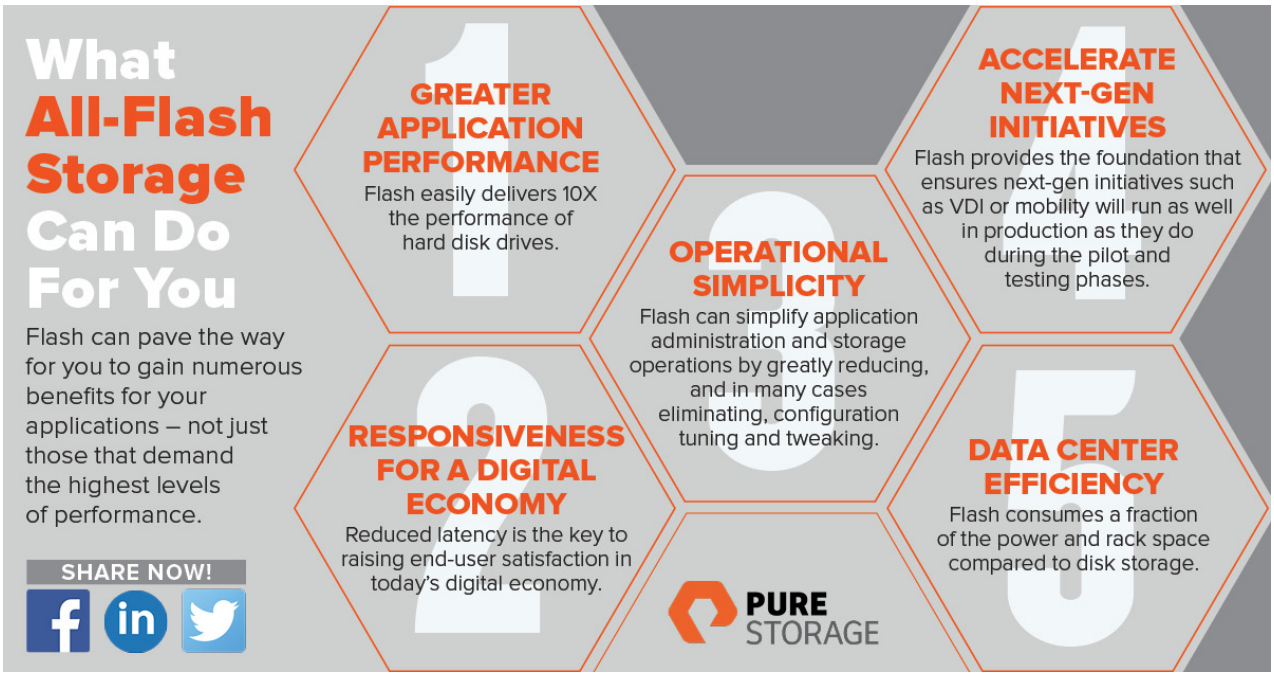
IT departments in education are under pressure to deliver improved services with limited resources. All-flash storage can help.

Is it time to upgrade your storage? Answer these 5 questions to find out

The changing nature of technology in education is putting enormous pressure on the underlying infrastructures at educational organizations. Simply put, most legacy data centers are not capable of delivering the performance required for today's workloads and learning environments, particularly as organizations embrace important new initiatives such as virtual desktop infrastructure (VDI) or high-definition video.

The performance gaps are most often rooted in legacy storage infrastructure. If you're not already running up against the limitations of your storage systems, you're likely to be soon. Take this brief assessment to see if it's time to move on from legacy hard-drive storage.

1. Are you deploying or do you plan to deploy VDI to reduce costs and simplify IT management?
2. Are you looking for new/better ways to support mobility (e.g., BYOD) in your school or district?
3. Have you suffered at least one "boot storm" over the past three months? (Boot storms occur in a VDI environment when many users are simultaneously logging on or doing other activities, causing a significant degradation in application performance.)
4. Do your users complain that their applications are sometimes slow and/or unresponsive?
5. Have you launched or do you plan to launch a distance-learning solution for students?



If you answered "yes" to any of the questions above, it may be your storage infrastructure that's holding you back.

Many IT departments in education have successfully turned to all-flash storage to alleviate the challenges described above. While the driving factor for considering flash is most often around performance, educational institutions have been surprised to discover that all-flash storage can also lead to simplicity as well as significant reductions in total cost of ownership (TCO).

In today's climate, the ability to demonstrate clear value and ROI is essential in getting any IT investment prioritized for funding. St. Luke's University Healthcare System, for example, achieved a 234% ROI on its deployment of an all-flash storage system for a virtual desktop infrastructure (VDI) environment, with a three-month payback, according to Forrester[1].

BENEFITS OF ALL-FLASH STORAGE

The three most common uses for all-flash storage in education, according to Pure Storage, are VDI, application performance, and distance learning.

Virtual Desktop Infrastructure

VDI offers significant advantages for K-12 and higher education. With VDI, schools can reduce costs and simplify management by using thin clients. They can also improve security and support mobility; deliver a broader range of applications to students and teachers; enable bring your own device (BYOD) initiatives; and centralize administrative functions such as patching and updates.

Challenge: As many schools, districts, colleges, and universities have discovered, a successful VDI deployment is wholly dependent upon the underlying storage infrastructure. With applications, data, and even operating systems centralized in the data center, the storage solution needs greater capacity and performance. The end result all too often is a boot storm, which occurs when many users are simultaneously logging on or using the system concurrently. Legacy hard disk drive solutions are simply not up to the task.

For example, when the Judson Independent School District in San Antonio first deployed VDI, its spinning-disk storage system buckled

under the pressure. It would take as much as 15 minutes for a student to log in to a lesson application, a totally unacceptable lag time given that their class periods only ran for 45 minutes.

Solution: All-flash arrays make it simpler and more cost-effective to deploy VDI. By moving to all-flash storage, the Judson Independent School District reduced application login time to 36 seconds.

Another school system, the Waxahachie Independent School District in Waxahachie, Texas, improved uptime from 80% to 99% after deploying an all-flash array. Flash storage also helped the district simplify its storage management by moving away from the legacy SAN that required significant expertise and proprietary software.

A move to all-flash storage helped the Judson Independent School District reduce online application log-in time from 15 minutes to 36 seconds.

Mobile users at the University of Portland also gained a big boost from an all-flash solution for VDI. Smartphone- and laptop-wielding students and faculty expect anytime, anywhere connectivity. The university's VDI environment and advanced all-flash storage system lets students connect anywhere, from their dorm room using a laptop, from a student kiosk, or even from the university's satellite campus in Austria.

For more case studies like this,
visit **www.purestorage.com/education**

Application performance

IT infrastructures in education support a wide range of databases and applications for teaching and administration. Even at smaller schools, the IT infrastructure must handle back-office and administrative tasks, teacher records and resources, and instructional tools such as language labs and music composition software.

Challenge: Until a recent upgrade, the Castilleja School in Palo Alto, California, was using a hybrid storage system that used spinning-disk storage fronted by cache memory using flash. Applications were running slowly, impacting administrative tasks as well as the learning experience for students and teachers.

The poor performance had other negative effects as well. For example, the IT team had to perform system backups at night, making the school more vulnerable to data loss. In addition, the hybrid solution was not very efficient, with only a 15% data reduction with compression.

Solution: A move to all-flash storage helped Castilleja address the challenges caused by the hybrid solution. With compression and deduplication, Castilleja is achieving a consolidation of about 3.5:1, significantly reducing the storage overhead prior to deploying the all-flash array. In addition, the all-flash solution has eliminated application latency issues and is enabling multiple daily backups without affecting application performance.

For more case studies like this,
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Distance learning

Distance learning and online education continue to grow in importance. A 2014 study found that nearly three-quarters of chief academic leaders said online learning is critical to their long-term strategy[2].

Challenge: Distance learning places huge performance, capacity and scale demands on a school's storage infrastructure. As course content moves from books and PDFs to online videos and streaming services, application performance is paramount – and the storage burden grows. At the University of Portland, IT leaders discovered that the university's spinning-disk

storage system could not keep up with the school's growing population of distance learners.

Storage solutions in distance learning environments must be able to scale quickly and easily, with IT being able to add capacity and accelerate performance to satisfy the needs of growing numbers of users and, increasingly, data-intensive applications.

Using Pure Storage FlashArrays can deliver a positive economic impact of more than $1.9 million, according to Forrester.

Solution: All-flash storage solutions are important to the success of distance learning environments because they deliver a dramatic and necessary improvement in performance, as well as a much more predictable cost structure for scalability. The right solution will help to reduce costs through a less frequent refresh cycle, simplified manageability, and reduced energy consumption. A new flash array helped the University of Portland reduce its annual computer refresh budget by 20 percent.

Better performance and availability of applications and coursework often contribute to revenue growth in higher education through better courses and higher levels of user satisfaction.

Check out our white paper, When Flash Makes All the Difference at **www.purestorage.com/education**

CONCLUSION

Flash storage is a breakthrough technology for the education market. As the price of flash has fallen, market leaders such as Pure Storage have been able to deliver all-flash solutions with a total cost of ownership (TCO) that is now lower than traditional spinning disk storage. Forrester estimates that using Pure Storage FlashArrays can have significant economic impact, driven largely by business benefits, improved productivity, simplified deployment and management, and cost savings[3]. In the case of St. Luke's, Forrester calculated risk-adjusted benefits of $1.8 million over three years vs. implementation and operating costs of more than $536,000, equating to a net present value (NPV) of nearly $1.3 million.

With Pure Storage all-flash solutions, your organization can take important steps forward in improving the learning experience, lowering costs, supporting mobility and BYOD, improving operations, and building a technology infrastructure that will be the backbone of your future.

1 "The Total Economic Impact™ Of Pure Storage FlashArray Storage Solutions For VDI," Forrester, March 2016

2 2014 Survey of Online Learning Grade Level: Tracking Online Education

3 The Total Economic Impact of Pure Storage FlashArray FA-400 Series Storage Solutions," Forrester Research, August 2014

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