

# Knowledge is Power: Learning to Build a Flexible Data Center

## Customer

A small- to medium-sized college in New England

## Product

Powerware® BladeUPS®

## Markets Served

Education



*"While this was our first time designing a true data center from scratch, working with Eaton® on our power distribution strategy was easy and it helped alleviate one of my biggest fears."*

- Science center's IT manager

Eaton  
Electrical Group  
8609 Six Forks Road  
Raleigh, NC 27615  
800-356-5795  
www.powerware.com

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## Background

A small- to medium-sized college in New England needed to plan for the future. The college anticipated a great deal of growth in the coming years and wanted to have a data center that could expand to accommodate its increasing power needs.

The sciences division of the college is comprised of five buildings which house the sciences, mathematics and engineering classrooms and labs. This area is supported by its own data center, separate from central information technology (IT). The college's technical staff manages about 600 computers, 15 servers and a growing number of clusters for scientific computing. A new building is under construction with plans for a second building to follow.

The college's data center houses servers that support a wide range of academic applications, from administration and chemical safety to teaching general Web technologies, and supports 12 computer classrooms and lab environments. Scientific research applications and data in bioinformatics, cosmology, computational chemistry and various disciplines reside within this structure.

## Challenge

As the college continues to grow and expand its technology infrastructure its power needs have increased as well. The data center needed to be expanded but without room to build another data center the obvious solution was to renovate the existing space. With dimensions of only 11 by 33

feet, the racks of equipment were tightly configured into narrow aisles, making routine moves, adds or changes very difficult. "As we planned our expansion, we needed to allow for about 10 years worth of growth. And that's a major challenge because we have such a small space to work in," said the IT manager for the computing and technical services group for the college.

In addition to accommodating future growth, the IT staff sought to develop strategies around power management and power quality, having experienced issues with power outages in the past. In fact, a string of power outages, which lasted for several hours at a time, caused critical equipment to "fail catastrophically" after power generators did not start. This experience,

coupled with equipment overheating in the data center, caused the IT manager to seriously consider new power protection solutions. "IT infrastructure and especially backup protection are all things that are easy to ignore," he said. "You don't want to spend money on something you will hopefully never need; at the same time we had become painfully aware of just how much we did need it."

## Solution

The college's IT staff had several requirements when searching for an uninterruptible power supply (UPS) to outfit its data center. The IT manager needed to rebuild the data center with a power protection solution that would accommodate the small space, address power and cooling concerns and allow enough flexibility to support future expansion.

The college had worked with Eaton before and knew its equipment for power protection within the data center environment would be robust and reliable. The IT manager became very interested in the new, Powerware BladeUPS, a modular, three-phase system designed and optimized for high-density computing environments with industry-leading efficiency. Not only was he impressed with the features but the price was \$10,000 less than a competitor's UPS. As a result, the Powerware BladeUPS was installed in fall, 2007.

"For the college, as in any small- to medium-sized data center, space and heat were two main concerns," said Chris Loeffler, product manager for Eaton's Electrical Group.

"With 12 kW of power protection in a 6U unit, expandable to 60 kW N+1 in one 19-inch rack, the Powerware BladeUPS was designed to deliver twice the backup power of competitors' modular solutions, while dissipating only one-third the heat, making it ideal for this implementation."

The Powerware BladeUPS does not require a dedicated cabinet, therefore more space is available for IT equipment. Housing the BladeUPS within a single rack provided ample space for future expansion. The Powerware BladeUPS offered the flexibility that was required to meet expansion needs for the next 10 years. "The BladeUPS supports the constant moves, adds and changes of today's dynamic data center with a modular, scalable and flexible backup power architecture," the IT manager said. "For a small data center like ours, we needed flexibility, and that's what the BladeUPS provided. The UPS is also incredibly efficient in normal operation (97 percent) and we weren't adding to the heat load in our tight space."

## Implementation

The college implemented three Powerware BladeUPS units (12 kW each) and three extended battery modules. The UPSs were configured as a single module with the option to easily expand capacity by removing the battery modules and adding additional 12 kW BladeUPS systems as needed.

While renovating the space, the IT manager set up a temporary data center and essen-

tially rebuilt the infrastructure to improve all components. The data center was configured to use a Powerware Remote Power Panel (RPP) to dedicate two branch circuits to each rack; one circuit feeds power distribution on the left side of the rack and one feeds power on the right. Each server is equipped with dual power supplies, connecting each power supply to a different branch circuit and ensuring another level of redundancy.

While the Powerware BladeUPS can provide up to 20 minutes of uptime during a power disturbance, the generator is programmed to turn on after five minutes as an added layer of reliability.

The college has a culture of handling IT requirements internally, and outside consultants are seldom hired. "We like to handle equipment ourselves because we want to personally know the ins and outs," the IT manager said. "While this was our first time designing a true data center from scratch, working with Eaton on our power distribution strategy was easy and it helped alleviate one of my biggest fears."

The Powerware BladeUPS simplifies installation and service with true plug-and-power connections and hot-swappable batteries and electronics modules. The IT management team was able to easily install the BladeUPS modules practically on its own. They needed an electrician to wire the 250 amp feed and help with power distribution. After one brief but informative call to the Eaton help line, the data center was up and everything worked properly. "Since startup we haven't had a single problem,

everything has been absolutely perfect," said the IT manager.

## Results

The Powerware BladeUPS has given this New England college's data center greater reliability and flexibility to meet its growing power demands. The modular design enabled the college to face the space restrictions of its data center and deploy the backup protection at the right price for their current needs with the flexibility to expand in the future. "Until the Powerware BladeUPS from Eaton, we have never had a system in place where I have not had to worry about it," the IT manager said. "Now, the only time I think about the UPS is when I'm showing it off to visitors."

After working with Eaton, the college can now:

- Conserve valuable rack space with 12 kW of power in only 6U of rack height, including batteries
- Protect mission-critical applications with innovative backup power technology designed specifically for high density computing environments
- Accommodate growth by installing additional 12 kW building blocks to 60 kW in a single rack enclosure
- Reduce energy costs and cooling needs through best in-class efficiency performance

