Creating Digital Learning Spaces

Alcatel-Lucent Solutions for K-12

Alcatel·Lucent

Rapidly evolving technology offers both opportunities and challenges for today's educators. Advancements in communications enable new ways to reach students and enhance learning, but at the same time, they raise new issues. Preparing the next generation to live, work and flourish means ensuring equal access to technology for all of our children. And delivering that access while maintaining the security of students, teachers and staff – as well their information – becomes more complex.

As a technology and communications partner, Alcatel-Lucent understands these challenges, and primary and secondary educators around the world are choosing Alcatel-Lucent to help them build networks that connect their communities and teach students the skills they need to succeed in the 21st century.

CUSTOMER NEEDS

The primary goal for administrators and teachers is to educate children – preparing them to live and work in today's complex world. Students need to learn basic skills – such as problem solving, communication, and interpersonal skills – plus the information to support good decision making.

Technology

The industry group Partnership for 21st Century Skills has outlined how technology can play a significant role in teaching these skills and how technology skills are themselves vital to teaching and learning. As Table 1 shows, students must have information and communications technology (ICT) literacy.

Communication

An effective technology solution should create digital learning spaces that support those vital 21st century skills. It must facilitate communications among the many education stakeholders – students, teachers, principals, and parents.

• Students get information and share projects by working confidently with tools such as the Internet, audio and video collaboration.

• Teachers and administrators can share best practices to generate new ideas and leverage the competencies of other teaching professionals.

• Parental support and involvement are key to a child's education. Without it, a child can easily fall behind in school and even develop social problems.

Communications technologies are a primary tool for relaying important information about a child's activities and progress in a timely and effective manner.

Table 1. Partnership for 21St Century Skills Learning Matrix, www.21stcenturyskills.org

Learning skills +	21st Century Tools	= ICT Literacy
Thinking and problem solving skills	Problem solving tools – spreadsheets, decision support, etc.	Manage complexity, solve problems, think critically
Information and communication skills	Communications tools – e-mail, groupware, web, collaboration	Access, manage, integrate, evaluate create and communicate information
Interpersonal and self-directional skills	Personal development tools – e-learning, time management, collaboration	Enhance productivity and personal development

Administrators are challenged to integrate technology into the classroom and its operations in a way that productively supports the goal of educating children. Technology for its own sake is counterproductive.

Government Standards

The pressure to address these issues has increased in recent years with the implementation of the No Child Left Behind act in the U.S., and many other mandates at the state and local level. No Child Left Behind states that by the end of the eighth grade, all students should have technology literacy. States must certify that they are working toward this goal to receive certain federal funds.

Governments and communities are raising the bar on education standards, even as budgets are more and more constrained. In many cases, not meeting these standards means losing funding and losing students to other schools.

Given these additional headaches, it behooves a school district to seriously review its communications strategy to see how it can get teachers and staff more connected to parents and each other – in the classroom, in a mobile campus environment, and in the community.

Security

Every school needs a way to quickly lock down the premises and broadcast emergency messages to the necessary personnel. And information security is also vital. Student records, teacher files, and district applications must be protected from mischievous students, hackers, identity thieves, worms and viruses.

And just like businesses, districts have human resources, payroll, food services, transportation departments, etc. These staff members need access to the highest quality, most reliable enterprise network – with access and security extended to wireless data service. A district that runs well operationally is best positioned to support teaching and learning.

And with tight budgets for network and telecom equipment, a good solution must be user friendly with simple network management, manageable with only a handful of network administrators.

# ALCATEL-LUCENT SOLUTIONS

Converged Networking

Alcatel-Lucent's network solution for educators provides a converged, high-capacity infrastructure that supports applications from email and broadband Internet access to voice over IP (VoIP). With Alcatel-Lucent, a district can scale its network from a single site with basic Internet to multiple schools with gigabit Ethernet across a wide area network. This scalable, flexible network is the foundation for creating digital learning spaces that will drive 21st century teaching and learning.

Plus, converged networking offers significant cost savings over leased lines and IP Centrex, while offering more services and functionality.

- Every teacher can have a phone in the classroom with unique voicemail
- Dial-by-name on IP or digital business phones enables fast communication
- Automate school directories to allow a teacher to call a parent by entering a student's name
- Client or web-based IP soft phones allows teachers and administrators access to school phone features from home or remote offices

All of these features empower teachers, make it easier for them to communicate with parents, and increase their professional autonomy and satisfaction. And by empowering teachers, you boost their performance, which in turn improves the learning and performance of students.

Figure 1. Alcatel-Lucent's Solution for K-12
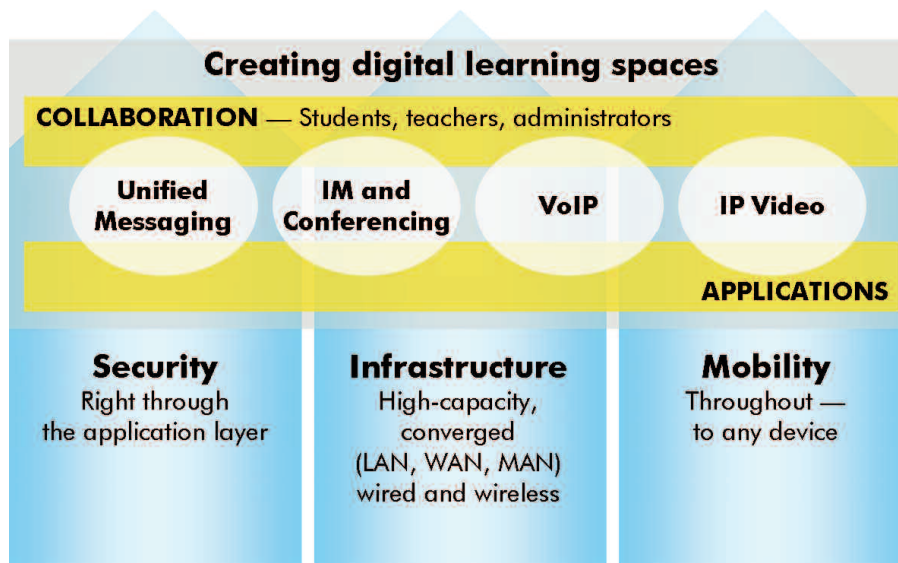
To administer the converged network, Alcatel-Lucent provides simplified, centralized network management to configure and troubleshoot each device, monitor network traffic, and deliver end-to-end security. Easing network management supports a district's IT staff – helping them do more to support students and teachers with their limited resources.

CONVERGED NETWORKING FEATURES

- Leverage your data network to offer newer, higher value services that integrate voice, data, and video
- Seamless operation of multiple high-bandwidth applications in classrooms, libraries, and offices
- Instant access to information and online resources around the globe
- Connectivity among students, teachers, parents, and administrators

SOLUTION COMPONENTS

- OmniSwitch Series - optimized for voice and data integration, intelligent switching and routing services with capacities up to multi-gigabit Ethernet

- OmniStack Series – cost-efficient, stackable workgroup switches that deliver power, flexibility and network services, plus a wide range of uplinks (fast Ethernet, gigabit Ethernet)

- OmniPCX Series – an integrated communications solution that combines traditional voice and IP networking for cost-conscious districts on the cutting edge

- IP Touch or Reflexes Phones – flexible digital phone options that allow districts to choose whether to deploy IP to the desktop while still implementing a full-featured IP telephony network

- OmniTouch Unified Communications – suite of next-generation IP-based applications for unified, multimedia messaging, conferencing and collaboration, call forwarding, integration with automated directories, and support for custom XML development

- OmniVista – comprehensive, centralized management with embedded security that can monitor network activity and configure and troubleshoot each device

- VitalQIP – complete centralized and scalable IP Address Management system to manage, maintain, distribute and secure IP addresses as well as DHCP and DNS services for continuous uptime and communication across the IP network.

Mobility

Building on the foundation of a converged network, Alcatel-Lucent's mobility solution for education facilitates anywhere, anytime access to information. Our flexible wireless local area network (WLAN) technology allows a school to deploy laptops that can be shared and moved between classrooms, to a library or science lab, or even outside – with ubiquitous access to the Internet, email, and online school applications. Wireless VoIP handsets are also supported, providing a greater degree of mobility for staff and helping improve overall school security.

For example, a principal can access her email or voicemail from a handheld device while visiting a classroom or attending an event in the auditorium. Or emergency personnel can launch a conference with a principal and school counselor instantly from a hallway on the other side of the school.

MOBILITY FEATURES

- Support for multiple devices, including PDAs and mobile handsets.
- Support for VoWLAN, when coupled with a VoIP solution
- Wireless savings
- Greater access to all network applications, regardless of device used
- Better manageability, scalability, availability and security
- Lower total cost of ownership

SOLUTION COMPONENTS

- OmniAccess Wireless LAN Series – flexible, scalable WLAN switches and access points providing industry-leading security and reliability
- OmniPCX Series – beyond VoIP, this integrated communication solution supports voice over wireless LAN handsets and WiFi-enabled handheld devices such as smart phones and PDAs
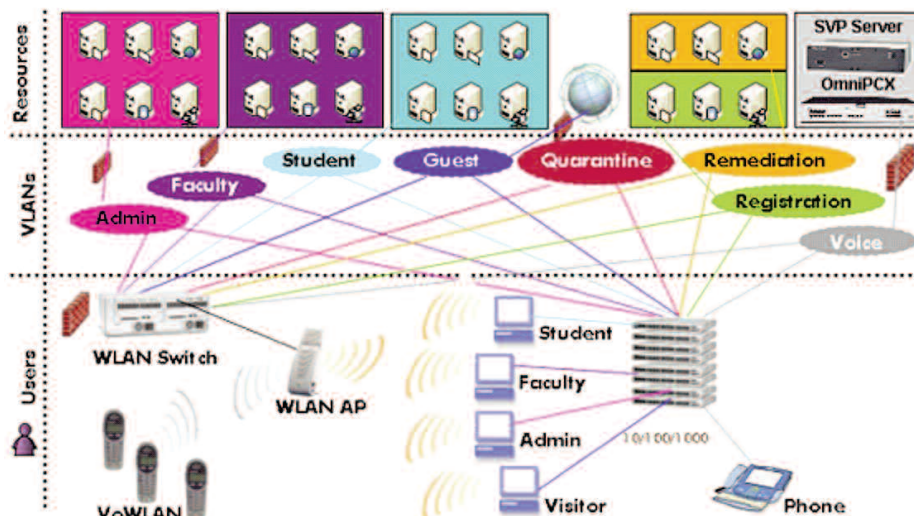
Security

Security is a primary concern for school districts, and Alcatel-Lucent's networking solutions are built to support and extend their security policies across the network – from the network core to the applications and devices students and teachers use everyday.

As you can see in Figure 2, Alcatel-Lucent's converged wired and wireless networks are composed of virtual LANs (VLANs) with the access rights and applications for each user role – students, teachers, school and district administrators, parents, etc. A user's network access and assignment to the appropriate VLAN can be based on the device media access control (MAC) address, IP address, or protocol. A district can configure its security solution to match its desired security policy.

Alcatel-Lucent's OmniAccess SafeGuard further enhances a district's ability to peer deeper into network traffic to determine what users are doing on the network and then compare that with what they're allowed to do. OmniAccess SafeGuard then flags any activities prohibited by the district's acceptable use policies (such as peer-to-peer downloads or unsecure, public instant messaging), therefore helping K-12 districts enforce the school board's desire to keep students safe online.

Figure 2. Alcatel-Lucent's role-based, VLAN security solution

In support of physical security, teachers can signal an emergency in the classroom from a PC or phone and instantly, simultaneously notify the principal, security officer, nurse or counselor on their mobile phones, desk phones, PCs, etc. IP-enabled alarms on doors, windows, or smoke detectors can signal those same staff members as needed. Administrators can also deliver lockdown alerts to every classroom via email, text or voice message to phones and/or computers, supporting school and district security policies.

SECURITY FEATURES

- Check user devices for virus protection status before granting network access
- Isolate/quarantine unrecognized or suspicious users without disrupting access of authorized users on the same port
- Monitor file sharing to limit legal exposure on copyright violations
- Seamless, flexible delivery of information via voice, data, and video to multiple devices
  - Alarms and monitoring plus notification messages
  - Support for SIP, XML, and other open communications standards

SOLUTION COMPONENTS

- OmniVista with Quarantine Manager – integrated security management that screens, maps, and inspects users accessing the network and enforces district policies
- OmniAccess WLAN Series – secure switches that define user roles and extend VLAN security procedures to the wireless data network
- OmniAccess SafeGuard – management application that allows IT managers to ensure compliance with acceptable use policies
- VPN Firewall Brick – advanced firewall to protect against hackers and denial-of-service attacks while delivering high-speed content security and premium authentication services
- FortiGate Security Appliance (in partnership with Fortinet) – multipurpose intrusion detection and prevention system, antivirus, and firewall appliance capable of issuing a simple network management protocol (SNMP) trap or syslog message upon detection of a violation

Success Story

Cheltenham School District
Location: Elkins Park, PA
(in suburban Philadelphia)
Solution: Converged networking with voice over IP and wireless handsets

Cheltenham needed to address the inability of its communications network to support business operations across separate phone systems. District goals included reducing telecommunications costs from Centrex, and installing advanced call features, security with text messaging, and e911.

With Alcatel-Lucent, Cheltenham achieved cost savings with voice over IP and implemented an IP communications system that delivered:

- Digital classrooms connecting students to the world
- Enough bandwidth to support video streaming in the classroom and teacher applications like LetterGrade
- District-wide emergency notification and lockdown communications to phones, wireless handsets, and PCs

"We now have more open communication, and the technology provides the district with tools to make us more productive, efficient and successful that were not previously available to us. The impact is very significant."

Gary Bixby, Director of Facilities and Support Services

Conferencing and Collaboration

Alcatel-Lucent offers a packaged solution providing audio, data, and even video conferencing. The software-based solution – My Teamwork – is a part of Alcatel-Lucent's Unified Communications suite and can be enabled from any telephone, any location, and any browser. It allows secure conferencing with anyone, inside or outside the school district, without the need for downloads or a VPN. My Teamwork can be deployed on any vendor's PBX or softswitch in an IP or PSTN calling environment.

The presence-aware, self-service user interface offers meet me, ad hoc, and scheduled conferencing with click-to-call, document management, and much more. With My Teamwork, a district gets secure, on-network instant messaging that allows for instant collaboration in a safer, monitored environment.

Alcatel-Lucent partners with Polycom to add video, bringing rich multimedia conferencing in support of district operations, classroom learning, and professional development. Smoothly integrated into My Teamwork's one-click browser interface, video conferences may be initiated as easily as IM, audio or Web conferences, or added to an ongoing session. My Teamwork users may also participate in room system-centric video conferences.

Students can:
- Share data with other students in the district or around the world for group projects
- Attend class virtually if they are home bound or in distance learning programs
- Review class sessions to study or catch up on missed lessons

Teachers can:
- Attend virtual training sessions
- Collaborate and share curriculum content within a district or beyond
- Launch instant conferences with parents
  - Application sharing shows grades and student work
  - Parents don't have to leave work
  - Non-custodial parents can attend conferences from out of state

Administrators and staff can:
- Conduct audio and video conferences for more effective meetings
- Record memos and presentations teachers can view on their own time
- Conduct individualized education planning (IEP) meetings and archive them for the student's record

CONFERENCING AND COLLABORATION FEATURES

- Presence awareness
- Secure, on-net instant messaging (IM)
- Ad-hoc, scheduled and meet me conferencing, presentation, and application sharing
- Blended learning through video conferencing
- Session recording and archiving

SOLUTION COMPONENTS

- My Teamwork—part of the OmniTouch communications suite designed for multimedia conferencing and collaboration
- OmniPCX Series—converged communications platform that supports conferencing and collaboration using IP and SIP. Advanced features

Video Distribution

Integrating video can dramatically improve the blended learning environment. In addition to video conferencing, Alcatel-Lucent can provide video distribution for streaming live video or delivering video on demand into the classroom.

A school can digitize its media assets—purchased or created by the teachers and students—and store them within the system for on demand availability across the district. For live television, the district can work with a local content provider (telco, cable or satellite) and distribute channels to classrooms and libraries.

Teachers can easily take clips from the Discovery Channel or a foreign language program and add multimedia that enriches the lesson and helps students remember key concepts. Or, if a school or district has video cameras, it can do its own live streaming and broadcast school assemblies, performances, or athletic events over the network.

VIDEO SOLUTION FEATURES

- Clientless
    - No special video players or browsers
    - Saves on administration time and cost
- Live streaming
    - Broadcast/cable/satellite TV distribution
    - School or district TV stations
- Video on demand
    - Digitized media assets
    - Meta-tagging for searchable content
- Operates over Ethernet
    - No need to run coaxial cable in new buildings or campus expansions
    - Delivers content to a PC or TV with set-top box
- Standards based – MPEG 1/2/4

SOLUTION COMPONENTS

- OmniSwitch Family – a reliable, high-speed data infrastructure that supports the bandwidth requirements of unicast and multicast video
- OmniVista – powerful network management for traffic monitoring and quality of service
- Video Distribution Hardware and Software (in partnership with Video Furnace) – standards-based (MPEG 1/2/4) solution offers clientless viewing, live encoding and playback, and fully integrated programming guide

WHY PARTNER WITH ALCATEL-LUCENT

Alcatel-Lucent has global education experience, working with some of the largest school districts in the U.S. and with ministries of education in countries around the world.

With Alcatel-Lucent, you have an outstanding business partner that provides not only technical expertise, support and service, but that can help with teacher professional development and introducing technology into the classroom.

Success Story

Hamilton Southeastern School District
Location: Fishers, IN
(in suburban Indianapolis)
Solution: Powerful data networking with secure wireless LAN solution

To keep pace with explosive growth in the student population, Hamilton Southeastern constantly updates its technology, maintaining state-of-the-art communications systems for access to services such as the Internet and to student databases. One of the major challenges for the district was to provide mobility for students and teachers so they can incorporate the power of computers into the classroom.

The district chose an Alcatel-Lucent solution that upgraded their network core to a gigabit MAN and added wireless data networking.

The solution delivered:

◆ Fast, reliable wireless Internet access across district locations

◆ Virtual LANs to segregate user traffic and provide secure access to the appropriate applications

◆ Intelligent network engineering with redundancy and high port density

◆ Easy installation with minimal impact on management of the network

"It's always nicer to be in the position where you can look back and say 'Yes, I made the right decision.' We've had good help from Alcatel-Lucent. We consider Alcatel-Lucent to be a partner in every sense."

Jay Denney, Assistant Director of Technology

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