

SCHOOLS GET SMARTER

Humble ISD's centralized, clustered network infrastructure is improving the quality of education through 20-fold faster data access, greater uptime, more reliable data backup and a 40% reduction in IT administration time.



- SOLUTIONS**
- BACKUP/RECOVERY/ARCHIVING
 - CLUSTERING
 - CONSOLIDATION
 - MESSAGING

HUMBLE ISD

CUSTOMER PROFILE

COUNTRY: Humble, Texas (USA)

INDUSTRY: Public school district

FOUNDED: 1904

NUMBER OF EMPLOYEES: About 3,000

WEB ADDRESS: www.humble.k12.tx.us

CHALLENGE

The fast-growing Humble Independent School District needed to improve network bandwidth and uptime, make data backup faster and more reliable, and reduce the time its IT staff spent on repairs and routine maintenance.

SOLUTION

Dell Services helped Humble ISD implement a highly robust, scalable server cluster, based on Dell™ PowerEdge™ servers. The cluster consolidates e-mail, office software and educational tools from 40 separate servers and offers dramatically faster access and simplified maintenance. The district turned its old data center into a mirrored disaster recovery site using Dell and EMC® technology.

BENEFITS

Run IT Better

- 25% faster data backup, from 12 hours to 9
- 90% faster server and printer reboots, due to remote management capacities
- 20-fold increase in network speed, from 100 MB to 2 GB
- 40% reduction in overall IT administration time
- Higher availability, from 80-90% range to 98% or more
- Improved disaster recovery capacity due to self-contained DR center

Grow IT Smarter

- Lower technology TCO due to not replacing servers and reducing travel
 - Easier system-wide IT upgrades and maintenance, due to consolidation of servers and less network traffic
 - Increased instructional time on computers



The Humble Independent School District is named for a pioneering Texas settler, not for its approach to education. It serves over 33,000 K-12 students in the booming suburbs north of Houston. The district already has 39 campuses and facilities, with a 40th campus due to open in 2008. It must build at least one new school a year to accommodate a student population that's increasing 5 percent a year (1,700 children), making it one of the fastest-growing public school districts in Texas.

“AS A VETERAN OF IT IN SEVERAL DIFFERENT INDUSTRIES, I’VE BEEN IMPRESSED WITH DELL’S SERVICE AND SUPPORT FOR A LONG TIME. WHENEVER I CALLED DELL, THEY’D DO EVERYTHING THEY WERE SUPPOSED TO DO — AND SOMETIMES MORE THAN THE CONTRACT STATED. YOU RARELY FIND THAT IN A COMPANY!”

Jim Crawford, Assistant Director for Technology Services, Humble Independent School District

In recent years, every spare dollar went to build and furnish new classrooms, not to behind-the-scenes improvements such as IT. So by 2006, the Humble school district was running all its IT services, from e-mail and Web browsing to school office administration and storing students' homework, off a motley collection of underpowered, six-year-old servers that could no longer keep up with demand.

“We were starting to see some catastrophic server failures on the campuses,” says Jim Crawford, assistant director for technology services at the Humble Independent School District. “A couple of principals actually lost 15 years' worth of data. We knew we had to fix things before any more servers failed.”

JUST-IN-TIME IT MAKEOVER

The Humble technology team had already drafted plans to consolidate distributed servers at each campus into a centralized clustered server and storage infrastructure that would be easier to manage, automate backups and lessen the burden on the district-wide network. In fall 2006, facing the risk of losing vital school records and computer service, the Humble school board approved the plans.

The new infrastructure would need to support:

- 13,000 PCs and about 1,200 network printers district-wide
- Network password access for 36,000 users currently, up to 45,000 in a few years

HOW IT WORKS

HARDWARE

- Clustered Dell PowerEdge 1950 servers with Intel® Xeon® processors
- EMC CX300 networked storage arrays

SOFTWARE

- EMC MirrorView™
- Microsoft® Office 2003
- Microsoft Windows® XP
- Novell® GroupWise® collaboration software
- Novell Open Enterprise Server 1
- SUSE® Linux® Enterprise Version 9

SERVICES

- Dell Infrastructure Consulting Services

“THE OVERALL VALUE OF THIS SOLUTION IS TREMENDOUS. THE ABILITY TO MAKE DOWNTIME ALMOST INVISIBLE TO THE END USERS—I CAN’T TELL YOU HOW VALUABLE THAT IS TO US. THEY CAN SPEND THEIR TIME ON EDUCATION, NOT FRETTING ABOUT THE TECHNOLOGY.”

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- Dozens of applications, from Microsoft Office to mapping and educational tools such as Broderbund® Kid Pix®
- Novell GroupWise software for e-mail communication

And it had to satisfy the expectations of teachers, students and staff for:

- Near-zero downtime during class
- High network bandwidth to support daily demand spikes when students logged on
- 24x7 e-mail access
- Faster, more reliable data backup
- Better disaster recovery, including a remote recovery site
- Flexibility to evolve as the district grows

Reliable e-mail access was key, Crawford says. “The principals primarily communicate with their teachers through e-mail. And our superintendent, who’s very technologically savvy, relies on GroupWise being up 24x7. His e-mail is forwarded to his cell phone.”

Faster network access was also a high priority. Sometimes it could take up to 20 minutes of class time just to get all the students logged on and ready to start an exercise. “Network performance was limping badly, and users hated us for it,” he recalls wryly. Armed with network specs, the Humble school district was ready to start shopping for a new technology platform.

DELL OFFERED BEST SOLUTION

Dell was a leading contender for both hardware and services, Crawford says. “As a veteran of IT in several different industries, I’ve been impressed with Dell’s service and

support for a long time. Whenever I called Dell, they’d do everything they were supposed to do – and sometimes more than the contract stated. You rarely find that in a company!”

Dell actually wasn’t the lowest bidder for the network contract. But it was the most responsive to Humble’s needs. “One vendor’s bid had serious flaws, including using a flavor of Linux that wasn’t yet certified on its own servers. Another was priced at triple our district’s budget. And no competitors offered the cutting-edge dual processors we wanted. In terms of hardware specifications for the money, Dell beat the competition hands down,” Crawford says.

The contract included hardware installation from Dell Infrastructure Consulting Services. They took care of server standardization in summer 2007, targeting one school at a time to minimize disruption. They also transferred user data at the first five campuses, showing Humble’s own IT people how to do all the remaining sites. Dell’s experts even helped resolve conflicts between the district’s existing Novell NetWare applications and the new Linux operating system. “With one phone call they bypassed all the call-center stuff at Novell and went straight to an engineer. Dell’s relationship with Novell really helped us get the job done.”

CLUSTERING HELPS REDUCE COMPLEXITY

The core of the project was replacing 39 legacy servers with a cluster of 14 Dell PowerEdge 1950 servers running SUSE Linux Enterprise 9

and Novell Open Enterprise Server 1. They are supported by an EMC CX300 storage area network with a capacity of 12.1 TB.

The cluster houses GroupWise (consolidating 32 electronic “post offices” into four), file and print sharing, and the major educational and back-office applications, including Microsoft Office. The servers are clustered for automatic failover protection.

The network configuration uses NIC Teaming, which connects the dual Network Interface Cards (NICs) in each Dell server to double the available capacity for network traffic. “This has boosted the server bandwidth from 100 MB to 2 GB,” Crawford says.

Meanwhile, Humble created a fully functional disaster recovery site at the district office, about 10 miles from the new data center. It houses a second EMC CX300 SAN, asynchronously mirroring the main cluster with EMC MirrorView software. “If a hurricane or other disaster knocks out the main data center, within two days the district’s e-mail and user data could be reassembled and fully operational from the backup site,” he says.

CENTRALIZED SERVER MANAGEMENT CUTS IT ADMINISTRATION TIME BY 40 PERCENT

The consolidated, simplified infrastructure is benefiting Humble in several ways. First, the IT administrators no longer have to visit each campus to do server repairs or upgrades. “They’d spend about 1 to 1.5 hours of unproductive time just driving. And most

of the time, it wasn't a serious failure, just a power fluctuation or a failure in the operating system – so all they had to do was press F1 to restart," Crawford says. "Our people were swamped. They felt like all they were doing was driving from campus to campus restarting servers, on top of all their regular jobs."

Now, the team has eliminated at least 90 percent of that repair and upgrade time, thanks to the Dell systems' capacity to reboot and send out server patches remotely, he says. That works out to a 40 percent decrease in overall infrastructure administration time.

Also, data backup is now automated and takes place in 9 hours, rather than the 12 hours it took previously. Not only is the backup copy more current, there is also less traffic pressure on the network overnight, when district-wide software updates typically go out.

"Before, network admins were always stepping on one another when they were trying to push stuff at night," Crawford recalls. "An anti-virus update might get in the way of application patches going out to all 13,000 workstations. We used to come in the next day, wondering what actually got through." Centralized updates now have a near-100 percent completion rate.

Availability has also improved, from the 80-90 percent range to 98 or even 99 percent, due to the cluster's failover capacity. This got its first test in Spring 2007, while campuses were being added one by one to the new network. Two schools' legacy servers failed beyond repair, but their data had already been migrated.

"Those students and teachers and staff didn't realize they were actually getting their data across our WAN from another campus. We just made it look like they were still logging onto their own server. And that capacity to make failovers transparent to users is exactly what we wanted."

MORE TIME FOR EDUCATION

One pleasant result for Crawford's staff is that they can actually take vacations now. "Before the cluster upgrade, some of our network administrators had 20 or 30 days of vacation time saved up that they couldn't take because they were too busy," he says.

More importantly, they now have time to invest on innovative projects such as a remote imaging system that will let them re-provision PCs from anywhere on the system, getting them back into service much sooner. Another staffer has consolidated each school's library applications into a single database that tracks the district's entire book inventory. Students and teachers can search the database with a Web interface to request hard-to-find books on inter-campus loans.

"The overall value of this solution is tremendous," Crawford enthuses. "The ability to make downtime almost invisible to the end users—I can't tell you how valuable that is to us. They can spend their time on education, not fretting about the technology."

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HUMBLE ISD



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