

Northwestern University and Video Furnace: Delivering Cable TV to Students Over the Campus' Existing IP Network

ABSTRACT

Northwestern University uses the Video Furnace System 3 solution to deliver cable TV to all students across campus over its existing IP network. The solution offers more features and customization, easier management and savings of several million dollars over traditional cable systems.

EXECUTIVE SUMMARY

Customer: Northwestern University

Industry: Higher Education

Business Challenge

- Equip individual dorm rooms with cable TV service without the prohibitive cost of installing coaxial cable infrastructure
- Deploy a solution easy to maintain and administer
- Tightly control access to content

Network Solution

- Video Furnace System 3

Business Value

- Helps enable full-featured cable TV service across campus
- Saves as much as \$5 million over deploying coaxial cable infrastructure
- Allows easy management of access and content in a diverse university environment

PULLQUOTE

“Rather than having to watch whatever their roommates want to watch, our students have their own unique cable TV systems. Even when students share a room with two or three others, they can watch what they want and change channels as often as they like.”

--Tim Ward, associate director of Telecommunications and Network Services,
Northwestern University Information Technology

BUSINESS CHALLENGE

Founded in 1851, Northwestern University is one of the most highly regarded institutions of higher learning in the United States. Located in Evanston, Ill., Northwestern's

renowned undergraduate colleges of liberal arts, journalism, engineering and other programs are home to nearly 8,000 full-time students.

Like most universities, Northwestern had offered students cable television in dormitory lounges for years. But by 2001, a growing number of students expected to have access to cable TV in their rooms. The university's leadership believed that this was becoming an important factor in prospective students' choice of which school to attend. They decided it was time to consider expanding the dormitory cable system.

“We did the traditional investigation of what would it take to partner with our local cable provider and actually install coaxial cabling to all the dorm rooms,” says Tim Ward, associate director of Telecommunications and Network Services for Northwestern's IT department. “It looked like the cost would be somewhere between \$2 and \$5 million. And given that our residence halls are occupied almost year round, it was going to take us four or five years to reach the point where every single dorm room had a connection.”

Given the huge costs and lengthy deployment timeline needed for a traditional cable system, Northwestern decided to explore alternatives. Recognizing that each dorm room was already connected through a switched 10-Mbps Ethernet network, the university's IT staff decided that the best solution was to find a way to deliver cable TV over the existing IP infrastructure.

Delivering TV over the IP network, however, presented challenges—especially within a university environment. College students use a wide range of computer platforms, operating systems and media players. Any solution would need to be easy to manage and provision for this extremely diverse user base. Because network security and copyright issues were a major concern, the university would also need a solution that gave them tight control over access. Most importantly, the solution had to be extremely reliable. Students had come to view cable TV in the same way that they viewed a light switch — they expected it to work every time.

“The biggest complaints you get from students is when you start messing with their TV service,” says Ward. “Phone service can be down temporarily, and even e-mail can go down briefly. But if you take away their TVs, that's when they start screaming.”

NETWORK SOLUTION

After extensive investigation, Northwestern University chose the TV over IP (TVoIP) solution, now known as System 3 from Video Furnace. System 3 helps enable universities to deliver high-quality cable TV and video programming throughout a campus over a converged IP infrastructure. System 3 is a complete, end-to-end solution incorporating a scalable architecture built on the MPEG standard. The solution's simple client and server architecture is designed to help ensure smooth delivery of TV content across a campus' IP network while providing a low-cost, low-maintenance system for university IT departments.

With traditional video players, such as Real Player or Windows Media Player, end users are responsible for downloading the latest version of the player, as well as the correct video decoding software for the video that they wish to view. Users also have to make that sure they have all of the correct software preinstalled before trying to view content, which is far from an ideal solution for someone who simply wants to switch on the TV and start viewing.

By contrast, when users connect with the System 3 TV server, a Java applet determines the platform and operating system of the user's PC, and then automatically downloads the correct binary viewer application. The entire process takes less than three seconds. In addition, the viewer application is never written to the users' hard drives. Each time the user logs onto the system, a new viewer is downloaded. This helps ensure that users always have the latest, most up-to-date version of the software.

Once installed, the user experience is essentially the same as watching cable on a traditional television—with some noticeable enhancements. For example, System 3 includes a built-in, interactive program guide application.

“With the other systems we evaluated, we would have been responsible for all the program guide development work,” says Ward. “System 3 is already optimized to give you all of that information.”

Depending on the speed of the users' PCs, students can also use a picture-in-picture feature to view two or more stations at once. If students don't wish to view TV programs on their computer screens, they also can use composite video connections on their PCs to view the content over a standard television; however, the ability to watch TV on a computer has its own advantages.

“Rather than having to watch whatever their roommates want to watch, our students have their own unique cable TV systems,” says Ward. “Even when students share a room with two or three others, they can watch what they want and change channels as often as they like.”

Keeping Content Secure

Because System 3 operates over the IP network, universities have a much wider range of options for controlling access and usage than with traditional cable TV. Northwestern employs security features both within the System 3 solution and within the network itself. Multicast streams are encrypted, so even if someone found a way to hack into the signal, it would not be viewable. Users also must launch the viewer from a Web page. As a result, the university can use standard Web page access controls to confirm that users are students, that they are on campus and that they are accessing the solution from their residence halls. By retaining tight control over access to the viewer, Northwestern can carefully control who accesses the content.

“If you want to use security controls for Windows Media Player or Real Player, you need specialized knowledge of how those systems operate to understand how to set that up,”

says Ward. “In this case, everybody knows how to set up access controls for a Web server. It’s just that simple.”

Delivering Unicast Video Services

Northwestern primarily uses the multicast functionality of System 3 to deliver cable TV programming to residence halls and other public spaces. The university is also using the solution’s unicast capabilities to provide video-on-demand (VoD) services for some users. Faculty can schedule programming for a specific classroom at a specific time. For these users, Northwestern can help enable an expanded feature set, allowing the professors to pause, fast forward or rewind videos. The IT department even has the option of delivering a higher-resolution video feed for large-screen projection if that is required.

“Whether we’re working with multicast or unicast, the back-end infrastructure is still the same set of servers,” says Ward. “It’s the presentation to the user and the viewer application that people download that is different, depending on who you are and whether you’ve been licensed to receive the extended content.”

BUSINESS VALUE

The technology on which System 3 is based has been fully operational at Northwestern University since 2002, and the solution has been extremely well received by students, faculty and the university’s IT department. By the university’s own estimates, deploying a TVoIP solution over the existing IP network saved Northwestern millions of dollars over the cost of installing a new coaxial cable network. The solution also helped enable Northwestern to roll out cable TV to all residence halls in only a few weeks.

Today, each student at Northwestern can easily access cable TV service from his or her dorm room. The solution also has become an outlet for a broad range of original content at the university. For example, Northwestern used to partner with a local cable provider to broadcast the annual commencement ceremony to remote seating venues throughout Evanston. Now, the IT staff achieves this themselves by simply adding new remote IP addresses to the System 3 system. Northwestern also uses the solution to broadcast university sporting events to dining halls and public spaces, instructional videos to residence hall advisors, and original content from journalism and communications students over Northwestern’s campus TV station, NU Channel 1.

Cost Savings and Operational Enhancements

Northwestern has realized substantial savings by not having to employ network staff to engineer and maintain a coaxial cable infrastructure, as many universities do.

“We don’t need to go out and spend money on signal amplifiers; we don’t need to have a set of specialized monitoring equipment to see whether parts of the coax network are performing up to spec,” says Ward. “Instead, we have one person monitoring the solution, and everything else becomes a standard data networking issue.”

The unique viewer application of System 3 also eliminates many potential frustrations for both students and IT staff that result from users with out-of-date media players.

“If we discover we need to modify some behavior of the player, or if we want to roll out a new version with additional features that students have been asking for, it’s very easy to do,” says Ward. “The students automatically get the newest version of the client the next time they watch TV. We know which version of the client they’re using because it’s the one they just downloaded.”

Ongoing support for the solution has also been extremely easy and inexpensive. When students have an issue, it is handled with the existing technical support services for the residence halls. At the system’s backend, the IT staff originally thought they would require a full-time employee to maintain the solution, but the actual requirements have been much less.

“From a staff allocation perspective, this is an ideal solution,” says Ward. “In most education institutions, it’s the human capital you need to pay most attention to. The easier a system is to deploy, the more it plugs in and just works, the better off you are. This is one of those rare systems where, if you’ve built your network the way you’re supposed to, it just works.”

- 30 -

*Video Furnace, 14052 Petronella Drive, Suite 202, Libertyville, IL 60048, 847-362-6800,
www.videofurnace.com*