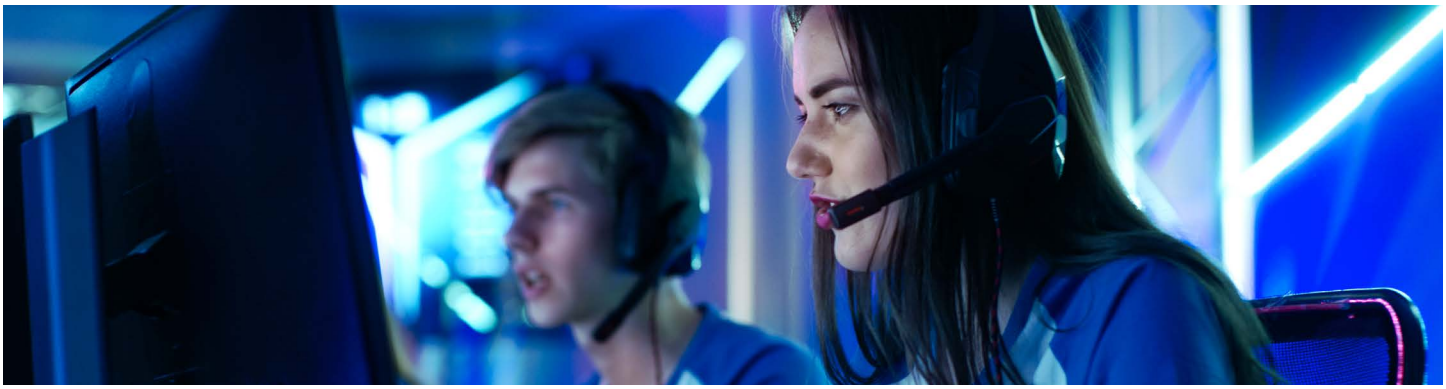
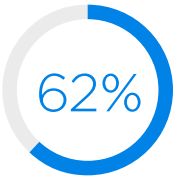
WHITE PAPER

Deliver a connected campus experience with high-capacity networking



Higher education bandwidth demands are rising exponentially as the number of internet-connected devices and data-rich applications on campus multiplies. About six-in-ten adults ages 18 to 29 say they are constantly online.[1] Institutions need a significant amount of capacity to support their research, learning and student success initiatives — and that's especially true for large R1 research universities.

To keep their institutions ahead of the curve, campus IT leaders must understand their own network demands and have a forward-looking plan for addressing them. Leaders also need to partner with a connectivity provider that can set up their college or university for success by offering opportunities to easily expand network capacity as demand rises.



of adults ages 18 to 29 say they are constantly online.[2]

Demand is surging

From cutting-edge research in campus labs to intelligent automation powering university facilities, today's higher-education institutions are at the center of new advancements.

High-capacity networks make these innovations possible, but each year the amount of bandwidth needed to support them increases. In response, institutions are adding more network capacity — networks with speeds up to 100 Gbps are becoming more common on campus. Consider these examples:

- The University of South Florida recently upgraded its network capacity to 100 Gbps, up from 10 Gbps. In explaining the decision, CIO of USF Information Technology Sidney Fernandes said: "An R1 institution like USF needs to ensure that our faculty have the fastest possible connections to the internet."[3]
- Texas A&M is in the process of building a Next-Gen Network to meet the university's growing bandwidth demands. On a typical day, more than 100,000 devices connect to the campus network, the university says — transferring over 60 terabytes of information.[4]

As the pressure to attract and retain students heats up, ensuring reliable, high-speed internet connectivity everywhere on campus could become a key differentiator for colleges and universities. To provide an exceptional student and faculty experience, institutions will need a strong network infrastructure with enough bandwidth to support innovation.

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Understanding key stressors

On smart campuses, self-service kiosks speed up food service lines. Smart machines alert students when their laundry is done. Wireless beacons pinpoint the location of students who need emergency help. Interactive screens and high-performance WiFi networks enhance the fan experience at sporting events.

Each new innovation requires additional network capacity. Along with the rise of smart campus infrastructure and the desire for students to be connected anywhere on campus, here are three other key network stressors.

College esports

According to the National Association of Collegiate Esports, more than 260 colleges in the United States and Canada now have varsity esports programs.[5] For collegiate esports teams, winning doesn't just take extraordinary skill and gaming acumen. It also requires a top-notch technology infrastructure. Matches involve rapid-fire action and split-second decision making and speed matters. Even the slightest delay in network transmission could put teams at a considerable disadvantage.

Each gamer will need at least 5 Mbps of bandwidth during matches. Now consider there are multiple players on each team and colleges might have multiple teams entered in a tournament. Campus IT leaders have to make sure their networks can handle this additional traffic with no lag time that could disrupt performance.

The challenge is further compounded by the fact that esports spectatorship involves live streaming. Fans might be watching matches on a streaming platform from their dorm room or another campus location while students who attend esports competitions in person expect to be able to watch live streams of their favorite players' gaming action on a giant screen.

Students expect reliable, high-speed wireless connectivity all over campus — especially in their dorms.

On-campus housing networks

On-campus housing networks are a key driver of bandwidth demand. The biggest consumers of on-campus bandwidth are video streaming services, but gaming, music and cloud-based content aren't far behind.

Meanwhile, the number of bandwidth-using devices that students bring to campus has expanded well beyond computers, smart phones, gaming systems and TVs to include wearable technologies, voice-controlled assistants and even drones.

Institutional research

Modern scientific experiments can generate hundreds, thousands or even millions of gigabytes of data. Often, researchers must transfer the data to remote collaborators for analysis or to cloud-based data centers for storage. Sending large data sets can be challenging and puts a significant strain on campus networks.

To handle these loads, many universities have created separate research networks with multi-gigabit capacity. One model that institutions are adopting is the creation of a "science DMZ," or a scalable network enclave that sits at the perimeter of a university's enterprise network and accommodates high-performance science applications while excluding general-purpose computing.

Planning for the future

How can leaders plan for such rapid growth in network use and keep ahead of bandwidth demands? Here are three critical strategies.

Understand usage trends. Effective planning begins with knowing current network utilization, where this traffic is coming from and how it's trending. Having full visibility into network usage over time gives IT leaders the insight needed to plan successfully.

Anticipate growth. Consider what new applications your network will need to support in the next five to 10 years that aren't being supported now. Talk with deans, department heads, students and other stakeholders to learn what capabilities they expect and what innovations might be coming down the road.

Create a path for expansion. Design and implement flexible campus networks that match current demands but can expand easily to support future requirements. Making small, incremental improvements every few years is much easier than having to rip and replace your entire infrastructure. Choose a network connectivity partner that offers opportunities for growth.

How Spectrum Enterprise® can help

Spectrum Enterprise has made it easy, quick and cost-effective for colleges and universities to get high-capacity circuits with up to 100 Gbps connectivity for the following services:

- **Dedicated Fiber Internet** is a fast, symmetrical service with speeds up to 100 Gbps that delivers a dedicated internet experience to keep up with the high demands of your network. The service is backed by a 100% uptime service-level agreement (SLA) guarantee all the way to the hand-off point at your location.

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"Anytime we do run into a roadblock, I have been able to reach out to Spectrum Enterprise technicians, who are great at giving advice. I've actually learned a lot about my own profession from dealing with Spectrum Enterprise over the years."

Nat Keebler, Assistant Director of Infrastructure and Technology, Laurus College

- **Ethernet Services** allows you to meet ever-growing data needs by connecting locations with a fast, reliable wide area network (WAN) solution backed by a 100% uptime SLA guarantee and built on a dedicated fiber infrastructure. Bandwidth up to 100 Gbps is available.
- **Wavelength Services** is a high-availability, secure and dedicated solution, that delivers consistent, ultra-low latency performance to support data-intensive applications at speeds up to 100 Gbps.

These high-speed services support a variety of uses on campus — from esports, streaming video and rising demands on on-campus housing networks to research applications and data center connectivity. They help enhance the performance of cloud-based platforms, improve the experience for network users and support business continuity.

Spectrum Enterprise high-speed services give colleges and universities the flexibility to implement network solutions that meet their evolving needs as they continue to innovate. These services provide a simple way to achieve real-time connectivity between campus locations, data centers and storage arrays no matter how advanced your requirements or how distributed your campus becomes.

Learn how Spectrum Enterprise can deliver a connected experience for your campus.

Learn more

1. Risa Gelles-Watnick, "Americans' Use of Mobile Technology and Home Broadband," Pew Research Center, January 31, 2024.
2. Ibid.
3. "USF Now Has a 100G Network," University of South Florida, February 7, 2023.
4. "Why a New Network?" Texas A&M University.
5. National Association of Collegiate Esports.

About Spectrum Enterprise

Spectrum Enterprise, a part of Charter Communications, Inc., is a national provider of scalable, fiber technology solutions serving many of America's largest businesses and communications service providers. The broad Spectrum Enterprise portfolio includes networking and managed services solutions: Internet access, Ethernet access and networks, Voice and TV solutions. The Spectrum Enterprise team of experts works closely with clients to achieve greater business success by providing solutions designed to meet their evolving needs. For more information, visit enterprise.spectrum.com.

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