How E-Rate Funding Is Enabling K-12 Schools to Expand Network Capabilities

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White Paper

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E-Rate funding has been a boon for many K-12 educational institutions, providing badly needed resources for technology initiatives. Now is the time for primary education IT and administrative leaders to think about how to use E-Rate funding to provide more advanced, high-performance networks for a range of important new use cases.

In many ways, the challenges of providing enough tools and resources for K-12 school systems aren't very different from what they were a generation or two ago. School districts are facing increased educational and operational needs, yet funding sources such as property taxes and government aid remain under pressure, especially in districts with less wealth than others. Class sizes continue to increase, regulatory and compliance mandates are proliferating, and the amount of information students must consume and master is exploding.

There's a flip side to those challenges, however: School systems are benefiting from the increased availability of cutting-edge technologies to accelerate new learning initiatives in the classroom while enhancing productivity and efficiency among teachers, staff and administrators. The U.S. Federal Communications Commission has made billions of dollars available to schools through its E-Rate technology funding program, which has become more popular and important than ever as school systems up their reliance on technology to drive student achievement.

The low-hanging fruit of earlier E-Rate funding—widespread PC deployment, nearly universal Internet access and computer instruction laboratories—is now being augmented by a wide range of exciting and potentially breakthrough use cases. Those use cases, and many more to follow in the near future, rely heavily on access to affordable, modernized, high-speed networks. While legacy networks continue to act as workhorses for fundamental applications and workloads in K-12 environments, entirely new levels of performance, scalability, manageability and security are now needed to turbocharge future innovations.

This paper looks at some of the exciting use cases coming to the forefront for K-12 educational and administrative requirements, the vital role high-performance networks play in driving those applications and what to look for in identifying high-performance networking solutions and a technology partner for your next E-Rate funding proposal.

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How high-performance networks drive K-12 digital learning, front-office efficiency

School systems have largely embraced the notion that information technology can provide dramatic enhancements in how students are taught and how school systems themselves are managed. However, K-12 organizations are looking to step up their use of technology to deliver even higher levels of functionality and productivity in the classroom and throughout their administrative operations. In fact, the ability to offer technology to drive important new use cases is helping K-12 systems make themselves more attractive to new families entering their districts and helping to retain existing families in their communities.

Many new applications are using modernized—most often network-driven—technology to enhance student achievement, demonstrate compliance, ensure physical and cybersecurity, and improve teacher and school district workforce productivity. Those applications include:

- **Personalized teaching and curriculum delivery.** Technology now allows teachers to construct and deliver one-on-one education for individual students' unique needs, adapting digital content to different requirements.
- **Active learning technology.** Students are increasingly interacting and engaging with digital material over Wi-Fi and WAN technologies, rather than passively consuming information in the form of lectures or textbooks.
- **Distance learning and videoconferencing.** Learning no longer takes place only in a single physical classroom. These applications—which are certainly highly bandwidth-intensive—allow students, teachers and outside resources to collaborate over wide distances.

- **Internet-based services.** The Internet has emerged as an invaluable education resource for everything from student research to real-time connectivity between parents and teachers.
- **STEM (science, technology, engineering and mathematics) support.** Tools like digital microscopes, interactive laboratories and access to public research databases are helping students improve achievement in critical STEM fields.
- **Mobility.** Students, teachers and administrators commonly use notebooks, tablets and smartphones at any location in their non-school activities, so why should it be any different in their schools? Enhanced performance and security for Wi-Fi networks now make mobility a fact of life in all aspects of the K-12 experience.
- **IoT.** "Connected things" such as sensors tracking school buses and monitoring heating and cooling system performance are being used throughout schools, putting pressure on infrastructure managers to ensure sufficient levels of networking performance to handle large-scale connectivity of extremely large data sets.
- **Analytics and business intelligence.** With more and more data being created, captured, shared and managed throughout school systems, school leaders have an unprecedented opportunity to mine that data for everything from school population demographic trends to analyzing ways to improve results on standardized testing.
- **School population and facilities safety.** Emergency response, environmental monitoring and other systems that provide a safer physical space for students, teachers and staff are now more important than ever.
- **Compliance and governance.** School districts are using technologies to manage more regulations than ever, from student achievement to privacy and identity protection requirements.
- **Cybersecurity.** Student records, financial data and other proprietary data are ripe for the picking among cyberthieves, making cybersecurity tools and protections across all reaches of the network among the highest priorities for school systems.

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There is little debate that high-performance networking is needed to handle the bandwidth, security, intelligence and manageability to support these and other high-value use cases. While legacy networks have served many school systems well over the years, it is clear that a new class of networking infrastructure and solutions is essential to meet the needs of students, teachers and staff.

Below is a great illustration of the relationships among networking technology, applications and stakeholder groups and why networking can be an important catalyst in delivering higher levels of achievement and productivity.

Infrastucture

To Support Everywhere, All the Time Learning

Source: Office of Educational Technology

What to look for in high-performance networks and your technology partner

For IT professionals working in K-12 settings, there's good news: Your commitment and hard work in getting your school system to adopt broadband technology for pervasive connectivity has paid off: Research indicates that nearly all U.S. public school districts are connected to high-speed broadband—and that the remaining districts are in the process of doing so.[1]

However, it is also clear that much work remains to be done. That's because the important new K-12 use cases discussed in this paper need even higher levels of functionality, performance, security, intelligence and scalability. High-speed networks must bring even more features to the table to support the performance, security, economic and usability requirements for use cases that may become part of your next E-Rate proposal. Among these are:

- Automated provisioning. Despite many IT and networking professionals' best efforts, it is harder than ever to estimate how much bandwidth K-12 organizations will need to support new and upcoming use cases. Today's best practices suggest that whatever you may think you need in bandwidth over the next three to four years, pad that by at least another 15% to 20%. That means you'll need to "turn on" more bandwidth faster without burdening your already-stretched IT and network staffs.
- A networking platform that offers a range of speeds, to meet both operational requirements and budget limitations. You may not need Gigabit Ethernet from day one, but chances are quite good you will need it eventually. Be sure to work with network solutions that easily and seamlessly scale from 25 Mbps to 1 Gbps—or higher—down the road.
- Security tools baked into your networking platform. The criticality of native security cannot be overstated, both to ensure a layered approach to cybersecurity and avoid having to evaluate, buy and manage multiple network security add-on products.
- Robust network monitoring and management. Again, your in-house team (or those of your third-party IT support organization, if you are outsourcing) is going to have limited time to spend manually monitoring and managing your network. Intelligent networking platforms are a must.

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1 "98 Percent of U.S. Public School Districts Connected to High-Speed Broadband, but 2.3 Million Students Still Left Behind," EducationSuperHighway, 2018

But technology itself is not all you need. K-12 school systems also have to pick and collaborate with a seasoned technology provider that not only has state-of-the-art networking solutions but also experience with the E-Rate process. Be sure to look for a partner that has worked with the E-Rate program in the past, and offers E-Rate eligible services, and can deliver networking technology and services built onto a physically diverse and distributed network.

Why K-12 organizations should consider Comcast Business

With high-performance networking playing such a central role in the delivery of invaluable services for K-12 school systems, it makes sense to select a technology partner with both a wide range of market-proven networking solutions and a successful track record in numerous system deployments.

Comcast Business offers K-12 school systems a number of innovative networking options that can be included in E-Rate funding proposals. These include:

- **Ethernet solutions.** Ethernet has long been established as the de facto standard for networking topologies in K-12 environments, and Comcast Business offers a wide range of options. Its Ethernet-dedicated Internet provides high-speed connectivity and fiber-based dedicated Internet access. Matching upload and download speeds are available, and its high-performance bandwidth of up to 100 Gbps is ideal for data-intensive applications such as cloud storage, web conferencing and audio streaming.
- **Internet solutions.** Comcast Business brings enterprise-class Internet functionality to K-12 systems, including speeds ranging from 25 Mbps to 1 Gbps and 24/7 dedicated business support.

- **Managed routers.** For performance-intensive workloads that are increasingly part of K-12 school systems' application portfolios, router management enables reliable, stable and secure data flow, without putting extensive demands on in-house staff. Comcast Business offers router management tools that cover the full spectrum of functionality, from initial configuration and installation to ongoing management and support, providing an end-to-end on-premise-based solution.
- **SD-WAN solutions.** Software-defined infrastructure has become invaluable to organizations, and K-12 school systems can take advantage of Comcast Business' SD-WAN offerings to provide high performance, security, scalability and easy deployment—without making a big dent in Capex budgets. Comcast Business' SD-WAN is built on the company's carrier-grade ActiveCore software-defined networking platform, enabling distributed K-12 school districts to deliver high-speed networking seamlessly and affordably across a wide geographic area.
- **Managed Wi-Fi.** Mobility is a key driver for students, staff and administrators across a wide range of applications, making Wi-Fi management essential in supporting important new workloads. Comcast Business' managed Wi-Fi offerings are ideal for the deployment and ongoing operation of Wi-Fi-enabled functions and systems, including bandwidth allocation, access point management, bandwidth allocation and security.

Comcast Business also offers additional technology solutions—voice, video and cybersecurity, for instance—that are not currently eligible for E-Rate funding but can be purchased outside of the E-Rate process.

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Conclusion

With increasing demands to provide a wide range of educational opportunities for K-12 students, school systems are looking for new funding sources to support investments in high-technology solutions. Use cases like cloud computing, distance learning, collaboration, video conferencing and more—not to mention front-office business applications like analytics, security and compliance—require investment in modern, high-performance networks that often can be funded by the federal E-Rate program.

Committing to high-performance, scalable and secure computer networking solutions is a smart way to meet the expanding needs of K-12 students, staff and business administrators—and E-Rate funding is available to help fund those and other initiatives. Networking solutions from Comcast Business can help make forward-thinking use cases possible for K-12 school systems, for their needs today and in the future.

Comcast Business is the right solution for schools looking to modernize their network infrastructure to support digital transformation in education. With Comcast Business, you have a wide range of solutions that deliver the connectivity, flexibility and visibility today's schools need. Plus, schools can easily expand their capacity as needed.

Comcast Business solutions come with 24/7 monitoring and a service-level agreement. Comcast Business has helped thousands of schools improve the quality of education, with solutions to support administrators, faculty and staff. Comcast Business is an experienced E-Rate partner, helping schools get the technology services they need at prices they can afford.

Visit **www.business.comcast.com/education** or call (877) 209-6360.

Final determination of any eligible services rests with USAC. Eligible and ineligible components of the service should be cost allocated in accordance to program rules.

Applicants that wish to purchase a commercially available Business Internet package that costs less than $300 per month (pre-discount) will be permitted to do so without complying with the Form 470 competitive bidding requirement. The exemption will only apply if the package offers speeds of at least 100Mbps downstream and 10Mbps upstream per building and the charges cannot be averaged across multiple buildings. The annual pre-discount $3,600 maximum includes any one-time installation and equipment charges.

For details on the E-rate program, visit the USAC website at www.usac.org/sl or call the Schools & Libraries help desk at 888.203.8100.