3com
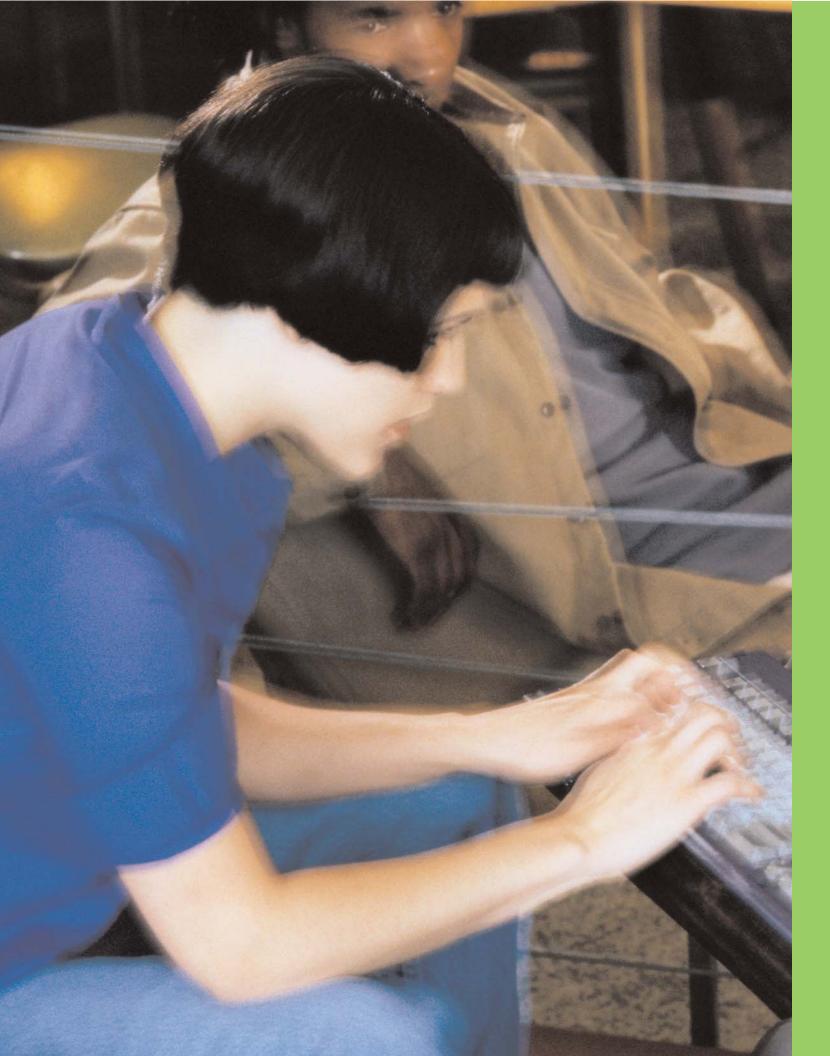
Expanding the Universe of Communications for 21st Century Living

3Com® is education's leading provider of networking solutions. We are deeply committed to providing schools, K-12 districts and college campuses with advanced communication technologies that create dynamic learning environments. Ever since 3Com pioneered the marketplace's first computer networks, we have empowered generations of students to bring the world, if not the universe, into their classrooms. Education is not only 3Com's strongest market, it is our largest single source of revenue.

3Com's enduring commitment to education

3Com offers affordable, simple-to-operate, end-to-end solutions that allow teachers and students to access data, resources, current events, and mentors quickly and easily. Our advanced technologies deliver state-of-the-art applications and limitless learning opportunities. They support effective teacher training and link all stakeholders, including parents, into cohesive educational communities.

Our new generation of networking switches provides the performance, scalability and functionality to support instructional environments from individual classrooms to multi-site campuses. Our wireless networking products extend learning venues quickly and flexibly. And our innovative networked telephone solutions allow even small schools to afford the security of function-rich voice services in every classroom.

3Com solutions are the most widely used in education because they provide the industry-leading performance, low cost of ownership and radical simplicity that schools require. We integrate voice, video and data applications into streamlined, enterprise-wide networking systems that meet tight budgets and help answer the call for educational reform. We have been in the forefront of revolutionizing how people teach and learn and we will continue to maintain our leadership position.

Linking students to the world they study

Whereas classrooms were once isolated from the world outside, 3Com networking solutions offer powerful, new learning opportunities. With mouse clicks, students can access vastly more content than offered in any textbook and interact with scholars, scientists and mentors, creating vitally-needed role models. They can probe the heavens, look for life on other planets, visit museums and examine the latest satellite imagery of weather patterns. By making learning an exciting, interactive experience, 3Com networks empower students to develop the communication, collaboration and critical- thinking skills that are so essential in the Information Age.

3Com communication technologies also enhance classroom teaching. Teachers bolster their skills with online professional development courses and communicate with their peers. They stay current in their fields, access the latest teaching resources, and learn to implement new assessment strategies. When connected, they become lifelong learners continually refining their practices.

3Com offers total solutions that extend campus connectivity well beyond Web access and e-mail. 3Com NBX® networked telephone systems bring voice services into classrooms, enabling teachers and parents to speak easily and effectively. The only phone solutions eligible for E-rate, NBX platforms enhance communications between faculty, parents and administrators with built-in applications such as voice mail and paging. The presence of a telephone set or PC client softphone allows teachers to summon assistance immediately. With quick access to both computer and phone communications, teachers can better engage parents in their children's education and schools can build communities of stakeholders.

3Com's mission has always been to combine cutting-edge performance with unprecedented simplicity. 3Com is the company that figured out how to deliver blisteringly-fast, high-function communications without the costs, complexity or administrative overhead of large, corporate systems. In fact, performance and radical simplicity are the defining qualities of our products.

Performance and ease-of-use are precisely what educational institutions need. Even small schools often must support as many users on their networks as some medium-sized businesses – and they must do so with far fewer resources.

Performance

Schools require robust networking services. Students increasingly rely on communication networks for their studies. They need rapid access to e-mail, the Web and a new generation of multimedia educational resources rich with data, imagery, graphics, video, and sound. As a result, even a single classroom or lab can generate greater volumes of network traffic than many business offices.

Additionally, school faculty and administrators depend on network services for their work. Their needs range from teacher professional development to administrative tasks, like record keeping, payroll, student registration, and report-card preparation. They place further pressure on school networks.

Schools, therefore, require end-to-end solutions with state-of-the-art performance. From the network interface card (NIC) within each computer to the main switch at the core of the system, school networks must be sufficiently robust to support large numbers of users and bandwidth-intensive applications, even during periods of peak usage.

Ease-of-use

Powerful, function-rich networks are useless if schools cannot operate them. Businesses can afford trained professionals on staff to administer their networks, but schools lack the resources for such services. Generally, only colleges and very large high schools can afford onsite personnel to troubleshoot local networks. Solutions, consequently, must be very simple to own and manage. Schools should evaluate only systems that are designed from the ground up for ease-of-use. Ideal solutions will feature plug-and-play installation and easy configuration.

Simple management

Since most schools lack large technology budgets and IT staffs, their networking solutions must be very simple to operate. School administrators should be able to control the systems easily from anywhere, even at home, to ensure optimal productivity. Moreover, students and teachers must find the products easy to use. A sophisticated phone system, for example, is wasted if its features are too complex to use routinely.

Flexibility

Schools need networks that can keep pace with their growth while meeting all present and future needs. Whether supporting an expanding user base or delivering next-generation applications, solutions must eliminate expensive obsolescence by providing cost-effective upgrade paths and networking communications whenever and wherever it is required.

Scalability

To meet future demands, school networks need to be scalable. Schools cannot afford to make wholesale changes whenever their networks require expansion or additional performance. School solutions should be easily expandable and, ideally, stackable so administrators can conveniently stack new devices onto existing ones in wiring closets. Moreover, many high schools and colleges already must increase the speed of their networks tenfold from Fast Ethernet to Gigabit Ethernet. Yet they often cannot afford to replace their legacy copper wiring with the fiber cabling required by many high-speed products. As a result, schools also need solutions that boost networking performance even over copper wiring.

Versatility

School solutions should offer the flexibility of wireless networking. Often, wiring a campus or building for network connectivity is impractical or very costly, particularly for older facilities. Sometimes, administrators must temporarily provide additional connectivity to a classroom or meeting hall. Or students outside on school grounds need to access the network when doing science fieldwork. For these and other needs, schools frequently require wireless connectivity to provide network and Internet access whenever and wherever it is needed.

Functionality

School networks must offer functionality. Schools, for example, often need to isolate student traffic from teacher/administrator traffic to ensure privacy. Yet, the cost of installing two separate wiring infrastructures is cost-prohibitive. Schools, therefore, need solutions that provide such capability over a single wiring system.

Reliability

School networks must deliver problem-free operation. Reliability reduces costs by eliminating frequent management by staff or outside vendors while ensuring that networks are continually available for students and teachers.

Control

Schools need to control student access to the Internet. A complete networking solution allows administrators to protect learners from objectionable Web sites. Conversely, to safeguard school records and resources, they also must protect the network from unauthorized intrusion by hackers and others.

Security

Security is a key issue today. Since classrooms usually lack telephones, teachers cannot rapidly call for help. To place or take calls, they must leave their students unattended. In response, states are beginning to mandate that every classroom be provisioned with a phone. For most schools, meeting this challenge is daunting because their traditional phone systems cannot double or triple in capacity. Large phone systems are expensive and very complex to operate. Even wiring a campus for phones can be very costly. Schools need communication infrastructures that also deliver voice services to all classrooms affordably and reliably.

Standards-based

To ensure ease of use and lessen operating costs, schools should consider networking solutions that are based on industry-wide standards. Standards-based products utilize proven technologies and ensure full interoperability. Proprietary systems are often costly and complex, and render schools dependent on the fortunes of one vendor for service and parts.

As the premier provider of networking technologies for education, 3Com offers end-to-end solutions tailored for school environments. From cost-effective connectivity for small offices and dorms to robust backbone links between buildings, from advanced phone services to Internet security, our entire range of products feature industry-leading performance and radical simplicity.

Networks

The 3Com Switch 4000 family

To power enterprise-wide networks, turn to the 3Com Switch 4000 family of backbone switches. These modular devices deliver the Fast Ethernet and Gigabit Ethernet port density and performance needed to anchor large networks. Their extraordinary scalability ensures that schools and colleges can easily grow their networks to meet the most demanding needs and their radically simple management keeps their cost of ownership low. Their support of copper wiring enables schools to deliver cutting-edge networking speeds even over aging infrastructures, providing an inexpensive strategy for upgrading campus backbones.

All 3Com Switch 4000 products feature 3Com's renowned quality, reliability and ease-of-use. They also provide flexible Layer 2 and Layer 3 switching, allowing schools to logically segment their networks. With virtual local area networks (VLANs) schools can maintain separate networks for students, teachers and staff on one switched infrastructure. With 3Com Switch 4000 solutions, the result is cost-effective, high-speed networking without obsolescence, high administrative overhead or expensive upgrades.

SuperStack® 3 Switches

For versatile connectivity ranging from large buildings and dorms to small sites and workgroups, 3Com's extremely popular family of SuperStack 3 switches offers precise networking solutions. These devices are available in a wide variety of configurations to meet every performance need and all stack conveniently for simple deployment. Featuring advanced capabilities, they support VLANs and even permit schools to distribute Gigabit Ethernet speeds to computer labs or entire floors over legacy copper wiring. Whether building a new network, anchoring a server farm, adding new sites to an existing system, or eliminating network bottlenecks that impede learning, SuperStack 3 switches deliver highly scalable solutions and the industry's simplest administration.

OfficeConnect® Switches and Hubs

For small sites and facilities, 3Com's class-leading OfficeConnect switches and hubs are perfect solutions. Designed for users with no technical expertise, they feature plug-and-play deployment, advanced autosensing capabilities, and virtually management-free operation. Yet they flexibly distribute Ethernet and Fast Ethernet connectivity, allowing even small classrooms to quickly access and share online resources.

3Com Network Interface Cards (NICs)

To ensure optimal connectivity to networks, 3Com is the industry's leading vendor of NICs. Relying on innovative technologies to boost performance, 3Com's extensive line of standards-based NICs offers the most advanced solutions for every budget and need.

3Com Storage Servers

3Com Storage Servers provide schools with vital resources for online communications. They deliver convenient networked repositories for storing files, records and applications that users can easily and quickly retrieve.

Wireless networking

3Com 11 Mbps wireless LAN solutions

When installing network cabling is impractical or costly, 3Com's array of advanced wireless LAN products provides affordable solutions. They deliver high-speed, campus-wide network connectivity without the high cost of leased lines or new wire installations. They permit students and faculty to communicate from the cafeteria, the lounge, dorms, temporary classrooms or anywhere else. They are so easy to use that staff can rapidly provide additional connectivity if only for the duration of a lecture. And our solutions are robust enough for school use.

With 3Com LAN wireless solutions, small schools can inexpensively build fast local area networks (LANs) or larger institutions can extend existing LANs with wireless segments. Schools even can create integrated, campus-wide networks by using the 3Com 11 Mbps Wireless LAN Building-to-Building Bridge to link facilities.

All 3Com LAN wireless products are Wi-Fi certified for interoperability with any other Wi-Fi certified products. Additionally, they feature 128-bit encryption to ensure that even the most sensitive wireless communications remain safe and private.

Access

3Com Firewalls and Web Site Filter

To protect campus and district-wide networks, 3Com offers a full line of firewalls. It safeguards the most demanding networking environments, yet is radically simple to use. These innovative products offer preconfigured, secure-out-of-the-box operation, simple Web-based administration, and support for virtual private networks (VPNs)—a very cost-effective remote-access capability. Where oversight boards and statutes require schools to block student access to "objectionable" Web content, schools can order the Firewall Web Site Filter, a subscription service that allows administrators to block access to set categories of Web sites—pornography, hate crimes, etc. Together, a 3Com firewall with the Web Site Filter option offer schools a complete Internet security solution.

The SuperStack 3 Webcache

SuperStack 3 Webcache products enable schools to contain their Internet access and WAN costs. These simple-to-administer a-ppliances store frequently requested Web pages locally on the LAN, so users requesting similar content get faster access with dramatically improved browser performance. Web responsiveness is enhanced while Internet access traffic is substantially reduced.

The 3Com Internet Server

The 3Com Internet Server is a boon for small schools that require complete E-education services. It seamlessly integrates key functions and flexible Internet access into one standalone box. The award-winning device features a robust firewall for security, complete e-mail capabilities, Web hosting, network storage, and services that enhance network printing. Best of all, despite its comprehensive set of functions, the Internet Server is extremely easy to install and use.

Telephony

NBX 100 and SuperStack 3 NBX Networked Telephony Solutions

3Com extends the classroom communications revolution with the NBX 100 and SuperStack 3 NBX systems, the leading IP telephony products on the market. These systems enable schools to provide full-featured telephone services with revolutionary economy and ease. NBX platforms use the cabling of existing LANs to deliver voice communications, thereby leveraging investments in school technology. This eliminates the need for wiring buildings separately for phones and enables administrators to move a phone by simply plugging the handset into any Ethernet network port.

Forever gone is the costly burden of scheduling service technicians for every little change to the telephone system. NBX solutions use proven, standards-based Ethernet technologies rather than the complex technologies of old-fashioned or traditional phone systems – therefore, they are vastly easier to manage. Administrators configure and control the system with point-and-click ease, even from home.

NBX solutions provide full access to the public phone system, enabling users to dial, according to their security clearance, any outside number as they would with traditional systems. Incoming calls are routed quickly to the appropriate department or informative recording. All staff can enjoy personal voice mail access, whether or not they have a dedicated phone set. For additional value, NBX platforms at different sites can communicate with each other over wide area networks (WANs), as well as over the Internet. This enables schools to significantly reduce long-distance tolls. Staff and faculty can even use NBX phones from home, enabling them to access the school phone system as if they were in their offices.

With NBX solutions, schools finally have an affordable strategy for placing phones in every classroom. For further cost-savings, NBX products, being networked devices, are the only phone solutions eligible for E-rate.

The tools to bolster teaching and learning: case studies tell the stories

The following examples are composites of schools that have deployed 3Com networking solutions to meet the particular needs of their campus environments.

K-5

The Coldwell Elementary School is a typical K-5 school. Its staff is small, its technology budget smaller, and no one is trained in networking technologies. Yet the school needed a LAN to support learning, administrative operations and school-wide Internet access.

Coldwell Elementary turned to an OfficeConnect solution. It deployed several OfficeConnect Dual Speed switches and linked them to OfficeConnect Dual Speed hubs in each classroom. It then installed 3Com NICs in each network device and connected them to the hubs or switches. For Internet access, firewall security, and e-mail services, the school connected a 3Com Internet Server to the system. To make full use of the network, it stored key educational tools, assessments and administrative data on a 3Com Storage Server for easy retrieval.

To enhance teacher security and accessibility, the school deployed an NBX 100 solution and installed NBX phones in offices and every classroom. The Coldwell Elementary School may be small, but it now has communications on par with much larger schools.

K-12

Rogers High School needed to expand its LAN. The school's preexisting architecture could no longer support increasing network traffic and it was not expandable. The school wanted to upgrade the system to Gigabit Ethernet performance, but it could not afford to replace its legacy copper wiring with fiber-optic cabling. Moreover, a smaller building on campus had no connectivity at all.

Turning to a 3Com solution, the school built its network around a SuperStack 3 Gigabit Ethernet core switch, which can support Gigabit Ethernet over copper wiring. It deployed smaller SuperStack 3 switches in wiring closets on each floor to distribute the network to classrooms and labs. For areas like the cafeteria where wires are impractical, the school uses 11 Mbps wireless LAN access points for connectivity.

In the smaller building, the school created a LAN using a SuperStack 3 switch on the first floor and, for cost saving purposes, 11 Mbps wireless LAN access points on the second floor. A 3Com 11 Mbps Wireless LAN Building-to-Building Bridge connects the building's LAN to the main campus network, creating a cohesive, campus-wide infrastructure.

Rogers High School relies on the SuperStack 3 Firewall to safeguard its networked resources and the SuperStack 3 Webcache reduces its remote-access needs.

The school completed its communications upgrade by replacing its outdated PBX with an NBX 100 Communications System and placing an NBX handset in every classroom. The new solution supports more users with enhanced voice communications, more affordably and with far less maintenance.

School districts

The Pleasantville School District wanted to bolster the networks at its five schools and link them into a single system. This would enhance communications within the community and allow the district to centralize Internet access at one site for significant cost-savings. To meet its needs, the district used SuperStack 3 Gigabit Ethernet switches to power the LAN at each school and smaller SuperStack 3 switches to distribute the network throughout the facilities.

Rather than relying on costly T1 connections, the district linked the LANs of two elementary schools to the high school LAN via more affordable 3Com 11 Mbps Wireless LAN Building-to-Building Bridges, which have ranges of up to 4100 meters (or 2.6 miles). After linking the other sites with WAN connections, it then installed a SuperStack 3 Firewall between the central district network and the Internet, enabling anyone linked to the school LANs to access the Internet securely. Pleasantville also used the easy management capabilities of its SuperStack 3 switches to create VLANs for greater efficiencies.

To improve telephone services, the district replaced its complex and limited PBX and Centrex phone systems with a SuperStack 3 NBX Networked Telephony Solution at the high school and NBX 100 platforms at the other sites. In doing so, it greatly enhanced voice communications, allowing faculty and staff to make calls between schools using simple extensions. Teachers also can speak far more frequently with parents about student performance or upcoming field trips. With its SuperStack 3 and NBX solutions, the district integrated its voice and data traffic into one powerful, cost-effective, easy-to-operate communication system.

Higher education

To attract good students, Wayland College needed to upgrade its campus communications. It also had to provision a new building on campus with a LAN. After examining competing systems, the college found that 3Com solutions were its best strategy. It deployed 3Com Switch 4000 switches

and SuperStack 3 switches in its data center and in wiring closets within its older buildings, quickly upgrading its network backbone to Gigabit Ethernet speed. For links in areas where wiring is impractical, such as the campus grounds, the college depends on 11 Mbps wireless LAN access points.

In the new building, the college installed SuperStack 3 switches to deliver Gigabit Ethernet to the floors and Fast Ethernet to desktops. Rather than lay costly fiber-optic cabling, the college linked its new building to the main network with 3Com 11 Mbps Wireless LAN Building-to-Building Bridges. To facilitate Internet access, the schools use the SuperStack 3 Webcache, providing users with very fast access to commonly used Web pages and data.

To strengthen its voice services, Wayland College replaced its difficult-to-manage PBX with a SuperStack 3 NBX platform. The 3Com solution gives the college complete control over its phones, economizing on maintenance costs, and is sufficiently scalable to meet the school's growth well into the future.

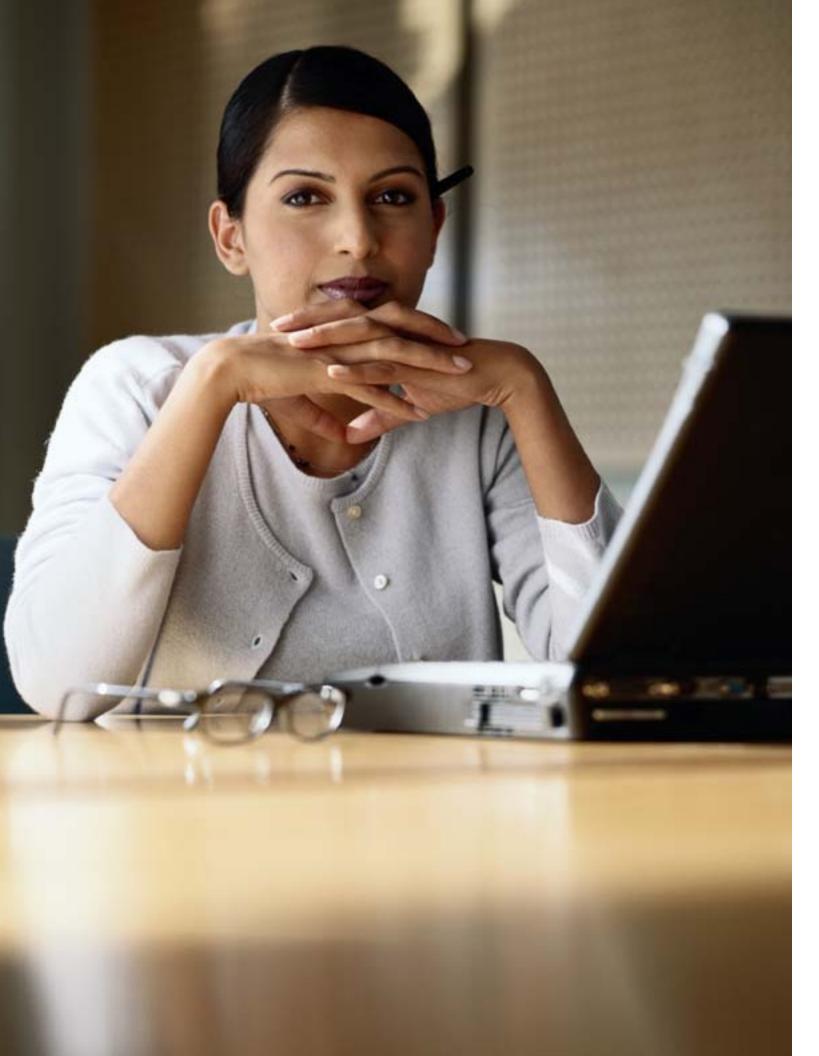# Building the classrooms of tomorrow

Urban Challenge

3Com's commitment to education is total. Though our solutions greatly enhance education, we understand that many communities lack the resources to deploy advanced networking technologies. To bridge this digital divide, 3Com offers its Urban Challenge program. 3Com awards grants of $100,000 in networking products to cities across the US. With these grants, communities can build networking solutions that meet their needs, endowing students and citizens with 21st century communication resources.

NetPrep®

3Com's innovative NetPrep program addresses a vital challenge of the Information Age. As computer networks proliferate throughout society, there is a pressing need for trained professionals to operate them.

Network administration is a rapidly-growing field and a rewarding career path, yet schools generally lack the faculty or curricula to train their students to meet this demand. In response, the NetPrep program provides secondary schools and community colleges with comprehensive, vendor-independent curricula that prepare students for careers in network administration. Offering online lessons, CD-ROMs, and instructional materials, the program allows students to graduate with multi-vendor, cross-platform skills and industry standard certification.

As a global leader in education, 3Com will continue to meet the needs of schools, providing students, teachers and all other stakeholders with the tools needed to prepare future generations for success.

The Hawaii Department of Education
The Hawaii Department of Education (HDOE) had a daunting task. Already using 3Com systems as the standard networking systems in all its schools and offices, for a total investment of $10 million, the department needed to upgrade networking performance at its 82 largest schools to support sophisticated new applications like high quality multimedia programs, streaming video, IP-based videoconferencing, etc. Yet many of these sites lacked capacity in their campus core switches.

To meet this need, HDOE deployed 3Com Switch 4007 switches at each school to deliver high-speed connectivity to SuperStack 3 Switch 3300 switches on the edge of school networks. The Switch 4007 switches deliver Gigabit Ethernet speed and Fast Ethernet over existing fiber and copper wiring and support Layer 3 segmentation of LANs. The Switch 4007s also are used as the internetworking device connecting to the wide area network. HDOE also installed a SuperStack 3 Switch 4900 switch at its central communications/server site to provide Gigabit Ethernet connectivity over copper to provide its schools with access to key instructional and administrative servers, services and the Internet services. Additionally, it has started deploying NBX networked telephony solutions at its sites for effective use of its network infrastructure and to deploy the features of the NBX system for efficient voice communications.

With its 3Com upgrades, HDOE has ample performance to support advanced multimedia applications, particularly since the Layer 3 capability of the 4007 Switch allows traffic to be distributed very efficiently. Access to vital servers has never been more robust through the use of the SuperStack 3 Switch 4900 switch, and the system rapidly delivers key instructional and administrative applications. Moreover, its NBX solution provides outstanding voice services with productivity-enhancing features.

The School of Communication, Information and Library Studies at Rutgers
The School of Communication, Information and Library Studies (SCILS) at New Jersey-based Rutgers, one of America's leading public research institutions, needed to improve the phone services within its degree programs. Its legacy Centrex solution was very difficult to manage and lacked basic features like voicemail and unified messaging. As a result, for a school of communication, SCILS's own communications were lacking.

SCILS turned to a 3Com NBX 100 Communications System, which offered greater price/performance value than conventional PBX systems. It appreciated how its IT personnel can effortlessly move, add or change phones, eliminating the need for expensive service technicians. Also, the system's open standards platform ensures that it interoperates with SCIL'S existing network infrastructure. Finally, the school preferred an NBX solution to a traditional phone system because its curricula feature the latest networked-based telephony technologies.

SCILS also wanted a wireless LAN solution to support a new degree program that will teach advanced applications of information technology. With a wireless system, the school could demonstrate to students that computing can be mobile and not tied to a specific location. The school chose a wireless LAN from 3Com because it offered the same proven performance and simplicity as its NBX system. The school provided wireless connectivity for classrooms, student and faculty lounges, conference rooms and computer labs.

SCILS's 3Com solutions boosted communication within the school. Professors rely on the many features of the NBX system to enhance messaging and they even can move their phones from one classroom to another. The wireless LAN permits mobile networking powerful enough to deliver key applications from e-mail to advanced library and research tools. At SCILS, students enhance their education by experiencing first-hand the future of networking communication.

Pine Crest School

Pine Crest School, one of the nation's top prep schools, enjoyed high-speed, low maintenance networks from 3Com to support its 1600 students. The systems at its Fort Lauderdale and Boca Raton campuses were built with a core Switch 4007 Gigabit Ethernet switch, SuperStack II Switch 3300 and 1100 switches, and 3Com wireless access points. However, the school relied on an Internet firewall from another vendor that proved to be very difficult to manage and unreliable, requiring frequent re-booting.

With Internet access playing a vital role in campus life, the school decided to deploy two 3Com SuperStack 3 Firewalls. These solutions reliably provide outstanding protection, preventing hackers or others from unauthorized access to school resources and records.

The school also relies on the SuperStack 3 Firewall Web filtering feature to effectively block students from inappropriate or objectionable Web sites. When students attempt to access blocked sites, the system notifies the IT staff, allowing administrators to easily address potential abuses. With the addition of the SuperStack 3 Firewall systems, Pine Crest School has a versatile and secure end-to-end networking infrastructure.

Berryessa School District

When it came to upgrading the networks at its 13 K-8 schools, Berryessa Union School District, a 3Com customer for 10 years, looked no further than education's leading network vendor. Located in San Jose, CA, the heart of Silicon Valley, the district installed key new 3Com data and voice solutions.

At each school, the district will deploy a core 3Com Switch 4007 switch for Gigabit Ethernet connectivity to server farms and stackable SuperStack 3 Switch 4900 switches in wiring closets. The SuperStack 3 Switch 4900 switches send the communications at Gigabit Ethernet speed over copper to next-generation 3Com SuperStack 3 Switch 4400 and 4300 switches, which provide connectivity to 1,350 workstations. All Berryessa's desktops and servers are equipped with 3Com network interface cards (NICs).

To replace its obsolete Centrex phone system, the district considered solutions from various vendors, but again chose 3Com technology. It deployed two 3Com SuperStack 3 NBX voice systems to support some 600 phones throughout the district. Leveraging the many built-in NBX applications, the district is implementing hunt groups and cost-saving routing features to ensure parents can easily and quickly access school administrators.

Thanks to 3Com, Berryessa upgraded its networks with cutting-edge but affordable solutions, streamlining communications among all stakeholders and providing students with exciting, new learning opportunities.

As a global leader in education, 3Com will continue to meet the needs of schools, providing students, teachers and all other stakeholders with the tools needed to prepare future generations for success.

3COM