Centralizing Infrastructure to Democratize Education

by Joe Kuehl

Providing a world-class education requires schools to understand the complex dynamics of teaching and learning, and how information flows between instructors and students. Today, technology is a big part of that dynamic. Students use many different kinds of devices to enhance their educational experience and explore the world beyond the classroom.

Millard Public Schools aims to provide a world-class education to 24,000 students in Omaha, Nebraska. Our 3,000 teachers and support staff deliver high-quality instruction in several streams, including a preK–8 Montessori program, a Core Knowledge Program, and the state's only K–12 International Baccalaureate program. We believe that every child is unique and we strive to give them the knowledge and the tools they need for life after high school.

Five years ago, our district adopted the one-to-one initiative, which currently provides every student with a mobile device. Our high school students are supplied with a touch screen laptop while elementary students work on iPads. In this way, our students can learn anywhere, anytime, whether they're in the classroom or not.

Breaking Down Silos and Finding Solutions

I've been with the Millard Public School district for 13 years. I began by providing entry-level building support at one of our high schools, moved up to primary building support, and then led some district-wide projects, including management of our Windows client infrastructure and print management.

> **Students should have equal access to #technology, and it should perform the same, regardless of which school they attend. @MillardPS #NutanixStories**

In 2007, every school building was a silo. There was very little centralized technology management, and building technicians managed the technology at individual schools. That led to inequities from site to site. Ideally, students should have equal access to technology and all services should perform the same, regardless of which school they attend. But that wasn't the case back then. We solved many of these problems when we moved to a one-to-one approach, but there were still disparities because the back end setup varied from building to building.

There was another problem looming. Millard didn't have a disaster recovery plan in place. We had application servers at our technology office and some of our high schools, but we had no way to recover our environment or our data in the event of a fire, tornado, flood, or any other calamitous event.

In January 2020, I accepted a role as the district's technology manager, following in the footsteps of a 22-year veteran who had grown the district's technology department from three people to a team of about 45. My predecessor started looking for a disaster recovery solution about eight months before I took over. He narrowed the field down to five or six vendors and laid the groundwork to implement a strategy by August 2020. When he left, I inherited the project.

Moving Beyond Disaster Recovery

Nutanix bubbled to the top of the list pretty quickly. It stood out not only for its features but also for its people. Their local reseller, Choice Solutions, put us in touch with Terry Homan, Nutanix's SLED accounts manager, right here in Omaha. He and his colleague Bill Roberts walked me through the platform's disaster recovery features but also alerted me to an equally important issue: cybersecurity.

> **When focusing on recovery from a physical threat, don’t ignore the more likely threats of #malware, #ransomware, and #phishing. #NutanixStories**

We were so focused on recovering from a physical threat that we hadn't explored how we might recover from cyberthreats like malware, ransomware, and phishing. Terry and his team helped us pivot from a disaster recovery mindset to a cyber recovery one. During the evaluation period, they showed us how their system could protect us from cyber and physical threats, and that was the tipping point for me.

While we were talking to Nutanix, we were also working with Choice Solutions to modernize and streamline our Virtual Desktop Infrastructure (VDI). Citrix is our solution of choice to create virtual machines for high end educational use. Citrix runs seamlessly on top of Nutanix's hyperconverged infrastructure, so our partners at Choice suggested that we consolidate the creation of a disaster recovery site with the much-needed refresh of our primary data center. By doing so, we’d streamline the deployment process.

We also realized that our backup infrastructure was near the end of its life cycle. We asked Nutanix about adding storage to our laundry list of needs, and Nutanix came back with a fully architected solution that backed up our files at our primary data center and also mirrored them at our disaster recovery site.

Finally, we were going to centralize our infrastructure, bringing workloads back from our building sites to our data center.

Deployment During a Pandemic

All of this happened during the COVID lockdown. We went remote on March 13th, 2020, which coincided with the beginning of spring break. We couldn't do onsite meetings, so we did the final demos and went through the selection process online.

Fortunately, we were allowed to return to our sites in June, and we installed and cabled all the hardware ourselves. We set up five Nutanix clusters in total: three at our primary data center and two at our disaster recovery site. Each of these clusters comprised four nodes. We had server, file / object, and VDI clusters at our primary site, but only mirrored the server, and file / object clusters at our disaster recovery data center. (Rather than replicating the VDI desktops in case of disaster, we decided to allocate our resources elsewhere.)

We then deployed both of these environments remotely using Nutanix Prism as our single-pane-of-glass interface. Moving everything from our bare-metal servers and our obsolete network storage arrays was as painless as it gets.

A Solution That Shines

One of the biggest advantages of Nutanix is easy and predictable life cycle management. Whenever there's a patch, we press a button in Life Cycle Manager (LCM) and update everything. If something goes wrong, we can revert in seconds. Upgrading hardware is even simpler. Nutanix generates usage reports that help us plan and budget for future storage and compute capacity. We can go in and replace individual nodes every year, thus spreading hardware upgrade costs over time.

In the past, we would have to evaluate our data center every five years, haul everything out and start from scratch. With Nutanix, we can increase or decrease storage or compute as needed and upgrade our hardware incrementally. We can start thinking in 10-, and even 15-year cycles. Best of all, we were able to upgrade all our infrastructure and add a fully-costed disaster-recovery site while only incurring a minimal increase in our infrastructure budget over the next decade.

All of this made Nutanix an easy sell to our director of technology. As a public school district, we have to count every penny and weigh costs against operational efficiencies and educational outcomes. Nutanix allows us to create a consistent and outstanding educational experience for our students with a comparatively modest investment.

Centralizing IT infrastructure can lead to the decentralization of learning. @MillardPS #NutanixStories

For example, instead of operating dedicated labs and buying hundreds of high-end workstations for students learning CAD, we now run Citrix virtual desktops on low-end laptops. Students can remotely access a fully functional high-powered graphics powerhouse either from the classroom or home. By centralizing our infrastructure, we have decentralized learning. By doing more with less, we have given our students the tools they need to succeed, no matter where they are.

We also standardized the way our schools set up their printers. Instead of letting building managers install printers wherever they felt they needed one, we created standardized printing hubs at key locations that also served as activity hubs. We manage them remotely from our primary data center and use Nutanix to create a consistent user experience at all our schools.

Nutanix shines in every category, be it ease-of-configuration, price, or functionality.

An Open Mind Opens Up the World

When I sat down to talk with Nutanix, I was solely focused on disaster recovery. But as I explored the solution's potential, I discovered we could do so much more with the platform, including retooling our data center, offering flexible and powerful learning technology to our students, and creating a long-term plan for our IT infrastructure.

Our partners at Choice Solutions and Nutanix were a huge help throughout our discovery journey. They reminded us that people power technology. Together we looked at our options and developed a comprehensive IT strategy that transformed the way we deliver a world-class education to the students at Millard Public Schools.

We went in with an open mind and asked what our vendors could do for us. That opened up a world of possibilities for our IT team, our teachers, our staff, and the 24,000 young learners who we serve.