Extreme Makeover

New York's Orange County Community College overhauls its tech infrastructure with new blade servers.

Jim Dutcher
Associate Vice President of Technology
Orange County Community College
Middletown, N.Y.

Think of Jim Dutcher's job as an IT version of ABC's show, Extreme Makeover: Home Edition. But instead of turning an old, rundown home into a beautiful showcase house, he's retrofitting an outdated technology infrastructure into a highly reliable, blazing-fast data center.

Dutcher was hired a year and half ago to revamp Orange County Community College's aging technology. Some computers on the Middletown, N.Y., campus still run DOS and Microsoft's Windows 95 operating systems. Its 30 servers are strewn across multiple campus buildings, with many of the servers running single applications or databases that are not integrated.

Dutcher, the college's associate vice president of technology, and his IT staff have embarked on a two-and-a-half year, $3 million project to consolidate the servers and bring the two-year college's computing infrastructure into the 21st Century.

His first step was to purchase nine IBM blade servers. His team is now implementing new Enterprise Resource Planning (ERP) software that will boost the campus administration's productivity, improve efficiencies and serve as the foundation for new academic and student services, such as online class registration.

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"Our school has very good — probably the best — in-person customer service for our students. But if we were a bank, we'd be out of business," he says. "Ninety percent of a bank's business can be done at the ATM, so customers don't have to stand in line, waiting for services and filling out paperwork. And that's what our students have been experiencing."

About 6,300 students attend Orange County Community College, which is about 70 miles northwest of New York City. With the county rapidly growing, college administrators are preparing for an onslaught of new students by upgrading and building new facilities in its main and satellite campuses and by investing heavily in technology to give its current and future students the richest learning experience possible.

When Dutcher was hired, he immediately evaluated the administration's computer operations and realized it was sub par. "The infrastructure here is, on average, five years old. That puts you at a great disadvantage, especially in the Internet age," he says.

While he and other college leaders develop a technology master plan for the college, Dutcher has already made some improvements. With the financial backing of the administration, he's begun to update computers and has introduced a few new online services for students, such as the ability to submit college applications and check grades online. The new data center serves as the foundation for everything the college wants to accomplish.

Under Dutcher's direction, the college recently purchased seven IBM eServer BladeCenter HS20 blade servers, which feature 3.2GHz dual-core Intel Xeon processors; and two IBM BladeCenter HS40 blade servers, which feature 3.0GHz dual-core Intel Xeon processors. Both server models feature 8GB of RAM and Gigabit Ethernet connections.

The college's nine new blade servers are attached to a storage area network (SAN) featuring 12 terabytes of storage space. Dutcher is standardized on the Red Hat Linux operating system, Oracle databases and Novell software for directory, user login and authentication services. The total price for the initial hardware investment is about $900,000.

Blades vs. Rack-Mount Servers

When faced with whether or not to continue to buy rack-mount servers — which the college had been doing — or new blade servers, he chose blades because of their architecture, reliability, ease of maintenance and cost.

Dutcher isn't alone with that assessment. Even though blade servers currently account for only 5 percent of the overall market, blade server sales are skyrocketing. Sales reached $569 million during the 2005 third quarter, a 72 percent increase from the previous third quarter, according to research firm IDC. IBM was the top seller of blades, with 42 percent of the market.

The analyst firm believes blade servers are the form factor of choice in the future because the technology offers greater manageability, ease of use and flexibility. It's also proven to save office space.

Blade servers, which have built-in multiprocessors and memory, are thinner than traditional rack-mount servers and can be stacked side by side like books on a bookshelf. Blades can share the same power source, storage, cooling and network connections, which simplifies the design of a data center and greatly reduces the amount of space servers occupy.

The main reason to go with blades is that they are easy to manage and maintain, Dutcher says. The blade center architecture is highly redundant and fault-tolerant, meaning if there's a hardware or software failure, the rest of the system can keep running. Self-diagnostic software from IBM alerts the IT staff of potential problems.

"If something goes down, I can swap it out and the rest of the system stays up and running. It's seamless," he says.

In the college's data center, the architecture separates the disk drives that house applications and data from the blade servers. If a blade server fails, the other blade servers will pick up the workload. And if a disk drive fails, Dutcher can take it out and replace it with a new one without losing data.

"The data center shares the workload, so if one server goes down, it doesn't affect any single application," he explains.

While traditional rack-mount servers can offer the same failover features through server clustering, they can be difficult to install and manage. Blade servers, on the other hand, are designed to be redundant and fault-tolerant right out of the box, he says.

As for the architecture, Dutcher and his staff segregated the ▸

college's storage solution into two distinct types: a SAN for fast access to data that needs to be accessed quickly, and Serial Advanced Technology Attachment (SATA)-based storage for longer term storage needs.

In addition, the IT team has implemented a RAID 6 (Redundant Array of Independent Disks) configuration, which protects the storage system from multiple drive failures at the same time. Essentially, the system makes periodic snapshots of data, so if a drive fails, data can be quickly recovered.

Consolidation Efforts

Orange County Community College's administration currently uses IBM RISC (Reduced Instruction Set Computer) servers running on AIX (Advanced Interactive eXecutive), while the servers running academic operations are mostly AS/400-based, as well as a smattering of other servers running on a variety of operating systems including Windows and Linux. As at other college campuses, many servers are running single applications and databases and need to be integrated, Dutcher says. For example, there are separate servers that manage human resources/payroll, student information, e-mail and the alumni association.

"It's just how things evolved. People set up applications and one-off data repositories to do their day-to-day work, and it becomes a day-to-day challenge to get at the right data from all the disparate silos and data islands," Dutcher says.

The college's institutional research director, for example, needs to produce regular reports to meet various federal regulations, such as financial aid, student immunization records and information on foreign students.

"Because he has to touch different data sources, it takes him weeks to get the vital statistics to compile basic reports," Dutcher says. "All these one-off applications and databases are sitting under someone's desk and it's not the most safe and secure place to be."

The base installation of the new ERP software is complete. But it will take about two years for the IT staff to train users on the new software and migrate all the legacy data from the college's administration servers into the new database system in the new data center, Dutcher says. Once that's complete, administrators will have quick and immediate access to all the information they need. "Then we can be at that nirvana of just one click and getting the information we need," he adds.

Another problem with the old servers is that they're — on average — three years old and break down easily, which can prevent staff, faculty and students from accessing the services they need. The IT staff run around campus fixing servers on a daily basis, Dutcher says.

Dutcher adds that blade servers also offer two other important features: better security and easier expandability.

Orange County Community College's data center features nine IBM blade servers and 12 terabytes of storage, but Dutcher and his staff can quickly add more blades and more storage space as the need arises. And rather than having some servers operating under people's desks, all the blade servers are housed behind a locked cage at the school's telecommunications provider, whose data center co-location space is just two blocks from campus.

"Having everything consolidated makes maintenance and monitoring easy to do," Dutcher says. The time saved will allow IT staff to work on other important IT projects, such as offering new technology services to staffers, faculty and students, he adds.

Choosing a Vendor

Dutcher says CDW•G was invaluable in helping the college purchase, design and install its new data center. When he called CDW•G about purchasing servers, the company quickly put him in touch with IBM and immediately gave price quotes. Dutcher conducted his own research on a second vendor, but that vendor was slow in responding. So he went with CDW•G and IBM.

"CDW•G offers outstanding customer service. Whatever equipment I need, I have one single point of contact. When I call for a quote, I get a quote expeditiously. It makes my life tremendously easy," he says.

CDW•G set up meetings between IBM and Dutcher's IT team, and together they discussed the college's current and future needs, devised a solution and built the new data center.

"Both CDW•G and IBM were very helpful with our technical questions," Dutcher says. "They explained what I needed to implement and what new equipment was coming down the pike. They were very attentive to our needs."

Jonathan Williams, Account Manager, CDW•G, recalls staying in daily contact with Dutcher and IBM representatives during the entire process, even when IBM was handling the technical work during the installation.

"With a project this size, it was important that all of us stay in constant contact," he says. "It keeps all of us on the same page, and it gives reassurance that everything is proceeding on schedule and in the right direction. Being responsive to our customers is important to us."

Beyond the Data Center

With the data-center installation complete, Dutcher is looking forward to completing his server consolidation. He's currently migrating existing administration and academic applications and data to the new servers. In the future, he plans to offer new services for administrators, staff, faculty and students, including more online storage space for files. Because the new data center features cutting-edge server technology, the school's computer science department can offer new computer programming and information systems classes for which the previous infrastructure did not allow.

"The data center will allow us to make our college staff's work lives easier and give our students state-of-the-art technology," he says. "I couldn't be more pleased with the solution."

Key Factors in Choosing a Server

To blade or not to blade, that is the question.

Jim Dutcher, Orange County Community College's associate vice president of technology, believes a blade server architecture is the best option because it's reliable, easily upgradeable, simpler to manage and maintain, and is more secure and cost-effective.

"In this day and age, it no longer makes sense to use dedicated servers to run single applications. It's a management nightmare," he says. "You want the flexibility of divorcing the application and storage from the server, so if anything goes wrong, everything keeps on running."

While traditional rack-mount servers can offer similar features through server clustering, they're harder to install and manage, Dutcher says. Blade servers are designed to be redundant and fault-tolerant, he adds.

Dutcher advises IT administrators to choose a vendor that is attentive to their needs and is willing to be there every step of the way, from devising a solution to installation.

Make a forecast of your server needs for the next several years to help you decide the number of servers to purchase and the specifications of each server.

"Don't just look at individual application needs. Plan holistically," Dutcher points out.

When choosing a server, also consider the total package of offerings, including the quality of a vendor's software tools to manage the servers, he adds.

Dutcher recommends a Linux server operating system. Linux can be more secure and works well with a wide range of applications, from Enterprise Resource Planning systems to course management systems, he says.