Networking Solutions to Facilitate Student Learning During the COVID-19 Pandemic

As COVID-19 cases increase around the globe, and school closures impact billions of children and youth, educational providers look for creative ways to continue student learning. The only option to educate students during mandated closures is through some form of remote online or virtual learning. Equitable access to technology (devices and internet) is a major problem. Millions of children lack basic internet connectivity at home.

Educators are exploring all possible delivery modes available within their communications infrastructure. Solutions such as mobile Wi-Fi hotspots, drive-in learning or remote network-equipped learning facilities are being deployed to extend connectivity to the students that need it. At the same time, Educators look for ways to bolster the performance and security of their online learning solutions, in order to better protect student privacy and safety, and to ensure a high-quality learning environment.

Extreme offers a range of network solutions that can help. Regardless of size, environment, and deployment scenario, Extreme's curated solutions can assist educators adapt and scale to the unprecedented urgent demands of online learning.

1. Extending Student Connectivity

To ensure equitable learning for all students, school districts are bridging the homework gap by expanding internet connectivity and the learning environment beyond traditional school buildings. The network infrastructure requirements can differ greatly depending on the scenario. For example, extending Wi-Fi into a school parking lot to facilitate a drive-in school environment has different network requirements to a mobile Wi-Fi bus deployed to a rural area; which again has different network requirements to a mobile Wi-Fi hotspot deployed in an urban district with high concentrations of students who lack internet connectivity.

Key factors to consider in choosing the appropriate network solution include:

- **Location**: Proximity to the school building or an existing communications infrastructure
- **Environment**: Dense, urban environment (such as an apartment building) where tens or hundreds of students require connectivity. Or a rural environment where a smaller number of students need to be accommodated over a broader physical area.

- **WAN Connectivity**: While Wi-Fi may an option for extending connectivity to areas in close proximity of a school, remote sites need to rely on WAN connectivity. Consider the WAN options available (broadband, cellular, private) at the remote location

- **Speed of Deployment**: What is the target timeframe for connectivity to be extended?

All factors need to be considered when expanding learning services. While speed is of the essence, upfront planning can mitigate future issues, resulting in a superior communications network infrastructure and enhanced student learning and privacy.
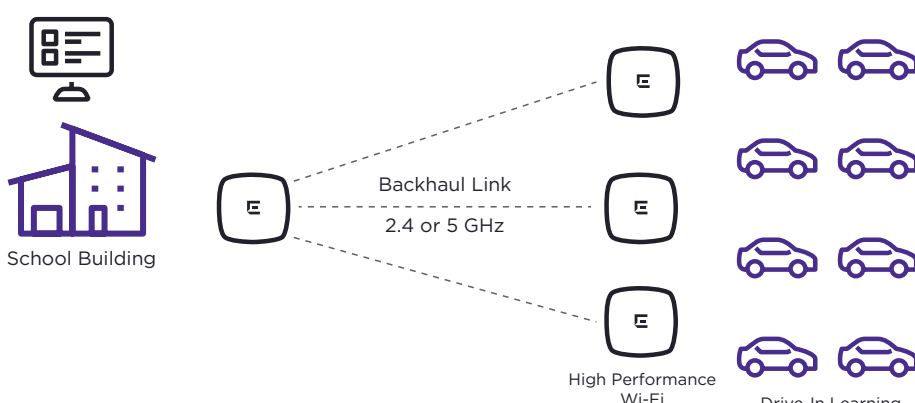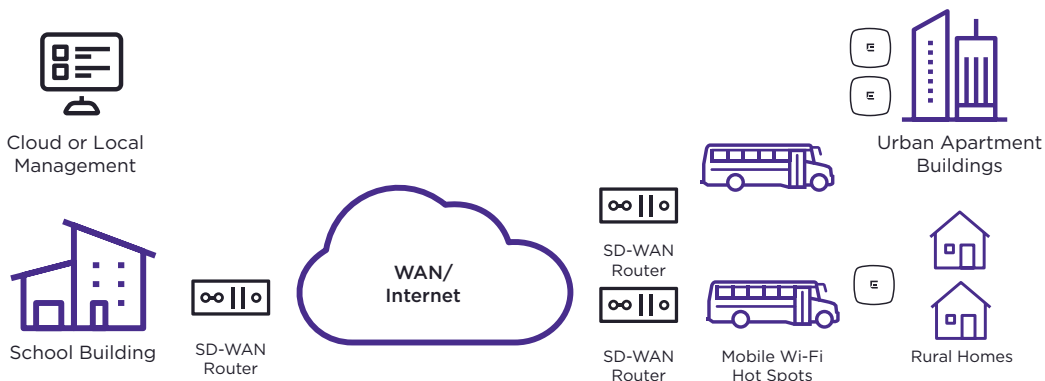
Extreme Networks Network Connectivity Expansion Solutions

As highlighted in the tables below, Extreme offers a range of pre-validated, curated packages enabling fast, secure, and compliant deployment for your emerging education needs. There is no 'one size fits all' solution; what is best depends on your unique requirements.

Extreme Network Solutions for Extending Connectivity

Close Proximity to School Building

Requirement	Extreme Solution	Benefits
Extending connectivity to school grounds to facilitate "drive-in" learning	**Rapid Outdoor Connectivity Kit** The Rapid Outdoor Connectivity Kit helps schools extend secure wireless connectivity to sites like parking lots and pop-ups (<150 ft from school building). The solution leverages powerful, wireless mesh technology to provide a secure, encrypted extension of the school's existing communications infrastructure. Students can drive in and connect with their teachers/peers while remaining safely apart.	- **Rapid deployment**: Pre-validated, curated packages; deploy without delay and without relying on external providers. - **Speed and performance**: Supporting Wi-Fi 6, superior performance ensures uninterrupted access to eLearning. - **Facilitates Privacy**: Helps schools maintain security and data privacy. - **Optional cloud-based management**: To simplify deployment and management; features such adaptive RF management and AI/ML driven analytics dramatically simplify ongoing operations. - **Connects to existing Extreme or third-party networks** that are deployed within the school.

School Building

Backhaul Link 2.4 or 5 GHz

High Performance Wi-Fi

Drive-In Learning

Extreme Network Solutions for Extending Connectivity

Remote to School

Requirement	Extreme Solution	Benefits
Extending connectivity to sites remote from school (e.g. areas beyond reach of the school Wi-Fi, >150 ft)	**Extreme Portable Branch Kit** Extreme Portable Branch Kits extend connectivity to locations beyond the school property. Ideal for extending connectivity to rural locations or to urban apartment buildings. Diverse packages catering to different sizes and requirements Learn more	• **Curated solutions for rapid deployment** of remote connectivity, that delivers essential networking capabilities to connect, secure, and manage remote locations. • **Flexible WAN Connectivity:** Ability to connect remote sites with whatever WAN connectivity is readily available (broadband, LTE, private WAN). • **Intelligent Traffic Management Features**: Prioritize traffic from groups of users and/or prioritize eLearning applications over single/multiple WAN connections. • **Centralized Cloud-Based Orchestration and Management**: Remote locations without IT resources are managed through a single user-friendly interface. • **Integrated Security Features**: L2-7 firewall on the router and AP with advanced Wi-Fi security features such as WPA3, Private Pre-Shared Keys and more.

Cloud or Local Management · School Building · SD-WAN Router · WAN/Internet · SD-WAN Router · Mobile Wi-Fi Hot Spots · Urban Apartment Buildings · Rural Homes

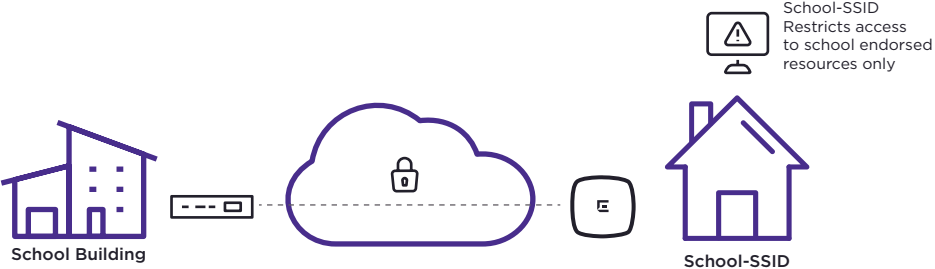# 2. Enabling Online and Virtual Learning

For successful online learning, speed and security matter. As homebound students turn to online learning in record numbers, there has been an increased focus on protecting students from malicious hackers. To date, many government agencies, including the FBI's Internet Crime Complaint Center (IC3), have issued public service announcements warning that attackers are increasingly targeting virtual environments, including those utilized by school districts.

It is imperative that online learning and education technology be secure and protect student and educator privacy. Just as when the students are physically in a classroom, their online activity should be monitored when they study at home.

Many children simply do not have a foundation for online safety, nor do they recognize the dangers of visiting unknown websites or corresponding with strangers online. In the US, compliance with the Children's Internet Protection Act (CIPA) is critical.

A secure, robust networking infrastructure is vital for maintaining student safety, security, and privacy. It is essential that teachers can connect with, engage, and teach their students remotely. Extreme offers a range of remote access solutions to enable secure and seamless connectivity for educators and students, as outlined in the next table.

Extreme Network Solutions for Remote Learning and Telehealth Services

Requirement	Extreme Solution	Benefits
Remote Access: Educators and Administrators	**Extreme Remote Access Kit** Secure VPN from a school-managed AP that is deployed at the home back to a VPN gateway or Extreme Networks controller. Extreme's Portable Remote Access Kits provide curated high-performance kits ideal for teachers and school administrators working remotely.	• Secure, high performance connectivity that provides students a positive online learning experience • High performance Wi-Fi for superior mobile experience • Extends school defined policies to the home – strong authentication and segmentation • Optional cloud-management to facilitate deployment, management, and troubleshooting
	 School Building / School-SSID / High Performance Wi-Fi	
Remote Access: Students	**Extreme Remote Access kit** Secure VPN from a school managed AP that is deployed at the home back to a VPN gateway or Extreme Networks controller. Extreme's Portable Remote Access Kits provide curated packages for cloud-managed remote access.	• Secure, high performance connectivity that provides students a positive online learning experience • Wi-Fi AP at an attractive price point • Extends school defined policies to the home – strong authentication and segmentation keeps students safe and ensures that they get access only to school-approved resources and sites.
	 School Building / School-SSID Restricts access to school endorsed resources only / School-SSID	
Telehealth Services	[ExtremeSwitching](#), [ExtremeWireless](#), [Extreme Fabric Connect](#) For education institutions, such as in higher education, who offer telehealth services to students, Extreme's networking solutions ensure your healthcare infrastructure can scale to accommodate the rapidly growing telehealth requirements.	• **Delivers high performance, secure networking solutions that allow educational providers to realize the full potential of their telehealth services** • **Better video clarity, security and performance** • **Easier to deploy and scale video-based service**

Security Considerations

While the top priority is to rapidly extend connectivity to enable all students to participate in online learning, cybersecurity cannot be forgotten. School districts, similar to health organizations and retailers, face an elevated level of risk of cyber security incidents during the COVID-19 pandemic. The World Health Organization reports a 2x increase in cyber-attacks and the World Economic Forum has stated that "Cybersecurity matters more than ever during the coronavirus pandemic". Some students have already experienced first-hand the negative impacts of security breaches, such as Zoom bombing. And, as more students and teachers connect through VPNs, cybercriminals are capitalizing on the opportunity by exploiting critical vulnerabilities. Ransomware attacks are increasing since IT departments, tasked with rapidly extending connectivity to new locations, are too stretched to keep up with patches and security updates.

All Extreme Network solutions are designed with security in mind. Our multi-layered security approach, that includes policy, segmentation/ isolation, application telemetry, and compliance are critical in hardening the network infrastructure. It is very reason why many educational institutions choose Extreme for their networking infrastructure. To learn more, reach out to Extreme or review our comprehensive network security offerings.

Investment Protection

With declining school budgets, and the constant request to do more with less, maximizing return on infrastructure investment is critical. A key value of Extreme's network solutions is their ability to be rapidly and easily deployed for different use cases, as requirements change. For example, the rapid deployment solutions outlined previously can be quickly and easily redeployed in different educational ways – whether it is bolstering classroom Wi-Fi, providing high performance connectivity for gymnasiums and auditoriums during online exams or extending connectivity outdoors for graduation ceremonies.

Conclusion

As the learning needs of students continue to evolve to address the COVID-19 pandemic, the underlying network infrastructure has never been more important. Educators require innovative, flexible and secure solutions that allow them to reach their students and support their online eLearning requirements.

Regardless of size, environment and deployment scenario, Extreme's curated solutions can help. The pre-packaged solutions have been specifically designed to address the demands of COVID-19 –ease of use, rapid deployment, security and high performance. Reach out to Extreme to learn more. Visit our remote networking solution center or our education pages for primary and secondary education and higher education.