



Networks Have to Work...or Education Doesn't

Managed Internet Network Services as the New Foundation for Education Delivery

Executive Summary



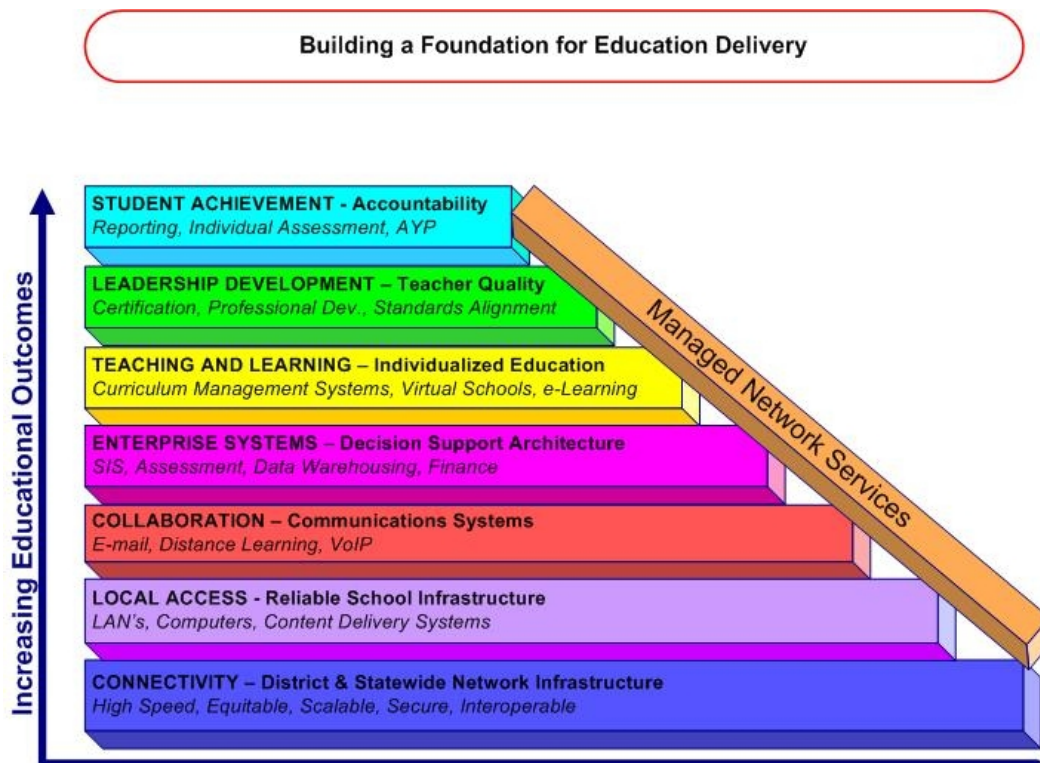
Networks Have to Work...or Education Doesn't Managed Internet Network Services as the New Foundation for Education Delivery

Executive Summary

Accountability is a top priority in education. Implementing accountability measures is not possible without technology and to use technology effectively, you need a robust, reliable, and comprehensive network.

The No Child Left Behind Act (NCLB) places new challenges and responsibilities on state education agencies (SEAs) and local education agencies (LEAs) which demand increased levels of accountability for student achievement. States and school districts must now implement sophisticated instructional and educational reporting systems to meet the challenges of NCLB.

Without a secure, reliable, equitable, scalable, and state-of-the-art network in place, it is virtually impossible to consistently deploy evolving national, state, and district K-12 initiatives. This white paper addresses the need for critical district or statewide network infrastructure to serve as the foundation that enables and supports learner-centered education. The following chart illustrates the accountability applications, processes, and tools that can be deployed to increase educational outcomes.



Improving and sustaining academic performance involves multiple and interrelated education applications. Building blocks such as communication tools, distance learning systems, student information systems, assessment tools, curriculum management systems, and professional development services each play an important role in improving student achievement. Without a reliable network as a foundation, the building blocks will crumble. Administrators have to construct rock-solid networks that will be able to grow and scale to meet new, increasing, and unforeseen needs.

Key Consideration:

How can we create an education-centric network that builds on existing infrastructure strengths and leverages existing funding sources?

Recommendation:

Managed Internet Service Provider (MISP) – A Single Point of Accountability

ENA recommends using a Managed Internet Service Provider (MISP) as the single point of contact and accountability for K-12 Internet network services. A MISP leverages both the existing infrastructure and contracts with multiple telecommunication providers to provide an essential foundation to support and enhance network-delivered education. This model capitalizes on the combined strengths of multiple technologies and telecommunication providers.

Having a MISP is similar to hiring a general contractor to build your house. It is the single service provider responsible for making all of your networks and technology work together. Utilizing the MISP model, the district or state contracts with a MISP responsible for providing a ubiquitous, education-centric district or statewide network. From the design, implementation, and management of the network the MISP model provides a single point of contact and accountability ensuring exceptional performance.

Essential Points to Consider when Evaluating Network Services:

Network Performance and Reliability:

The performance and reliability of applications must be such that teachers and administrators can be assured of their availability and performance. Staffers embrace these tools when the applications are relevant and simple to understand, and their reliability and performance makes repeated classroom instruction and administrative use feasible. The K-12 environment brings its own special challenges in terms of the sheer number of end points and users. The consistent reliability of a school network depends on more than just a large data-pipe. Schools, districts, the state, the Internet, and the application servers themselves all create islands of network service. Coordinating these disparate services through a MISP ensures high performance and real-time classroom reliability – from end-to-end.

More than Just Bandwidth – Looking Beyond Circuits:

In a lab with 30 computers all trying to download the same video file through a single T1 line it takes an average of 12 minutes to download the file. Doubling the school's bandwidth only reduces the file download time by half – to 6 minutes. **Ideally, it should take all 30 computers less than 12 seconds to download the file. MISPs close this gap by optimizing the combination of bandwidth lines, servers, and organization of content.** With hierarchical content caching to maximize the network's utility, downloads are performed in a fraction of the time, without the purchase of additional bandwidth.

A MISP can maximize the performance of the many elements that comprise overall network performance and actually reduce the need for greater amounts of bandwidth by making existing bandwidth more efficient. The result is K-12 administrative and classroom applications running at peak performance and the purchase of bandwidth can be scaled to meet real needs as they grow.

Interconnectivity between Varied Networks:

Interconnectivity allows networks to function in harmony and permits selected applications to receive priority across the network. In a typical K-12 district network, schools are connected to a central point and then data is transferred to a state backbone network or the individual district's Internet provider. This means neither side has visibility or monitoring capability into the other network. Employing a MISP allows separately controlled networks to interconnect thereby optimizing the full network's performance by creating a more reliable end-to-end connection.

Network Security:

School systems are vulnerable to network security problems, including student hackers and virus outbreaks. These problems can paralyze school networks for days or even weeks. A MISIP provides its customers with secure Internet access by managing firewall services and virus screening. Additional levels of protection are achieved when these services are deployed at the higher common network levels at costs substantially lower than those available to individual districts or schools.

Basic Foundations to Integrated Network Services:

For networks to be fast and for the cost to be reasonable, they have to be planned, built, and managed together the way architects and engineers design and construct a well-functioning high-rise building. Bringing local, backbone, and Internet access links under a single management structure, interconnectivity is simplified. The single-structure approach introduces additional value-added benefits not otherwise achievable.

Equity and Access – Last-Mile Connectivity:

The key to effective networks is the reliability and availability of bandwidth between the school and its district or statewide area network (or backbone). Due to the remote locations of small and rural school systems it is often more costly and difficult to secure their Internet services. In every state, the inequality between the data services provided by local carriers in rural and urban areas creates a “last mile” cost disparity. This disparity translates into less choice for rural users and slower broadband capabilities to support digital teaching and learning tools. A MISIP can act as a broker between numerous rural and urban carriers to create a model that allows for both large and small districts across a state to benefit from similar services and pricing. This method creates an incentive for smaller rural carriers to deploy advanced services, thereby equalizing the resource availability across a state or region.

Reliable Backbone Management and Internet Connectivity:

For schools to gain quick access to Web materials and major applications, the backbone network must be fast, reliable, and accessible. You do not want to sit and wait to download your student information data. The application servers for K-12 management and instructional systems are housed at the local, state, and Internet levels. MISIPs enhance access to these servers by developing network backbones or utilizing existing backbones. By ensuring reliable connectivity, these managed K-12 backbones are essential to the successful utilization of state department of education-provided data applications.

Internet connectivity is also imperative for K-12 classroom application performance and curriculum integration. Since the Internet is now a primary source of Web-based applications and educational study material, it must be available at all times to all schools. A district or statewide K-12 MISIP-enhanced network can provide K-12 schools with consistent performance and built-in Internet backbone redundancy that cannot be cost-effectively achieved by independently-networked districts.

Enhanced Support:

Most school systems lack the personnel to keep networks and technology functioning adequately. The network management expertise needed to meet the reliability and performance levels required in today’s K-12 network environment strains valuable personnel resources. District technology personnel are inundated by the demands of virus protection, an increasing number of computers, and the requirement for more sophisticated technology management. When multiple network providers exist, school personnel waste valuable time determining the problem’s source. With a MISIP, the customer makes a single phone call to the MISIP. Highly skilled MISIP network engineers utilizing customized software and monitoring tools are available 24/7/365 track and respond to the problem. This allows district personnel to focus on education, not technology.

New Opportunities and Future Enhancements:

A network is dynamic -- constantly evolving and growing – to meet the specifications of new applications and increasing traffic. Typically, states and districts purchase the newest equipment when they establish a network. Ideally, networks should provide the best-of-breed technology for the life of the contract, rather than the best technology available at the beginning of the contract. Networks managed by a MISP achieve this best-of-breed approach, as all of the components necessary to deliver their services are the MISP's responsibility to purchase and maintain. If the state or district's needs expand, the service level can be contractually adjusted to meet this growth. This scalable best-of-breed approach eliminates a second capital expense and the costs associated with the disposal of obsolete equipment.

Unique Advantages of Managed Network Service Offerings:

Due to their scale and sophistication, managed network service offerings present the following advantages:

- **monitoring and ongoing maintenance of the network**
- **the flexibility to change the configuration of the network to match evolving needs**
- **the ability to fully leverage E-Rate funding**

Monitoring and Maintenance:

Managed network maintenance includes sophisticated network monitoring, trouble ticket, and notification tools which provide customers with information necessary to understand problems associated with the network. These tools provide technical personnel with a real-time 24/7/365 view of the status of the network and a real-time view of the MISP efforts to correct any operational issues.

Flexibility:

Managed networks are flexible. They can be scaled from simple backbones to sophisticated networks which provide remote management services in the classroom. They can be turned up to accommodate the needs of student information and testing systems that have distinct time and volume demands. These scalable offerings can grow with various clients at varying rates. By shifting the understanding of network operability from simply hardware and telecommunication management and procurement to service management creates the widest, best-cost, range of local choices for schools and districts. Districts can choose from an ever-expanding menu of optional services and take advantage of the unique E-Rate benefits found only under a managed Internet access service.

E-Rate and Other Funding Sources:

E-Rate is the major source of funding for education network and Internet services. The MISP must be both E-Rate eligible and E-Rate savvy to understand the intricate nuances of successful E-Rate filings and funding. The MISP's streamlined access to E-Rate benefits allows a district or state to leverage the maximum available federal, state, and local dollars.

In statewide deployments, local dollars are maximized because the larger managed service offering typically covers the cost of basic connectivity to schools at all districts. This allows individual district dollars to be spent on upgrades to this basic statewide service. Such funding leverage is particularly important in rural environments where educational dollars are often needed to simply sustain the basic connectivity (see last-mile connectivity). MISPs provide economies of scale unmatched by any other contract method.

The Value Propositions; Cost and Quality Over Time:

MISPs cost less and provide higher quality services than contracting with a variety of network carriers. Unlike telecommunications or cable companies, a MISP can bring several significant cost-savings methodologies such as:

- MISPs can use a mix of telco, fiber, wireless, and other technologies based on the best available costs and technical solutions in given areas.
- Unlike telephone or cable companies, MISPs are not bound to provide an in-house solution when that solution is not cost effective.
- MISPs will contract and manage the connectivity component directly with infrastructure carriers to maintain lowest cost service.

Total Cost of Ownership (TCO):

School districts and state departments of education care about the total cost of ownership of a service over the lifetime of the service. Without a managed service, costs are typically underestimated. Services delivered by a MISP include all costs from all parties to deliver an end-to-end service. Typically, other service contracts offered by telecommunication or cable companies only include the direct cost to provide a specific service such as the ISP, omitting the necessary costs associated with additional hardware, staffing, and expertise necessary to enable network functions. Service pricing from MISPs are all-inclusive and represent the entire TCO of the service. There are no additional or hidden costs for hardware, staffing, or expertise to manage or monitor the service.

Seek Expert Assistance:

It is complex to build, manage, and grow an efficient network that addresses the needs of teaching and learning. School systems need a considerable amount of external support to implement and maintain networks which function well technically and that address requirements of instructional improvement. **MISPs provide this service.** There is no other model that provides the essential comprehensive support infrastructure to build a foundation for meeting the needs of educators.

State education departments and K-12 school districts are under pressure to increase advanced network services on a district or statewide basis. ENA believes the K-12 MISP model is the K-12 network model that provides all K-12 schools the tools necessary to achieve the mandates of NCLB and prepare students with 21st century skills. The MISP business model is a proven way for states, intermediate units, and large districts to provide equitable services across all schools -- regardless of locality, economic strata, or technical expertise.

About ENA:

ENA is a leading MISP that provides managed network and technology solutions for schools and libraries. Since 1996, we have established a reputation as experts in the design, deployment, and operation of broadly distributed networks. ENA designed and deployed one of the first statewide K-12 networks in the U.S. connecting all schools and school districts in the State of Tennessee. ENA has managed significant deployments in other states. Customers know ENA as a reliable partner with expert knowledge in Internet connectivity, E-Rate and other funding sources, and value-added customized services. Our technology solutions make reaching and using valuable information as easy and reliable as turning on the lights.

Our full white paper on Managed Internet Network Services, "Networks Have to Work...or Education Doesn't: Managed Internet Network Services as the New Foundation for Education Delivery" provides information and greater insight into the impact and effectiveness of the MISP model for K-12. Based on our experience and success, ENA has demonstrated that a MISP model is the most cost-effective and

expeditious way to provide cohesive and highly reliable, district and statewide education-centric networks that best meet the current and future needs of SEAs and LEAs. If you would like to receive a free copy of this white paper or discuss your individual needs and how to potentially deploy this type of service in your area, please contact us or go to www.ena.com/education.

Lillian Kellogg
Vice President
lkellogg@ena.com
615-312-6072

Gayle Nelson
Vice President
gnelson@ena.com
615-312-6056