



FORSYTH COUNTY SCHOOLS OFFERS UNINTERRUPTED DIGITAL LEARNING WITH VMWARE SOLUTIONS



INDUSTRY

EDUCATION (K-12)

LOCATION

GEORGIA

KEY CHALLENGES

- Keep up with growth rates of up to 1,800 new students per year
- Make sure digital learning tools are always available
- Support a bring-your-own-technology program with more than 80,000 devices connecting every day
- Be nimble enough to adapt quickly as education changes

SOLUTION

To achieve the capacity and resiliency that modern education requires, the district upgraded its VMware virtual server environment to vSphere 6.5 and replaced its legacy SAN with a vSAN stretched cluster.

BUSINESS BENEFITS

- Increasing capacity to enable current and future growth
- Supporting uninterrupted learning with near-instant disaster recovery
- Enabling students to bring and use whatever devices they prefer
- Offering a Virtual Academy for flexible digital learning

Forsyth County is a fast-growing, tech-savvy community with the seventh-largest public school system in Georgia. Many residents come and stay for the schools: Forsyth County Schools (FCS) has the highest county graduation rate, highest SAT scores, and highest financial efficiency rating in the metropolitan Atlanta area. However, as the district grows by 1,600 to 1,800 new students per year, it must keep up with families' high expectations and fast-changing educational requirements.

With technology integral to student experiences and more than 80,000 devices connecting to its network every day, FCS needed to make sure it could provide reliable service even in the case of a local disaster. The district decided to upgrade its VMware vSphere® environment and add a disaster recovery (DR) site 10 miles away. It replaced its legacy storage with a virtualized, all-flash stretched cluster using VMware vSAN™. As a result, FCS can now provide near-instant disaster recovery to support uninterrupted learning. And with VMware Horizon® virtual desktops, students can use whatever devices they prefer.

A public school district based in Cumming, Georgia, FCS serves 48,000 students and is the largest employer in the county with over 5,000 full-time employees and 1,500 substitutes. Since 2001, the district has grown 170 percent in terms of student population and built 21 new schools.

The Challenge

FCS has long been a model district when it comes to applying technology to learning, winning [numerous awards](#) for science, technology, engineering, and math (STEM) education. It was one of the first districts in the state to adopt a [bring-your-own-technology](#) (BYOT) program, encouraging students to bring their personal technology tools to school for learning.

As the county's population exploded, the district virtualized its data center with vSphere to improve scalability and manageability. However, the potential for a local disaster to interrupt learning still kept IT leaders up at night.

"We owe it to our students to have a technology infrastructure that's redundant, reliable, and relentless," says Tim Fleming, director of technology services at FCS. "We didn't want to be in the position where a local disaster could potentially take systems down for hours or days. That's no longer acceptable in education. Learning must continue, and it's our job to make sure the infrastructure is up to the task."

"Our vSAN stretched cluster gives us nearly instantaneous failover. If a disaster struck our primary data center, applications and data would still be available. Learning would continue uninterrupted."

TIM FLEMING
DIRECTOR OF TECHNOLOGY SERVICES
FORSYTH COUNTY SCHOOLS

VMWARE FOOTPRINT

- VMware vSphere 6.5 with Operations Management™ Enterprise Plus 6.6.1
- VMware vRealize Operations
- VMware vRealize Log Insight™
- VMware vSAN 6.6
- VMware Horizon 7.0

APPLICATIONS VIRTUALIZED

- Microsoft Exchange Server
- Microsoft SQL Server
- File/print servers
- Educational applications

PLATFORM

- Dell PowerEdge (vSAN ReadyNodes, All Flash)

PARTNER

Technology Integration Group

The district also wanted a data center platform that would allow it to adapt quickly as educational requirements change. FCS already offers a Virtual Academy that provides an immersive digital learning environment and is opening an Academy for Innovation that will focus on STEM fields. Students and parents can get updates and interact with the district via the FCS mobile app. As new teaching methods and new ways to apply technology come along, the district needs to be ready to embrace and adopt them.

"To help all students reach their potential, we need flexible technology," says Fleming. "In education, there's always going to be something different coming along tomorrow or next year. If your IT department is rigid and slow to adapt, you're going to be in trouble."

The Solution

The district turned to Technology Integration Group (TIG), a trusted technology advisor and VMware partner, for advice. TIG recommended a hyper-converged infrastructure using vSAN to build a resilient stretched cluster, giving FCS the ability to quickly fail over virtual servers between two geographically dispersed locations. If either site fails, vSAN uses the storage at the other site. A virtual witness appliance at a third site stores metadata about virtual machine objects, helping to keep datastore components available if the network connection between the two sites is lost.

"TIG explained how moving to vSAN would give us a seamless, vSphere-native architecture that no other storage could provide," says Curt Godwin, network operations coordinator at FCS. "We used a traditional SAN to support our previous vSphere infrastructure, which didn't offer the flexibility we needed for cost-effective DR."

With assistance from TIG, the district deployed a fully active-active, stretched cluster on 20 Dell EMC vSAN ReadyNodes split evenly between its primary data center and a DR facility 10 miles away. Each node is configured with 1TB of RAM and 345TB of storage capacity on solid state drives, providing fast performance in a small footprint. To make the most of all-flash storage, vSAN performs block-level deduplication and compression, saving the district more than 13TB of capacity thus far.

"Deduplication, especially with fast flash storage, makes the combination of vSphere 6.5 and vSAN 6.6 extremely compelling and useful," says Godwin. "We've been able to rapidly spin up services that in the past would have taken significant time and money to accommodate, and we have much greater flexibility and redundancy."

TIG helped the district complete the upgrade and migration in one week, and provided ongoing assistance and support. "TIG did an unbelievable job of helping us design and deploy a modern yet cost-effective data center architecture that can scale easily using commodity servers," says Fleming. "That fundamentally changes the level of service we can provide to students, faculty, and staff."

The district uses VMware vRealize® Operations™ to monitor its new infrastructure, gaining valuable insight into capacity and performance. To make its BYOT program even more flexible, the district uses 400 VMware Horizon virtual desktops to enable students to access Windows desktops and cloud applications from Chromebooks or any other device.

Business Results & Benefits

With its upgraded vSphere environment and vSAN stretched cluster, FCS has the capacity it needs to support the fast growth that it expects to continue well into the future. With sub-millisecond latency between sites, the district also meets recovery objectives that until just a few years ago could only be achieved by global organizations with huge technology budgets.

“Our vSAN stretched cluster gives us nearly instantaneous failover,” says Fleming. “We test it regularly, and we’re comfortable that if a disaster struck our primary data center, applications and data would still be available. Learning would continue uninterrupted.”

The district’s newfound resiliency also helps it manage planned maintenance and avoid downtime windows for patches and upgrades. Workloads can simply shift between locations, allowing administrators to improve security by applying patches immediately instead of waiting for an available window.

If there’s bad weather, building maintenance, or problems with a facility, learning doesn’t stop—the district simply switches to online learning. When new educational applications come along, it’s easy for IT to stage, validate, and optimize them before rolling them out to the entire district.

“VMware allows us to be much more nimble and respond faster to educational needs,” says Godwin. “Capacity is no longer an issue. We can give schools and teachers what they ask for without wondering ‘how can we make this work?’ We can stay focused on the future rather than trying to play catch-up, which is a great position for a school district to be in.”

The district expected that upgrading its infrastructure and DR capabilities would require hiring another full-time network engineer. However, vSphere and vSAN work together so seamlessly that the extra employee was not needed, allowing FCS to use that budget to augment other IT skill sets, such as security.

“Our VMware infrastructure is a resource multiplier, helping us focus on security, auditing, and enhancing the services we provide in the classroom,” says Godwin. “The schools have seen a night and day difference.”

Looking Ahead

With its servers and storage already virtualized, the district is considering taking the next logical step toward a software-defined data center by deploying VMware NSX® for network virtualization. “Using NSX would give us even greater flexibility, allowing us to configure virtual networks for each individual school or building, and make those topologies portable,” says Fleming.

