CASE STUDY

Schools Virtualize and Modernize

Districts look to upgrade their networks and save money on energy costs with server virtualization.

Karen D. Schwartz

When Joe Penney joined the Madison-Plains Local School District in 2007, he felt as if he had traveled back in time to the 1990s. The London, Ohio, school district was running on a rudimentary network with no servers at all — just desktop computers running Windows 95 and slow, virus-prone Internet access.

Clearly, the district was in need of an upgrade. Penney, the school district's technology coordinator, drafted an ambitious technology plan and, slowly but surely, started to implement it. The first step was buying four servers, followed by a comprehensive overhaul of the networking and storage infrastructure.

Joe Penney says server virtualization saved money and simplified desktop management at Madison-Plains Local School District in London, Ohio.

Andrew Spear/Aurora Select

Last year Penney began the next step of the process — adding an extra quad core processor and 32 gigabytes of memory to three of the four servers and implementing VMware ESX 3.5. The clustered servers, now running in the school district's data center, serve five schools with about 1,300 students.

"I knew that we weren't taking full advantage of the resources available on our physical servers," Penney says. "And I was worried that because we run an e-mail server, web server and SQL server all on the same physical box, if one went down, it would take the rest of them down. Virtualization seemed like the answer."

The virtualization project was finished last June, and Penney reports numerous benefits.

The system simplified desktop management, saved the district significant money and increased flexibility. Because each server now houses eight virtual servers, power requirements have been dramatically reduced. What's more, Penney can now test products he may want to implement — something he couldn't do before because he didn't have test servers available. To prevent outages from hardware failures, Penney is using VMware's High Availability and Distributed Resource Scheduler. And VMware's free plug-ins have let him perform network monitoring and load balancing.

The cost savings have been significant. "If we were to run 16 servers physically instead of virtually, it would cost $5,000 to $6,000 per server, plus the power consumption," Penney says. "And we would need another network module on our switch to provide more ports."

Jeff Boles, a senior analyst at Taneja Group of Hopkinton, Mass., says Madison-Plains is taking the right approach.

"Lean-running K–12 organizations are often hard-pressed to manage all of the physical infrastructure they have, and often get a double whammy from a number of systems that require their own separate servers and infrastructure," he says. "Server virtualization gives them a great opportunity to consolidate and make better use of their hardware, while reducing their administrative overhead."

A data center with 60 physical servers that virtualizes 20 of those servers will save nearly $270,000 in net IT capital costs and $232,000 in net IT operation expenses over five years.

SOURCE: VMware Virtualization TCO and ROI Calculator

For Punahou School, an independent K–12 school in Honolulu, the impetus for moving to server virtualization was a campuswide sustainability initiative in which departments were challenged to find ways to better manage energy consumption. CIO Wendi Kamiya believed server virtualization was a great candidate, and she was right: After implementing virtual servers, the school's data center was able to reduce hardware-based energy expenditures alone by 40 percent.

To achieve those results, Kamiya replaced 40 older physical servers with four IBM System x3850 M2 servers running VMware ESX. Together, the four servers run 50 to 55 virtual servers.

In addition to energy efficiency, the biggest benefit the school has seen is flexibility. When an administrator wants to test a potential new application, for example, it's a simple matter to provision a new virtual server, instead of finding room on a physical server.

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The server virtualization platform, in place since 2008, has worked so well that Kamiya is open to expanding virtualization to the desktop, she says.

As for Penney, his goals don't end with virtualizing a few servers. He has already moved forward with 60 virtualized desktops, running VMware vSphere 4.0 and VMware View 4. He also has implemented an 802.11n wireless network from Aruba Networks and believes the combination of that network and the virtualized servers will move the school district toward the future. Next up is delivering a host of applications and resources to students on their own personal devices, such as cell phones.

Virtual Best Practices

Follow these tips for a successful deployment.

- **Think big picture.** It's not easy to change direction once you have chosen one manufacturer's virtualization solution, so take a hard look at the big picture and plan for the long term before diving in. Understand your capabilities and create a road map for technologies and skills; for example, consider whether you will be using storage networks, and whether your use of such technologies might make one choice a better fit than another.
- **Estimate capacity.** Make sure your core network infrastructure can handle the capacity you expect, plus a generous margin, from your virtualized servers.
- **Use VLANs.** Set up virtual LANs to segment traffic so everything runs smoothly.
- **Be consistent.** Make sure your settings on each virtual server within a physical server are identical. This ensures that when one virtual machine borrows capacity from another, there are no problems.
- **Offer training.** When you implement server virtualization, don't skimp on training. Virtualization is a new way of working, and training is essential.