# Fulton County Schools Improves Application Performance by Nearly 90 Percent with VMware Virtual SAN

The award-winning Fulton County School (FCS) system sees technology as a catalyst for helping students reach their full potential. Already nearly 100 percent virtualized using VMware® vSphere™, FCS decided to deploy VMware Virtual SAN™ to improve performance of a critical student information system. The result was a dramatic boost in application performance - tasks which took 45 minutes earlier now took less than 5 minutes. Moreover, FCS was able to rack up tremendous cost savings of at least 50%, money that would help improve key student education initiatives.

The Fulton County School (FCS) system is the fourth largest in Georgia, serving more than 96,000 students in 94 schools and employing more than 14,000 teachers, administrators, and other workers. With a commitment to continual improvement, FCS has earned a reputation as a premier school system, winning many state and national honors for its schools, staff, and students.

## The Challenge

The goal of FCS' IT organization is to give teachers, students, and parents the tools and information they need to accelerate learning and prepare students for college and careers. "Our students were born with tablets in their hands," says Kenny Wilder, Director of Network Infrastructure at FCS. "We created the One-to-One Initiative, which provides tablets for students so that they can learn at their own pace."

Infrastructure readiness was a critical path to success for not only the One-to-One Initiative, but the broader aspects of implementing FCS' personalized learning goals. As part of preparing the infrastructure, the FCS IT organization knew it needed to tackle performance problems for a mission-critical application: the student information system eSchoolPLUS, which tracks student data and achievement.

The system ran on 500 virtual machines supported by 21 physical servers and used a traditional storage area network (SAN). Latency was a major problem, with the heavily used system serving as many as 8,000 users concurrently. The physical servers were due to be refreshed, and the vendor of the student information application suggested increasing the physical hardware footprint and capacity at the same time to improve performance.

"We were skeptical that replacing the hardware would improve performance," says Wilder. "That's when we started considering other alternatives such as hyperconverged storage that would eliminate the I/O congestion." At the same time, Wilder needed to find a solution that would not require hiring additional, specialized engineers to manage it. The technology needed to be easily managed by existing FCS staff.

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**INDUSTRY**
Education

**LOCATION**
Atlanta, Georgia

**KEY CHALLENGES**
- Critical systems performed poorly, with key tasks taking up to 45 minutes to complete
- Excessive latency during heavy usage with the traditional SAN solution
- Hardware refresh & expansion would be costly without improving performance

**SOLUTION**
FCS deployed VMware Virtual SAN to improve performance of the massive student information system by nearly 90%, while saving the school system at least 50% of infrastructure costs.

**BUSINESS BENEFITS**
- Reduces latency during peak usage from 50 milliseconds to less than 1 millisecond
- Improves performance on certain tasks by nearly 90%
- Frees up teachers' time and enables them to be more productive
- Eliminates hardware lock-in and provides at least 50% savings to the school system

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## VMWARE FOOTPRINT

- VMware vSphere
- VMware Virtual SAN
- VMware NSX
- VMware vRealize Operations and vRealize Log Insight
- VMware vCloud Air
- VMware Horizon Standard
- AirWatch

## APPLICATIONS VIRTUALIZED

- Student information system
- SAP (planned)
- Line-of-business applications

## PLATFORM

- Dell servers

## The Solution

After considering all the options, FCS decided to try VMware® Virtual SAN™—VMware's software-defined storage solution for hyperconverged infrastructure—because it was the only solution that had the performance horsepower to handle the large student information system and all of its data, while still meeting FCS's budget and IT goals

FCS only took two weeks to roll out the new environment for the student information system. Immediately, Wilder knew it was a success. Because Virtual SAN is seamlessly embedded within the VMware hypervisor, it eliminates extra network hops, which reduces latency and response times for users. "Using VMware, we reduced 21 physical servers down to a three-node cluster with local storage based on Virtual SAN," says Wilder. "It exponentially increased performance."

Wilder also appreciates that FCS can use any certified server platform and disks for deploying Virtual SAN, which helps the school system avoid hardware lock-in—and save money by using commodity servers.  Currently, FCS has two VMware clusters on Virtual SAN – one hybrid cluster and another all-flash cluster, each powering database and other line of business application workloads for their student information systems.

In addition to Virtual SAN, as part of its move to continue improving its infrastructure and operations, FCS also relies on VMware vRealize™ Operations™ and VMware vRealize Log Insight™, VMware NSX™, VMware vCloud® Air™, AirWatch®, and VMware Horizon Standard. Air Watch, in particular, helps FCS successfully manage, track, and secure the Apple, Windows, and Chrome devices used by students as part of the One-to-One initiative.

## Business Results & Benefits

In the previous environment, the student information system would experience 50 millisecond latency on its traditional SAN during heavy congestion.  With the new environment and Virtual SAN, latency is less than 1 millisecond. "What used to take our users 30 to 45 minutes to accomplish—entering grades or scheduling, for instance—in the old environment, now takes less than 5 minutes," says Wilder. "That frees up valuable time for our teachers that they can use to help students."

While the main goal was to improve performance of the student information system, Virtual SAN also delivers many other benefits. "Virtual SAN is less expensive than traditional SAN, takes up less rack space in the data center, and requires less power and cooling," says Wilder. "We've probably saved $400,000 by moving to Virtual SAN instead of upgrading the existing environment."

According to Wilder, Virtual SAN is also easy to learn and maintain, so FCS doesn't have to hire new engineers to manage it. "It only takes a few clicks to make changes to Virtual SAN," says Wilder. "Better yet, I can use my same VMware administrators to manage Virtual SAN without needing to hire SAN engineers."

## Looking Ahead

With the overwhelming success of moving the student information system to VMware's software-defined hyper-converged infrastructure solution, FCS is looking forward to migrating other systems as well. But that's only the first step. The school system is taking the software-defined approach to its data center as well. "Moving towards a Software-Defined Data Center will help us improve our security, take advantage of the cloud, and respond more rapidly to the needs of our teachers, students, staff, and parents," says Wilder.

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