



# Lessons from the Campus Scene

By Steven S. Ross ■ *Editor-in-Chief*

Looking for ways to bring more bandwidth to the MDU environment? Broadband projects in college dormitories offer a wealth of ideas. Students, of course, tend to embrace new technologies. What's more, they share information among themselves to a much greater degree than do normal neighbors. Thus, when one student finds a new use for broadband, the news quickly spreads throughout the campus. And of course, if the network equipment can stand up to student use and abuse, it should work reliably anywhere.

There was a time when colleges drove Internet technology. The first non-military users of the Internet were, of course, colleges. The first big e-mail users were on college campuses. And of course, the graphical Web browser was developed at the University of Illinois. Today, the picture is mixed. There's plenty of bandwidth. But few colleges are using it to full advantage. What are they doing?

Perhaps the biggest news over the past few years has been students' heavy use of peer-to-peer file exchange programs, often to exchange copyrighted materials they haven't paid for. Several ISP officers have also told me about students who became mini-ISPs of their own by adding a wireless node, enhanced with easily fabricated antennas to expand the node's range. The file exchangers and wireless experimenters get caught only because someone at the ISP notices abnormally high bandwidth use.

## **IPTV on Campus**

But colleges continue to increase dorm bandwidth to accommodate VoIP and IPTV. Some of the most notable IPTV projects have been at Northwestern, Dartmouth, and a host of smaller colleges, mainly public campuses. At these schools and at many others, students get

their television on their computer screens, thanks to IPTV. At Dartmouth, in fact, the video can be seen through the Gbps campus wireless network. Some campuses have converted their coaxial cable plant to IP. Most run IP over a network that was originally designed for data, but upgraded to improve bandwidth.

The IPTV technology is not new. Many campuses are clients of vBrick Systems ([www.vbrick.com](http://www.vbrick.com)), which introduced its EthernetV system in 1997, and Video Furnace ([www.videofurnace.com](http://www.videofurnace.com)), which has been around since 2002. Students connect to a Web-based programming guide to choose what they want to watch. Most implementations of IPTV require a permanent viewer in place on the hard drive. Video Furnace sends a small Java applet viewer (about 300 K) with the video stream itself. It disappears when the video session is over. Other campuses are using Cisco Systems (now considered somewhat obsolete, although many corporate video networks use it), Cdigix ([www.cdigix.com](http://www.cdigix.com)), Radvision ([www.radvision.com](http://www.radvision.com)), and GlowPoint ([www.glowpoint.com](http://www.glowpoint.com)).

Video Furnace requires a little \$10,000 video server for each channel. Campuses typically get the programming from big cable companies operating locally, like Comcast, which sends analog signals to the video servers. The servers, in turn, digitize the signal to MPEG and encapsulate it into packets.

The video servers can also be used to originate content – plug them into any Ethernet port, attach a Firewire- or S-video-equipped video camera, and classroom happenings can be broadcast to the whole campus. Another \$15,000 buys a video archive device, so that live programming can be stored and served on demand.

State schools, hard-pressed to stretch their budgets and to get noticed, are

more likely to be pushing the technology than are the elite universities. Southeast Kentucky Community and Technical College used Video Furnace to set up the Kentucky Postsecondary Education Network for Webinars. Some schools use it to archive sports events. Ohio State, Seton Hall and others use Radvision's system for distance learning.

## **VoIP, Too**

Colleges used to make a good profit on student phone lines, but the cell phone killed off that business. So college administrators have generally allowed attachment of VoIP appliances to their network. And of course, students can use their computers to run Skype for Internet-based phone service as well. They try to draw the line at students reselling their VoIP access to others, but VoIP overuse is not that easy to monitor and infractions can be tough to prove.

It is not hard to see the future in all of this. Within a few years, the typical PC will have all the power of Video Furnace's little servers, at a fraction of today's price. A small fraction. That means millions of potential television studios in the United States alone. What will it take for an IP channel to turn a profit? Well, the key expenses for outbound bandwidth (with a fixed IP address) and equipment will come in at a few hundred dollars a month. Publicity will be word-of-e-mail or search engine. Revenue will be pay-per-view or subscription: \$5 a month for the knitting channel, anyone? A thousand customers worldwide, plus some advertising revenue, will support it. Go back to school to see how it is done. But certainly don't stick to your knitting.