Network modernisation in education
The foundation for student success and digital transformation

Alcatel·Lucent
Enterprise

Table of contents

Overview

Modern campus network is a must

Campus networks at educational institutions globally have reached a tipping point, and there are multiple reasons why.

The pandemic caused significant upheaval, shining a light on the evolving requirements for teaching, learning and campus safety and making clear the expectation that educational institutions would evolve in synch with these needs.

Even as these institutions are being asked to do more, though, they are facing financial constraints and need options to manage their environment and service delivery in a cost-effective way.

Additionally, while most networks at universities, colleges and kindergarten to grade 12 (K-12) schools were ready for upgrades prior to the pandemic, IT teams were suddenly and unexpectedly diverted to adapt networks, applications and services to meet urgent needs. At the same cybersecurity threats have grown in frequency and complexity, and IT must adopt a potent defence strategy.

1   How technology is shaping learning in higher education. McKinsey & Company, June 2022.

Now this combination of evolving needs, financial challenges and deferred network priorities has forced the issue, making an upgrade to a modern campus network a must.

The modern campus network is agile, reliable, and secured against cyberthreats. High-performance wired and wireless connectivity throughout even the most sprawling campuses supports student and staff initiatives and broader digital transformation goals in a cost-efficient and sustainable manner. And it securely extends services beyond campus to wherever students and staff are located.

Higher education: Technology has transformed learning

"Research shows that students and faculty are eager to continue using new classroom learning technologies adopted during the pandemic, but institutions could do more to support the shift."

McKinsey & Company[1]

Early adopters already benefitting

Educational institutions around the world recognise their existing networks simply cannot provide the speed, resilience or flexibility needed to meet modern educational requirements and expectations.

At the post-secondary level, forward-thinking institutions are moving beyond short-term fixes and are overhauling their networks to meet immediate and long-term needs. Examples include:

- University of Johannesburg in South Africa
- Wagner College in the United States
- University of Sriwijaya in Indonesia
- Paula Souza Center in Brazil
- Dresden Student Network Working Group in Germany

At the K-12 level, schools and school districts are upgrading their networks to support the massive increase in student devices and provide more interactive and engaging learning opportunities. Baldwin-Whitehall School District, Verona Public Schools and Parsons School District USD 503 in the U.S. are just three examples of institutions that have transformed their networks to provide personalised, next-level educational opportunities.

K-12: Student devices drive network demands

The legacy networks in K-12 schools were not designed for the one-to-one computing model being adopted today. In 2021, 90% of U.S. school district leaders reported a device for every middle and high school student and 84% reported the same for elementary students.[2]

2   What the Massive Shift to 1-to-1 Computing Means for Schools, in Charts, EducationWeek Special Report, May 2022.

Drive success with a smart, connected campus

The modern campus network makes it easy and efficient to support large volumes of users, data, devices, applications and systems end-to-end across wired and wireless networks, including off-campus locations. It also provides fast access to the high-capacity bandwidth to support applications and services that improve student success from every perspective:

- **Educational:** Deliver flexible and engaging student-centric learning opportunities and more rewarding teaching opportunities
- **Mental health:** Create a nurturing and supportive community that helps students stay on track to complete their education
- **Physical safety:** Improve campus safety and resilience to protect students, faculty and staff

Deliver advanced, student-centric services

In our increasingly digital, post-pandemic world, many students now expect access to both hybrid and remote learning environments. In one global study in 2022, more than 80% of students wanted online access to some course activities and more than 40% wanted access to a fully online education.[3]

3   If Students Had Their Way, Hybrid Learning Would Be Here To Stay. Forbes, May 2022.

Modern campus networks empower educational institutions to permanently accommodate student preferences, learning styles and need for flexibility. Today's network infrastructure was hurriedly adapted during the pandemic to meet urgent and supposedly temporary requirements. In contrast, the modern network infrastructure was designed and built from the ground up to provide the security, reliability and performance needed for consistent, high-quality online course delivery.

The modern network also empowers students and faculty to incorporate new and more sophisticated digital learning tools and technologies into their courses — whether they are participating on campus or remotely. For more engaging and interactive educational experiences, students can take advantage of HD video, virtual reality, augmented reality and other cutting-edge technologies.

For primary and secondary students, a modernised network fully supports personalised learning pedagogy, 1:1 device classrooms and secure adoption of science, technology, engineering and mathematics (STEM) and science, technology, engineering, arts and mathematics (STEAM) curricula.

Create a nurturing and supportive environment

Academic and societal pressures have long caused students mental grief, particularly in higher education. However, the stress and uncertainty of the past few years – combined with rising rent, food and tuition costs – have pushed student anxieties to new levels. As a result, many students are struggling with low energy, concentration issues, depression and other challenges that hinder educational performance.

The modern campus network supports critical applications and services that help to counter mental health challenges:

- **Online campus communities** give students an easy way to collaborate, communicate with professors, engage in meaningful activities and connect with other students
- **Digital nudge technologie**s provide reminders, alerts and resources that help students stay on track and feel valued

For more insight into how technology can help address the mental health crisis in education, read our White Paper, Mental health on campus: The critical role of a student-centred community.

Improve campus safety and resilience

Technologies that protect the physical safety of everyone on campus and secure their personal data and course content are crucial. A secure and reliable, high-capacity, high-speed network that covers indoor and outdoor spaces meets these requirements:

- **To improve collective safety**, mass notification systems can instantly alert students and staff to emergency events such as a fire, flood, gas leak, approaching storm or other threats
- **To improve individual safety**, panic buttons, safety hotlines and alarms can be implemented across campus and centrally monitored through a campus-wide safety dashboard
- **To improve campus resilience**, the network continues to deliver online learning and critical campus services during and after unexpected events and emergencies. And it includes robust cybersecurity mechanisms that protect against unauthorised network access

Learn from online education pioneers

In addition to student success initiatives, the modern campus network helps educational institutions streamline operations, reduce costs and build their brand. By adopting an engaging approach to teaching using cutting-edge technology environment, institutions can build a reputation as future-oriented, within an environment that offers a safe, caring and appealing place to work and study.

The modern network gives IT teams a single, automated network and a single point of management that eliminates operational complexity and accelerates tasks, ensuring a seamless journey for students and staff.

Futureproof your network

To maximise network benefits and return on investment, educational institutions must choose network solutions that meet today's needs – including to defend against cyberthreats – and allow smooth, cost-effective evolution as new needs arise.

Affordable and flexible network approach

The fast-changing nature of technology means no educational institution can be certain of its long-term requirements for networks, applications or services. These uncertainties make it even more important to choose network approaches and solutions that will continue to make sense and pay off in the long term.

Five factors give educational institutions the flexibility they need to manage network expenses and evolution in the way that's best for their organisation:

1. **Flexible deployment models** with the ability to move to the cloud immediately, or gradually shift from on premises deployments to the cloud when the time is right
2. **Flexible financial models**, including capital expenditure (CAPEX) approaches or operating expenditure (OPEX) approaches that provide Network-as-a-Service (NaaS) to eliminate the need for large expenditures, accelerate network upgrades and enable predictable payments
3. **Built-in features and functions** that are available with no extra fees or additional deployment effort for a faster, easier and more feasible approach to advancing network capabilities
4. **A comprehensive family of network solutions** that makes it fast and easy to adopt new and more advanced tools, technologies, applications and services with no worries about compatibility issues
5. **Environmentally friendly solutions** that reduce power consumption and cooling requirements to help lower energy consumption and achieve sustainability goals

Adopt a zero trust security strategy

A zero trust network access (ZTNA) security strategy provides no implicit trust to any user, device, or application – no matter where it is located. A ZTNA strategy is the most effective way to reduce the risks of both external and internal threats and to manage the fast-changing cyberthreat landscape.

There is no specific technology or solution set that makes a network zero trust. Instead, every network solution must support mechanisms that contribute to the zero trust paradigm. These mechanisms include:

- **End-to-end encryption:** To protect communications and information from origin to destination, every hardware and software element in the network must include native encryption capabilities that are approved by security agencies
- **Unified network access control:** When the same access control mechanisms are embedded into every network solution, IT teams can define which users, devices and applications can access different types of functionality in a consistent way. As a result, they can more effectively limit network exposure and fully comply with security and privacy policies.
- **Macro- and micro-segmentation:** This combination is needed for a comprehensive approach to network segmentation. Macro-segmentation divides the network into distinct zones based on factors such as function, application, or user group to isolate critical assets and resources from the rest of the network. Micro-segmentation takes a more granular approach, segmenting the network at the individual user or device level to provide finer control over network access and enforcement of security policies.
- **Consistent application of security policies:** With a single network that is comprised of hardware and software elements from the same product family, IT teams can efficiently apply a uniform set of security policies across the network. This consistency reduces the risk that different policies or policy versions will introduce vulnerabilities in the network.
- **Integration with cybersecurity solutions:** The ability to seamlessly integrate and interoperate network solutions with existing or best-of-breed cybersecurity solutions such as firewalls and intrusion detection systems creates synergies that lead to a more consistent and context-aware approach to cyberthreat mitigation

For more insight into zero trust cybersecurity strategies and solutions, read our White Paper, [Cybersecurity for world-class teaching and learning](#).
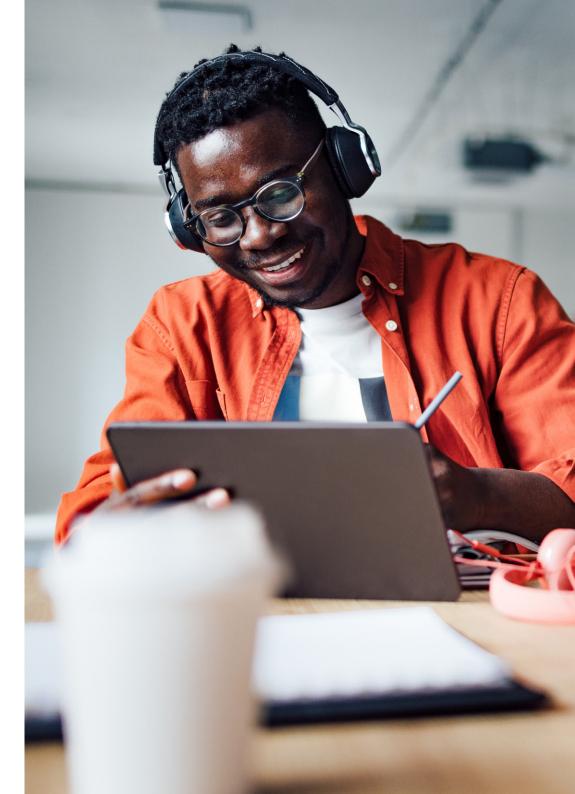
Streamline network operations and management

Network solutions that make it faster and easier for IT teams to deploy new applications and services and keep the network running at peak performance to save time and money. They also reduce the burden on IT teams, allowing these valuable and skilled resources to focus on strategic priorities rather than routine and mundane tasks.

The simplicity starts with a single network infrastructure, a single, unified operating system and a single-pane-of-glass network management platform. This cohesive approach significantly reduces the complexity, costs and human errors that inevitably occur with multiple diverse networks, operating systems and management platforms.

To increase operational efficiency and reduce the need for staff training, solutions must be straightforward to deploy and intuitive for users. Software-defined solutions and the ability to automate workflows minimise the need to perform manual tasks to further streamline network operations.

Network solutions that are based on open standards are designed to easily interoperate with other systems and technologies. As a result, IT teams can avoid the hassles and additional points of failure and vulnerability that are introduced when adapters, converters and workarounds are required to overcome incompatibilities.

Finally, network solutions must come with simplified, hassle-free licensing, strong warranties and technical support services. These elements are essential to eliminate unexpected, hidden fees as new or different requirements emerge and to ensure every network element provides maximum value over its lifespan.

Choose the right partner for success

Upgrading to a modern, campus-wide network is a significant undertaking, so it is extremely important to work with a network partner that provides deep experience, technical expertise and a flexible, cost-effective approach. With the right partner, strategy and network technologies, educational institutions can create a secure, agile and high-performance Ethernet and Wi-Fi network that supports:

- More personalised, engaging and fulfilling learning and teaching experiences
- Digital transformation initiatives across campus

The network partner must be attentive and able to effectively assist educational IT teams at each stage of their network modernisation journey — from needs assessment to network implementation, daily operations and technical support over the full lifespan of all network solutions.

The partner's approach to network infrastructure and technologies is critical. A converged network that aligns network capabilities with academic, research and business priorities today and tomorrow is the optimal approach from operational and financial perspectives. This requires:

- **Secure, flexible and scalable network infrastructure solutions** that can deliver campus-critical applications and services while simplifying and accelerating every aspect of network deployments, operations and management
- **Open, interoperable solutions** that provide the agility to extend network capabilities without being tied to expensive solutions or locked into specific vendors
- **Cost-effective, fully supported solutions** that provide easy access to new capabilities and functionality within budget constraints

Verify industry credentials before choosing a partner

Before choosing a network partner, ask candidates to provide a wide range of examples demonstrating they have successfully helped other educational institutions achieve their goals.

Alcatel-Lucent Enterprise offers concrete proof of its ability to help educational institutions globally, including:

- California State University in the U.S., which has saved hundreds of millions of dollars with a network modernisation strategy that encourages innovation, removes barriers that impede student success and provides new services for students
- Linkoping University in Sweden, which has cut per-port costs by 80% with a modern network solution that gives network users a consistent, high-quality experience and frees IT teams to focus on value-adding and interesting tasks and services
- University of Technology, Sydney, which has simplified Wi-Fi access and increased network resilience to improve the user experience for students, staff and guests
- Gwinnett County Public Schools, which is using its advanced network foundation to overcome the digital divide among students and create a secure and supportive environment for students to learn
- Whiteriver Unified School District, which is using a reliable, secure wired and wireless network to help more than 2,400 Native American students and staff explore the world outside their Arizona reservation

"Alcatel-Lucent Enterprise solutions enable hybrid education systems for current and future needs. And transform us into a smart campus to generate competitive and qualified graduates."

Dr. Ani Cahyadi, M.Pd, Head of the Project Implementation Unit at UIN Antasari Banjarmasin in Indonesia

Learn more

To learn how we can help your educational institution upgrade to a single, secure, modern campus network, visit our website or contact us today.

Alcatel·Lucent @
Enterprise