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Modular Data Centers Let Schools Add Capacity Easily

IT managers at school districts say applying modular data center principles will let them add IT infrastructure as their data needs grow

Karen D. Schwartz

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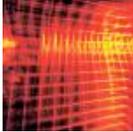
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Jeff Simons is on a mission. As infrastructure services director for the organization that manages back-end data services for all 270 school districts in Washington state, it's his job to run the systems smoothly and at low cost.

Simons and his staff decided that one of the best ways for the school systems to increase efficiency was to consolidate data centers, and his group is currently consolidating seven regional data centers into one. The consolidated data center will be located at the headquarters of the Washington State Information Processing Cooperative (WSIPC) in Everett, Wash., where Simons works.

"We want to get to a place where we can be more efficient and greener while minimizing the cost to the state," Simons says.

As part of the project, WSIPC is replacing older floor-based cooling units with more efficient rooftop units and virtualizing more servers. Because funding is an issue, Simons knows he can't move too fast. However, at some point in the future, he expects to take further steps to increase efficiency and save money and says he'll consider a variety of options, including a more modular approach to heating, cooling and power.

A modular data center consists of scalable, pre-engineered modular components that, at a minimum, include power distribution, cooling, uninterruptible power supply systems and backup generation, but that can also include monitoring and control systems, access control and physical security.

The modular data center approach has already gained many converts in higher education, but is moving more slowly in the K–12 sector. In fact, Simons acknowledges that while it's unlikely WSIPC will deploy a prepackaged modular data center, his group will apply many of the technologies and principles of modular centers. "The real goal is to have a system where we can add capacity as we need it," he says.

Datacenter 2.0

The growing interest in modular data centers is not surprising, says Jason Schafer, a research manager at Tier1 Research. In fact, says Schafer, modular data centers are part of what Tier1 describes as "Datacenter 2.0" — a fundamental shift in the way data centers are designed, built and commissioned.

"Modular technology is much faster to get up and running, and it can save money over time," says Schafer. "And when you adopt a modular approach to the data center, you can take advantage of advances in efficiency and technology as it happens, without replacing your entire infrastructure."

The technology team at Aldine Independent School District in Houston knows how hard it is to manage a data center that has run out of space, cooling and electrical capacity. In 2006, the data center hit its limits. "We couldn't fit another cable in there," says John Crumbley, director of technology support services.

Crumbley, along with Margaret Barnett, executive director of technology services, and Dale Jahnke, network architect for the district, worked hard to design a new data center that was as flexible and modular as possible. Crumbley and his colleagues were directed by the school board and administration to develop a 10-year data center plan, a difficult task when technology and requirements frequently change. The result was a five-year plan for a single data center, with the capability of building an identical one if necessary after five years.

While it was a few years too early to adopt some of the modular data center technologies available today, the team did what it could to extend the flexibility of its data center plan to the data center itself.

12 weeks
The time it takes to fully deploy a modular data center.

SOURCE: Cisco Systems

By late 2007, Aldine ISD's new data center was operational. The facility contained enough cabling to allow for more equipment without having to run fiber through a ceiling or door. The district used *IBM blade servers* virtualized with *VMware* to save space and allow for easy additions and changes. The data center also included four air-conditioning units, with built-in capacity to add two more.

"We made it as modular as we could, and did the best we could at the time," Crumbley says. "We knew we couldn't go back and request anything for 10 years, and had to prepare ourselves for whatever came."

Modular Products Come on Strong

Modular data center technology has come a long way in a short time. When the first products came on the market three years ago, offered mainly by server manufacturers, they were not what users were looking for. Not only were they based on proprietary technology, but they also didn't solve the biggest problem data center managers were facing: how to quickly add more capacity.

What a difference a few years makes. Today's modular data center products — *IBM*'s Portable Modular Data

Center, *HP*'s EcoPOD, *Cisco Systems* and *NetApp*'s FlexPod and *VCE's Vblock* — are targeted at organizations that deal with capacity, scalability and cost issues.

 "Everybody talks about capacity planning, but there really is no such thing. At best, it's 'capacity guessing,' " says Jason Schafer, a research manager at Tier1 Research. "Modular data center technologies take away some of the need for exact capacity planning, because they can keep pace with where the organization is at any given time."

Schafer expects the use of modular data center components to grow significantly over the next year.

"If organizations don't consider modular components at the very least as part of their build strategies, they will be starting off at a disadvantage both financially and in terms of flexibility," he adds.

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