA CENTER VIRTUALIZATION** is nothing short of revolutionary. It is transforming data centers into network traffic centers, shifting IT assets from capital budgets to operating accounts, moving applications from controlled servers to hosted servers and transferring data and application access from wired networks onto arrays of wireless, portable devices.

But in moving toward total virtualization, CIOs need to recognize some critical legal and compliance risks up front in order to protect the impressive ROI that virtualization provides. Here are four strategies to help you do that:

## 1 Track your applications.

To manage an application effectively, you have to know where it is. Establish a “chain of custody” that enables you to see where applications are running and manage them against any legal concerns. The chain of custody includes which machine an application is installed on, what data is associated with that application, who is in control of the machine and what controls

are in place.

With server virtualization, applications move among different machines. Without careful control over the chain of custody, you can expose an application or the data to circumstances where a high-security app may be shifted into a low-security environment. So watch that, and before you change anything in the environment, consider whether the change will create unauthorized access to the application or related data.

## 2

## With off-site hosting, keep your assets separate.

If a third party controls or hosts one of your servers, keeping your operating assets separate from those of the host's other customers is critical to avoid potential liability for security exposures, including improper access. For hosted applications, you also need to ensure that settings for one application cannot drift or migrate into the control of another, so no other host customers can access your data.

To do this, you need to evaluate

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how the host distributes and controls applications and data stored in its server array. Depending on the configurations of the hosts and client machines, settings and programmatic adjustments can trickle down and install in unexpected manners.

That's why you need to make sure that appropriate security controls are in place. You don't want unexpected updates or configuration controls to gain control over your data or application versions. Make sure your contract with the hosting company details the technical specifications that protect your data and users, and that the hosting company provides the testing and monitoring reporting that shows compliance with your controls.

**3 Protect yourself against power disruptions.** Any CIO overseeing a data center knows that power outages can be a common occurrence. The reason is simple—the power to run and cool a data center is more and more vulnerable. A 2006 AFCOM survey reported that 82.5% of data center outages in a five-year period were power-related.

If your data center has experienced power-related business interruptions, consider drafting contract terms for your own customers that protect you from liability if the power supply to your facilities is disrupted or lost. You may want more than general “acts of God” excuses in your cus-

tommer-facing agreements.

If you are considering a shift to a hosted extension of your data center, you need to understand your hosted site's power supply and capabilities. Make sure your contract precisely defines those capabilities and allo-

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cates the risks for any service disruptions that occur. Account for this in your own customer contracts as well. Draft them carefully to make sure that power disruptions to your suppliers do not expose you to liability that you would avoid if your data center were in-house.

**4 Ensure vendor cooperation in legal matters.** So, what happens when virtualization and compliance collide and the matter ends up in court? I have rarely seen a commercial contract for hosted or outsourced services that addressed the potential need for the service provider to cooperate in testifying in lawsuits. However, when a legal collision between virtualization and e-discovery occurs—

such as if a third-party host was unable to produce documents you

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needed for a legal action—a service provider can be a significant rogue variable. You may well be able to compel your service provider to participate through a subpoena, but you can imagine how those executives will feel about doing business with you afterward.

## Virtualizing any aspect of your data center changes the game for compliance and e-discovery.

To head off this potential scenario, make sure that in any contract with a third-party custodian of data, you obtain the service provider's commitment to cooperate in the courtroom. You may need to pay for this, but it's better than having a service provider that is annoyed at the burden of the litigation support.

In conclusion: Virtualizing any aspect of your data center changes the game for compliance and e-discovery. Make sure you know exactly where your applications are running, that your server controls are intact and that your service provider contract provisions are "virtualization-friendly." You want to enjoy all the benefits of a virtual data center, not worry about whether your compliance controls are adrift in the computing "cloud."

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