


# Lessons in Data-Voice Convergence

*Algonquin College positions itself for technology leadership with a Cisco AVVID network and IP telephones.*



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**—Rod Martin, Network Infrastructure Manager, Algonquin College**

## Background

At six locations in and around Ottawa, Ontario, Canada, Algonquin College of Applied Arts and Technology serves over 10,600 full-time and 50,000 part-time students. An integral part of the college’s vision for education is to be “recognized nationally and internationally for the use of technology to support success in teaching and learning.” According to Barry Brock, Director of Information Technology Services (ITS) at Algonquin, “We are committed to ensuring that the College is ranked as one of the most suitable, if not the most suitable, College in Ontario and Canada to use IT to train and support students.” The ITS team provides many services to faculty, staff, and students such as computer lab support, an Access Centre for Internet and remote access services, network and Web services support, telecommunications, corporate information management support for Human Resources, finance, and students, and IT project management for design and implementation of the proper systems to support the College’s goals.

Algonquin has an established relationship with Cisco Systems. The main Woodroffe campus houses the College data center, network backbone, and Internet access point. Remote access servers and ATM WAN lines extend Web services to off-campus students and faculty, to satellite campuses in Perth, Pembroke, and Kanata, and in downtown Ottawa at the Rideau and Elgin Street locations. Before moving to a Cisco AVVID (Architecture for Voice, Video, and Integrated Data) network, Algonquin had a switched Ethernet data backbone based on Cisco Catalyst® 5500 Series Switches, with a Cisco 7513 router providing Internet, WAN, and LAN routing services. Fast EtherChannel® technology among the backbone switches and router supplied the necessary bandwidth before Gigabit Ethernet was available. Wiring closets in each building connected a Catalyst 5000 Switch to multiple Catalyst 2924 Switches for 10/100 connectivity to the desktop. Telephony services were provided with Nortel PBX systems.

## Challenge

Algonquin is actively growing. Its growth doesn't end with the recent addition of its first on-campus student housing unit with 350 beds and—a new, state-of-the-art Police and Public Safety Institute (PPSI) at the Woodroffe campus. Another 350-bed on-campus student residence will be added to the Woodroffe landscape during the 2001-2002 academic year, along with a new Advanced Technology Centre scheduled to open in 2002. An overall five-year growth plan includes expansion of the campus network and its ability to deliver high-quality services. “We had a change in our environment,” says Rod Martin, Network Infrastructure Manager at Algonquin. “With all these changes, we were looking at a phone system that would be maxed out if we didn't do something.”

Another driver for change is that many student services are currently older “greenscreen” databases, including an Interactive Voice Response (IVR) telephone-based registration system for part-time students. All full-time students still complete registration forms on paper that must be keyed into the system by staff. ITS is transitioning that system to a self-serve, Web-based platform over the 2000-2001 school year. Says Martin, “As we're doing that, we recognized that we also need to change some of our customer service processes. So we're looking at an integrated client service center, and Cisco voice over IP technology will help us get there.” Another driver for change is connecting journalism students to news services on the Internet. “Just like the real world, we have to provide that facility to our students.”

However, as an educational institution, Algonquin must watch expenditures very closely. “The cost of an integrated call center is fairly significant,” says Martin. To realize its vision of technology leadership in education, Algonquin needs an underlying network with scalability to grow and flexibility to accommodate multiple technologies without costly upgrades. Yet the largest cost is not the capital outlay, but maintenance and operations. Therefore, the network also must provide efficiencies for management after installation. Says Martin, “We've been hearing about data-voice convergence. So we went through an RFP process with a lot of traditional PBX

vendors.” However, after talking with Cisco about its packet voice solutions, Algonquin saw the potential to do much more. “We looked at Cisco Voice over IP (VoIP). The dollars made sense. The future growth potential and future capability made us go with a Cisco solution.”

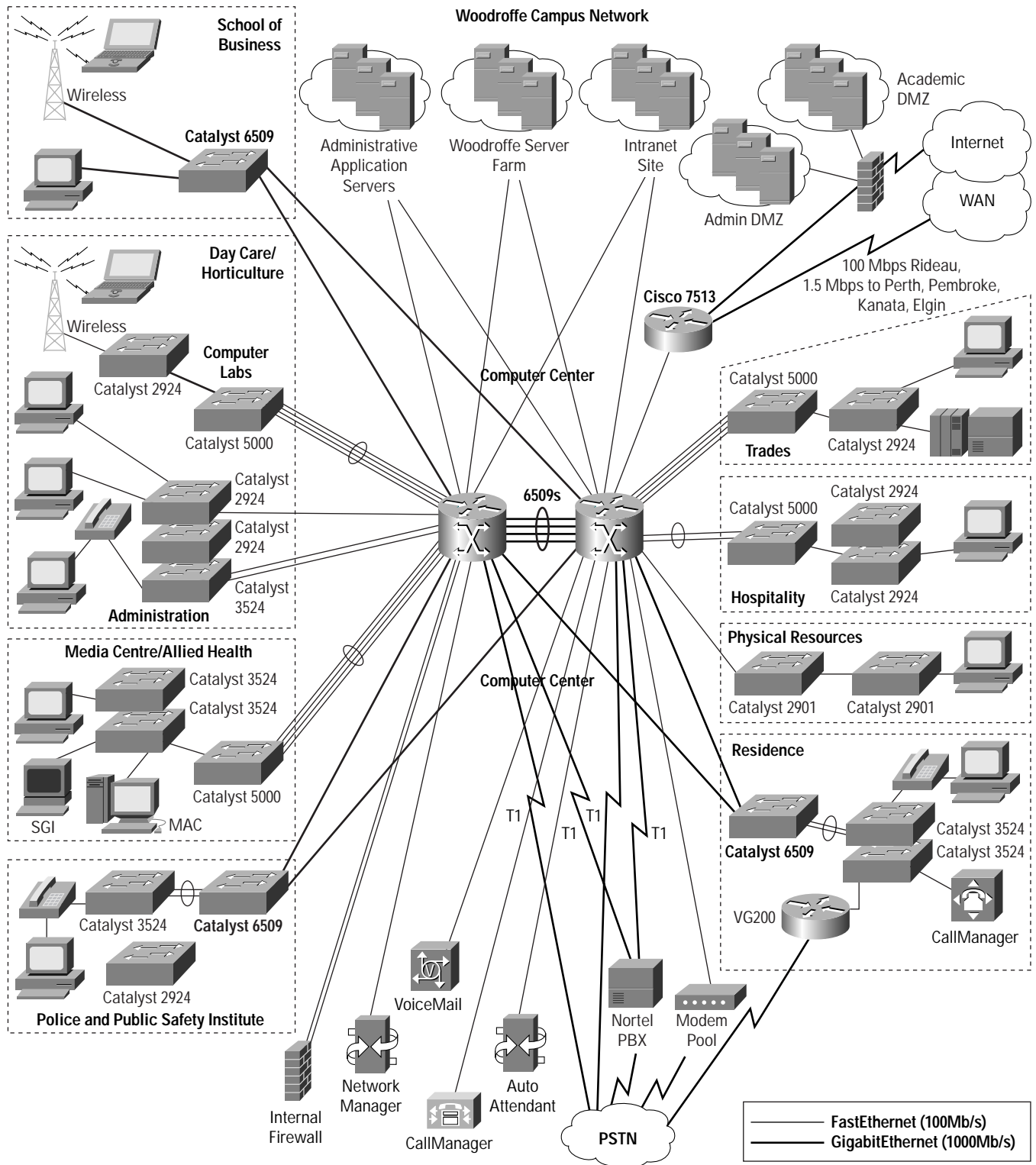
## Solution

The Cisco AVVID solution meets the college's requirements for cost-efficiency and technology leadership. Consolidating voice and data into the same network is their first step toward a completely integrated multiservice network—providing powerful new capabilities while substantially lowering costs over managing separate voice and data networks. “Our original budget did not include a data network for the residence, even though that was something we wanted,” says Martin. “One of the features we liked about the Cisco IP telephone is it allowed us to put a switched 100-megabit data network inside the residence.”

Algonquin built their new AVVID network in a big hurry during the summer break of 2000. “We decided we were going to do it in June. We had a design ready to go when we ordered the gear in June 2000. It was up and operational at the end of August,” says Martin. The successful build-out was a joint partnership between Algonquin, Bell Canada, and Cisco Systems, overseen by a Cisco Certified Internetworking Engineer (CCIE) from Exocom.

Upgrading to an AVVID network leveraged Algonquin's existing expertise in Cisco IOS software, management, and switching software. The new network has a Gigabit Ethernet backbone built with Catalyst 6509 Switches, with Cisco 6509 Switches in the new residence hall and PPSI building. Within each wiring closet, Catalyst 3524 Switches provide 10/100 connectivity to each drop, which supports a Cisco IP Telephone and PC. Telephones and PCs are kept on separate virtual LANs (VLANs) for address management and security purposes. Most off-campus calls are routed to the public switched telephone network (PSTN) via the PBX in the data center (Figure 1).

Figure 1 Algonquin AVVID Network



Algonquin provides voice-mail services to the two buildings with a Cisco ActiveVoice Unity system, located next to the Call Manager in the data center. An Intermedia XMU Auto-Attendant answers incoming calls to the campus, and the existing PBX provides telephony services for the balance of the 1700 telephones currently on campus. A Cisco Voice Gateway 200 provides backup Centrex telephone connections from the residence hall to the PSTN for 911 emergencies.

When the software is available, Algonquin wants to leverage the Web capabilities of the new IP telephones in the residence hall. They plan to reach residents with targeted advertising that supports local businesses and helps pay for the new system. They also plan to offer bulletin board functionality such as campus telephone directories, event calendars, cafeteria menus, weather, and other information aimed at making student life easier.

## Results

Algonquin's phone installation came down to the wire before students arrived. With little time for testing, "it was plug and pray," says Martin. They set up the Call Manager, programmed 350 IP telephones, and distributed them within days, with only three failures. By the end of the fall term, Algonquin will have over 600 IP telephones deployed.

Algonquin recently upgraded its Pembroke campus to voice over IP, replacing its 15-year-old PBX and adding ActiveVoice Unity voice mail. Having a state-of-the-art network is also a competitive advantage for the College to recruit students. "Algonquin College not only instructs people on technology, but is an actual user of innovative technology," says Martin. "That's worth something."



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