

Cisco IOS Software's Multicast Technology Delivers First Large-Scale Internet Broadcast— *Is It Live Or Is It Multicast TV?*

Imagine delivering real-time video and audio to millions of users—simultaneously—without network congestion and associated quality degradation. Now imagine experiencing high-quality multimedia content from your desktop. You can. Today. With technologies from Cisco Systems. Only Cisco delivers a complete Internet broadcast solution.

On October 9, Cisco and the University of Oregon collaborated to bring the very first large-scale Internet broadcast trial to life. Two Cisco technologies - IP Multicast and IP/TV - were key to providing a virtual front-row seat to the NetAid concert.

Saving Bandwidth and Boosting Speed with IP Multicast

Cisco IP Multicast, (www.cisco.com/ipmulticast), delivered by Cisco IOS® Software, enables simultaneous transmission of content, including live video and audio, over the Internet to PCs at multiple sites—with no impact on bandwidth or quality degradation.

“Multicasting boosts Internet transmission speeds by delivering a single stream of information to potentially millions of requesting receivers at the same time,” explained Christine Falsetti, manager of Cisco IP Services Product Marketing. “This prevents network congestion problems caused by unicasting alone, where one copy of the information is sent to each receiver. Multicasting also solves the overkill problem of broadcasting, where every user receives the information whether they requested it or not.”

IP/TV: Delivering Digital Quality to the Desktop

The second key technology is IP/TV, www.cisco.com/go/iptv, a complementary client/server software application that uses IP Multicast to deliver TV-quality video programs over data networks to PCs. With IP/TV, networked users can watch management broadcasts, training programs, university classes, business TV and other programs from their own desktop.

“With IP/TV, every networked user can watch NetAid and other live events, attend business meetings and take university classes right from their computer screen,” said Joe Huber, product manager for Cisco IP/TV. “IP/TV can transmit video and audio data using multiple

encoding schemes. Users can experience DVD-quality video on their desktops, with no signal degradation.”

Cisco Partners with University of Oregon to Bring NetAid to the Digital Desktop

On October 9, Cisco Systems transformed the Internet into an instrument for social change through NetAid, a global initiative to end extreme poverty. NetAid was launched via three simultaneous concerts held in New York, London and Geneva, and performed by the world's most popular entertainers.

To expand the reach of this global event even further, Cisco partnered with the University of Oregon to conduct the first large-scale Internet broadcast trial. The University of Oregon is a leader in network and Internet research, and has established itself as a source of high-quality video on the Internet.

During NetAid, the University of Oregon sourced a live, digitized satellite feed of the event. Using Cisco IP Multicast and IP/TV, the University of Oregon then distributed this digital data over the Internet2™ networks. Over three million university students at more than 150 Internet2 member universities were given front-row seats to the concert and access to special backstage interviews.

INTERNET 2

The genesis of this groundbreaking Internet broadcast trial was Internet2, a nationwide project led by more than 150 research universities to develop advanced Internet applications such as telemedicine, digital libraries and virtual laboratories-applications that are not viable using today's Internet technology. To help drive this kind of innovation, Internet2 often teams with government and industry partners to build and test next-generation Internet applications.

For the NetAid event, Internet2 member universities were able to access the digital data distributed by the University of Oregon. Students were able to download the IP/TV player to experience high-quality digital broadcast and watch NetAid at its best.

Halfway across the country at the University of Indiana, Stacy Wenz, lead operator of the Network Operations Center, was amazed. “Is it live or is it NetAid?!” she wondered. “We watched the broadcast from the time it started and it was like sitting in the front row.”

With only one network operator at the University of Oregon and four video servers, students tuned into fully synchronized video and audio on their desktops—transmitted in real time without any quality degradation. Only four engineers were involved in ensuring that the Multicast trial worked without glitches. Participating universities experienced 0% to less than 2% packet loss during the concert. “The broadcast trial went flawlessly,” said Joanne Hugi, director of campus computing at the University of Oregon. “The signal was very clear, providing a TV-quality broadcast. We didn’t experience a single technical problem.”

At the University of Oregon, where all dormitory rooms and faculty offices are equipped with 10BaseT Internet connections, users could watch NetAid from anywhere on campus. The University also set up a “cybercafe” at the technology dormitory to showcase the Internet broadcast trial and promote community participation in NetAid.

Building the Future of Internet Broadcasts

Over the next year, Internet2 and Cisco will further expand the horizons of Internet broadcasting through Cisco IP Multicast and IP/TV.

“The success of our NetAid broadcast trial proves that multicast is viable on a very large scale,” said Vinay Anand, product manager for IP Multicast. “We will continue to use Internet2 as a proving ground for broadcast applications such as distance learning, collaborative research, college sports—even campus film festivals. IP Multicast is the perfect solution to the multimedia bandwidth problem because it allows millions of users to share a single stream of information.”

Potential broadcast applications are not just confined to the university level, either. “More and more K-12 schools want to bring video and other multimedia technology into their classrooms,” noted Anand, “but they don’t have the resources. By conserving bandwidth, IP Multicast provides a cost-effective multimedia solution for the K-12 market as well.”

With the success of the NetAid trial, Cisco plans to broadcast many more events using IP Multicast and IP/TV over the Internet2 Networks. “Internet2 is a great test bed and a great audience for these kinds of broadcasts,” said Joanne Hugi. “We’re very proud to have been part of NetAid, and we’re grateful that our partnership with Cisco enables us to deliver such compelling content.”



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