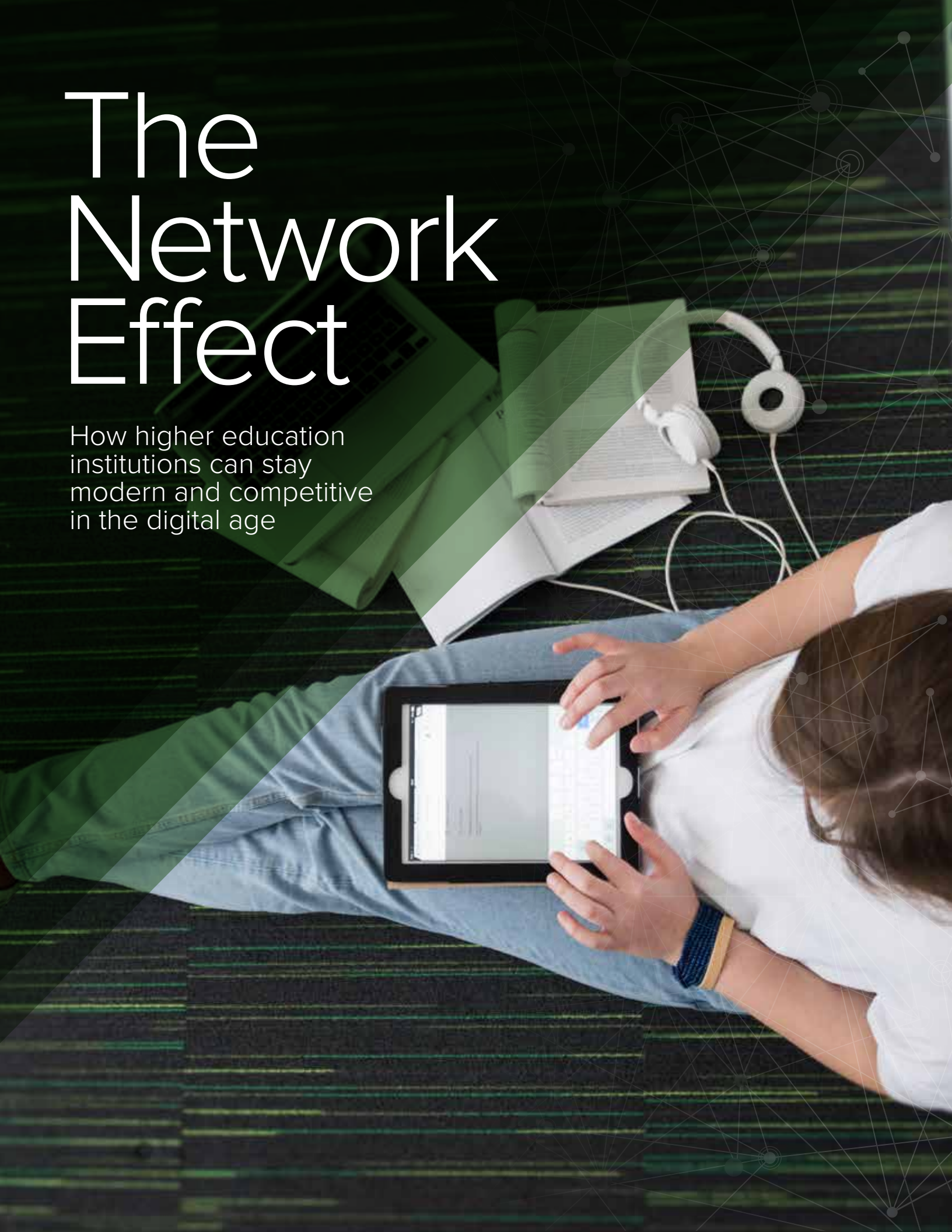
The Network Effect

How higher education institutions can stay modern and competitive in the digital age



INTRODUCTION

When Pfeiffer University designed a new campus in downtown Charlotte, Dr. Ken Russell and his six-member Digital Transformation and Technology Team opted to put new networking equipment in a custom-designed, glass-walled data room.

"What I wanted to do was not just fix the network, but position Pfeiffer for the 21st century in a way that showed folks even a small university can have a big impact with the right environment," says Russell, the university's vice president of digital transformation and CIO.

Pfeiffer's new network is front and center in more ways than one. The modern installation was configured with high-density access points, powerful switches and robust security appliances. This provides students and faculty with multigigabit capacity, connecting them to online resources, including video and personalized content, wherever they are on the Charlotte campus. Just as importantly, the glass-walled data room serves as a highly visible reminder of the university's commitment to improved student experiences, including emphasizing lifelong opportunities and creating an individual learning plan for each student.

Across colleges and universities of all sizes and missions, the need for modern solutions is clear. Higher education caters to some of the nation's most tech-savvy citizens: students. As part of the first generation to be digital natives from childhood, today's college students have never known a world without the internet. In fact, 94 percent of adults ages 18 to 29 own a smartphone.[1] As students arrive on campus, they expect instant connectivity — from streaming Netflix and playing video games in their dorms, to receiving notifications from mobile apps that guide them to their next class or inform them of relevant campus activities.

Just like the students they serve, college campuses are becoming more digital. Blended learning is booming — 90 percent of college and university deans say their campuses will increase online learning over the next decade[2] — and even traditional lecture halls and classrooms are suffused with digital content, such as video, lecture notes and other online curricular materials. Smart campus initiatives are automating a range of functions, and growing concerns about student safety are prompting a redoubled emphasis on both physical and cybersecurity.

Tech-savvy students and smart campuses require a new kind of network, one which provides superior performance, scalability, reliability and manageability, while providing advanced analytics and automation. By addressing their network challenges, higher education institutions can position themselves to meet the needs of students and faculty — now and in the future.

CONNECTED CAMPUSES: MEETING THE NEEDS OF TODAY'S STUDENTS AND STAFF

Colleges and universities are actively competing for students and confronting questions about the sustainability of the campus, all while tackling complex technology challenges. These key challenges include:

Student demands and expectations. Studies show students now bring an average of seven connected devices to campus, including mobile devices, laptops and computers, smart TVs and gaming consoles. One university, for example, has capped the maximum number of devices per student at 12 — a number that would have been unthinkable even a few years ago.

Students expect seamless connectivity everywhere they go on campus and enough bandwidth for work and play. As institutions compete for incoming students, reliable digital access is a must-have.

"Wireless is no longer an option," says Noore Ghunaym, infrastructure services manager at Albany State University in Georgia, which creates a separate sign-on process to allow prospective students to connect during campus tours. "For the generation of students that are coming in, Wi-Fi is a necessity. We want to make sure students are happy so they stay here."[3]

The campus experience. While connectivity is a requirement, digital services that accentuate the campus experience can be the differentiator that helps colleges and universities attract and retain students and faculty. Students expect simple online processes to register for classes and receive relevant information as they go about their daily tasks. Many colleges offer applications that notify students when their laundry is done, allow them to send assignments to the library printer remotely, and provide them with location-enabled alerts about events, directions and coupons as they walk by the bookstore or dining facilities.

Academic needs. Colleges and universities are developing plans to integrate digital content into traditional lecture halls and classrooms. Plus, online programs and blended learning opportunities allow students to livestream or view captured video of lectures, removing worry of missed classes or snow days. For example, DeVry Education Group, a collection of eight institutions offering programs in business, health care, law and technology, plans to roll out video-connected classrooms where students

At Illinois College, eSports Attracts a New Breed of Student Athlete

Illinois College is differentiating itself in a competitive market for prospective students by seeking a new kind of student athlete: video gamers.

The college's eSports program, launched in fall 2017, recruits students to be part of a competitive gaming team that, like other athletics programs, offers private scholarships to the best players.

"We wanted to be one of the first in the country to really embrace these students," Stephanie Chipman, the college's vice president of enrollment management and college marketing, told a local television station.

Competitive gaming requires flawless connectivity. As part of a broader campus network revamp featuring Cisco Meraki, the school's gaming center was upgraded with robust technology to allow high-bandwidth student gaming to take place without a hitch.

can wirelessly connect to the whiteboard on their devices — whether they're in or out of class.

"We can't afford to not have wireless coverage that is beyond stellar," says Jim McMaken, former director of network operations. "We want students to focus on the class, not the technology we're using to present the class."[4]

In-classroom technologies and digital content were ranked as higher education's top two technology priorities for 2018-19, according to a Center for Digital Education (CDE) survey.[5] In addition to attracting students to campus, more colleges are working to keep students engaged and progressing in their programs of study as part of broader retention and student success strategies. Institutions are using analytics and early alert systems to identify struggling students at risk of dropping out and provide targeted resources to assist them.

Smart campuses. Today, more than eight in 10 higher education institutions are either using or plan to use Internet of Things (IoT) technology, according to CDE research. Many start with low-hanging fruit, such as adding internet-enabled controls to lighting, HVAC and other building systems to save costs. Plus, IoT will drive the connected services students and staff expect in their day-to-day experiences, from targeted notifications from appliances like washing machines and printers, to automatic notifications that can help students navigate academic buildings and learn about nearby activities and events. Doing so will dramatically increase the number of connected devices, increasing reliance on the network.

"We can't afford to not have wireless coverage that is beyond stellar."

Jim McMaken, Former Director of Network Operations, DeVry Education Group

Security. Across campuses, there is an expectation to assure the physical safety of students and staff, as well as to protect both campus networks and the confidential student information and research data they contain. Implicit in this is securing student and staff devices, as well as the growing number of IoT devices — all of which are targets for malware and other cyber attacks. Institutions must balance the need for security with the need for students and staff to have access to relevant information.

Data, analytics and the cloud. As in the corporate world, the volume of available data on campuses creates new opportunities for analytics. In a 2017 CDE survey of 138 higher education officials, 46 percent said they were interested in implementing data analytics solutions and 64 percent identified data-driven decision-making as the top perceived benefit.

With a controllerless environment, one IT staff member at the University of the Incarnate Word was able to install more than 500 access points and easily configure them using the network's cloud-managed dashboard.

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At the same time, IT staff must manage a range of systems, including those hosted on-premises or in the cloud. These solutions and the data they gather and store must be tightly integrated to take advantage of the power of analytics. Doing so requires networks to scale as institutions develop a strategy to harness and use this ample data.

EMBRACING OPPORTUNITIES WITH THE CONNECTED CAMPUS

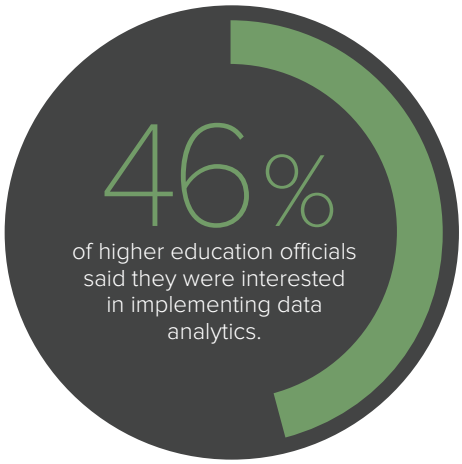
Connected campuses rely on an underlying network, and evolving technology needs have prompted many institutions to rethink their existing IT infrastructure. As earlier generations of wired and wireless networking solutions lack the capacity to meet growing demand, colleges and universities must take a careful, comprehensive look at their networks. Take these steps to evaluate your connected campus strategy:

Assess campus needs — both across the institution and within individual departments. No two campuses — or the students they serve — are alike. Among the areas that IT departments must consider when assessing networking needs are their organizational structure (central or decentralized), physical characteristics, commuter vs. residential student makeup, and the impact of planned initiatives such as smart campus/IoT ventures or digital learning projects. Higher education has a long history of siloed initiatives, so it's also vital to survey stakeholders and identify needs across all departments.

New technology presents opportunities to streamline network infrastructure management across multiple campuses and departments. For instance, with its previous network solution, DeVry Educational Group had difficulty assessing bandwidth needs. The IT staff manages more than 2,000 access points on eight campuses spread across the U.S. and the Caribbean.

"We could tell the access points were relatively overloaded, but we had no visibility — we couldn't see why or what," says McMaken.[6]

On some campuses, students struggling to connect learned to stand next to access points or space themselves out to improve connectivity. Even the local IT support staff had limited visibility into the network, making resolving access issues raised by students and staff a difficult, time-consuming process.



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After choosing Cisco Meraki wireless access points, DeVry has not only realized increased network capacity and speed, but both the central and local IT staff have better visibility through the web-based Meraki dashboard. On DeVry's Dominica campus, for example, networking staff used a heat map of a large presentation hall to identify where to place additional access points; previously, local staff had to use a handheld Wi-Fi monitor to identify problem areas.

"We've been able to empower field IT professionals because they have so much more visibility than before," McMaken says.

Consider the cloud. As institutions realize the limitations of traditional, on-premises solutions, they are moving more systems, applications and services to the cloud. These cloud-managed solutions provide

several advantages, including easy set up, simplified management and remote access.

For instance, the University of the Incarnate Word — a 12,000-student college in Texas — chose a controllerless environment for its residential networks. This allowed one IT staff member to install more than 500 access points and easily configure them using the network's cloud-managed dashboard.

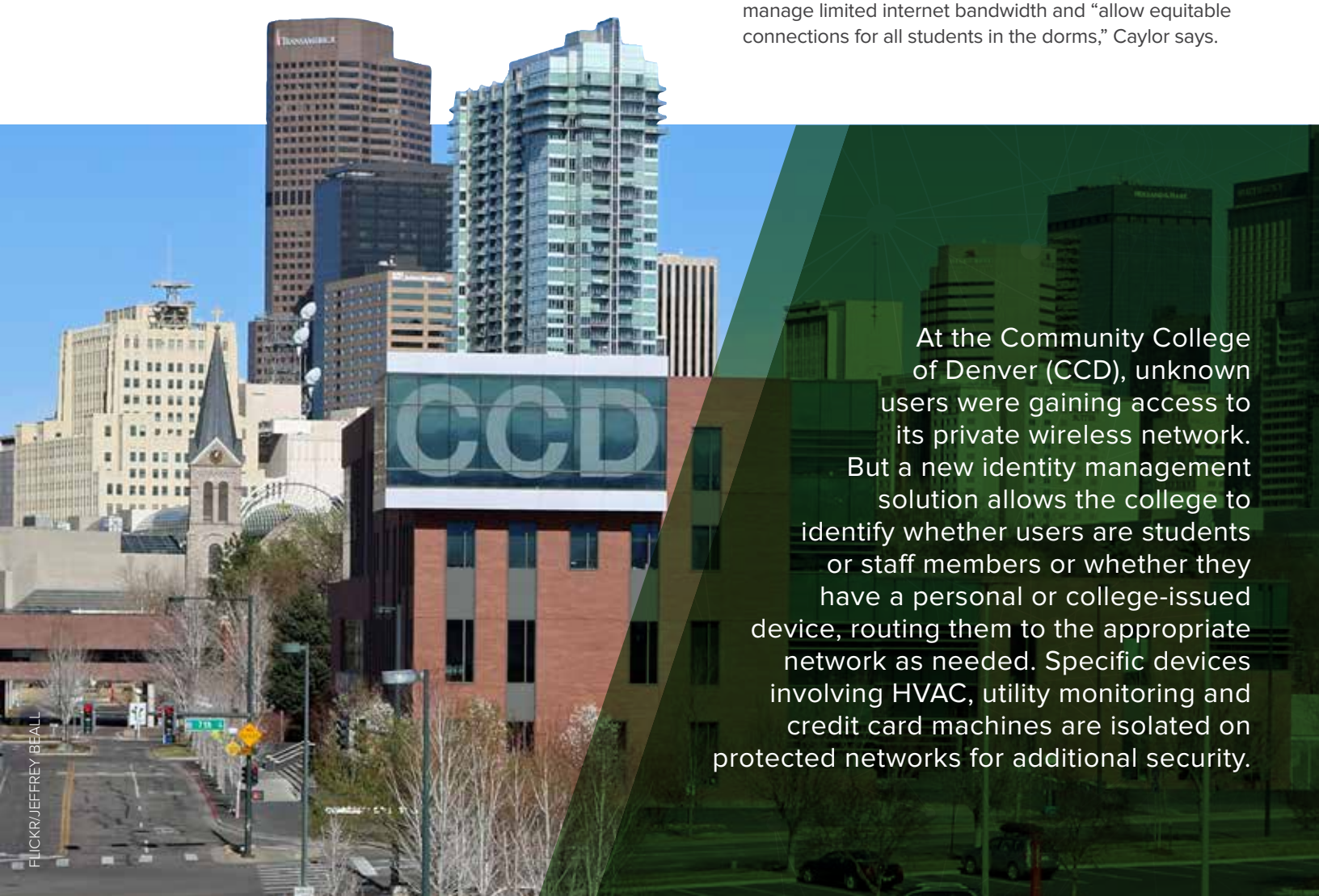
"The hardest part is getting all of the access points hung up," says Neil Schroeder, senior director of digital infrastructure and user services. "The deployment itself is a snap ... [the IT staff member] had never touched the product line before and was able to master it, deploy it and monitor the setup."[7]

Determine connection needs. Where will students need to connect? Are additional access points needed? What kinds of uses — in the classroom, dorms or research centers — require the most bandwidth or need to be prioritized?

Solutions that offer the ability to prioritize bandwidth based on location, time and application will become necessary as more devices come online. Prioritizing bandwidth for users across campus helped Ottawa University in Kansas ensure students had network access during peak times such as football games and in high-need areas like dorms.

"In a university setting, the demand on the network just keeps increasing, especially as students use bandwidth-guzzling applications and devices like Netflix and Xbox Live," says Adam Caylor, manager of network operations.

To address growing networking needs across campus, Ottawa decided to ditch its grab-bag assortment of vendors to adopt a single solution from Cisco Meraki. By using traffic shaping at the Kansas campus, located 35 miles from a metropolitan area, the IT team can manage limited internet bandwidth and "allow equitable connections for all students in the dorms," Caylor says.



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At the Community College of Denver (CCD), unknown users were gaining access to its private wireless network. But a new identity management solution allows the college to identify whether users are students or staff members or whether they have a personal or college-issued device, routing them to the appropriate network as needed. Specific devices involving HVAC, utility monitoring and credit card machines are isolated on protected networks for additional security.

"Everyone can get online — [students] can still watch their shows and other users can still get on and play games or stream music," he adds.

A cloud-managed solution helped Ottawa's small IT staff address connection issues, particularly as their network responsibilities grew. When the university established a new residential campus located halfway across the country in Surprise, Ariz., Caylor stressed that the "simplicity of being able to manage everything from a single pane of glass" made this expansion that much easier.[8]

Review network security. Higher education IT teams must protect school networks from outside infiltrators and ensure internal users can access the resources they need. Visibility into the actions of network users, paired with a robust firewall and endpoint security measures, can ensure students and staff are accessing the network securely.

At the Community College of Denver (CCD), for example, "[unknown users] were getting into our private wireless," says Chris Arcarese, director of IT. "We didn't really know what was going on." With a new identity management solution, the college now identifies whether users are students or staff members, or whether they have a personal or college-issued device, routing them to the appropriate network as needed. Specific devices involving HVAC, utility monitoring and credit card machines are isolated on protected networks for additional security.

To address internal issues, IT security solutions must be combined with policies governing responsible network use. At CCD, policies are reinforced by firewall rules that block access to peer-to-peer websites and unwanted protocols like BitTorrent.

Evaluate physical security needs. While video surveillance solutions address security needs by locating students in times of crisis and helping to find stolen or misplaced items, they can also present significant bandwidth and storage issues. Storing recorded video on-premises or in the cloud can be very expensive and take up significant network bandwidth that needs to be allocated for student use. With clunky network video recorders (NVR) connected to most security camera solutions, it can be challenging to retrieve video footage when an incident occurs, or to know when a security camera is down, leaving gaps in coverage. Plus, these solutions are generally outdated, leaving video footage unsecure and easily hacked or stolen.

New security camera solutions offer ways to overcome these challenges. Video footage stored directly on the camera removes the need for extra storage fees and additional bandwidth. And, with no NVR or extra software, IT and security teams can focus on making sure students and faculty are safe, rather than managing complex security cameras.

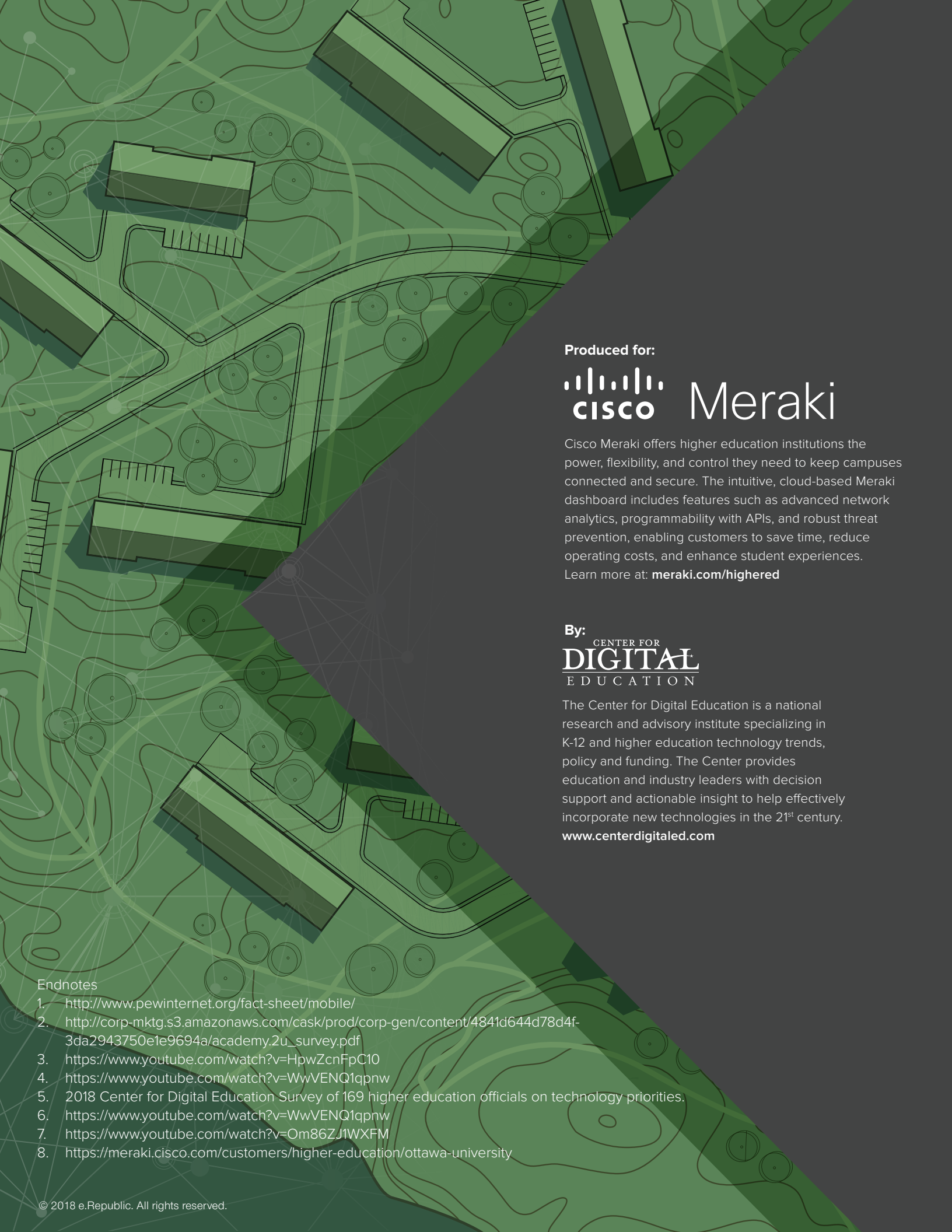
Such was the case at Illinois College. As part of a broader network refresh, the Illinois College IT team deployed Cisco Meraki MV security cameras across campus. The team is now able to manage its security cameras from the same dashboard it uses to manage the rest of the network. Previously, storing and managing a traditional security camera solution would have strained the college's network, but Meraki MV eliminates this problem. Motion storage capabilities allow the IT team to keep only footage where motion takes place, allowing them to save relevant video for several months. When an incident does occur, the team can use motion search functionality to quickly find the incident and share with law enforcement as needed.

CONCLUSION: BRINGING IT ALL TOGETHER

In an increasingly competitive higher education landscape, attracting and retaining students by improving the overall campus experience with new technology, personalized academic programs and enhanced safety is paramount. In addition, connected campuses are paving the way for institutions to take advantage of IoT technologies and analytics in ways that will ensure they remain relevant and responsive for many years to come.

For higher education leaders to support the connected campus, they need to develop robust networking strategies. This requires them to evaluate networking solutions that meet their schools' connection and security requirements, while being responsive, flexible and scalable to address evolving needs. But most importantly, they will have to take the lead by promoting a vision of their campuses' connected future.

This piece was developed and written by the Center for Digital Education Content Studio, with information and input from Cisco Meraki.



Produced for:

cisco Meraki

Cisco Meraki offers higher education institutions the power, flexibility, and control they need to keep campuses connected and secure. The intuitive, cloud-based Meraki dashboard includes features such as advanced network analytics, programmability with APIs, and robust threat prevention, enabling customers to save time, reduce operating costs, and enhance student experiences. Learn more at: **meraki.com/highered**

By:

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Endnotes

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