

Madison-Plains Local School District



“VMware vSphere technology not only enabled a highly reliable server infrastructure, it also allowed us to save enough money on our servers that we could move to the next step, a VMware View virtual desktop deployment. VMware virtualization therefore became a core technology that opened new doors, including opportunities to offer more educational technology to our students.”

— Joseph Penney,
Technology Coordinator,
Madison-Plains Local School District

KEY HIGHLIGHTS

Challenge

Madison-Plains needed to modernize its servers and extend educational technology to students, but as a rural school district, its budgets are tight.

Solution

By virtualizing its server environment, the district lowered its enterprise technology costs, freeing budget required to fund a virtualized desktop infrastructure.

Results

- Cost-efficient server environment freed money to invest in student technology
- Teachers have more flexible access to desktop computing resources for their students
- Server availability is 99.999 percent
- Snapshot-based data recovery ensures servers can be restored if needed
- Servers easier to maintain

Virtualization Frees Madison-Plains Budget for Student Technology

Modernizing Servers as VMware Virtual Machines Helps Rural District Afford VMware View Virtual Desktop Environment

Madison-Plains Local School District, located in south-central Ohio, faces many challenges common to schools serving rural communities.

The median income of its community residents is below the national average. The population density is low, which means fewer school tax dollars. And the local economy is largely agricultural—88 percent of Madison County is farmland. There are no large manufacturing or high-tech businesses to help fund the public coffers.

At the same time, Madison-Plains is committed to helping its students realize their full academic potential. And one of its six district goals is to provide those students with state-of-the-art facilities—including the technology they need to enhance their academic experience and prepare them for future success in their careers.

Making good on this commitment in a district where funding is stretched thin isn't easy.

But Madison-Plains is succeeding, in large part because it uses VMware virtualization to make its academic technology affordable.

Virtualization Supports “the Right Costing Model”

Today, technology is very much in evidence in each of the Madison-Plains district schools.

Every classroom in the district's three elementary schools is equipped with a Smart Board; many classrooms in its middle and high schools are, too.

All students in the district, from first grade through graduation, are provided with school user and email accounts.

The middle and high schools are served by a wireless network and a mix of personal computing devices students can use to conduct online research, work on keyboarding skills, and access word processing and other software applications.

The district has also moved key applications to a virtual learning environment. This serves students in a number of ways. It provides opportunities for credit recovery, participation in courses that they would otherwise miss because of scheduling conflicts, access to an off-site college program, and alternatives to school suspension or expulsion, as well as access to distance learning classes in Mandarin Chinese and American Sign Language.

Much of this technology, however, is less than five years old. “When I took over managing the district's technology four years ago, it had no servers. At that time, we didn't have much money in technology at all,” explains Joseph Penney, Technology Coordinator, Madison-Plains Local School District. “What desktops we did have in the classrooms were years out of date.”

VMWARE AT WORK

VMware vSphere™

- VMware Data Recovery
- VMware vMotion®

VMware View™ 4.5**VMware Thinapp™ 4.6**

DEPLOYMENT ENVIRONMENT

Primary application

- VMware vSphere virtual server infrastructure
- VMware View virtual desktop infrastructure

Primary hardware

- Dell PowerEdge R610 servers
- Dell PowerEdge 1950 servers
- Dell PowerEdge 2950 servers
- Dell PowerVault MD3000 Storage Area Network
- Wyse V10L thin clients

Primary software

- Microsoft Exchange
 - 1400 mailboxes
- Microsoft SQL
- Microsoft Active Directory
- Microsoft Windows 7
- Microsoft Office 2007
- Paint.net
- Moodle course management software
- Lexia reading software

Charged with playing technology catch-up, Penney's first step was to implement a server architecture. Over the next two years, district budget money was allocated to purchase two Dell PowerEdge Servers, and to cobble together another handful of servers from recycled workstations. He used this hardware to deploy an applications infrastructure comprising of Microsoft Exchange, SQL, Active Directory, a Windows domain controller and three backup domain controllers.

This infrastructure was far better than no servers at all, but Penney wasn't satisfied. "Using workstations as servers was a band-aid solution," he says. The infrastructure imposed constraints that affected application performance and availability. "I had to put Exchange and SQL on the same server, which was creating bottlenecks. And if the server got corrupted for some reason, it would crash both applications."

In addition, the environment didn't have the capacity to support the roll-out of new applications. For Penney, who holds a Master's degree in education technology and taught third grade before accepting his current position, this was the most significant issue. "We need to put technology into students' hands," he says. "I knew I needed to find the right costing model so that I could deliver computing resources to our students."

So Penney decided to try something completely different: virtualization. "Instead of adding new PowerEdge servers, which would have been cost-prohibitive, I converted to a VMware virtualized environment," he says.

Excellent Uptime, Easier Maintenance

It was a decision that transformed the district's server infrastructure. Penney now runs all of the district's enterprise applications as virtual servers on his two original PowerEdge systems. "All of a sudden, I had fault tolerance," he says. "With the physical environment, if a hard drive failed, that server's applications crashed. Now, if there's a hardware issue, VMware moves the applications to the other server. I have uptime well in excess of five nines. It's extremely rare that we experience any outage at all."

Another component of the environment that Penney appreciates is VMware Data Recovery. "I take snapshot-based backups of the servers. If anything happens to our data or applications, I can easily restore it from a snapshot." Penney also takes snapshots before he makes changes or upgrades to the enterprise applications or server operating systems, so if anything goes wrong with the upgrade he can revert to a working version.

Maintaining the servers is now easier as well. "I can slide my virtual machines onto one server while I perform maintenance on the other. My users don't even know I'm doing it," he says. And the environment gives Penney flexibility to test new applications. "It used to be a struggle to allocate machines for testing or simulations. With VMware, I can easily set up a test environment on a virtual machine any time I need it."

All of these changes have made life easier for Penney. But the benefits to the district are even more dramatic, because virtualizing the server environment freed funding for other technology—and Penney knew just how to spend it.

"One and a half years after I implemented VMware virtualized servers," he says, "I was able to afford a Dell PowerVault MD3000 Storage Area Network and another two PowerEdge servers." And with those resources in-house, Penney moved forward on the next phase of his plan: he implemented a VMware View virtualized desktop environment.

Flexible Technology Resources, Plus a Path for Growth

One day, Penney hopes that Madison-Plains will achieve 1:1 computing for all of its 1200 students. But surprisingly, he doesn't assume the district will do this by purchasing 1200 computers, thin clients or notebooks.

Instead, he believes the environment will include a mix of district- and student-owned devices. "Personal computing devices are coming down in price," he notes. "And we're seeing hand-held devices that function more like computers." As this happens, more and more Madison-Plains students have access to their own portable systems. The district, in turn, can focus its resources on the students who don't.

Today, Madison-Plains has deployed a mix of thin and fat clients throughout its five facilities. Fat clients include some class room desktops, as well as two hundred netbooks deployed on carts. Teachers can bring the netbooks into their classrooms when needed to support coursework or curriculum objectives.

In addition, Penney has deployed seventy Wyse V10L thin clients running VMware View virtual desktops in various classrooms around the district. These virtual desktops, which run applications like Microsoft Office, Paint.net, and the open-source course management software Moodle, complement the classroom's desktop systems to create a highly adaptive desktop environment. "The VMware View desktops give us the extra personal computing resources we need for teachers who have requested more systems in their classrooms," Penney explains. "And we can do this without having to spend as much on hardware and dedicated software licenses."

In the future any teacher who wishes to provide 1:1 computing in the classroom should be able to do so.

The changes Penney has made to Madison-Plains' technology infrastructure to date have modernized its server environment and extended computing resources to more classrooms.

It also provides a cost-efficient foundation for future technology growth and enhancements.

On the server side, VMware virtualization ensures that Madison-Plains can keep its hardware up-to-date. "Because we require far fewer physical servers, we can afford to refresh our technology more often," he says.

Growing the VMware View environment can also be accomplished cost-effectively. Penney can re-deploy old desktop computers as thin clients, for example, which will provide more students access to View desktops without requiring a hardware investment—while also extending the useful life of existing devices.

Nor does Penney anticipate running out of space on the server that runs VMware View any time soon. "We use VMware linked clone technology," he says. "It's a great way to save space on the server, because we only need to spin up enough desktops to accommodate the users that need them at any given time."

And the VMware View environment also won't overextend Penney and his assistant as it grows, since managing VMware View desktop images is not a labor-intensive task. "If I need to update the virtual desktops, I make the change in one place, to my gold image," he says. "It takes only a few minutes."

With this foundation in place, Penney is confident that Madison-Plains will continue to advance its instructional technology. "Educationally, technology brings the world to students' finger tips," he says. "It supports research-based projects, and it enhances students' ability to engage with and understand subject matter.

"By allowing us to implement both servers and desktops cost-effectively, VMware virtualization is helping our district equip students with that technology," Penney continues. "It has empowered us to deliver a better educational experience."

