The Path to
IT Modernization in Higher Ed

An enterprise cloud approach gives colleges and universities a cost-effective foundation for new data-driven initiatives.

nstitutions of higher learning are starting to apply data-intensive strategies in almost every facet of their work.[1] Data analytics and other advanced IT tools give colleges and universities powerful new ways to support student achievement and engagement, and to enhance life on campus. Video is playing a greater role in instruction, and large datasets have become a staple in some faculty research. The more a higher education institution capitalizes on data, the greater the demand this data usage places on its IT infrastructure.

Colleges and universities can't alleviate the growing strain on their IT resources simply by buying more hardware and adding staff. Faced with public concern over rising tuitions, and with fierce competition for students, these institutions are under continual pressure to control costs. For IT professionals, that means finding less expensive ways to run internal systems.

A modernization strategy based on the use of a hybrid enterprise cloud can help colleges and universities get the processing power and storage capacity they need to achieve their goals, while also reducing capital expenses and operational costs.

Demands on Campus Infrastructure

As an education institution embraces innovations such as data analytics and new instructional technologies, it faces a continuous need for greater IT capacity. As colleges and universities enroll more students, both on campus and online, that growth boosts the need for capacity as well.

In the past, IT leaders just added more infrastructure. That usually meant making large, upfront investments to accommodate their needs over the next five to seven years. However, if planners missed the mark in their estimates, it triggered serious financial consequences. If the processing power and storage

capacity they purchased turned out to be inadequate, the institution would have to undergo an expensive forklift upgrade and replace the entire infrastructure. In other cases, planners overestimated the growth of data use. Based on those figures, the institution tied up cash in excessive infrastructure, depriving other important projects of crucial funding.

To gain greater infrastructure efficiencies, colleges and universities moved some of their infrastructure to the cloud. This is a good way to support data volumes that are hard to predict, are growing quickly or that fluctuate over time. Cloud-based processing and storage allow an institution to pay only for the capacity it uses, scaling that usage up or down as needed over time.

However, as demand for capacity becomes more stable and predictable, an on-premises solution is cost efficient. It also offers advantages in areas such as uptime, security, privacy, data governance and compliance.

Hybrid Solution: Reduces Costs, Simplifies Management, Accelerates Performance

To gain the benefits of both public and private clouds, one of the most promising strategies is to adopt a hybrid solution. In this approach, organizations implement workloads, applications and data across both public and private environments. The most cost-effective way to implement a private on-premises cloud is to build it on a hyperconverged infrastructure.

Hyperconverged infrastructure replaces traditional blade servers, storage area network (SAN) fabric and storage arrays. This is done by putting the compute and storage into a single server and adding a software-based control system that allows a small or a very large environment to be managed as a single system. This has a big impact in relation to improved space, performance and management time needed.

When a higher education institution uses hyperconverged infrastructure, it gains several advantages. First, it saves money. Planners no longer need to worry about over-provisioning the private infrastructure as a hedge against unpredictable usage. Since each node in a hyperconverged solution contains all the necessary elements in one package, the institution can acquire just the units it needs. As enrollment increases, or the institution starts to conduct more data-intensive activities, the IT department adds more capacity, paying for what it needs in a predictive, linear fashion.

A hyperconverged infrastructure also cuts operational costs. When organizations migrate from traditional multi-vendor solutions to a hyperconverged solution, with all the components in a module provided by one vendor, often they find they need only one-tenth, or even one-twentieth, as much rack space as they did before. This smaller server footprint requires less supporting equipment, such as cabling, racks, and power and cooling systems. The institution may even need fewer licenses for operating systems, databases and applications, and it spends less on energy.

The hyperconverged solution also simplifies management. Instead of using multiple tools from different vendors to monitor operations, administrators gain a single view to manage computing, storage, virtualization and other functions. Reducing management time by as much as 71 percent, a hyperconverged infrastructure helps the IT department accomplish more work with a smaller staff. By reducing both capital and operational costs, a hyperconverged infrastructure has been shown to provide an average ROI of 510 percent.[2]

IT departments also enjoy much faster deployments when they switch from a multi-vendor, multi-hardware environment to a single platform. Infrastructure implementations that used to take months are reduced to just a few days — or, in some cases, half a day.

Another advantage lies in application performance. By providing seamless access to data via high-speed PCI connection to local SSD, an enterprise cloud solution using hyperconverged infrastructure on-premises offers much less latency than users see in a traditional SAN environment.

Enterprise Cloud on Campus

Edmonds Community College (Edmonds CC) in Lynwood, Wash., implemented an enterprise cloud with hyperconverged infrastructure to replace a blade server infrastructure and SAN backend that were reaching the end of their support. The legacy system included more than 100 physical servers on 10 server racks and a supporting system — networking, electrical wiring, power management and cooling — that IT Manager Rod Halverson termed "a logistical nightmare."

Managing the legacy system demanded a great deal of time. "Not only did we have to perform updates on all of the servers, storage and switches separately and in exactly the correct sequence, we had to make sure all firmware versions were compatible with each other," Halverson said.

A great deal has changed since Edmonds CC migrated to the new infrastructure. The data center virtualized 80 of its 100 servers onto 12 physical blades attached to two SANs, cutting the number of server racks from 10 to 4. It now takes much less energy to run the infrastructure, and the need for cooling has been cut in half.[3]

Although the IT department still needs to perform various updates to the infrastructure and hypervisor, a "one click" feature allows an entire data centers' worth of hyperconverged infrastructure to be updated with the click of a button. The process will do a full health check of the entire environment and then proceed to update all firmware, drivers, storage fabric and even the hypervisor. No overly complex project management plan with multiple teams is needed as all of the compatibility and process is fully automated. Months of work can be reduced to a click. The new infrastructure is also more reliable and offers better performance.

"Our DBA [database administrator] reported that his SQL server was responding much quicker than before, and our network admin remarked that the software package he was running was 'far less sluggish,'" said Halverson.

The Way Forward

Given the trend in higher education to provide more sophisticated and well-targeted services to students, and the power of data-driven tools to foster those services, demands on the campus IT infrastructure will increase in coming years. Enterprise cloud based on hyperconverged infrastructure offers an efficient, flexible way to meet the evolving data requirements while keeping costs under control.

1. Bridget Burns, "Big Data's Coming Of Age In Higher Education," Forbes, January 29, 2016, https://www.forbes.com/sites/schoolboard/2016/01/29/big-datas-coming-of-age-in-higher-education/#53f54ee41c41
2. Matthew Marden, Eric Sheppard, "Quantifying the Business Value of Nutanix Solutions," IDC White Paper, August 2015, https://www.ciosummits.com/Online_Assets_Nutanix_Whitepaper_-_IDC_TCO_Report.pdf
3. https://www.nutanix.com/company/customers/all-customers/edmonds-community-college/