

Issue Brief

Enabling New Efficiencies for Education IT

Server and storage consolidation help IT better support academics and business operations

Servers and storage systems are scattered here, there and everywhere — and not always in the data center. That is a common story for IT in the education sector, from small K-12 districts to large universities.

Education IT leaders at all levels increasingly recognize that current data centers are no longer able to support how their institutions deliver learning and conduct business. As a result, they are looking for new technologies that will make data center resources more efficient, flexible and easy to manage. These technologies include virtualized computing and cloud-based storage, which K-20 education IT professionals surveyed by the Center for Digital Education indicated are the top two technologies they plan to implement in the near term.¹

These survey responses reflect three trends that are impacting education IT today: virtualization and cloud, operational efficiency, and flexible infrastructure for application development and delivery.

Trend 1: Evolving the Data Center to Hyperconvergence for Virtualization and Cloud

The traditional image of a higher education data center is a cavernous room filled with rows of equipment racks and whirring, blinking boxes. In K-12, the “data center” may be a school’s equipment closet. Both realities are disappearing fast as advances in virtualization technology pack more capabilities into smaller devices.

Data centers in many industries are evolving to take advantage of virtualization, especially for servers and storage. The goal: to capture the associated benefits of higher efficiency and optimization, as well as reduced capital and operational expenses. The data center model is also evolving to support private cloud and IT as a service in order to accomplish IT projects faster and more effectively.

Virtualization enables hyperconvergence infrastructure that integrates servers and storage in a single appliance. The systems leverage industry-standard hardware and software-defined storage, enabling easy scalability and management. This model replaces the expense and complexity of traditional storage-area networking (SAN) and network-attached storage (NAS) systems, which use separate hardware and management.



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The software-defined storage pools the storage and coordinates the operations among all hosts in the cluster. New capabilities are delivered as upgrades to software, avoiding the expense, downtime and disruption of hardware upgrades.

Well-designed hyperconvergence infrastructure in the data center offers several additional advantages for IT operations and service delivery:

- ✓ Cost reductions for infrastructure, software licenses, cabling and other elements, with predictable budgeting for data center growth
- ✓ Easier, on-demand and linear scalability of compute and storage resources, which reduces the need to overprovision resources in anticipation of potential performance demands
- ✓ Flexibility to support new IT offerings, such as analytics, that help academic leaders improve services for student success and business staff improve daily operations
- ✓ Simpler management with fewer server and storage silos and a self-healing server cluster design

Several of these advantages were gained by William Jessup University,² where the server and storage infrastructure was straining to keep up with fast-growing student enrollment and new academic programs. By implementing a hyperconverged solution, the university has a single platform for storage and compute resources that enables high-availability operation. The solution also reduced rack space by 94 percent and produced 88 percent savings in power costs.

How Hyperconvergence Reduces TCO

Lower Capex	Lower Opex
<ul style="list-style-type: none">✓ Fewer physical servers✓ Eliminate standalone storage systems✓ Reduced need for cabling; equipment racks; and elements for power, cooling and connectivity✓ Smaller data center or equipment room footprint 	<ul style="list-style-type: none">✓ Fewer licenses for operating system, database and application instances✓ Reduced costs for power and cooling consumption✓ Lower requirements for infrastructure maintenance and support 

Trend 2: Improving IT's Operational Efficiency

As technology becomes a bigger part of delivering, supporting and assessing student learning, the IT department is facing more demands for more resources. The catch: There isn't a commensurate rise in budgets, so IT can't always add new staff to maintain and manage those resources.

This challenge can be overcome when more intelligence is built into the IT infrastructure. For example, more intelligent infrastructure allows IT to automate or even eliminate many tasks such as storage provisioning and tuning. The time savings from automation allow IT staff to focus on improving service delivery and performance.

Managing the separate server and storage systems in each school required a lot of time for the IT team in Missouri's Blue Springs School District.³ When the servers were scheduled for replacement, the team determined that creating a central data center for the district would be simpler to manage and reduce costs. Using hyperconverged infrastructure allowed the district to consolidate servers and storage in a single central rack, which simplifies training and management activity for IT staff. It also avoids problems caused by inconsistent processes and implementations in each school.

Trend 3: Any Application at Any Scale

From a smartphone app used by a few students or staff to a complex information system used by hundreds, the ability to deliver any application at any scale is essential for education IT. This scalability requires an infrastructure that can quickly

deliver the right resources for compute requirements, storage capacity and application performance.

Yet different applications commonly used in school districts or higher education institutions require different types of resources and performance levels. For example, digital learning content typically needs more storage capacity than compute capability, while transaction-oriented applications are often compute-intensive without requiring as much data storage.

IT infrastructure that is designed for easy scalability supports the growing resource requirements of application deployment and delivery while minimizing impact of that growth on IT operations.

Building an IT infrastructure that can support the high — yet very different — demands of SQL systems and a Microsoft Exchange environment was the challenge facing Joseph Chamberlain College⁴ in Birmingham, United Kingdom. The IT team needed servers and storage that could reliably handle the heavy stresses of very high use. After deploying a hyperconverged solution, the college easily meets current demands and can support new applications with a 95 percent improvement in provisioning time for new virtual machines.

Today's Lesson: Simpler Is Better

At all levels, education institutions need IT resources that will truly support the academic mission. By considering the data center trends discussed in this issue brief, IT can make the technology infrastructure simpler while also delivering services that improve teaching and learning.

Endnotes

1. Center for Digital Education IT Infrastructure Survey, 2015.
2. www.nutanix.com/resource/william-jessup-university-achieves-94-rack-space-reduction-and-easy-scalability/
3. www.nutanix.com/resource/blue-springs-school-district-makes-educated-decision-move-nutanix/
4. www.nutanix.com/2015/01/27/joseph-chamberlain-college-dramatically-improves-end-user-experience-infrastructure-agility-nutanix/

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