



SOLUTION OVERVIEW

CISCO WIRELESS SOLUTION IN HIGHER EDUCATION

EXECUTIVE SUMMARY

Technology plays a vital role at today's colleges and universities, but traditional wired networks are often too costly and inflexible. Wireless LAN (WLAN) technology helps higher education institutions to securely extend their existing network into areas where hardwiring would be expensive or difficult, while improving mobility and productivity. Cisco® Aironet® wireless solutions offer a host of benefits for educators, providing support for fast, cost-effective connectivity, even over long distances or beyond the campus.

Cisco Aironet Solution helps higher education institutions to improve learning infrastructure without breaking the budget.

CHALLENGE

Technology poses a huge challenge for schools, colleges, and universities. Besides supporting administrative and faculty requirements, institutions must introduce technology to enhance the learning experience and attract the best students. Yet they are faced with meeting these requirements on a limited budget and with an infrastructure that is unlikely to have been designed with such technology in mind.

Wired networks have limitations: growth in demand puts strain on network access; computing resources can be tied to specific physical sites; the cost and time needed to extend the network are often prohibitive. The challenge is to create a robust end-to-end network that meets the current and future needs of all users.

WLAN technology is an important enabling technology that lets institutions extend their existing network into areas where hardwiring would be expensive or difficult. The Cisco Aironet Family of wireless LAN solutions introduces new levels of mobility and productivity for educational establishments worldwide, while protecting their investment into the future.

WHY HIGHER EDUCATION INSTITUTIONS ARE GOING WIRELESS

To date, education has been one of the most aggressive market areas adopting wireless technology. A recent NOP World Technology survey¹ found that 35 percent of educational institutions in the United States have already implemented wireless networking. This is far higher than in any other industry. The reason is simple. The use of WLANs



¹ 'Wireless LAN Benefits Study' (2003) conducted by NOP World Technology on behalf of Cisco Systems. For full copy go to <http://www.in-emea.cisco.com/splob/0/2696/3768/8873/NOP%20Wireless%20LAN%20Benefits%20Study%202003.pdf>.

helps financially constrained institutions achieve more within their existing budgets. It allows them to introduce, at a reasonable cost, leading applications—like e-learning—that enhance the learning experience.

The survey determined that the benefits for educational IT departments were based on mobility, convenience, and flexibility. It was the ability to quickly deliver IT services anytime, anywhere, without the need for cabling that distinguished this technology (Figure 1). When translated into a return on investment (ROI) calculation across all industry sectors, this represented a US\$550 savings per user or an average US\$164,000 annual cost savings—not including ROI from productivity gains.

Table 1. IT Managers Perceived Benefits of WLAN Technology

Mobility within building or campus	80%
Flexibility (anytime, anywhere access)	69%
Easier adds, moves, and changes	49%
Convenience (no cabling)	78%
Easier to set up temporary spaces	62%
Lower cabling costs	58%



Mobility Increases Productivity

In a campus setting, wireless technology allows users to achieve total PC portability and location independence. Computer resources can now be put wherever they are needed without wire connections for every computer. In the ever-changing educational environment, wireless technology can reduce the cost and complexity of facility reconfigurations.

With a WLAN, a single access point provides network access for multiple PCs equipped with WLAN client adapters. With a Cisco Aironet solution, users can roam among access points without connection interruptions. This means freedom to move in the area with wireless coverage without having to log on again to the network and not having to find a connection to the wired network.

As long as an area is covered by the wireless infrastructure, educators and students can work, share resources, or communicate anywhere within the institution—classroom, study area, library, etc.

The NOP survey found that this level of mobility brings real productivity benefits to an organization. On average, end users said WLANs allowed them to stay connected 3.5 more hours per day—an estimated extra 90 minutes of productive time or US\$14,000 per employee. Within education, that can equate to a productivity improvement of more than US\$3 million per year.

No Cabling Means Flexibility and Cost Reduction

Wireless LAN equipment allows educational institutions to provide broadband capabilities quickly and cost effectively without expensive rewiring. Providing Internet access to students can be prohibitive if existing buildings are not properly wired. Most institutions cannot afford the high expense of installing high-grade copper or fiber cabling, especially with the environmental concerns inherent in many older buildings—such as asbestos remediation or restrictions placed by listed or protected buildings.

A wireless solution averts these problems by eliminating the need for new wiring. Administrative costs are reduced and many improvements in faculty convenience are realized. Educators can immediately share course materials and other teaching aids.



Network access is no longer determined by the capabilities of assigned rooms; it is straightforward to make adds, moves, and changes, and providing access to temporary facilities can be done in a timely manner.

With flexibility comes scalability. The Cisco Aironet product line allows individual units to be used alone or in tandem with others, so wireless technology can be installed in as little as a single room. Taking another computer into a room and installing a Cisco Aironet client card is all it takes to increase the size of the network—no costly wire drops. It is more cost-effective to provide wireless network access in classrooms and lecture halls than to install individual ports. As network use increases, the system can be expanded to cover a building floor, entire buildings, and the entire site by adding access points in appropriate positions.

Bridging Expands Your Network

For off-campus sites or campuses with multiple buildings, wireless technology can prove invaluable by connecting facilities within a region. A wireless point-to-point or point-to-multipoint bridge can connect remote campuses, research field sites, and even community or industry facilities to provide communitywide information, learning, or research networks. The technology also allows multiple buildings to share a single high-speed connection to the Internet without cabling or dedicated lines.

In addition, wireless bridges lead to elimination of recurring leased-lines expenses, delivering tremendous financial benefits.




SOLUTION

The Cisco Aironet Family of wireless LAN solutions integrates easily into an existing network as a wireless overlay, or creates freestanding all-wireless networks, facilitating mobility and increasing productivity quickly and cost effectively. The Cisco Aironet Family sets the standard for high-performance, secure, manageable, and reliable WLANs. With products supporting IEEE 802.11a/b/g technologies, the Cisco Aironet Family offers a complete line of in-building and building-to-building WLAN solutions. The product line includes access points, client adapters, bridges, antennas, and accessories.

The Cisco Aironet Family includes the following important products:

Cisco Aironet access points—Access points connect wireless clients to the wired network, or can serve as the backbone of an all-wireless network. With the Cisco Aironet 1100, 1200, and 1300 series access points, Cisco Systems® helps WLAN customers to meet varying technical and business needs. Cisco Aironet 1200 Series access points deliver the flexibility of dual-band wireless connectivity. Cisco Aironet 1100 Series access points offer an affordable, easy-to-install, single-band alternative. Cisco Aironet 1300 Series access points offer an environmental enclosure for outdoor deployments. All three series deliver enterprise-class management, security, and scalability.



<p>Cisco Aironet wireless bridges and workgroup bridges—Cisco Aironet wireless bridges help enable high-speed, long-range, outdoor links for applications such as connecting difficult-to-wire sites, campus settings, satellite offices, and mobile and temporary networks.</p>	
<p>Cisco Aironet wireless LAN client adapters—The adapters quickly connect desktop and mobile computing devices to the WLAN in 802.11b-compliant or 802.11a-compliant networks.</p>	
<p>Cisco Aironet antennas and accessories—With the industry's widest selection of directional and omni-directional antennas (2.4 GHz or 5 GHz), low-loss cable, mounting hardware, and other accessories, you can create a customized wireless solution that meets the requirements of even the most challenging applications.</p>	

Cisco Aironet wireless solutions provide the following benefits:

- Set new standards for broadband performance
- Offer the industry's strongest network security
- Easily integrate with wired networks and the wireless components of other manufacturers
- Support flexible management of central or remotely located access points from a single management console

CASE STUDIES

Cisco wireless solutions have already been deployed throughout numerous colleges and universities. The following sections describe a few examples.

Increased Productivity at Japan's Naruto University

With more students using notebook computers in class, estimating the required number of ports per room was becoming difficult. Naruto University implemented 80 Cisco Aironet access points to give secure access to the university's LAN anywhere in the facility, with lower total cost of ownership. Naoto Sone, teaching assistant at Naruto's Computer Centre, comments: "We chose wireless LAN products on our requirement for inline electrical power supply. Cisco was the only vendor that offered 128-bit WEP and RADIUS authentication."

Arnhem Goes Wireless with Cisco

Arnhem & Nijmegen High School spans two cities in the Netherlands approximately 25 kilometers apart and has 20 buildings throughout the two main campuses. “Arnhem Business School initiated the notebook project because computers are increasingly being used in all aspects of education. Students write assignments and project reports; check the latest changes in schedules and their exam results on the Intranet. They can e-mail their lecturers and search unlimited sources for information on the Internet. In the coming year the plan is to extend the network to 1000 clients within the business school. And ultimately the plan is to bring in the entire campus to the project,” says project leader Jeroen Langestraat.

Cisco Aironet Helps the University of Akron Realize Significant Cost Savings

“We were facing an \$800,000 cost to hardwire our old four-story library. But for \$80,000, we put in an entire wireless system. The savings will enable, among other things, the replacement of the library’s desktop computers with hundreds of laptops, which we made wireless with Cisco Aironet 350 Series Client Adapter cards,” says Thomas Gaylord, PhD, vice-president and CIO at the University of Akron.

Cisco Powers New Zealand’s First Wireless College

The biggest problem in St. Kentigern College was access—there were never enough Ethernet points in any particular room. The answer was 31 Cisco Aironet access points across the college’s 12 buildings—all installed in three days.

“Students are able to connect their notebooks from within 100 meters of any access point and can download their schoolwork in seconds. Students’ learning has been transformed as a result,” reports Walter Chieng, the college’s director of information technology.

Welsh Students Get the Information They Need, When They Need It

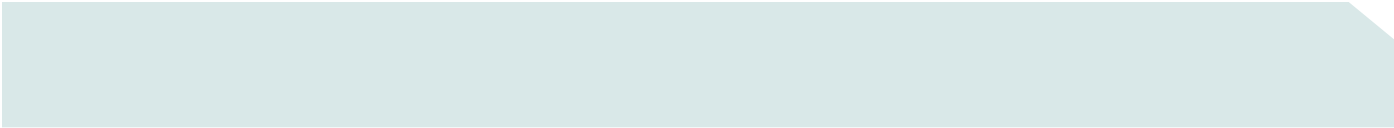
Using a Cisco wireless bridging solution, students at 22 different schools in Wales now access the Internet at 200 times the speed of the previous wired system. “When we interviewed teachers and the students, they were very pleased that they were able to utilize the Internet to download materials without having to go through the usual wait. The teachers can also now deliver more content per class hour than they were able to in the past,” said Tom Last, a senior technical consultant with Gaia Technologies, who designed and installed the network.

WHY CISCO

The Cisco Aironet Family sets the standard for high-performance, secure, manageable, and reliable WLANs. The Cisco Aironet Family helps minimize the total cost of ownership and maximize wireless network uptime with the following deployment, management, and security features:

- Simplified management of several, hundreds, or thousands of centrally or remotely located access points
- Simplified WLAN deployment with assisted site surveys
- Enterprise-class security and security-policy monitoring with smooth delivery of enhanced network security solutions
- Unified wireless and wired infrastructure, delivering a single point of control for all WLAN traffic
- Extension of rich, intelligent Cisco infrastructure-device features to wireless traffic
- Simplified WLAN management and operations support
- Air and radio frequency (RF) scanning and monitoring

Cisco Systems, Inc.

- 
- Interference detection to isolate and locate network interference
 - Enhanced troubleshooting and diagnostic tools for proactive performance and fault monitoring
 - WLAN intrusion detection system (IDS)
 - Self-healing WLANs that provide high availability
 - World-class service and support

The Cisco Aironet solution easily integrates with an existing network, increases the freedom that institutions can offer both students and faculty, and saves money. Cisco solutions give the mobility and flexibility needed to cost effectively provide computing resources wherever and whenever they are required.

FOR MORE INFORMATION

For more information about Cisco Aironet products or wireless solutions, visit <http://www.cisco.com/go/wireless>.

**Corporate Headquarters**

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters

Cisco Systems International
BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters

Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on **the Cisco Website at www.cisco.com/go/offices.**

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica
Croatia • Cyprus • Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR
Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico
The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia
Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan
Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Copyright © 2004 Cisco Systems, Inc. All rights reserved. Aironet, Cisco, Cisco Systems, and the Cisco Systems logo are registered trademarks or trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0406R) KB/LW6303 09/04

Printed in the USA