

WNY & Internet2 Collaborators Achieve Another Success With High Quality Internet Video

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The Western New York High Performance Networked Video Initiative (WNY-HPNVI), a public service project supported and hosted by the University at Buffalo, reached and passed another milestone in its efforts to develop and demonstrate public benefit applications of emerging high quality Internet video today. A medical Grand Rounds conference, hosted at the Erie County Medical Center (ECMC) was made available for global participation and observation over the Internet. Healthcare professionals, students and support personnel at seven North American and European sites were able to observe and participate in the conference using high quality videoconferencing facilities and near broadcast quality video streams right at their desktops. Those who were not able to participate or observe at the time of the conference could review a high quality on-demand video recording of the proceedings within minutes of its completion.

While most of the technologies that were used had been previously demonstrated in various Internet2 trial and demonstration events, the group had never before succeeded in applying them in such a diverse real world heterogeneous context. The event was not an artfully constructed technology demonstration, the participating sites were not carefully screened and implicitly pre-selected Internet2 sites, and the public benefits that could arise from broader participation, in this case saving human lives, were quite real.

The Friday event included four characteristically different participation modes. Participants could interact with high quality visual and visceral connections in real-time with new high quality multi-point Internet video conferencing, either at their desktops or in auditoriums and conference rooms around the world. Those who were unable to participate using the interactive technologies, which for larger groups can still be modestly expensive, were able to observe and hear high quality live broadcast video streams of the conference at their desktop PC's using free and readily available software tools. In such cases, they could gain many of the benefits of interactive participation by using telephones, email and real-time Internet chat facilities to submit questions to the interactive participants. Both of these modes require high bandwidth and high quality Internet connections, however, and these are not yet ubiquitously available around the world. For those who lacked such connections, the group provided lower quality and lower bandwidth consumer-grade live broadcast streams that preserved high quality voice audio at the expense of video quality and frame-rates. These lower grade streams could be received by virtually anyone, anywhere in the world, with a simple dial-up Internet connection. Finally, for those who could not participate because of schedule conflicts or time-differences, digital recordings of the event were made available minutes after its completion for on-demand playback and review over the Internet.

Four of the participating sites actively developed and supported the multi-institutional infrastructure facilities behind the event. The University at Buffalo's WNY-HPNVI, along with their business and institutional sponsors, provided the Internet multi-point video conferencing systems and related infrastructure facilities and supported the background telephone conference bridge that linked technical support personnel at all sites for real-time control and problem resolutions. They also provided and supported the Internet video broadcasting and on-demand replay systems used to originate all of the broadcast and on-demand replay streams. The University of Rochester's Telemedicine and Video Services Department, provided and supported

dial-up videoconferencing multi-point conferencing systems used to include the older dial-up video conferencing systems. They also provided and supported the infrastructure facilities used to couple the dial-up and Internet based videoconferencing technologies. The Upstate Medical University's Telemedicine Department had also provided and supported multipoint videoconferencing facilities for older dial-up systems but apparent technical difficulties that arose in the preceding weeks precluded using them for the live event. Finally, the SURFnet Innovation Management group provided support and facilities in Utrecht, the Netherlands, to demonstrate the full range of participation alternatives to observers in Europe. SURFnet is the government sponsored next-generation Internet development organization of the Netherlands.

The technical feats and leger-de-main were impressive enough but the intended audiences and participants were the real beneficiaries. In addition to the technical observers and support personnel at all the participating sites, physicians, healthcare professionals and medical students enjoyed the benefits and convenience of high quality live participation from four sites using a mixture of dial-up and Internet systems. The live participation sites were The Erie County Medical Center Emergency Medicine Department in Buffalo, NY, which was the event organizer and host, the Upstate Medical University Department of Emergency Medicine in Syracuse, NY, the National Highway Transportation Safety Administration in Washington, DC, and the Ohio State University Department of Surgery.

The Extended Grand Rounds presentation was hosted by Dr. David G. Ellis, MD, FACEP, Assistant Professor of Clinical Emergency Medicine at the University at Buffalo School of Medicine. Dr. Ellis is also the Associate Director of Emergency Services and Director of Telemedicine Services at the Erie County Medical Center in Buffalo, NY. He is a principal investigator in the federally funded Center for Traffic Injury Research (CentTIR) and is a nationally recognized pioneer in telemedicine. The Grand Rounds presentation was part of the CentTIR project and was prepared and presented by Dr. Daniel G. Hankins, M.D. of the Mayo Clinic. The topic was: Controversies in Out-of-Hospital Airway Management.

WNY-HPNVI members have been working towards the realization of an event like this for years. High quality networked video technologies, while deceptively simple on surface, are dauntingly complex and difficult to support outside of sanitized research environments and controlled homogeneous private networks. Whenever "real world" projects of this complexity have been attempted in the past, numerous seemingly insurmountable problems have stood in the way of success. They include poor endpoint and infrastructure component interoperability, institutional Internet firewalls (security facilities) that do not easily pass the exotic traffic, long tortured traffic routing on mixed Internet1/Internet2 paths, an unusual sensitivity to network impairments that do not affect most other Internet applications, and critical dependence on emerging multicast Internet routing protocols that are not yet ubiquitously supported. In light of the difficulties, the success achieved on Friday with the Extended Grand Rounds trial was a major milestone on the way towards realizing the numerous practical public benefit applications foreseen for these exciting new technologies.

The preparations for the event on Friday required months of intense collaboration between the network and IT support staffs of the participating sites. Alternative equipment configurations had to be found and tested to eliminate interoperability problems, institutional firewall policies had to be adjusted, tuned and stabilized, and multicast routing problems had to be resolved across several institutional and transport networks in North America and Europe. While numerous quality-affecting issues were identified and targeted for further investigation and developmental work, the observers and participants were unequivocally enthusiastic about the

success achieved and several plans for new collaborative developmental trials were immediately launched.

The group expects to expand the Extended Grand Rounds project over the next year to include Grand Rounds programs at other North American and European sites and to include other healthcare disciplines as well.

The WNY-HPNVI has been developing solutions to problems affecting practical public benefit networked video applications for about five years. First focused on developing cost effective production-grade PC based endpoint systems for collaborative and content-origination applications, the group and its sponsors have recently been working on infrastructure, network and institutional support and connectivity issues. They meet regularly with network engineering and IT support staff at participating institutions to clarify and resolve issues and have developed a public-access "Sandbox" of networked video infrastructure components for the use of regional early-adopters in education, healthcare and government service.

The primary financial sponsors of the WNY-HPNVI include the University at Buffalo, Cisco Corporation, Veraview Inc., and Viewcommunications Inc. Cisco provided the high quality IP/TV multicast broadcast and on-demand servers used for the event. Veraview, a Buffalo, NY, networked video system developer and integrator that the group has been cultivating to provide the local in-depth support required by early adopters, provided the Windows Media Player broadcast and on-demand servers used for dial-up grade streams. Veraview also developed and installed the latest high quality Internet videoconferencing hospital systems deployed by ECMC to support the event. Viewcommunications, a networked video system developer and integrator in Manchester, NH, with whom the group has been working since its inception, provided the high quality videoconferencing system used as a conference control system and stream head-end. In addition, numerous pieces of equipment that supported the event and the developmental activities leading towards it have been donated or loaned privately by individual members whenever needs arose that could not be met by the sponsoring institutions and businesses.

WNY-HPNVI membership is open to all bona-fide early adopters of high quality networked video applications in Western New York education, healthcare and government service institutions. In addition to its technology development work and its application demonstration and trial activities, the group hosts regional meetings a few times a year. The next meeting will be on June 7th at the University at Buffalo and will include demonstrations and displays of the systems and facilities that have been used to achieve several successes during the last year.

Further information about Extended Grand Rounds trial plans and about the WNY-HPNVI and its activities can be obtained from:

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