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### How to Consolidate the Data Center

**Follow these tips to smooth the consolidation process and obtain the most value.**

Karen D. Schwartz

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It takes more than a cadre of foresters to manage 25,000 acres of open space. In the case of the Forest Preserve District of DuPage County, Ill., the job requires a dedicated technology staff along with the right hardware, applications and infrastructure.

By 2005, it was clear to the agency that its 35 servers weren't efficient, so the county consolidated and virtualized them. The virtualized data center created just the type of consistency, manageability and cost savings that IT Manager Dave Tepper wanted.

"Before we started, we had about 30 physical servers and five remote servers," says Tepper, who is currently on leave from the district. "The consolidation took a while, and we encountered some challenges, but the payoff was well worth it."

Fauquier County, Va., a fast-growing suburb of Washington, D.C., virtualized servers to ease the operational load on its small IT staff. The county's data center handles the data processing and storage needs for 25 departments from its data center.

"Many departments kept requesting more and more applications, and we were being more reactive than proactive," says Network Supervisor Sean LaChance. "All we were doing was troubleshooting."

Today, Fauquier County has a consolidated data center built on VMware and HP ProLiant servers. The new data center offers everything the county needs, but it didn't come easily, or quickly. IT specialists learned the ropes along the way and share the following pointers for speeding and easing the data center consolidation process.

## Don't make it harder than it has to be.

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DuPage County's Tepper experienced this firsthand. About halfway into a data consolidation project at the Forest Preserve District, he and his staff did an about-face, switching from VMware to Microsoft Windows Server 2008 R2 and Hyper-V. "At the time we started the project, Microsoft Windows Server 2008 R2 wasn't available, and we should have waited for it, because we're a Microsoft shop," he says. "We like VMware, but our staff didn't have the background or capabilities to deal with the complexity of migrating to that environment."

Once the organization switched to Microsoft, the data consolidation project went smoothly. The data center originally housed 30 physical servers, but it now houses two Microsoft clusters running on five HP BL460c blade servers in an HP c7000 enclosure, along with two iSCSI storage area networks. Tepper recommends that organizations evaluate their internal expertise before committing to a virtualization technology.

## Take your time.

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By conducting a phased deployment, you'll gain insight that will pave the way for harder tasks down the line, Fauquier County's LaChance says. He and three network administrators took six years to fully consolidate the county's data center from 80 physical servers down to two HP ProLiant DL585 servers and an HP 4400 Enterprise Virtual Array SAN, all running on VMware. The team approached the consolidation in a very systematic way, starting with its web servers, which LaChance says were the easiest to do.

Through that process, the staff learned a lot about virtualization — lessons they could apply to the rest of the data consolidation project. By the end of the first year, the team was able to tackle its database and applications. "In one case, we virtualized SQL Server one night, and users never even knew the difference," he recalls.

## Think outside the box.

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The IT department of McHenry County, Ill., has been pursuing data center consolidation for some time. Recently, the county moved from HP blades to Cisco System Unified Computing System blades for its VMware-centric data center, mostly to take advantage of the virtualization-friendly features of Cisco's UCS Manager software.

But the real "aha!" moment happened about six months ago, when IT leaders devised a plan to reduce costs while creating redundancy. Instead of constructing its own redundant server room in another building, the staff intends to work with a local community college.

"They would replicate their data here, and we would replicate our data there, and we can use a slice of each other's VM cloud to power up our servers," explains Tom Sullivan, the IT director for McHenry County. "We'll even provide a place to relocate each other's personnel in case of disaster." Sullivan said the plan, which he hopes will be put into production by next summer, will save the county about \$4 million.

### Disaster Recovery

The top reason why state agencies engage in a data center consolidation project, followed closely by replication, redundancy and fault tolerance, and cost savings

**SOURCE:** "Data Center Consolidation in the States: NASCIO Edition" (Deltek, July 2011)

## Keep up with care and feeding.

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Once the data center consolidation is complete, it's easy to think you're home free. Not so, Tepper says. To keep reaping the benefits of your efforts, make sure everything stays up to date by implementing a tool to monitor and update server capacity, processor, memory and hard drives. He uses Microsoft's System Center Configuration Manager.

Tepper also adds hardware when the existing blade reaches 50 percent utilization. Although many data center managers wait until the 75 percent point, Tepper says doing it at 50 percent ensures smooth operations in the data center. Tepper also recommends checking compatibility before adding new applications, making sure that images are up to date, and that hard drives on the cluster are clean. "That's how we can deliver a fully configured server, with an operating system, in 10 minutes," he says.

## Factor in network latency.

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In older data centers, the only worry was whether there was enough bandwidth for the network. But with consolidation and virtualization, there are fewer connections. Even though those connections tend to be fast, it's still smart to factor in network latency and the latency of the drives in the array, says Fauquier County's LaChance.

The county initially deployed Serial ATA drives in its HP Enterprise Virtual Array, thinking all that was called for was storage space. "In reality, the latency of those drives couldn't handle some of our server processes," LaChance says. "Automated tiering on arrays is actually very important when you start to virtualize."

## Consolidation Roadblocks

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With budgetary pressures hanging over their heads, state CIOs are well aware of the benefits of data center consolidation. But depending on the state, CIOs face obstacles that can make it difficult to achieve their goals.

Some states, such as Minnesota and New Jersey, have laws that forbid data centers from being located beyond state boundaries. That can result in missed opportunities for saving money, says Randi Powell, a research analyst at Deltek.

Budgets also can limit how far CIOs can go toward consolidating data centers. "Many of them would like to have vendors come in and help run everything, and try new types of technologies," Powell says. "But they don't have that option because of the cost, so they turn to creative solutions like public-private partnerships and leasing."

### About the Author

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