

POWER TO THE TEACHERS

Dell servers, storage and Intel technology provide a firm foundation for education applications, growth and 50% power and cooling savings



SOLUTIONS

- GREEN COMPUTING
- BACKUP/RECOVERY/ARCHIVING
- CONSOLIDATION
- VIRTUALIZATION



CUSTOMER PROFILE

COUNTRY: United States

INDUSTRY: Education

FOUNDED: 1947

NUMBER OF CUSTOMERS:
6,800 students

NUMBER OF EMPLOYEES: 1,000

WEB ADDRESS:

www.midwayisd.org

CHALLENGE

Midway Independent School District sought to gain control over server sprawl and implement a consolidated solution for growth.

SOLUTION

The district virtualized its applications and storage onto Dell™ PowerEdge™ blade servers with Intel® Xeon® processors and a Dell EqualLogic™ iSCSI SAN, allowing the district to expand its capacity, control server sprawl and save on power and cooling costs. The district also used Dell PowerVault powered by CommVault with deduplication to protect the virtualized servers

BENEFITS

- 50% reduction in power and cooling costs
- Minutes to data recovery instead of days
- \$20,000 cost avoidance in hardware upgrades
- 42 physical servers consolidated to 2 PowerEdge blade servers
- Expanded capacity for growth without adding hardware
- Improved system speed and availability
 - Deployed deduplication to control storage growth



Deep in the heart of the Lone Star State, a population boom is shaking things up in McLennan County. Serving 6,800 students in the area, Midway Independent School District is bucking the declining enrollment trend most Texas districts currently face.

“ACTUALLY, WE HAVE BEEN ABLE TO RUN AS MANY AS 43 SERVERS ON A SINGLE POWEREDGE M710 BLADE—THE NUMBER OF PHYSICAL SERVERS WE’VE BEEN ABLE TO REPLACE WITH ONE BLADE IS JUST PHENOMENAL.”

Adam Feind, executive director of technology, Midway Independent School District

Experiencing yearly five percent student population gains, the district’s leaders are facing a different set of challenges and successes. “We’re what they call a fast-growth district,” says Brad Lancaster, superintendent of schools for the district.

With that growth comes a solid tax base that gives the district’s 1,000 employees the resources they need to offer a secure and technologically advanced learning environment to their students.

That environment includes control of video, telephony, email, Internet access, surveillance and security, air conditioning and even elevators—all over IP. “Our infrastructure is very robust—we even have video surveillance on the buses that transmit data to our schools,” says Adam Feind, executive director of technology for the district.

APPLICATION BOOM

Add to that list a growing number of classroom technologies and applications, and you have a formula for district server sprawl. “Recent initiatives in K-12 education were requiring us to spin up four-to-six servers per year. Every time we turned around, we needed a new application server to provide a resource for some

teacher, some group or a subpopulation within the district,” recalls Feind.

The volume of new programs on the one-application-per-server model was crowding the district’s data center. “We were literally running out of space, and we were starting to run into power and cooling problems,” Feind explains.

Feind and his team suddenly found themselves managing 42 physical servers with demand for more on the horizon. The team started researching virtualization as a way out of its dilemma. “We looked at Microsoft, Citrix, Virtual Iron and VMware, and ultimately chose VMware vSphere,” says Feind.

AVOIDING \$20,000 IN HARDWARE PURCHASES

The team decided to virtualize onto Dell PowerEdge M710 blade servers with Intel Xeon 5500 processors in a Dell PowerEdge M1000e modular blade enclosure. The servers provide the scalability and availability the district needed to grow its educational environment without tapping out its power and cooling infrastructure. Before making the decision, Feind compared current blade server solutions from various vendors. “The

HOW IT WORKS

SERVICES

- Dell ProConsult Virtualization Services
- Dell ProSupport for IT

HARDWARE

- Dell™ PowerEdge™ M710 blade servers with Intel® Xeon® 5500 processors
- Dell PowerEdge M1000e modular blade enclosure
- Dell EqualLogic™ PS6000X and PS6000E iSCSI SAN arrays
- Dell PowerVault™ DL2000 powered by CommVault

SOFTWARE

- eduphorial educational software
- Microsoft® Exchange Server 2007, 2003
- Microsoft SQL Server® 2008, 2005
- Scholastic Read 180
- Scholastic ReadAbout
- VMware® Site Recovery Manager
- VMware vSphere

“SINCE VIRTUALIZING ON DELL POWEREDGE M710 BLADES, WE’VE CUT OUR POWER AND COOLING COSTS BY MORE THAN 50 PERCENT AND SAVED \$15,000.”

Adam Feind, executive director of technology, Midway Independent School District

Dell M1000e, in my opinion, was superior to any other offering available in the market,” Feind explains. “Particularly, the number of available I/O channels on the blade were very important to how we were going to enable virtualization.”

The consolidation was fast and dramatic. “We virtualized Microsoft Exchange, Microsoft SQL, our file servers and 30-40 other servers that run educational software such as eduphoria!, Scholastic Read 180 and ReadAbout,” Feind recalls. “We consolidated 42 physical servers onto 2 Dell PowerEdge M710 blade servers.”

The success has encouraged the team to experiment with its virtual environment. “Actually, we have been able to run as many as 43 servers on a single PowerEdge M710 blade—the number of physical servers we’ve been able to replace with one blade is just phenomenal,” explains Feind.

It’s a solution that relies on the brute force of high-speed processing to succeed. “The performance of the Intel processors allow the virtual servers to perform as if they were enabled on physical hardware, Feind says. “Users have not noticed any difference since we virtualized.”

And because the demand for new applications hasn’t diminished, the team is now running 53 servers on 2 blades, with a third blade running for failover purposes. Using the Dynamic Scheduling of System Resources of VMware Distributed Resource

Scheduler (DRS) and High Availability (HA) features within vSphere, the district is able to offer near constant availability and fast recovery to its students, teachers and administrators.

The district is already realizing savings in the form of avoided hardware purchases as a result of creating a virtualized architecture on Dell blades. “We knew deploying a new version of our student services system was going to require five additional servers,” Feind says. “Under the old architecture, that would have meant five physical boxes. With our virtual environment running on PowerEdge M710 blades, we know we’ve saved at least \$20,000.”

SAVING MORE THAN 50% ON POWER AND COOLING

The consolidation of the district’s physical server farm onto Dell blades has the district poised for some big energy savings. “With Dell PowerEdge blades, we’re saving more than 7,000 volt amps of electricity per hour over our old environment—more than a full generator’s worth of power,” Feind says.

Before virtualization, the team’s air conditioning system was running out of capacity. “We had difficulty keeping our environment cool with all those physical servers running. Now we have the opposite—we actually have too much cooling capacity. We’re now saving about 40,000 BTUs per hour,” explains Feind. “Since virtualizing on Dell PowerEdge M710 blades, we’ve cut our power and cooling costs by more than 50 percent and saved \$15,000.”

STORAGE TRANSFORMATION

When the district began looking at replacing its near end-of-life storage environment with a flexible, scalable solution, the IT team researched EMC, NetApp, HP and Dell products. Looking for iSCSI storage to integrate with its virtualization plans and provide disaster recovery options, the team at Midway chose Dell EqualLogic PS6000X and PS6000E iSCSI arrays.

The combination of fast-bus SAS and high capacity SATA storage gives the district 20 TB of EqualLogic storage configured as a standard storage pool. “The feature set, the product breadth and the availability of what those products can do led us to EqualLogic. It’s a perfect marriage with our PowerEdge server hardware that we know is going to be perfect for our K-12 environment,” says Feind.

The team liked the fact that the storage fit in with its IP environment while giving the district the bandwidth to handle high traffic volume without system lag. “We have 1,800 students at Midway High School, and when they all start logging into the system and accessing their work files, it places a tremendous load on the servers—we needed all the input-output operations per second (IOPS) we could get. We know that with EqualLogic iSCSI in the infrastructure, we can handle all that traffic,” Feind explains.

RECOVERY TIME FROM DAYS TO MINUTES

Using the snapshotting technology included as a standard feature of

EqualLogic arrays, the district decided to deploy a disk-based backup solution with replication and deduplication services to protect its data center and conserve disk space.

The team chose Dell PowerVault DL backup appliance storage appliances powered by CommVault to back up data directly from EqualLogic snapshots. The solution replaces an HP tape array that was nearing end of life and giving the team reliability issues. “We started having problems with tapes going bad, so it was good timing with virtualizing our servers,” recalls Jeremy Neal, network administrator for the district.

“The PowerVault backup appliance integrates with the EqualLogic iSCSI network because as a snapshot is issued, it pulls the snapshot straight off the EqualLogic array, rather than off of the server, which could degrade performance on that server,” explains Neal.

And because the Midway team is optimizing its Dell storage environment with deduplication technology, the district is realizing additional time and disk-space savings. “With deduplication, even if a file exists in multiple locations on the system, it will only be backed up once,” Neal says.

It’s a feature that allows Neal and team to backup about 5 TB of data in roughly 2 TB of disk space. Now if the team needs to recover its data, it will be a

process of minutes, not days restoring from tape. “You never know a tape is bad until you try to back up from it. At that point, it’s not a good time to discover you don’t really have your data,” Neal says.

MAXIMIZING SCHOOL BUDGETS

Neal’s excitement about the impact of virtualization is borne from personal experience. Formerly in the medical IT world, Neal was in a different economic environment as well. “When we needed a new heart catheterization machine, it didn’t matter that it was \$10 million—we needed it, so we purchased it.”

In the education landscape, IT directors have to operate with a given pool of resources. “We have to be very cognizant of how we spend our money. So it’s imperative that districts look at virtualization,” explains Neal.

“Not only does it save on power and cooling costs, but even a small school district can get virtualization products absolutely free,” Neal says. “And every application server today has excess CPU cycles that it doesn’t use. By virtualizing, we’re making more efficient use of the hardware we’re purchasing for K-12 education.”



VIEW ALL DELL CASE STUDIES AT DELL.COM/CaseStudies

February 2010

Intel and Intel Xeon are either registered trademarks or trademarks of Intel Corporation in the United States or other countries. Microsoft and Microsoft SQL Server are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. This case study is for informational purposes only. DELL MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS CASE STUDY.

