



## Ohio Is Turning Upside-Down IT Spending Right-Side Up

SERVER CONSOLIDATION ACROSS OHIO'S 26 LARGEST STATE AGENCIES IS CUTTING IT INFRASTRUCTURE COSTS AND BOOSTING BUSINESS AGILITY.

Two years ago, technology spending in Ohio was upside down. The state government spent 70 percent of its annual IT operations on maintaining infrastructure — servers, storage and network hardware — and just 30 percent on maintaining software applications. During his first days on the job, Ohio Gov. Ted Strickland realized that the state government needed an efficiency overhaul. Strickland engaged The Hackett Group, which provides strategic consulting services, to conduct a benchmarking study of Ohio's government operations. Upon conclusion of Hackett's study, Strickland ordered a series of changes, including IT modernization, and tasked Department of Administrative Services Director Hugh Quill with implementing them. Responsibility for IT improvements ultimately fell to Quill's assistant director, state CIO Sam Orth.

Orth, who had just been appointed to the CIO position, recognized the tremendous task that lay before him. With most of its IT operations costs locked up in infrastructure maintenance, the state struggled to cope with rising citizen expectations and growing budget challenges.

"We should be investing 70 percent in maintaining applications and 30 percent in maintaining infrastructure," said Orth. "I don't think taxpayers in Ohio care about what kind of servers, storage networks or e-mail systems we have. What they care about is education, jobs and health care."

As the recession began to hit, state IT executives came under growing pressure to cut costs. In January 2008, state agency CIOs were asked to slash technology spending by 30 percent — a total reduction of \$240 million statewide. Clearly Ohio needed a strategy for reducing the amount of money it spent on buying and maintaining computer hardware.

Part of the solution was a statewide consolidation initiative that would replace costly physical servers with flexible virtual servers. Using sophisticated server virtualization software from VMware, Ohio government could dramatically cut IT maintenance and energy expenses — and it could acquire the agility it needed to quickly respond to new business challenges.

"Our move toward server virtualization is a way to rebalance our IT investments," Orth

said. "It helps reduce infrastructure costs, freeing up capital to invest in new applications and other needs."

## Rethinking Conventional IT

Like many states, Ohio operates a highly federated IT environment. Before the consolidation began, Ohio's 110 largely autonomous agencies, boards and commissions ran more than 5,000 individual servers. The huge array of computer hardware translated into complexity and cost.

To help identify cost-saving opportunities, Ohio turned to an advisory council of CIOs from multiple state agencies. The council identified 126 strategies for cutting IT spending, and server consolidation was at the top of the list. The state then assembled a working group to focus on server virtualization, hammering out standards, guidelines and practices for the transition.

"The math is pretty straightforward," Orth said. "In an environment like ours where you have 5,000 physical servers across the government, if you consolidate 60 percent of them, you can eliminate upward of 2,500 servers. So that's substantial."

## BY THE NUMBERS

### Ohio Server Consolidation

- » Servers virtualized statewide: **1,400**
- » Estimated statewide cost savings: **\$10 million** (over three years)
- » Physical servers removed from state data center: **180**
- » Data center power reduction: **105 kilowatts**
- » Estimated data center energy savings: **\$255,360** (over five years)
- » Carbon reduction: **8,667 tons** per year



The initiative kicked off last year with 26 of the state's largest agencies participating. Ohio took several steps to ease the agencies' shift to the new computing paradigm. For instance, a server virtualization help desk was created which offers planning and estimating tools, procurement assistance and extra resources. The initiative also consolidated buying power to negotiate state discounts with VMware, making those discounts available to any state or local jurisdiction. Agencies used VMware's Capacity Planner tool to gather information about their current server environment and estimate their requirements with the new technology. A dedicated VMware technical account manager also was assigned to help agencies complete the move. Nearly 70 planning sessions were held with the participating agencies.

Efforts like these are crucial to the success of Ohio's virtualization initiative, Orth said, because the move toward having multiple virtual servers run on a single piece of server hardware is a dramatic change from conventional IT thinking, in which a one-to-one relationship between physical servers and software applications is the norm.

"We've had our heads organized around a certain paradigm for 20 years, so we really had to invest in understanding the requirements and implications of server virtualization — not just from the business perspective, but from the practitioners' perspective," he said. "With an environment the size of ours, we had to enable and foster the change."

## Virtual Environment, Real Benefits

Since launching the consolidation about a year ago, Ohio has virtualized nearly 1,400 servers, or almost 30 percent of the servers operated by the 26 participating agencies. Orth estimates that those virtual servers will cut IT costs by more than \$10 million over the

## KEY BENEFITS

### The Value of Virtualization

- » Overall reduction in IT spending
- » Less infrastructure spending; more investment in applications
- » More business agility
- » Better resiliency for critical applications
- » Improved environmental sustainability



next three years. Virtualizing just 60 percent of the remaining physical servers will net additional three-year savings of \$16 million.

"The payback is substantial and you can achieve it in a quick amount of time," he said. "And these are extremely conservative estimates."

Indeed, a report from technology analyst IDC says that organizations may be able to consolidate 80 percent or more of their physical servers using virtualization technology. "Encapsulating multiple physical servers into a single consolidated server through virtualization enables cost and resource efficiencies, including a reduced consumption of physical floor space in a data center," according to the report. "Today's use of virtualization technology allows IT professionals to automatically manage the resources of a physical server to efficiently support multiple operating systems, each supporting different applications."

Tim Stephan, senior director of product marketing for VMware, said the typical server running a single application often uses less than 10 percent of its computing capacity. By using computing power more efficiently, virtualization technology can enable a single physical server to run 10 to 20 virtual

servers. "You can increase the utilization of a physical server from 8 percent to 80 percent very safely," he said. "You'll realize no performance impact and you're able to deploy, configure and maintain virtual servers much more easily and effectively than you would in a physical environment."

In Ohio, virtualization is paying off in a number of different ways. Reducing the amount of server hardware has cut capital expenditures and ongoing maintenance costs associated with operating physical devices. It also has lowered power consumption by reducing the amount of electricity consumed by physical servers and cutting the energy needed to cool the data center where they are housed.

This was a boon for Ohio, where the uninterruptible power supply in the state's primary data center is taxed nearly to its limit. So far, 180 physical servers have been removed from the facility, reducing power consumption by 105 kilowatts annually and generating an estimated \$255,360 in energy savings over the next five years.

"That translates into a carbon reduction of 8,667 tons per year," added Orth. Ohio's virtualization efforts even earned the state a \$38,000 power rebate from a local utility company.



### Faster Deployment, Better Business Continuity

Beyond these savings is a dramatic improvement in business agility. Tasks that once took weeks or months can now be accomplished in hours or days, Orth said. "The bottom line is that you're really able to move from concept into production a lot more quickly in a virtual environment."

In the old environment, deploying a new application — whether it was to meet federal requirements, solve a business problem or launch a new citizen service — meant engineering and procuring new servers, configuring them, loading the operating system and application, and testing them to ensure everything works. In a government setting, buying the hardware alone could take weeks or months.

In a virtual environment, server resources can be quickly allocated to support new applications. "You're just essentially turning on a new virtual machine in your server cluster," Orth said. "It really makes server deployment a lot more flexible from the business perspective, because you can respond to the business much more quickly when the need for new applications pops up."

The same is true for disaster recovery and business continuity. Virtualization dramatically cuts costs and improves resiliency compared with traditional methods. VMware technology automatically shifts applications from one physical server to another

to compensate for failing equipment or to accommodate system upgrades and maintenance. This reduces the need for duplicate disaster recovery hardware, and protects critical systems from interruption.

"The fact that a server is reduced to a file that contains the operating system, the application and the data greatly enables disaster recovery and high availability," Orth said. "It allows you to share underlying physical resources, so that if the primary production environment is lost, it automatically fails over to the secondary environment, and users don't know anything went wrong."

By contrast, restoring applications from a tape or disk to new physical hardware can be a much longer process. "Reinstalling the operating system, the application, the data, testing it and putting it back into production — that all takes time, which can be detrimental to the business depending on the criticality of the application," Orth said.

### On the Road to Statewide Cloud Computing

Besides its immediate benefits, virtualization positions the Ohio state government for the future. The current initiative forms the foundation for cloud computing and shared services efforts that will further boost efficiency and effectiveness.

The Ohio Department of Administrative Services' Office of Information Technology is building capacity to host shared infrastructure services that can be consumed by multiple state agencies, eliminating duplicative hardware and applications. The state also is investigating emerging virtual storage technology, which could dramatically improve data storage flexibility and reduce expenses.

"These are the building blocks of a statewide government cloud," said Orth, adding that network upgrades are under way to strengthen agencies' ability to use cloud-based applications. "We're not going to get there overnight. But that's the direction we're going."

In the meantime, Orth continues to help turn Ohio's upside-down IT spending right-side up. With the help of VMware's server virtualization technology, the state steadily is reducing the amount of money it spends on IT infrastructure support, allowing it to invest more in innovative and cost-effective services.

"We always have to remember that servers aren't really about wire, plastic and silicon in a box," he said. "They're devices that provide applications to the end-users — the business agencies and citizens. As IT professionals in government, that's the value we need to deliver."

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