MULTICAST VIDEOCONFERENCE TOOLS AND TECHNOLOGIES

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By

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MULTICAST VIDEOCONFERENCE TOOLS

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ABSTRACT

Multipoint video conference (VC) technologies rely on workstation session tools, dedicated hardware and software capabilities, and local area network bandwidth to generate, route and receive video, audio, text and document packets with little loss and minimal network hops. MBone virtual networks, web-based services, desktop workstation software applications, and dedicated routing hardware & software tools are different approaches to achieving real-time audio and video communication between multiple parties. MBone technologies require dedicated, secure routing techniques and are lacking in sufficient development to guarantee stable performance. Proprietary hardware and software solutions developed by third parties achieve acceptable QoS performance levels for daily use. Web-based video 'portal' services have been developed that offer multipoint conferencing capabilities with acceptable quality and availability using the public Internet.

Objective

The overall goal of this study was to explore video conference tools in an attempt to achieve acceptable quality levels and integration of video, audio, text exchange, and collaborative tools sharing using existing telecommunications infrastructures at different locations. The QoS goals for this study included:

- Video frame rates approaching full-motion imaging (15-30fps);
- Uninterrupted speech and audio;
- Real-Time text exchange ('chat') capabilities;
- Collaborative document and application sharing capabilities (depending on solution features)

Network infrastructure available on the Telcot LAN, CSU-Hayward LAN, Internet WANs in the United States and selected countries of Europe were utilized for test purposes. A variety of session and application tools were to be tested to find a selection to tools that achieved acceptable quality and ease-of-use for everyday business, professional and personal use.

Challenges

Many deficiencies were anticipated in infrastructure limitations, software abilities, and hardware availability during multicast test sessions. Major hurdles were encountered in sending and receiving multicast traffic using publicly-available software tools. Difficulty in locating and obtaining proprietary software solutions were expected and realized; obtaining access to web-based solutions was expected to slow down the testing process. Contacting and negotiating with dedicated hardware vendors to obtain service solutions was also anticipated. Recognizing and resolving LAN limitations at TELCOT, CSUH and remote locations became apparent during the various testing procedures.

Solutions

Dedicated VC software packages achieved the level of QoS desired in this study with proper setup. Proprietary web-based software and hardware services achieved acceptable levels of QoS

and service using the public Internet infrastructure when available, are compatible with specific workstation platforms, but require sufficient network bandwidth and unrestricted transmission to perform as advertised. Use of multicast MBone tools and routers requires sufficient network throughput, dedicated virtual connections, and network administrative control to achieve an acceptable Quality of Service (QoS); acceptable results were seldom achieved during this course of study. Dedicated VC hardware solutions were not available for testing during this study and no comment can be made on their effectiveness.