

# HOW TO TRANSFORM YOUR SCHOOL

## A Guide for Application-Enabled Learning for K-12 School Districts

### EXECUTIVE SUMMARY

The introduction of bandwidth-intensive learning applications, including video and peer-to-peer applications in teaching has fundamentally transformed the way teachers teach and students learn. The federal E-rate program has forever changed the technology landscape of school districts and libraries in the United States.

Over the past 14 years, billions of dollars of E-rate money has subsidized communications and technology. As a result, school districts and libraries nationwide provide high-speed network access to their students and faculty and deploy learning and teaching applications never before thought possible.

Receiving funding is not always guaranteed, and following the E-rate process and procedures is critical – especially when thousands, even millions, of dollars are at stake for your district. The rewards that new, cutting edge education applications deliver to the classroom far outweighs the effort required to participate in the program. This paper briefly examines the promise of new applications and advanced high-bandwidth services that can be funded by the E-rate program.

### PROGRAM OVERVIEW

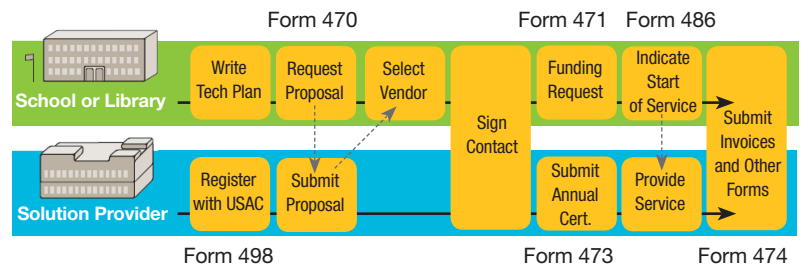
The E-rate program (EducationRate) was approved by Congress as part of the passage of the Telecommunications Act of 1996.

Over \$20 billion has been committed to schools and libraries since the program was created. As schools

and districts expand their electronic curriculum through streaming video and web-based applications, the demand for E-rate dollars remains strong. Each year there are over 20,000 applicants requesting funds for discounts of 20 to 90 percent on eligible services, products and e-Education content delivery.

The program is intended, in part, to address the “digital divide” that blocks disadvantaged communities from equal access to the benefits of technology.

#### Parallel Activities = A Complex Process



Undoubtedly, E-rate funding is a resource to help school districts achieve their technology goals and enable tomorrow’s learning applications today. This funding particularly is valuable at present as school budgets are under significant pressure.

### APPLICATION ENABLEMENT

The availability and application performance advantages of fiber connectivity via Metro Ethernet in the private sector has some in the public sector asking, “Why not in my schools too?” The very technology that has been powering the enterprise is now available to schools.

With Metro Ethernet, a school's infrastructure will be more scalable, reliable and cost effective than with legacy technologies such as T1s, Frame Relay and ATM. Connection speeds can be quickly increased and levels can often be changed remotely to support the high bandwidth your school's applications need.

The most frequently deployed technology applications in schools – listed here – are those that connect content to the student, the teacher and the parent.

Tele-Reporting Applications	Google Earth Classroom	Central Data Backup and Retrieval	Door Access Controls
Emergency E911 Dialing	Distance Learning	School Safety and Security	Automated Software Delivery
IP-Based Paging District Wide	Remote Video Surveillance	Centralized Course Criteria and Score Reporting	Asset Protection & Monitoring
Telephony	Video	State and Local	Service Delivery

## VIDEO

The ability to capture at high frame rates, transport, retrieve and store high definition video has enabled distance learning, safety and access to movie file archives from learning channels. These developments have been accelerated by innovative technologies like Metro Ethernet.

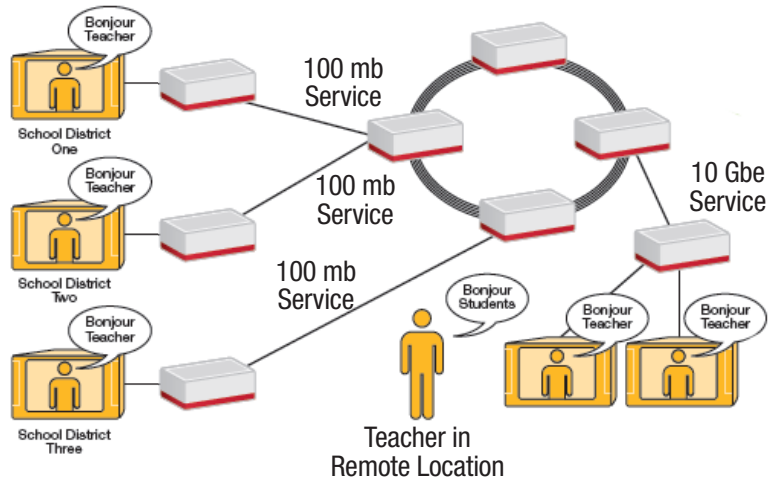
### Distance Learning

Students in remote locations can receive instruction from teachers anywhere in the world through a broadband connection.

Distance Learning and on-demand (at your own pace) learning that has been widely used in corporate America for years, has found its way to K-12. With distance learning, VOIP and streaming live two-way HD video on large projected screens, the school district can host a French class from a single location to multiple classrooms, for example. No longer is it necessary for there to be a

French teacher in every school. This allows districts to pool resources. Even access to guidance counselors can be accomplished with an appointment-based telepresence meeting.

### Distance Learning – Share a French Teacher



### Grade 'A' Internet-Assisted Learning

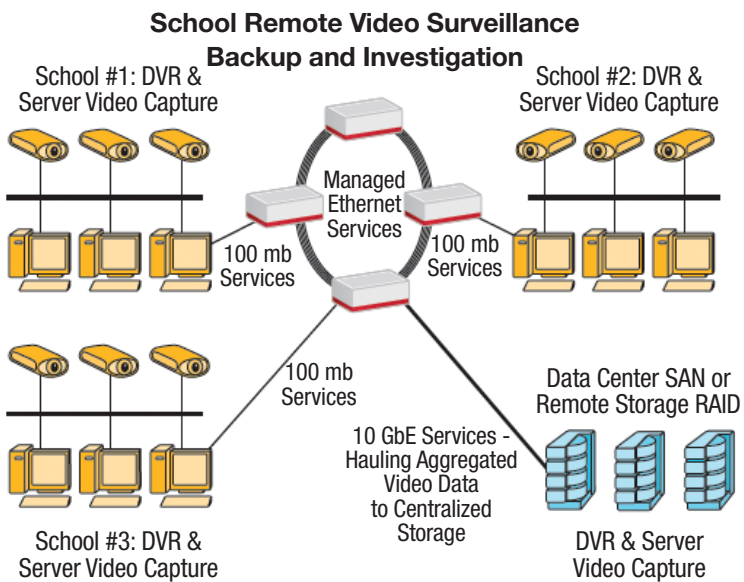
By far, one of the most bandwidth-intensive uses of network access is Google Earth. When a geography teacher is able to zoom in on a specific location on the globe, students are granted a learning experience that goes well beyond what a textbook can provide. Google Earth offers more than a third of the world's land surface in high-resolution imagery and requires high-speed access to return refreshed results. Prior to high-speed cable and Metro Ethernet, if every student in geography class performed a search at the same time, the classroom would either be unable to connect, or would lose valuable educational time waiting for the pages to load.

### Remote Video Surveillance

The risks posed to schools by student access to weapons has changed the way we protect our classrooms, students and teachers, and has resulted in increased use of video surveillance.

Local law enforcement, school administrators, and teachers have discovered that video storage and collection from schools requires massive bandwidth. Video typically gathered from school districts can take

massive amounts of data transport. Master video banks can store and retrieve 30 days of footage to allow for the playback of incidents. Applications such as these can help deter perpetrators, impress upon parents that their children are safe, and possibly lower insurance premiums.



Applications such as *Digital Chalk* and *Draw* that take central images from a remote database have increased fourfold.

District administration professionals have deployed remote access CBT (Computer-Based Training), IBT (Internet-Based Training) or WBT (Web-Based Training) to recertify teachers and rank them in the state school system as a means to measure teacher effectiveness. Parents have embraced the ability to access the teacher-student portal to discover their student's lesson plans, homework assignments, test scores and teacher ratings. So many simple applications, such as e-mail linking, have given parents access to their child's attendance and teacher's desktops, that some school districts are offering online virtual parent-teacher conferences.

## BEST PRACTICES FOR SCHOOLS AND LIBRARIES USING E-RATE

The ability to deliver differentiated instruction and achieve education acceleration goals has been possible, in part, because of E-rate-funded optical delivery of high-speed Ethernet technology. The technology provides for:

- Centralized course curriculum delivery
- Centralized storage of score and student completion records
- Attendance tracking and real-time truancy reporting to the district and state level
- Distance learning, streaming video course content from a central data center
- IP Telephony and Voice communications

There are a variety of resources that districts can turn to for help in planning and implementing E-rate discounts. Most districts already have some experience and can learn from the experiences of others. Networking vendors, cable operators, and providers of Ethernet and optical based equipment have embraced the E-rate program and learned how to navigate the complexities of the program. However, service providers are not permitted to assist in any way with preparation or completion of Form 470s or technology plans. Also, beginning July 1, 2011, technology plans are not required for applicants that only apply for Priority 1 services, which include Metro E. The technology plan requirements continue for applicants that apply for Priority 2 equipment and services.

## OTHER APPLICATIONS

### Connected Classrooms

High-tech devices in the classroom can allow students to instantly contribute and collaborate on projects with advanced teacher assessment and monitoring.

### Intelligent Tutoring

With mobile devices, homework can be tailored to individual aptitude with online interactive learning programs that provide intelligent tutoring based on student responses.

### Instant Feedback

Parents and teachers can receive instant feedback on student performance, identifying difficulties so educators can course-correct upcoming instructions.

In the last five years, teachers and district administrators have embraced software-based learning tools for math, social studies and geography studies. Wireless devices enable the teacher to ask a question of the class, and allow students to "enter" their answer virtually.

To enable your school district to take full advantage of available and needed applications, follow these steps:

**Step Action**

1. Determine eligibility
2. Develop a technology plan
3. Open a competitive bidding process
4. Select a service provider
5. Calculate the discount level
6. Determine your eligible services
7. Submit your application
8. Undergo application review
9. Receive your funding decision
10. Begin receipts of services
11. Applicants reserve the right, per funding year, to select their desired method of reimbursement: SPI or BEAR.
12. Transform learning with new applications

## SEEKING SUCCESS

E-rate-funded Metro Ethernet network connectivity can enable the future of education by providing high-speed network access to applications that are hosted elsewhere. There are thousands of E-rate success stories in school districts and libraries across the country. High-speed network connections have transformed education in rural districts, where they are now able to deliver Advanced Placement courses that were once impossible to offer.

Schools and public libraries now offer users access to state, regional and national library resources, and to databases that were difficult or impossible to access before E-rate funding. Public libraries offer patrons opportunities for continued education and professional development through resources available via high-speed network access, and through easily deployed Metro Ethernet services offered by local cable operators.

Both large and small school districts have benefited from E-rate. The most successful districts have developed long-term, comprehensive technology implementation plans that view E-rate discounts as integral, and as only one of many funding sources supporting their infrastructure and curriculum.

## COMCAST BUSINESS CLASS FOR EDUCATION

Comcast Business Class uses Ciena Metro Ethernet gear to provide Metro Ethernet services to K-12 School Districts in more than 20 major markets across the U.S.

Comcast's Metro Ethernet services range from 1 Mbps to 10 Gbps and are available with three different classes of service backed by service level agreements and continuous monitoring from Comcast's dedicated Network Operations Centers. The services leverage Comcast's 147,000 mile IP-based fiber optic network that serves 20 of the nation's 25 largest markets.

To learn about the education-related services available from Comcast Business Class, please visit [business.comcast.com/education](http://business.comcast.com/education).

Contact Comcast Business Class for a free consultation. **Call 877-790-1938 or e-mail [erate\\_info@cable.comcast.com](mailto:erate_info@cable.comcast.com).**



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