



## Eaton technology puts school district ahead of the curve

**Location:**

Thornton, Colo.

**Segment:**

P-12 Education

**Challenge:**

As part of a network upgrade aimed at enhancing the learning process and complying with New Online Testing requirements, the district needed a robust, highly reliable power protection solution.

**Solution:**

Eaton® 9PX, Eaton 9130, Eaton 93PM with ESS, Intelligent Power Manager, Network-MS Cards, ePDUs, Environmental Monitoring Probe

**Results:**

Since deploying a comprehensive Eaton solution consisting of more than 120 UPSs, power management software and other power quality tools, Adams 12's network is thriving, which in turn enables students to be highly engaged.

*"We have moved from an era where it was nice just to have a network to rely on, to one in which the network sustains education . . . The resilience we used to have only in our data center we now have in all of our schools."*

*Erik Moore, director of academic computing, Adams 12 Five Star Schools*

**Background**

Serving 40,000-plus students from five Colorado communities—Thornton, Northglenn, Federal Heights, Broomfield and Westminster—Adams 12 Five Star Schools encompasses more than 50 individual school sites, as well as administrative buildings. In addition to traditional elementary, middle and high schools, the district offers educational diversity with an early childhood development center, a Gifted and Talented Education program, magnet schools, a career/technical school, alternative high school, online/credit recovery high school program (STEM), and an independence academy. In all, some 5,000 teachers and staff members work together to achieve the district's mission: to engage and inspire all students to innovate, achieve and succeed in a safe environment through high quality instruction in every classroom, every day. An integral part of that commitment is ensuring students have the technological tools they will need to succeed in the real world.

**Challenge**

A desire to comply with online testing requirements was the catalyst that sparked Adams 12 to do a comprehensive overhaul of its network infrastructure, which included significantly bolstering wireless capabilities. However, the district wasn't satisfied to simply achieve passing marks. Instead, Adams 12 sought to be at the top of the class in enriching the educational process and empowering teachers through instant and continuous access to technology.

"Our vision was always bigger than simply facilitating the online testing process," emphasizes Project Manager Jean Schneider. "We wanted to get away from students having to go to a different room in order to use technology and instead, create an environment in which every classroom would be capable of utilizing it at any time."



Powering Business Worldwide

First in the project's planning process was the selection of the networking gear and hardware that would be placed in equipment closets at each individual school site and administrative building. As part of its decision to add wireless capabilities to every classroom and teachable space, Adams 12 earmarked the purchase of approximately 750 HP switches, 15 Cisco switches, 5,000 Xirrus arrays, and some 500 miles of cable for the endeavor. The district quickly realized that the addition of a highly reliable power protection solution was essential to its ability to attain its goals, and also recognized the need to upgrade its existing 120V power supply to 208V in order to power the new infrastructure.

Although Adams 12 had a variety of existing uninterruptible power systems (UPSs) from multiple manufacturers spread out across school sites, the district had experienced spotty dependability from the units, while also remaining vulnerable to ongoing issues with incoming power—all of which was contributing to downtime and equipment damage.

"We have 52 buildings across five municipalities, served by two different electric companies," Schneider explains. "A lot of things can happen in our district, beyond our control, to cause a power loss."

In addition to enhancing reliability and uptime, Adams 12 desired a robust UPS solution capable of helping the IT team capitalize on another trend identified as part of its network upgrade: implementing Power over Ethernet (PoE). As a result, the district wanted backup power not only for its switching inventory and wireless network, but for a wide variety of school services including Voice-over-IP, intercom systems, remote servers, phone systems, PBX boxes, security cameras, card readers and more.

"This changed our availability model," explains Erik Moore, director of academic computing for Adams 12. "If we hadn't been able to scale up with UPSs to handle that additional load, then we wouldn't have been able to accomplish that."

"We needed a UPS that could power all of our systems, because otherwise, if there's an outage, the whole school would go down," adds Scott Capser, the district's senior enterprise systems engineer. "We want kids to be able to finish taking a test and get their homework assignments. We want to allow teachers to finish a lesson and keep our Voice-over-IP working and be able to make announcements over the Internet. We couldn't do that without having UPS coverage on the entire school system."

## Solutions

With its objectives now clearly defined, Adams 12 turned to longtime technology partner, CDW-G, for assistance executing the project. CDW-G, in turn, brought in Eaton® to meet the district's comprehensive power protection requirements. Working together, the three organizations put on their thinking caps and formulated a strategy designed to be at the top of its class.

"Eaton helped us map out our entire solution," says Dana Kukkonen, principal systems architect for Adams 12.

"This really helped with sizing and knowing exactly how much power we needed in every closet."

Based on the results of the collaborative effort, Adams 12 deployed more than 100 Eaton 9PX UPSs, installing either a 6kVA or 11kVA unit at every school site, as well as in several remote locations and administrative offices. In addition, the district selected the Eaton 9130 rackmount UPS to safeguard equipment in numerous rack-based closets. In fact, Eaton customized four racks exclusively for the district. "They were designing them on the fly as we were installing the UPSs," Moore reports. "Eaton was a great help, it was very impressive."

In all, more than 120 Eaton UPSs were deployed to keep essential operations up and running within Adams 12 Five Star Schools. "We standardized on Eaton across the board," Moore reveals. "We are truly amazed and impressed with how rapidly Eaton collaborated with us on such a vast project."

The district opted to bolster the UPSs' internal runtime by adding extended battery modules (EBMs). Furthermore, the UPSs were outfitted with Eaton Network-MS Cards, which allow them to directly connect to the Ethernet network and the Internet, supporting real-time monitoring and control across the network. For ultimate management and monitoring capabilities, Adams 12 relies on Eaton's Intelligent Power® Software, which combines power monitoring and management with graceful shutdown and extensive notification capabilities.

"We love the software, especially the remote management and monitoring features," Capser confirms. "A lot of the school technicians now monitor their own buildings."



### Eaton 9PX UPS

An ENERGY STAR qualified UPS, the 9PX's graphical LCD interface and robust power management software makes managing your UPS easy—even in virtualized environments.



### Network-MS cards

A network card that allows an Eaton UPS to directly connect to the Ethernet network and the Internet.



### Eaton 9130 UPS

A rackmount UPS that delivers online power quality and scalable battery runtimes for rack servers, voice and data networks, storage systems and other IT equipment

Additionally, the district gained flexibility over power distribution by purchasing Eaton ePDUs, as well as the ability to keep an eye on hot spots using Eaton Environmental Monitoring Probes (EMPs), which enable remote monitoring of environmental conditions including ambient temperature and humidity.

The Eaton equipment has helped Adams 12 turn a page in availability and uptime. "We have moved from an era where it was nice just to have a network to rely on, to one in which the network sustains education," notes Moore. "And when that network is down, it is highly disruptive. So the UPS has moved from something that used to be just in the data center to something that is now an essential part of keeping sites up and running all the time. The resilience we used to have only in our data center we now have in all of our schools."

The solution was recently put to the test, when a power outage cut electricity at one school site. "The UPS ran for 4 ½ hours and students just kept working on their laptops," Capser reveals. "The lights may go out, but on students' devices, the lights stay on and they are still connecting to the network."

"Everything is no longer brought to a screaming halt when the power is unexpectedly cut," Schneider confirms.

In addition to continuous uptime, the district gives an A+ to Eaton's ABM® battery charging technology, which relies on sophisticated sensing

circuitry and an innovative three-stage charging technique to extend the useful service life of the batteries while optimizing recharge time. ABM technology provides up to 60 days' notice of end of useful battery service life, allowing ample time to hot-swap batteries without ever having to shut down connected equipment.

"We aren't replacing batteries like we were on our other units," Capser points out. "In fact, we haven't replaced one yet. With our previous UPSs, the batteries not only failed regularly, but we never knew one was bad until the power went out and we found out it wasn't working."

Furthermore, because all of its Eaton UPSs have bypass switches, the district can now easily maintain and even service the units with no downtime.

Adams 12 was so impressed with the Eaton equipment that it knew Eaton technology could handle the load when the district's data center UPS failed over the holiday break. "At that point, we were confident going into the procurement process that we had at least one strong technology player at the table," Moore reports.

The district not only installed a pair of 50kVA Eaton 93PM units in its main data center, but opted to place another 93PM within its secondary data center, which it had discovered was under-powered. With the new units, Adams 12 is looking forward to leveraging Eaton's Energy Saver System (ESS), which enables the UPSs to attain an industry-leading efficiency level of greater than 99 percent.

**First-class partnership**

Adams 12 attributes the success of its complex undertaking not only to the unparalleled quality of the power protection equipment, but to exceptional service. "There was great communication between CDW-G and Eaton," Schneider points out. "We never had to get involved and we always got our questions answered quickly."

One key aspect was CDW-G providing procurement and inventory management of the UPSs during the course of the project, which occurred over a 7-month period. "There is no way we could have received all those UPSs at one time," Schneider says. "CDW-G helped us to stage incremental orders so we could receive product in the timely fashion that we needed."

In addition, CDW-G oversaw the warranty process and handled any issues that arose throughout the project. "We were moving so fast, there was no way we could have managed that," Schneider says. "With Eaton and CDW-G working together, all we had to do with the UPSs was un-box and install them.

"Eaton was great in taking the time to help us understand how to learn the tools," Schneider continues, noting that the software training was outstanding. "It's one thing to say you have remote monitoring, but the number of things you can do with that is far more than we ever realized. Now we can't imagine how we managed without it."



**Eaton 9130 UPS**  
A tower UPS that delivers online power quality and scalable battery runtimes for rack servers, voice and data networks, storage systems and other IT equipment



**Eaton Intelligent Power Manager software**  
Software that provides all the tools you need to monitor and manage power devices in your physical or virtual environment



**Eaton 93PM UPS**  
This UPS combines unprecedented efficiency, reliability, and vertical or horizontal scalability with eye-catching design

## Results

When it comes to the success of its comprehensive Eaton power protection solution, Adams 12 has passed every test with flying colors. "The biggest benefit is pure uptime," Capser concludes. "The power goes out and everything we have stays on. And we haven't had a single device failure as a result of a loss of power."

The district's approach to the project has put it ahead of the educational curve "because we focused not on how to take the online test but on how to help education evolve and put technology in the hands of the kids," Schneider says. "Taking a bigger-picture approach allowed us to accomplish a lot more, and in the long run, get a bigger bang for our buck and better results for our kids."

While Adams 12 anticipates reaping cost benefits well into the future, the project's return on investment is more accurately measured in non-tangible factors. Of note, on the first day of Common Core testing, Adams 12 was one of the few districts in the state that did not encounter any problems. "We had a 98 percent success rate, which is huge," Schneider reports.

Moore emphasizes that the real ROI can be tied to improvements in the learning process and the many ways technology is benefitting students and teachers. "We now have benefits like textbooks that can be digitized so they are less expensive and be deployed rapidly," he points out. "But more importantly, we have students highly engaged in their discipline, preparing to solve the great problems of society."

"All school districts are facing a very high level of transition," Kukkonen emphasizes. "They have to accommodate new devices, new curriculum and new offerings to transform education. Having the power resources in place has allowed us to offer that higher level of services."

More information about Eaton solutions for K-12 at: [Eaton.com/powerquality](http://Eaton.com/powerquality)

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