



## A LESSON IN IT TRANSFORMATION WITH DESKTOP VIRTUALIZATION AND SOFTWARE-DEFINED NETWORKING



### INDUSTRY EDUCATION

### LOCATION HUTTO, TEXAS

### KEY CHALLENGES

- Aging hardware couldn't keep up with surging enrollment and move to digital classrooms
- Rapidly growing network traffic was slowed at the router by policy enforcement

### SOLUTION

Hutto ISD chose VMware Horizon to deliver virtual desktops and apps quickly and securely via a single digital workspace. They chose VMware NSX for software-defined networking, flattening from 37 to four virtual networks and eliminating a whole rack of networking hardware.

### BUSINESS BENEFITS

- Energy savings of \$250,000/year
- Access to software and learning environments from anywhere
- Increased security for student information using micro-segmentation
- Improved IT OpEx, managing the all-VMware solution with fewer resources than Citrix required

Facing phenomenal growth and new requirements for digital classrooms, the Hutto Independent School District (ISD) turned to VMware virtualization technologies to transform IT and enter a new era in connected learning. Key to this transformation was VMware Horizon® virtual desktop infrastructure and VMware NSX® network virtualization. With VMware virtualization solutions in place, Hutto ISD significantly improved students' connected learning, while gaining IT operational efficiency, agility and security. This desktop and IT transformation was implemented while dramatically reducing networking and security hardware budgets and saving hundreds of thousands of dollars in client and data center power costs. Freed from old hardware constraints, and with new safeguards such as micro-segmentation in place to keep data secure for students, teachers and school administrators, the district's IT infrastructure is poised to serve the schools of the future.

The Hutto Independent School District is in central Texas near the fast-growing city of Austin. During the past 10 years, the number of students attending Hutto schools has increased from a little more than 1,000 students in one K-12 campus to more than 6,800 students at nine campuses. Enrollment continues to grow by more than 300 students each year. The district is on track to build one new school per year.

### The Challenge

During the 2013-14 school year, the Hutto ISD Instructional Technology department developed a strong vision to see technology being used more effectively in the classroom. "We wanted to use technology to transform student learning, not just to assist teachers in presenting material to their students," said Hutto ISD's IT director Travis Brown. The department knew there had to be a way to get students more engaged in their learning and developing the 21st century skills that are an integral part of the Texas Essential Knowledge and Skills for Technology Applications (TEKS) standards for students in kindergarten through the twelfth grade.

Virtualizing the desktop learning environment was an important step for Hutto ISD to deliver a smart, secure digital workspace for modern education. With a virtual desktop, all users experience a consistent look and feel. Students and teachers get a school-branded experience that helps improve adoption and decreases professional development and training needs. Whether someone brings their own

“For our students and staff, the Horizon desktops make all their apps secure and easy to get to. NSX gives us the agility to change and adapt our network design, especially in a virtual environment, without having to purchase new equipment and re-cable. It’s a great combination.”

TRAVIS BROWN  
IT DIRECTOR,  
HUTTO ISD

#### VMWARE FOOTPRINT

- VMware Horizon
- VMware NSX

device or they use a device provided by the school, everyone works on a level playing field. Students are able to use programs or do their homework at any time and in any place. Regulations surrounding students’ digital privacy are very strict. A virtualized environment provides a secure, policy-managed workspace that dynamically adapts to the environment, providing better protection.

Once Hutto ISD started their virtual desktop infrastructure (VDI) pilot program, it quickly grew to ten times the expected size, from 150 to 1500 virtual machines. However, in the data center, traditional network segmentation was leading to VLAN sprawl. Security was a problem for users and IT administrators as more students used computing devices and network traffic choked at the router where all traffic was routed for policy enforcement. Said network administrator Christopher Harding, “I was spending probably five to six hours a week just working on getting things handled. There wasn’t that much more time I could afford to dedicate.” Hutto ISD’s IT staff saw the benefits of expanding virtualization, but had to get smart about how they would use limited resources.

#### The Solution

Hutto ISD chose VMware Horizon to deliver virtual desktops and applications through a single digital workspace, securely accessible on any device. Students can access class resources, books and software through 3,200 Chromebooks configured as endpoints. Teachers can also extend the benefits of classroom software to anywhere students can access an Internet connection and a computer. Network administrator Keith Reynolds describes one teacher’s reaction when she found out that her students could work outside of the school with expensive desktop publishing software such as Adobe Photoshop: “For students to be able to go home and jump on VDI and work with premium software like that, gosh, that teacher was pumped!”

VMware Horizon has also dramatically transformed how Hutto ISD manages the delivery of applications to their users. They had experimented with Citrix and found the solution to be cost-prohibitive, requiring them to manage the environment with extra time they couldn’t spare. The rollout of desktop and application patches was equally cumbersome, often requiring weekends to prepare the update for rollout before school resumed the following week. With Horizon, desktop image and application management has been streamlined, with significant savings on operational expenses. According to Travis Brown, “[Citrix] was too complicated. The Horizon architecture is just better. Ultimately, when you have a small but very efficient and very effective team, you can’t spend all your time managing a bunch of different ways to do one simple thing.”

On the data center side, Hutto ISD was able to significantly flatten their network, improve security and consolidate network hardware by choosing VMware NSX, a virtualization platform that brings the model of a virtual machine to the network to create a software-defined data center. Hutto ISD’s network has gone from 37 to four virtual networks—one for the main server, one for elementary students, one for secondary students and one for staff—deployed on Cisco UCS B200 blade servers. IT staff has been able to eliminate one full rack of networking hardware. Virtual desktops can be deployed in two to three minutes, and network segments are now faster to provision. For the original trial VDI deployment, it took the IT staff two days to connect 37 virtual networks. When they deployed NSX, those

two days were cut to 30 minutes total. Taking advantage of the built-in load balancing capabilities of NSX eliminates the need for extra hardware. Travis Brown noted that “I was able to deploy a virtual load balancer with NSX in the same amount of time it would have taken me to cut a purchase order to buy a new physical load balancer.”

Security is critical for school systems, to keep students safe and comply with privacy regulations. VMware solutions help Hutto ISD secure data at all points of the network. On the user side, when a student logs out, anything that was downloaded is deleted. This prevents the spread of viruses, malware or inappropriate material. In the network, NSX can create entire networks in software and securely isolate networks from each other. This means that Hutto ISD can isolate server-to-server data center traffic, keeping potential attacks from spreading. Micro-segmentation enables fine-grained, flexible security policies in software that previously would have required a physical firewall per workload.

VMware NSX also helps the district cope with aging equipment. NSX keeps all data traffic local, eliminating bottlenecks such as routers and speeding network performance. “By keeping it all contained to a single rack instead of sending it even three racks over to antiquated hardware,” said Christopher Harding, “we’re going to be able to scale this even if we grow to 15, 20 times our size. It’s just going to keep working natively and the load will be distributed. When it comes time to replace the hardware, because the software won’t change, we can do that.”

### Business Results & Benefits

By moving from traditional desktop computers to zero client Chromebooks over eight school campuses, Hutto ISD saved \$250,000 per year in power costs. That savings in itself will pay for the district’s virtualization investment within three years. Harding also noted that there’s additional savings in not having to cool computer-heavy rooms. Thirty students and thirty desktop computers in one classroom generate a lot of heat, meaning that the air conditioning needs to run more often. And eliminating that equipment also eliminates a lot of background noise. Speaking about a new elementary school, Harding said, “you walk into that campus compared to the other elementary schools and it’s just quiet because there aren’t 150, 200 computer fans running in the school. And it’s a noticeable impact to the learning environment when you don’t have to talk over those things.”

Teacher instruction time has doubled with use of Horizon virtual desktops. It used to take 25 minutes during each class session to take students to the computer lab, get them logged into their computers and finally walk them back to the classroom. With Chromebooks available in classrooms, as well as on mobile carts and in labs, teachers get that time back for teaching. With no hard wiring, teachers aren’t tied to a specific physical layout for classes, allowing them more leeway in planning activities.

Virtualization also allowed Hutto ISD to be the only school district in Texas that could administer state tests on Chromebooks. The tests require Java, which wasn’t supported on Chromebooks. With Horizon, students could still access the test through a Windows virtual desktop, taking the tests on their usual computers with the same interface they are accustomed to.

### Looking Ahead

Keith Reynolds agreed that “VDI already makes managing your desktop’s loads easier than managing physical desktops, but our goal is to have one single operating image for all desktops.” Reynolds said that the district would like further streamline application lifecycle management with VMware App Volumes™, which accelerates the delivery of applications and simplifies management of the user environment across any device. This reliable, modern and cost-effective solution built into Horizon, would enable Hutto ISD to customize application delivery for specific populations or sub-populations of users as they log in, providing contextual, role-based management of the entire user experience. Hutto ISD is also looking into a bring-your-own-device (BYOD) model that would support any mobile device a student wants to use.

Said Harding, “Horizon, supported by NSX, gives us the flexibility to change and grow and adapt to the situation that doesn’t even exist yet. We are looking forward to seeing where VMware takes us. I think it’s been a huge foundation for what we see as success.”