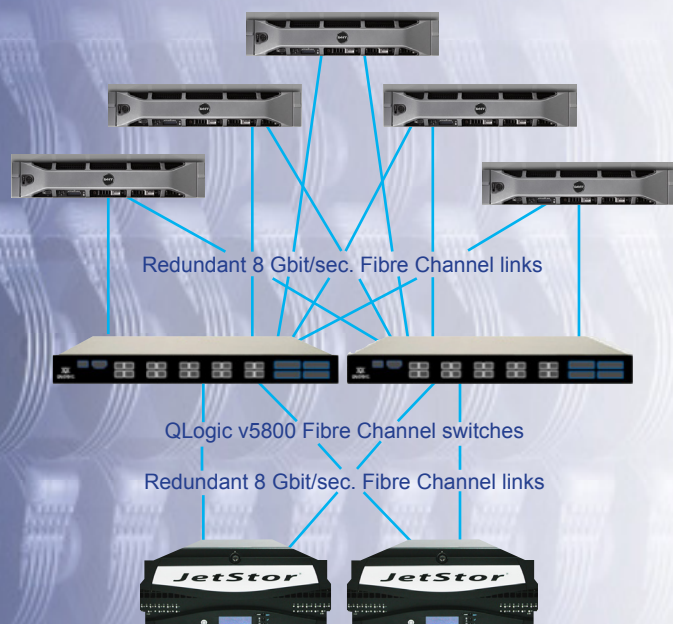


CUSTOMER TESTIMONIAL



“A Data Center in a Rack”

Dell PowerEdge R815 Rack Servers, each with a QLogic QLE10522 FabricCache adapter



AC&NC JetStor® SAS 724iFD RAID Arrays
25.6 TB

School District Lowers Costs & Improves Security by Virtualizing Desktops with Powerful JetStor® 724iFD Arrays

THE ORGANIZATION

Titusville Area School District (TASD) began in 1837 as a one-room, wooden building serving 100 students. Today, the public school system includes three elementary schools, a middle school, and a high school, and serves over 2,000 students with 286 employees. Located in northwestern Pennsylvania, it spans 200 square miles across three counties. But its mission remains the same—partner with parents and communities to ensure that students “achieve their fullest potential as life-long learners.”

THE CHALLENGE

Like many school districts, TASD must make do with limited resources and it had only a two-person IT staff to maintain over a thousand computers spread across six sites. Security patches and application updates were difficult to install in every individual device, which put the district at risk from malware. As a result, TASD faced the cost of hiring additional IT personnel.

An alternative was deploying a virtual desktop infrastructure (VDI). Computer would access operating systems and applications from servers in a data center. IT staff would maintain only centrally stored programs and could easily install patches and updates. However, VDI deployments demand extremely robust storage, and computer usage in schools only aggravates the problem. At the start of each class period, students all log in, flooding the storage devices with requests for applications and creating what is known as a “boot storm.” Yet the large, complex enterprise storage systems that could reduce boot storms were beyond TASD’s budget.

THE SOLUTION

Two JetStor SAS 724iFD 24-bay RAID Arrays from Advanced Computer & Network Corporation (AC&NC).

SYSTEM CONFIGURATION

- Five rack-mounted Dell R815 Rack Servers
- Five QLogic QLE10522 FabricCache adapters, one in each server
- Two QLogic v5800 Fibre Channel switches with redundant 8 gigabit (GB) Fibre Channel links
- Two JetStor SAS 724iFD 24-bay RAID Arrays, each with four 200 GB solid-state drives and twenty 600 GB hard drives, for 25.6 TB of storage capacity
- VMware® View 5.2

BENEFITS IMMEDIATELY REALIZED



By using an innovative combination of flash, solid-state, and mechanical storage to virtualize 1,200 desktops, laptops, and tablets, TASD significantly reduced its capital and operating costs while providing its students, teachers, and administrators with fast access to applications and the Internet. Every day, they can boot up their devices and log into class assignments without the latency of boot storms.

The district's IT staff merely updates master copies of applications that are centrally stored on the **JetStor 724iFD arrays** in the high school to ensure that every user is working with the latest versions. Additionally, security patches are now quickly installed on the master copies, enhancing the safety of devices across the district. The deployment so streamlined IT services that the district eliminated the need for, and costs of, additional IT staff.

By utilizing the solid-state and mechanical drives of the **JetStor 724iFD solutions** with the flash storage of QLogic FabricCache Adapters in its servers, TASD obtained blistering performance and immense storage capacity in a single rack. It avoided the pricey systems that would normally be required to deliver such a robust VDI, eliminating upfront capital costs and reducing its ongoing power and air conditioning expenses.

"The school district has a data center in a rack," said Thomas, TASD's IT manager. "Its solution has more power and capacity than much larger corporate data centers had not long ago. Moreover, the system is green because it lowers the district's operating costs and carbon footprint."

Other benefits of the VDI deployment include delivering any applications easily, even Microsoft Word to Android devices, and enabling teachers to access their files conveniently from home. The solution also can scale to support the district's remaining devices.

HOW WE DID IT

We engineered a powerful, cost-effective solution that features two key components, the first being the two **JetStor 724iFD RAID arrays**. Each 24-bay array has four extremely rapid 200 GB solid-state drives (SSDs) and twenty 600 GB hard drives spinning at a speedy 15,000 RPMs. "We could have used VMware-certified storage systems from any number of vendors but we chose these from AC&NC because they're screaming fast," explained Thomas. "When we ran a pilot with 250 virtualized desktops and just one **JetStor 724iFD chassis**, the device never broke a sweat and we knew we made the right decision. These systems are also rock-solid and require hardly any management, qualities that schools today need. If a problem ever arises, the devices will even email us and the district's staff."

The **JetStor 724iFD solutions** are configured for RAID 10 for both speed and data protection. They have redundant 8 Gbit Fibre Channel links to



The Titusville Area School District's high school (top) and its "data center in a rack" (bottom).

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two QLogic v5800 Fibre Channel switches. The switches, in turn, have redundant 8 Gbit Fibre Channel connections to five Dell PowerEdge R815 Rack Servers. Here lies the second component that makes this design so successful.

The servers have PCIe-based QLogic QLE10522 FabricCache Adapters that cache data to accelerate server I/O access. Each adapter has 200 GB of non-persistent flash storage for an aggregate of one terabyte. Operating systems and applications are stored on the SSDs in the JetStor 724iFD chassis and sent to the FabricCache Adapters for ultra-fast reads. This combination eliminates boot storms, even with 1,200 virtualized desktops. All writes are quickly stored on the hard drives of the JetStor 724iFD arrays.

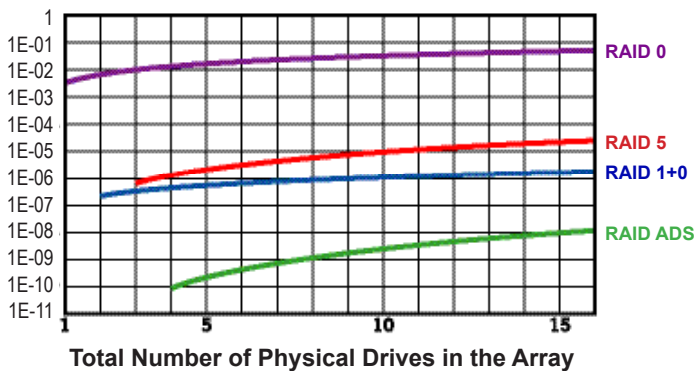
CONCLUSION

The installation at TASD shows that school districts can greatly economize on their IT services by deploying virtual desktops. "Bolstered by hybrid JetStor 724iFD RAID arrays with their SSDs and hard drives, schools can deploy high-density VDI solutions with the brute strength worthy of enterprise implementations," concluded Thomas. "These systems can cost-effectively meet the needs of educational institutions everywhere." John Frye, director of technology for TASD, agrees. "With clever engineering and products like AC&NC's JetStor RAID arrays, we're providing advanced data center capabilities," he said. "We're improving our educational services, streamlining IT, and saving money. It's a win-win for our students, staff, and communities."

ABOUT ADVANCED COMPUTER & NETWORK CORPORATION (AC&NC)

Advanced Computer & Network Corporation designs, manufactures and markets high-performance, competitively priced data storage RAID systems. With an extensive line of Fibre Channel, NAS, DAS, and hybrid flash storage solutions for any computing platform and operating system, comprehensive free technical support, and fast on-time product deliveries, AC&NC brings freedom of choice to all clients, from workgroup to enterprise. Our RAID systems ensure rapid, round-the-clock access to all of the information our customers rely on to move forward in the 21st century.

Probability of Data Loss by RAID Level



AC&NC JetStor® SAS 724iFD RAID Array



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