WITH AN ENTERPRISE-GRADE NETWORK, THE FUTURE IS BRIGHT

SCHOOLS CAN OFFER DIGITAL LEARNING WITH AN ETHERNET NETWORK AS A STRONG FOUNDATION

COMCAST **BUSINESS** **B4B** BUILT FOR **BUSINESS**

Whether it's expanding a distance-learning program, improving classroom technology, dealing with the influx of mobile devices or preparing for the onslaught of Internet-connected sensors and appliances, educational institutions have their work cut out for them. As services like these become part of the fabric of education, educators from K-12 schools to universities are grappling with how to make sure their networks can handle these advances. Often, they are finding that their networks can't keep up.

Many of these advancements won't be possible without an enterprise-grade network. Backed by a massively scalable network with an extensive reach and built on advanced technology, schools can change and grow as needed to serve students, faculty and administrators.

MEETING CHANGING NEEDS

Within the past several years, K-12 schools, colleges and universities have steadily adopted technologies and services that require greater network reliability, higher bandwidth, greater scalability and even global reach.

K-12 schools, for example, have increased their reliance on the cloud for online and distance learning, online testing and assessment, cloud-based student and research portals, and Internet-enabled classroom tools. Yet according to an eRepublic K-12 network survey, the majority of respondents indicated that their existing network connectivity can't currently meet all of those needs. Colleges and universities face similar challenges in keeping up with students' demand for ubiquitous connectivity, expansion of distance learning programs, and a general move to cloud-based services.

Today's K-12 schools rely heavily on mobile devices to enable learning.

In addition, educational institutions have embraced mobility in a big way, drastically increasing the demand for pervasive connectivity. According to a survey from Project Tomorrow, today's K-12 schools rely heavily on mobile devices to enable learning. The survey found that 86 percent of principals believe it is important for students to have access to mobile devices to help with schoolwork, and more than half allow students to use their own mobile devices at school to support learning.

That number is even higher in colleges and universities. According to a survey from Citrix, 58 percent of students own three or more mobile devices. The same survey also found that while 94 percent of higher education leaders believe that students today should be able to remotely access all the information, data, and software they need on any device at any time with a consistent user experience, only 34 percent of campuses have the network infrastructure necessary to make that belief a reality.

But that's only the beginning of what tomorrow's educational networks will have to support. The growing importance of the Internet of Things (IoT)—Internet-connected devices ranging from sensors and appliances to educational tools—increasingly provide important data that schools can use to improve productivity, efficiency and services. For example, sensors on a school bus could interact with students' mobile phones to take attendance. In the classroom, Internet-connected devices can provide teachers with real-time information on which students need more help.

IoT has a lot of potential for special needs students as well. For example, deaf students can wear sensor gloves while signing, and the signals can be transferred back to the computer and translated into written language. Visually impaired students can use assistive devices to automatically enlarge font size as needed.

On college campuses, there are many possibilities for IoT as well. On one campus today, for example, students use their smartphones to check when a washer is free in their dorm. At another, lab freezers in a biology lab send email alerts when the temperature rises or falls too dramatically. And of course there are numerous possibilities in all areas of research. In both K-12 and higher education, the Internet of Things is expected to help automate buildings and improve security. Major adoption of IoT in both K-12 and higher education is only four to five years away, according to EDUCAUSE.

THE CASE FOR AN ENTERPRISE-GRADE NETWORK

It is clear that many of today's WANs weren't designed for the needs of the future. Most WANs use MPLS and a combination of legacy technologies such as T1, OC3 and frame relay. In addition, many networks depend on copper infrastructure from multiple service providers, rather than fiber, making troubleshooting and repair difficult and time-consuming.

Schools and universities can seamlessly provide services by running on a proven, enterprise-grade network that is easily scalable, uses the latest technology and is easy to expand in both reach and capacity.

Scalable, high-performance network. Educational institutions must be able to adapt to changing requirements and technology and add new applications and services over time without worrying that network capacity is a showstopper. With an enterprise-grade network, scalability is not an issue. Dependable, enterprise-grade networks, made of pure Ethernet from end to end, are built to scale. A school district may only need 100 Mbps of connectivity today, but with a pure Ethernet network, it can easily scale to 1 Gbps as needed. Schools can increase speeds instantly.

Highly resilient. An effective enterprise-grade network uses the latest technology, such as fiber over Ethernet. With Ethernet comes a resilient, scalable carrier-grade network. This allows for speed and ease of repair. An Ethernet backbone also allows network providers to offer the most cutting-edge management tools, such as real-time remote monitoring and the ability to see packet latency from one end of the network to the other. It also allows for remote testing capabilities throughout the circuit. All of this helps increase operational efficiency, simplifies troubleshooting and reduces the mean time to repair when issues do occur.

Expansive geographic reach. Another important capability of an enterprise-grade network is the ability to service a school district or university from end to end. These networks are built for organizations with a vast geographic reach, since fiber access plants are spread out throughout suburbs and rural areas. In contrast, legacy WAN services tend to be centralized in downtown areas and can have limited access in locations far outside city limits.

Traditional WAN services typically terminate into one location within a building, such as the basement. With enterprise-grade networks, fiber can be run to every floor or other location in a building required by the organization.

Culture of innovation. Access to a large, proven network also provides access to the types of innovations carriers with reach, scale and vendor relationships can offer. Enterprise-grade carriers offer new technologies as they reach the market. This creates a culture of cutting-edge innovation and services that is well suited to a collaborative learning environment.

<div style="text-align: right;">

92%
of K-12 educators agree or strongly agree that a modern network infrastructure is linked to their district's success.

— E-Republic:
K-12 Fall Network Survey

</div>

THE FOUNDATION OF DIGITAL LEARNING

Leaders at Mercersberg Academy, a private college prep boarding school in Pennsylvania, knew that its 100 Mbps Ethernet service wouldn't be able to meet its ambitious educational technology needs, which included requiring all faculty and students to use tablets as their primary method of communication or meet continued needs for more bandwidth to improve video streaming and Internet performance across the 300-acre campus. The school moved to Comcast Business' 500 Mbps Ethernet Dedicated Internet and Comcast Business TV, which provided download speeds five times faster than the previous network—and at lower cost.

At Rockford Career College, the challenge was finding a way to support the college's bring-your-own-device (BYOD) program, online classes, e-textbooks and other 21st century learning tools. Its previous Internet download speed was only 12 Mbps—not nearly enough for today's educational technology needs and mobile habits. The college deployed a fiber-based, 100 Mbps Ethernet Dedicated Internet access connection from Comcast Business that can scale to 10 Gbps as needs grow. In addition to meeting its goals, the new enterprise-grade network will allow the college to begin offering new IT certification classes.

By choosing a proven, enterprise-grade network, schools and universities can be confident that they can support technology or services on the roadmap.

ENTERPRISE-GRADE NETWORK CHECKLIST

❏ Make sure it can service your organization end to end

❏ Ensure that it has a geographic reach in every area where the organization may expand

❏ Check the vendors statistics: How much bandwidth is it capable of providing? Are customers satisfied?

❏ Ensure that it uses advanced technology and keeps up with the latest networking advances

❏ Make sure it services the offsite data centers your organization uses or may use in the future