

# Belchertown Public Schools

## PROFILE

Belchertown Public Schools



### Industry

Education

### Corporate Headquarters

Belchertown, Massachusetts

### Employees

400+

### Students

2600

### Web site

<http://www.belchertownps.org>

## THE NUMBERS

- 400 virtual desktops
- 10:1 server consolidation ratio
- 133 virtual desktops per server

## IN BRIEF

### Objective

Belchertown Public Schools needed to restore functional classroom technology in order to take advantage of online resources and educational software.

### Solution

The district has replaced decade-old PCs with virtual desktops created using VMware® View™, accessed using new thin clients or older PCs.

### Business Impact

- Growing use among teachers and students
- More-productive sessions: login cut from 12 minutes to 90 seconds
- Help-desk tickets cut by more than half

## Cash-Strapped School District Restores Classroom Computing, Improves Access with Virtual Desktops

*“The success of desktop virtualization is clear in that teachers and students are using their computers now, whereas in the past, they weren’t because the computers were slow due to age and system restrictions.”*

— Kevin Hannon, Director of MIS, Belchertown, Massachusetts and Belchertown Public Schools

Belchertown, located in central Massachusetts, was first settled in 1731 and officially incorporated in 1761. Its history chronicles 250 years of growth and change, from the earliest appearance of white settlers in the Pioneer Valley to Belchertown’s present as a quiet, residential town with commuters traveling daily to Boston and to Hartford, Connecticut. The town’s population is estimated at 15,000.

The Belchertown public school district operates five schools. The town is proud of those schools—the high school recently was rated a “9” on a 10-point scale. More than 75 percent of graduates go on to further their education. And all of this occurs despite dramatic fiscal challenges.

### Falling Behind the Technological Curve

Belchertown High School opened in 2003 as a state-of-the-art high school with the latest in educational technology, including some 450 personal computers. But like many schools, Belchertown was unable to maintain its commitment to educational technology. Money grew increasingly tight through the millennium’s first decade. Those 450 personal computers—and others throughout the district—aged and became outmoded, but most were never replaced.

“A couple of years ago, we were facing a population of computers on the desktop that ranged from five to 12 years old,” explains Kevin Hannon, who wears dual hats as director of MIS for the town of Belchertown and its school district. “And we didn’t have the money to replace them.”

As Belchertown and the country fell into recession, Hannon puzzled through the challenge of updating computer technology with almost no funding. Enter the American Recovery and Reinvestment Act—popularly known as the “stimulus package.” New money was now available if Belchertown could offer a creative proposal that would maximize the value of federal dollars. So Hannon and Belchertown proposed to virtualize desktops, which could be accessed using either new thin clients or repurposed older PCs. That would enable the district to revitalize desktop computing without having to replace all the existing desktop PCs.

The idea of virtualizing desktops came naturally to Hannon. He and his limited staff had already virtualized much of the district’s server environment with VMware ESX over a two-year period in order to control costs. The virtualized environment ranged from application servers for major programs such as Microsoft Exchange and SQL Server, to file and print servers. The district was operating nearly 20 virtual machines on two physical servers.

## Deployment Restores Educational Functionality, Provides Web Access

Now Hannon hoped to repeat that success on the desktop. “Our primary goal was to provide access to a working computer to every student and teacher,” he explains. “Our old computers just weren’t functional. It took 9-12 minutes for many of them to boot. Some were unable to run modern software because they lacked enough RAM or CPU speed. Teachers and students alike had given up on them.”

Not only were the computers in Belchertown not supporting student education, but they also kept teachers from accessing the district’s Student Information System with the flexibility required. Teachers needed at the very least to use the Web-based application to do daily attendance and enter grades, and access was cumbersome.

Hannon chose VMware View over Citrix based on Belchertown’s previous successful experience with VMware software. He and his staff of only three embarked on a crash course in desktop virtualization using VMware View, with help from VMware partner ePlus Inc. The team created a lab with 20 virtual desktops and began testing them.

The requirements were simple. “We needed to be able to boot and run Windows XP, Microsoft Office and a web browser, and provide the level of access that students need in order to do research and write papers,” Hannon says. In testing, the staff found that the virtual desktops did all that and more—delivering streaming media and some limited 3D applications. Based on that success and eventual receipt of the federal funding just days before the beginning of school, Hannon’s team proceeded with widespread deployment.

The virtual desktops were hosted on three Cisco UCS servers, supported by two NetApp storage systems. The team developed six separate software images—one each for students and teachers at the high-school, middle-school and elementary-school levels. There is a dedicated pool of virtual machines for teachers and a floating pool for students. Users access the virtual machines using either a new 10ZiG thin client or one of the older PCs repurposed to act as a thin client.

“Thin clients are a natural choice going forward. They cost significantly less than a PC, which is very important to us. They have no moving parts, so they’re more reliable in the long run and they’ll last longer,” Hannon says. “They’re also a big energy saver; they consume about 24 watts of power, vs. 100 or so for a typical PC.”

The district didn’t have the money to replace all its aging PCs with thin clients, so in many cases, teachers are using the old PCs to access the virtual desktops. Even with minimal RAM and processing power, Hannon notes, the devices are able to run the VMware View client and provide access to a virtual desktop.

There is one PC or thin client in each classroom for teacher use, and up to three more available for students to use. Belchertown Public Schools is licensed to operate up to 400 VMware View desktops concurrently. Today traffic averages about 250 concurrent users but is expected to grow.

Teachers log in at least once a day. Some stay logged in through most of the day; others stay on for 10 minutes and then log out. Among students, the most use comes from the high school. In the middle school, a group of 30 may log in at a time, take a class online and then log out.

## Success Measured by Jump in Use

“The success of desktop virtualization is clear in that teachers and students are using their computers now, whereas in the past, they weren’t. Our old PCs were for the most part unusable on their own,” Hannon says.

Time required to boot up and log in has been cut from a high of 12 minutes in the past to just 90 seconds now. That improvement alone translates to a much more convenient, productive experience. “We run 42-minute periods in the high school, so if you had to wait 12 minutes just to log in, you were losing a lot of time.”

The real value of improved desktop access will become apparent over time as teachers integrate online access and use of educational software more fully into the teaching day. That’s just beginning to happen now, Hannon notes.

He says the virtual desktops also provide a much more consistent user experience. Because teachers each have a dedicated virtual machine, they always pull up their own desktop, complete with any customization they have implemented. Teachers can also install additional software onto their desktop, or bring a software package to Hannon’s team to install. For applications that will be widely used, the team uses VMware ThinApp to virtualize the application.

Students also have the opportunity to install software—such as additional fonts that might be required to study some foreign languages. And if a student abuses the privilege by installing something else, it’s easy to fix the problem, Hannon notes.

“If they install something that causes a problem, we can click a button and refresh the virtual machine to its pure state,” he explains. “In the past, we would have had to physically visit that machine in order to fix the issue. So we’re saving time and effort in troubleshooting problems compared to the past.”

In fact, he notes, the virtual desktop solution has freed up a significant amount of time for his small staff. “A couple of years ago, we were falling further and further behind in terms of maintenance and upkeep. We didn’t have time to think about implementing anything new, due both to our budget and time limitations,” he says. “Virtualization has made it easier to deploy and maintain desktops, and has driven down the number of help-desk tickets by more than half. We’re still busy, but now we’re able to be more responsive when a problem arises, and we have time to be more proactive in planning for the future.”

## Planning for the Future

Among those plans: enabling students and teachers to access their virtual desktops from remote locations. “Students will be able to log in from home and do their homework on the same computer they’re using at school,” Hannon explains. That eliminates the need to transport documents on flash drives or send them by email. Teachers, likewise, will be able to log in and use their virtual desktops to prepare for the next school day.

Based on the success of virtual desktops in Belchertown schools, Hannon plans to roll out virtual desktops for the town’s employees, too. “We’ll spend less time deploying, patching and troubleshooting desktops, and more time improving IT services.” He says virtual desktops will enable the town to provide better employee access to resources during emergencies, including the ability to work from home if necessary.

Virtualization also offers the promise of reducing software licensing costs. In the schools, Hannon notes, the district cut its licenses for Microsoft Office by almost half, from more than 700 licenses to just 400.

Overall, Hannon says, virtualizing desktops has been a very good decision. “I guess the litmus test is, if we stepped back in time, would we do it again? Definitely. Our users are much happier with the computers than they were before. They’re using them much more and being productive,” he says.

“A few years ago, the computers in our school were an embarrassment. Now they’re useful tools again. They’re helping us deliver on the promise of public education.”

IMPLEMENTATION OVERVIEW		
<p><b>VMware Products:</b>                      VMware vSphere 4.1                      VMware vCenter 4.1                      VMware View 4.5                      VMware ThinApp 4.6</p> <p><b>VMware Services:</b>                      Consulting</p>	<p><b>Applications:</b>                      Microsoft Office                      Microsoft Exchange                      Moodle</p> <p><b>Partner:</b>                      ePlus</p>	<p><b>Platform:</b>                      Cisco UCS C250 servers                      NetApp FAS2020 storage                      10ZIG thin clients</p>

