

# Virtualize Everything?

## Opportunities—and Benefits—Keep Growing



What's on your IT wish list? You could probably use more budget, servers, disk space, staff time, and space, power, and cooling capacity in your data center. Organizations are recapturing all these resources using virtualization—and sometimes in very large amounts.

By Alan Drummer

For instance, server virtualization—or isolating multiple applications so they can run on one physical server without conflict—can eliminate a large number of physical servers. At a key energy business in New York it will save the bulk wholesale energy marketplace a projected \$16.3 million over five years. Storage virtualization—or creating one virtualized pool of storage across multiple storage systems—enabled a memory chip manufacturer in Taiwan to reclaim \$1.8 million in unused primary disk space. And application virtualization—or isolating applications

from the desktop hardware they run on to eliminate conflict and streamline management—made it possible for a university in Utah to migrate the email systems of 10,000 users in two days instead of three months, all the while avoiding over a half million dollars in technician time.

The core idea is the same in all three types of virtualization: separate and isolate the computing resource you need from the underlying hardware. The results are large gains in efficiency and flexibility.

However, organizations tend to move into virtualization carefully. “We see customers adopting it in phases,” says John Humphreys, program vice president for enterprise virtualization at IDC. “First, they use it to reduce server infrastructure in test and development. Then, within a year or so, they find it’s stable and reliable, and the ROI is so quick and compelling that they move it into production. At that point, we see people say, ‘Wait a minute, what else can I consolidate? I’ve got this powerful hammer. Let me go out looking for nails.’”

Adoption is now accelerating. More than three quarters of IT decision makers worldwide expect virtualization to significantly impact their IT management requirements during the next two years, according to a poll conducted by the Enterprise Strategy Group (ESG).<sup>1</sup>

And “more than 90 percent of companies in the Fortune 1000 have some level of virtualization in their environment,” reports Mark Thiele, director of research and development business operations for VMware.

How can you profit from what other organizations are learning about virtualization?

CIO Digest talked with key decision makers at three enterprises that use it extensively.

### Shrink your server farm

Virtualization has made a critical difference at New York Independent System Operator (NYISO). This independent organization operates two data centers, and based on its core business, downtime could have a significant financial impact on its customers.

The reason is that NYISO is a key link in supplying energy to 20 million power-hungry New Yorkers—including the center for world finance known as New York City. NYISO runs an \$11-billion wholesale electricity market and manages thousands of miles of high voltage lines that supply the region. The challenge was to enhance availability and disaster recovery and increase server CPU utilization from 10 percent to 50 percent.

Virtualization was a core part of the effort, and NYISO developed an innovative virtualization model with assistance from ServerWare Corporation, a Symantec Platinum Partner. NYISO puts multiple applications on each server using Solaris 10 Containers in its Sun environment, and logical partitions (LPARS) in its IBM AIX environment. It then manages and moves applications between containers or partitions using Veritas Cluster Server from Symantec. It can manage all servers from a single management console. Applications can be moved between servers either in the same data center or between the two data centers, separated by 30 miles of fiber.

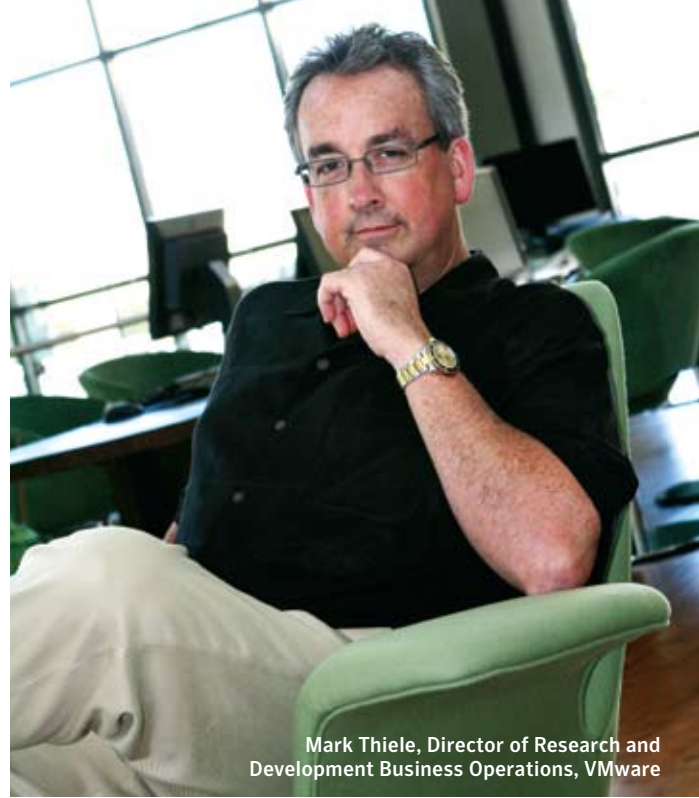
The benefits of this model are myriad. Uptime in the Solaris environment is now 99.9 percent, and uptime in the AIX environment is projected to increase from approximately 99 percent to 99.95 percent once virtualization there is complete. The high uptime is obtained by creating a high availability architecture that leverages the capabilities and benefits of virtual environments.

The IT team has won a Best Practices in Storage Award from *Computerworld* based on their virtualization project and the high availability and disaster recovery strategies deployed. Server utilization has increased from 10 percent to 60 percent, surpassing a 50 percent target.

“Increased utilization has enabled us to cancel plans for adding a new database on the AIX platform, saving us \$500,000,” explains Ken Fell, NYISO’s CIO. “Also, we’re now moving Oracle, mission-critical applications, middle-ware, and our development and QA environments off of 265 HP Tru64 boxes onto 35 virtual machines in the HP-UX, AIX, and Solaris environments. We can reduce our five-year budget by about 230 servers, saving \$16.3 million.”

“Consolidation was the primary driver for virtualization three or four years ago, and it’s still compelling,” comments VMware’s Thiele. “Now, the additional opportunities of being able to move workloads, dynamically allocate resources for workloads, do inline maintenance, and make systems highly available for almost no additional cost—all these benefits are really driving the adoption of virtualization today.”

Fell confirms that NYISO gains from each one of these benefits. The organization has become a virtualization leader in its industry. Fell is also leading the preparation of a Consolidated Cost Benefit report that summarizes virtualization savings from the nine North American Independent System Operator/Regional Transmission Operators (ISO/RTOs). This report will be presented to the ISO/RTO CEO Council and may be presented to the FERC (Federal Energy Regulatory Com-



Mark Thiele, Director of Research and Development Business Operations, VMware

mission) at the CEO’s discretion. The report will demonstrate joint savings associated with the joint virtualization efforts for the North American ISO/RTO Organizations. As a tactic, according to Fell, virtualization’s importance will only grow. “If you’re running out of server space as the economy slows down, building a new data center is not an attractive option,” he notes. “But virtualization is.”

### Pool your storage

Especially in tough economic times, efficiency is everything. Inotera Memories, Inc. offers an example of efficiency gained through storage virtualization. Inotera is a Taiwan-based manufacturer of commodity DRAM memory chips used in PCs and consumer electronics.

## Virtual Growth

**33%** of total server spend in 2011 will be for virtualization

**100%** projected increase in the number of virtual servers by 2011 to 9.5 million

**76%** of survey respondents use virtual machines on production x86 servers, with over half of workloads as enterprise applications

Source: “Server Virtualization Market Forecast and Analysis 2006-2011,” IDC Special Study, January 2008. Reference provided courtesy of VMware.



Ken Fell, CIO, NYISO

pool, monitor, and manage storage from one console for all their different storage systems.

“We gain centralized visibility and control,” Wang explains. “From a single console, we have solutions for capacity management, centralized monitoring, application to spindle mapping, and active management of storage components.”

The virtualized overview of storage from Veritas CommandCentral Storage has enabled

The result is that “we’ve improved storage utilization by 20 percentage points, from 50 percent to 70 percent,” Wang reports. “With a single overview of centrally pooled storage, we could identify 40 terabytes of primary disk space that were stranded, orphaned, or unused. We are re-assigning this space.” At \$45 a gigabyte, 40 terabytes represents \$1.8 million worth of reclaimed disk.

Having virtualized its storage, Inotera is in the process of evaluating how to use VMware’s technologies to virtualize its 2,000 Microsoft Windows-based servers. “We feel we can drive up CPU utilization rates and decrease our server count and power consumption,” Wang points out. “We project that virtualization can reduce power by as much as 30 percent and application licensing costs by 20 percent.”

Margins in Inotera’s industry have become wafer thin. During 2007, for instance, average selling prices for DRAM dropped more than 80 percent.<sup>2</sup> But despite the drop—and because of its efficiency—Inotera closed the year with positive income.

Part of the company’s efficiency is due to gains in storage management resulting from virtualization. The IT team at Inotera oversees 100 terabytes of data residing on storage systems from IBM, EMC, HP, and Hitachi Data Systems.

“We have so many kinds of storage arrays that if we didn’t centralize their management, maintenance and operations would have become too complex,” says Kun-Yung Wang, IT division director. So, in 2005, Wang’s team implemented storage virtualization using Veritas CommandCentral Storage and Veritas Storage Foundation to centrally



Kun-Yung Wang, IT Division Director, Inotera Memories, Inc.

Inotera’s storage administrator to identify wasted space. “We can answer important questions: ‘What data do we have? Where is it located? How is it being used? And is it in the right place?’” Wang points out.

### Found: \$1.8 million of disk space

Virtualization then brings new flexibility to efficiently make changes. “Storage Foundation enables storage virtualization across our different disk arrays,” Wang comments. “We can span volumes across the arrays that are visible to each array. Our storage volumes and file systems can be dynamically grown or capacity reclaimed, or storage can be dynamically provisioned to new applications without any modifications required by our end users.”

### Layering applications saves \$500,000

Besides virtualizing servers and storage, IT organizations are virtualizing applications for additional gains. The University of Utah’s University Healthcare system is one example. The IT team needed to migrate 10,000 end users from Novell GroupWise to Microsoft Office Outlook. It wouldn’t be easy. Users were spread across 25 clinics within a 50-mile radius.

“We estimated it would take a team of 15 technicians working full time for six months to manually switch email systems in the 10,000 PCs,” says Clint Criddle, client management principal at the university. The team searched for a different approach and considered application virtualization. By virtualizing Microsoft Office Outlook, the two email applications would be isolated from each other. Typically, email clients from two different vendors can’t be run on one PC, Criddle points out. It causes conflicts. “But if one of those applications is virtualized, it can be done,” he says.

The team reviewed possible tools and chose Altiris Software Virtualiza-



## Fighting Virtual Machine Server Sprawl!

- > Ask tough questions before approving a VM
- > Have a VM lifecycle management policy
- > Have VM decommissioning and archival procedures
- > Charge a monthly fee for VMs
- > Use a solution such as VMware Lifecycle Manager

tion Solution from Symantec. “We were already using Altiris Total Management Suite,” Criddle says. “And we saw that Altiris Software Virtualization Solution is easy to use.”

The new approach worked. “People needed to access their email during our migration,” Criddle says. “And we needed to deploy the new email client. Now we could run the old email client along with the new one. Users could log into the test system of Outlook and verify for us that their accounts worked. And we could take care of any problems in advance before switching.”

A tough project became an easy one. “Using Altiris Software Virtualization Solution, we migrated email systems in two days instead of six months—a 99 percent reduction in time,” Criddle says. “And we didn’t have to consume six months of staff time for 15 technicians.” That’s a savings of about \$576,000.<sup>3</sup> “Altiris Software Virtualization Solution paid for itself in this project alone,” he adds.

### What was hard is now easy

Since then, the team has virtualized 57 applications and can quickly install or re-install them as necessary on 5,000 desktops. “We can package applications the way we want them,” reports Brad Horrocks, senior client management professional and Software Virtualization Solution administrator at the university. “We can deploy applications automatically and cleanly to the machines without leaving our office, have them operate without conflicts with any other applications, and manage them from the Altiris console.”

The act of installing an application once required a technician to make a desktop visit of 30 minutes to an hour. Now installation takes five minutes from the central console.

The team is planning an upgrade to Altiris Software Virtualization Solution Pro to gain the ability to stream applications on demand. “The streaming feature will let us monitor application usage, auto-

matically harvest unused licenses, and see how many licenses we really need.” Criddle says. “Many people who request a \$300 Visio license could probably actually get by with a free Visio viewer. Tighter license management should save us a lot of money.”

“There’s another benefit to application streaming,” adds IDC’s Humphreys. “It enables organizations to get applications and tools to today’s mobile workers, when and where they need them. Every worker requires their own customized set of tools and interface—and application streaming can deliver them.”

Although it’s not yet streaming applications, the University of Utah is pleased with the virtualization benefits it is already realizing. “Application virtualization not only made our email migration possible,” Criddle says, “it let us turn our attention from managing applications to projects like proactive desktop security. Given the savings we’ve achieved with proactive security, we’ve had a 10-fold return on what we invested in application virtualization.”

### No turning back

Outside of “VM Sprawl,” (see sidebar on page 14), no one using virtualization expressed any reservations. NYISO’s Fell sums up the reaction. “Virtualization is optimizing our budgets, utilization, staff time, space, and energy usage,” he says. “It makes us greener. It adds as much value to our IT operation as anything we’ve ever done. And it enables many companies that have multiple data centers—some



Clint Criddle (left), Client Management Principal, University of Utah, and Brad Horrocks, Senior Client Management Professional and Software Virtualization Solution Administrator, University of Utah

have dozens—to get them down to one or two or three.”

Yet organizations getting started in virtualization are still starting slowly, notes VMware’s Thiele. “Once they get started, however, and get a taste of being able to move live applications from one hardware platform to another, without customer impact—there’s no turning back.” ■

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<sup>1</sup> Enterprise Strategy Group, “New ESG Research Identifies IT Service Management Automation and Best Practices as Essential,” Reuters, March 24, 2008.

<sup>2</sup> Inotera Memories, Inc., “Manufacturing Excellence 08,” 2007 Annual Report, 7.

<sup>3</sup> \$576,000 in staff time = 15 technicians x 6 months x 20 days/month x 8 hours/day x \$40/hr estimated salary plus benefits.



## Virtual Tools from Symantec

**Altiris Software Virtualization Solution Professional:** Instantly activate, deactivate, or reset applications and avoid conflicts between them. Stream applications for on-demand delivery.

**Veritas Virtual Infrastructure:** Unified enterprise-class virtualization solution bringing storage management into x86 virtual server environments for production workloads.

**Veritas Storage Foundation:** Streamlined, heterogeneous online storage management.

**Veritas CommandCentral Storage:** For centralized visibility and control across heterogeneous storage environments.

**Veritas Cluster Server:** Cross-platform clustering for minimizing downtime or moving partitioned applications.