



Secure Converged 3Com Gigabit and Wireless Network Blocks 2.5 Million Attacks For State College

The Challenge: At North Dakota State College of Science (NDSCS), 2,500 students pursue Associate Degrees in virtually every commercial technology under the motto “Learn by Doing.” To this end, NDSCS provides students practical labs for its areas of study, such as simulated hospital rooms with robotic patients for nursing students and computer-aided design labs for its aspiring civil engineers. Labs duplicate real-world conditions with students plugging laptops into diagnostic machines or reporting systems to access data for analysis.

Students exchanged high-bandwidth files via the college’s legacy Gigabit and wireless infrastructure. However, the network lacked the port density to efficiently support file transfers and began to buckle, particularly in buildings more than 3,000 feet away from switches which the college supported with three legacy, eight-port fiber switches. Distance learning students, whose numbers surged from 200 in 2004 to more than 900 in 2006, further strained the system as did data streams from CCTV surveillance cameras and keyless entry systems in the college’s 36 buildings. All of this made it extremely challenging for NDSCS to deliver network access efficiently to classrooms providing employee training programs for corporations, such as John Deere & Company and Bobcat.

In addition, NDSCS students experienced “dead spots” and dropped wireless connections in many academic buildings and residence halls when using their laptops. Finally, NDSCS was bereft of any network security appliances and was being bombarded with worms, viruses, phishing and

Trojans brought in via students’ laptops, which at times caused network slowdowns.

To continue to deliver secure, reliable, highspeed network services to a growing number of campus and remote students, NDSCS sought a more scalable Gigabit switching solution, a more resilient wireless infrastructure and a proven intrusion prevention system (IPS).

Why_Solutions_from_3Com_and_TippingPoint,_a_division_of_3Com

NDSCS put its network upgrade requirements out to bid under North Dakota state procurement policies. After reviewing market offerings, the college selected a secure converged solution based on 3Com Gigabit core switches, 3Com wireless switches and IPS from TippingPoint, a division of 3Com.

“3Com offered a broad array of feature-rich solutions from the core to the edge that gave us the scalable, secure, reliable performance we needed at the most affordable price point and with the lowest total cost of ownership,” said Carl Boomgaarden, IT hardware manager, NDSCS.

“Our TippingPoint IPS not only keeps our networks safe, it also dumps nonlegitimate traffic off our network, freeing up bandwidth for our students, faculty and administrators. It’s a virtually bullet proof system the college counts on every day without fail to sustain our communications.”

***Carl Boomgaarden
IT Hardware Manager
North Dakota State School
of Science***

“With the 3Com Switch 5500, we were able to obtain a single 24-port switch that delivers Fast Ethernet over fiber, which few competitive switches can do,” Boomgaarden added. “We were also able to significantly lower our electrical power costs and simplify our network management by replacing three eight-port switches with a single Switch 5500.”

The secure, converged 3Com solution is based on three 3Com high-density switches, which the college segmented to cost-effectively serve the primary areas of its network-hardwired PCs in academic buildings and wireless access points in academic buildings and in student residences. The multilayer Gigabit switches provide the scalable bandwidth the college requires through collectively providing NDSCS with 100 Gigabit ports compared to 16 with its pre-existing switches. To support critical and growing network demands, they also deliver system availability and high performance using an array of fault tolerant capabilities, including load-sharing, hotswappable power supplies, and hotswappable SFP and GBIC transceivers.

The core switches additionally upgraded NDSCS's security and simplified the tracing of network faults to individual users with their support of a new RADIUS authentication server. By cross-referencing users' names and locations from LDAP servers when users login, the RADIUS server eliminates time-consuming reverse look-ups by instantly supplying the source of network troubles. Network access is faster and security is assured.

The college also has dramatically accelerated network performance at the campus perimeter where a 3Com Switch 5500 now delivers high-speed fiber connections to 12 dormitories, each between 1,500 and 4,000 feet from core switches in the central administration building. A stackable 10/100 switch with Layer 2, 3 and 4 capabilities, the Switch 5500 delivers affordable enterprise-class performance, and supports access control lists (ACLs) for added security. It also lets the college expedite converged traffic through its support of Quality of Service (QoS), enabling NDSCS

to prioritize critical applications, such as CCTV camera surveillance and keyless entry.

To obtain ubiquitous access throughout its 128 acres, NDSCS supplanted its pre-existing wireless solution with new-generation 3Com wireless switches and access points. The college deployed two 3Com Wireless LAN Controller WX4400 systems in its main administration building—one managing access points in dormitories and public areas, the other controlling access points in classrooms and labs.

To add dual-band connectivity simply by inserting an 802.11A cards into the access points' expansion slots, the college installed 100 dual-band, 3Com Wireless LAN Access Point 2750s throughout its dormitories and upgraded 96 existing 3Com Wireless LAN Access Point 8750s in classrooms and laboratories.

“We loved the idea that we could migrate our existing 3Com Wireless LAN Access Point 8750's to support “fit” mode operation for use with our WX4400 Wireless LAN Controller. We were able to leverage our investment in 3Com technology without having to do a fork-lift upgrade of our access points,” said Boomgaarden.

“Using the Managed Access Point 2750s automatic power settings and channel selection, the WX4400 controllers can easily manage RF interference and authenticate sessions and users, eliminating authentication confusion that had sometimes interrupted students' access when moving from one classroom to another,” Boomgaarden added.

With 600 active wireless users a day supported by a two-person IT staff, Boomgaarden can monitor in real-time every connection and signal level and pinpoint any potential problem before it impacts users via 3Com Wireless Switch Manager software, which displays all WX4400 activity at a glance. “The wireless management software is an incredible help; it makes it so much easier for our limited staff to take care of such a large campus,” said Boomgaarden.

To safeguard its network, NDSCS implemented a TippingPoint IPS. The device diligently checks each incoming packet, blocking any Denial of Service (DoS) attacks, spyware, worms, viruses, phishing, and Trojans from entering the NDSCS network, while allowing legitimate traffic to pass. According to Boomgaarden, the TippingPoint solution stopped approximately 2.5 million attacks in its first 10 days of operation. “The TippingPoint solution is doing a remarkable job stopping every form of attack from penetrating our network.”

To proactively shield against the latest threats, the college turned to the TippingPoint Digital Vaccine service, which automatically updates the IPS with protection against the latest threats. The real-time inoculation service provides the college with new updates weekly or immediately when critical vulnerabilities emerge, protecting the college in advance of attacks. NDSCS also uses the TippingPoint Security Management System (SMS), a hardened appliance that lets IT administrators collect comprehensive, realtime reports and graphs on traffic statistics, blocked attacks, and more. The SMS additionally allows the college to employ multiple TippingPoint devices, ensuring the scalability the college requires.

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Benefits_Summary

Using its secure 3Com wired and wireless network, NDSCS is able to continue giving its growing numbers of students the real-world experience of learning by doing. Across campus, distance learning and employee training students can now productively access the network for research and collaborations even when roaming between access points. Critical applications, such as CCTV camera surveillance and keyless entry, also run more efficiently and reliably, giving the college the external security it requires to safeguard faculty and student activities.

In addition to these benefits, 3Com is maximizing NDSCS’s investment in 3Com solutions by upgrading its pre-existing 3Com access points to support both 802.11g and 802.11a standards, as well as convert them to fit mode for operation with the centralized wireless controller.

“Our 3Com network has improved every aspect of college learning and living at North Dakota State College,” said Boomgaarden. “Few investments have given our students, faculty and staff such a strong return on investment with the scalability to grow with us as we add new users and network resources.”

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