

Morgan County Schools reduce maintenance and enhance performance

Dell Wyse contributes to the best student/computer ratio as Morgan County Schools virtualizes all student desktops and leaves other districts behind.



Customer profile



Company	Morgan County Schools, Georgia
Industry	Education–K-12
Country	US
Students	3300
Website	www.morgank12.ga.us

Challenge

- Deliver excellent multimedia performance for educational applications
- Reduce desktop maintenance requirements
- Respond more rapidly to teacher requests for new software
- Conserve energy and save on energy costs

Solution

- Centralized virtual infrastructure with VMware, Cisco UCS servers, and NetApp storage
- VMware View serving 1,400 Dell Wyse P20 zero clients
- PCoIP over private Ethernet

Results

- Supported multimedia applications at least as well as PCs did
- Slashed maintenance requirements by 65%, improving uptime
- Accelerated response to teacher requests from two weeks to one day
- Saved \$30,000 in energy costs annually

“Whenever we want to fix software, change it, or install a new application, we can do it faster and more efficiently than before.”

Jay Cawley
Director of Technology
Morgan County Schools



Full virtualization achieved.

“I only have an IT staff of two, and managing all those PCs took up 75 percent of their time. We’d adopted virtualization with VMware on the server side a few years ago, and realized terrific cost savings and greater administrative simplicity. So when it came time to refresh the PCs I started thinking about virtualizing desktops with VMware View.”

Jay Cawley
Director of Technology
Morgan County Schools

The 3,300 students at schools in Morgan County, Georgia, enjoy the best student/computer ratio in the state: 2.25:1. That’s just one metric that helps tell the story of the district’s commitment to quality 21st century education for all its students, from preschoolers through to the high school students enrolled in its traditional high school, International Baccalaureate Program, or math-science academy. Jay Cawley, director of technology at Morgan County Schools, welcomes the challenge of supporting the district’s educational goals with state-of-the-art computing resources while staying within a tight budget. So when it was time to replace the district’s aging PCs, he didn’t just swap out the approximately 1,800 computers with newer models. He asked himself whether PCs were the best solution for the district.

“I only have an IT staff of two, and managing all those PCs took up 75 percent of their time,” Cawley explains. “We’d adopted virtualization with VMware on the server side a few years ago, and realized terrific cost savings and greater administrative simplicity. So when it came time to refresh the PCs, I started thinking about virtualizing desktops with VMware View.”

The more Cawley researched virtual desktop infrastructure (VDI), the more convinced he became that VDI could solve the challenges the district was facing. Virtual desktops could slash maintenance requirements, speed his ability to respond to teacher requests, and save the district on its utility bills by drawing less power.

As Cawley began considering endpoints, he looked first for endpoints that could provide a multimedia experience at least as good as PCs. He also wanted endpoints without an OS, so that he wouldn’t have to update them in a few years. Another “must” was support of PCoIP, the primary protocol for VMware View. One endpoint was the perfect choice: the Dell Wyse P20

zero client. Because it has no OS and runs PCoIP natively in hardware, it delivers the highest level of display performance available, satisfying Cawley’s requirement for high-quality multimedia playback and HD audio.

Cawley believed the best approach would be to replace all 1,400 lab and classroom PCs with zero clients, but he was concerned because he couldn’t find any other district that had made such a dramatic change. To set his mind at ease, he worked with reseller CDWG to set up a lengthy proof-of-concept. The team allocated physical hosts that could run up to 100 virtual machines and endpoints, then brought in 30 Dell Wyse P20 zero clients, and moved them from one setting to another to ensure they could meet all the district’s requirements and work with existing hardware and printers. After the proof of concept worked well, the rest was easy – and fast. Deployment of one group of 800 zero clients, for example, took just one week, during the evenings, because the team didn’t need to do anything to the devices except hook them up to the network.



Solution

Take virtualization from the data center to the desktop

Students at Morgan County Schools now work on 1,400 Dell Wyse P20 zero-client devices. Each classroom has five or six P20s to support web-based and multimedia applications. In grades K-5, teachers use the P20s as a center for instructional applications such as Classworks and Education City, which enable teachers to personalize instruction, assigning specific activities to each student and tracking that student's progress.

Students in the middle and high schools also have P20s in the classroom, plus a 30-unit P20 lab in each school. They use the P20s for special projects, web research, sending and receiving e-mail, collaborating using Google documents, and working with the Microsoft Office suite of products to create presentations and write reports. The P20s support USB redirection as well as standard PCs do, so students can also work with USB devices such as light probes for physics classes or pH probes in chemistry using some of the four USB peripheral ports on each P20 zero client.

On the back end, eight Cisco UCS servers power all the virtual desktops, using a NetApp SAN for storage. Private Ethernet fiber connects all the school buildings, providing plenty of capacity for the VDI's PCoIP connection. Cawley plans to increase the number of servers to 12 in the near future, to provide additional capacity that will increase the resilience of the system.

Cawley and his team put many of the district's applications on the new server infrastructure two years ago, but before VDI, PCs were still running a number of local applications. Now almost all of the district's applications come from the servers, either because they're network applications, or because the team has virtualized those applications using VMware ThinApp. The team uses the Terradici console to push out firmware updates and apply configuration settings.

A few applications run on the teachers' and administrators' PCs. The district's IT system still includes approximately 400 PCs for teachers and administrators, so that teachers can run smartboards in the classroom and work from home. Of course, the teachers also benefit from the back-end infrastructure, and can log in to their virtual desktops either from their PCs or from the nearest P20.

Benefits

Manageability and performance increase teacher satisfaction, save energy costs

The district considers the rollout of the VDI a complete success. The zero clients have almost eliminated downtime and endpoint maintenance issues. The IT team now responds more rapidly and efficiently to teachers' requests for new capabilities. Performance is at least as good as it was before, and much more reliable. And in the background, almost unnoticed, the VDI is quietly delivering serious savings on the district's utility bills.

Teachers are now more willing to build the zero clients into their lesson plans, because they're confident the P20s will work. Students appreciate being able to start work as soon as they sit down. And both groups are going to be learning more about technology and how it can help them, because Cawley's staff no longer needs to spend all its time repairing computers.

Zero clients improve manageability

Cawley doesn't miss the days when he had just two staff to manage 1,800 aging PCs. "Hardware and software issues kept us running all the time, and still we weren't able to keep ahead of the maintenance challenge," he says. He estimates that staff used to spend 75 percent of their time just on maintenance, but that now they spend less than 10 percent.

Nothing goes wrong on the zero clients, so his staff now allocates more time to teacher and student training, helping both groups make better use of the resources available. Plus, IT can be more proactive in researching other instructional tools, such as scanners, that can support teachers or help augment the curriculum.

"From a software standpoint, managing the View environment is straightforward," comments Cawley. "Central management means we can patch systems promptly and consistently, preventing problems from arising. Even making the transition from Windows XP to Windows 7 looks like it's going to be relatively smooth."

Schools are traditionally a tough environment for computers, but the zero clients are an ideal solution for the characteristic challenges of the classroom environment. "First of all, we can lock down devices – without impacting performance – so students can't make any changes to the applications or operating systems," says Cawley. "We refresh the zero client each time a student uses it, so it reverts to its previous state. Plus there are no fans, drives, or any other moving parts that they can jam pencils into, so we don't have the hardware problems we used to."

Security helps protect manageability, too. Viruses can't gain a foothold because of the constant systems refresh. Plus, while machines are in use, OfficeScan from Trend Micro provides real-time protection, scanning each zero client in 30 seconds or less in a serialized pattern to avoid overloading the servers.

Centralized system speeds responsiveness to teachers

When teachers asked Cawley to make new applications available to their students, he used to have to tell them it could take two weeks. Now, with the VDI, it takes him a day.

"The VMware environment and Dell Wyse P20s create a more robust and dynamic environment," w says Cawley. "Whenever we want to fix software, change it, or install a new application, we can do it faster and more efficiently than before." Instead of having to send out his team to install the application on specific computers, Cawley and his team can run regression testing on the server, then rapidly image and deploy the application centrally for system-wide access.

District saves money on power – and predicts savings on IT hardware

Cawley estimates that designing and building the district's virtual infrastructure and implementing the new desktop environment cost about the same amount as simply replacing the PCs. Looking ahead, though, he expects dramatic reductions in total cost of ownership.

"I predict we'll be saving money on maintenance and replacement parts for the PCs," he says. "Plus, we had to refresh PCs every four years or so, but I expect we'll be keeping the P20 zero clients for twice as long." Even calculating for new investments in the server and SAN infrastructure, Cawley expects future savings on IT hardware.

Already, he's seeing a saving in power costs. "It takes much more electricity to run a PC for a year compared to a zero client," he comments. "We're going to save approximately \$30,000 per year in energy costs across five schools just for this aspect of the transition to 1,200 zero clients. That's a lot of money to be freeing up for our programs year in, year out. Plus, it makes for a great story to share with a public that's increasingly concerned about environmental issues."

"I couldn't find any other school system that had gone as fully virtual as we planned to do. It was unnerving, to step out like that. But we had a good network infrastructure, and we tested the concept thoroughly – and it worked out beautifully."

Jay Cawley
Director of Technology
Morgan County Schools



Students appreciate being able to start work as soon as they sit down.



VDI delivers performance – and reliability

Teachers had grown wary of the district’s aging PCs, and were reluctant to design lesson plans that required all computers to be working at a specific time. Students weren’t happy with performance, either – login times could take as long as five minutes, burning up precious class time.

New PCs would have been welcome, but new zero clients have proven even more valuable. They virtually never have problems that can’t be solved by a reboot – and a login takes less than a minute. Plus, students and teachers alike have commented on the fact that P20s are much quieter than conventional PCs.

Especially in labs with 30 machines, the lack of fan noise makes a tremendous difference, helping students and teachers to focus.

Cawley initially feared that there might be some price to pay for the convenience of VDI, but performance, especially in dealing with multimedia applications, has matched or exceeded the team’s expectations. “I thought that, at the least, we’d have some applications not being able to run,” says Cawley. “In the end, only one minor application didn’t work well in the virtual environment. The other 20 or so applications we use work fine with the VDI.”



Delivering excellent multimedia performance for educational applications.

ROI factor	ROI calculation	Annual cost avoidance
Reduced desktop maintenance	Staff used to spend 75% of their time on maintenance; now less than 10%	District gains the value of almost two FTEs for proactive and value-add activities
Greater availability /reduced downtime	PCs used to suffer so much downtime that teachers would avoid planning lessons around them	Teachers can incorporate technology into the curriculum with confidence: zero clients are always up and ready for action
Faster login times for more productive use of class time	Login used to take at least five minutes; now less than one	Students can get started on their projects immediately and accomplish more in class
Longer life cycle: 8 years vs. 4	Using the same zero client for eight years instead of buying two PCs over the same period saves hardware costs	Projected saving of one complete hardware refresh cycle over 8-year period
Lower electricity consumption	Energy savings of \$25 per zero client annually	\$30,000 in energy savings predicted each year



Conclusion

Technology leadership supports teaching excellence

Cawley is delighted with the VDI implementation – and is already making plans for ways to extend and further improve it. Remote login for students and teachers is one of his goals, to support their ability to work from home or other sites. He believes that for the foreseeable future, the district will always have conventional PCs and laptops for the teachers, but for all other users, the Dell Wyse P20 zero clients will meet all their needs.

“I couldn’t find any other school system that had gone as fully virtual as we planned to do,” recalls Cawley. “It was unnerving, to step out like that. But we had a good network infrastructure, and

we tested the concept thoroughly – and it worked out beautifully.”

Cawley and his team aren’t done yet, either. They already have the best computer-to-student ratio in the state, but they’ve now set their sights on a 1:1 ratio. “With VDI, we can see ourselves achieving that soon,” Cawley says. “Soon we’ll be able to allow students to bring in their own devices and access virtual desktops using their own hardware, so technology becomes just as integral to our instruction and curriculum as papers and pencils. Plus, the cost-effectiveness of VDI will free up money we used to spend – on PC hardware, energy costs, and maintenance – so we can put it towards the programs that support our academic excellence.”

About Dell

Dell Inc. (NASDAQ: DELL) listens to customers and delivers innovative technology and services that give them the power to do more. For more information, visit www.dell.com

View all Dell Wyse case studies at wyse.com/solutions

