Internet Videoconferencing – What We've Learned

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Abstract

NDSU led a statewide taskforce to evaluate and recommend videoconferencing units for use over the Internet. The taskforce did recommended units that are now being used across the state. North Dakota is now installing a statewide video network that we are involved in planning. NDSU has purchased videoconferencing units that we are testing and using to connect to people within the state and beyond.

This presentation will discuss where we've been, what we learned and where we're going. We will also demonstrate or show some equipment.

Statewide Taskforce

In November 1999, the CIO of North Dakota's Higher Education requested that a project be started to look into and evaluate Internet based (H.323) videoconferencing. Representatives from several institutions, the Interactive Video Network (IVN), and the Information Technology Department (supports state government) responded.

We broke videoconferencing units into three levels.
1. Low-end desktop units at less than $500 using software with a USB camera or PCI capture card. The video and audio quality was fair to moderate (15 fps video and clear audio).
2. Mid- priced ($500 - $2000) desktop units including hardware and software solutions installed in a PCI slot. There are no Macintosh or UNIX solutions. The video and audio quality was moderate to good (15-25 fps video and clear audio).
3. Higher priced ($2000 - up) group or set-top units that include all the hardware needed for high-end videoconferencing (25-30 fps video and excellent audio).

The audience for the first level would be one-two people sitting at an individual's workstation. The audience for the second level would be a small group (1-4 people) at a workstation or in a conference room. The audience for the third level is a meeting of up to 15 people.

After sending out an RFP, we decided to concentrate mainly on the second level and ended up selecting the VCON Escort 25 and Intel Proshare as the products of choice at that level. The Polycom ViewStation, in level 3, was slightly higher in price, and was a stand-alone system. But because of price, quality, and capability, this became our product of choice overall, and the product we have purchased most often.

Since then there have been new products introduced. The new Polycom, ViaVideo, is an inexpensive desktop unit that has very good quality and compatibility. PictureTel has a new 970 unit that features a "people" monitor and a high resolution "content" monitor. This is a level 3 unit intended for classroom use. Polycom now has a plug-in that also allows high resolution. We have just started testing a low-end unit for a macintosh.

Although we are no longer meeting as a taskforce, our listserv list still keeps us in touch with each other. Some continue to evaluate equipment; some are looking at MCU's, gateways, and gatekeepers; some are participating in establishing the state video network; and some are participating in videoconferences of their own.

The Megaconference

At the fall 2000 Internet2 meeting, a virtual track featured presenters and approximately 100 participants from around the world. The Megaconference, as it was called, joined people who use H.323 based videoconferencing. Sites donated the use of their MCUs (Multipoint Conferencing Units) and cascaded them together to create this virtual

conference. NDSU participated as a presenter, a host for the tenor in the virtual Barbershop Quartet, and also as a participant. This event has not only brought people together who are researching this technology, but has also caused videoconferencing products to rapidly increase in capability as MCU manufacturers spent much time assisting participants to connect their MCU's from around the world together. The lessons learned from this major cascading activity causes them to alter their products as problems develop. For those interested in more information, see web site: http://www.mega-net.net/megaconference/.

State Video Network

North Dakota State Government, county courthouses, K-12, and higher education are working together to plan and implement a statewide network. Significantly, Internet-based videoconferencing (H.323) was selected over other videoconferencing technologies as the standard because of its expandability, and increasingly quality products at reasonable prices. To implement this network, T1 connections are being placed in all county courthouses, all state institutions of higher education and senior high schools (upon request). A large Accord MCU will be used to connect all videoconferences that require Quality of Service (QoS). The Accord also provides gateway services, so North Dakota's Interactive Video Network (IVN), an H.320 based system will be able to connect to all H.323 videoconferences. This will significantly increase the videoconferencing capability within North Dakota, as well as worldwide. The Accord will provide the gatekeeper functions, and so will be the network "traffic cop." In this capacity it will provide address translation for videoconferencing equipment on the network, it will require registration of equipment, and it will regulate the traffic – accepting or rejecting requests for connections based on available bandwidth.

TOP Grant

NDSU's College of Agriculture wrote a successful grant to the Commerce Department Technology Opportunities Program (TOP) for education on risk management/marketing. Research Experiment Centers (RECs) and County Extension Offices link rural North Dakota into NDSU and the rest of the state. Communication is sometimes a problem and the grant goal is to provide an easy to use, flexible, and appropriate tool to help keep rural North Dakota informed and connected. Videoconferencing was the technology chosen to distribute this information and initially four Polycom ViewStations were purchased and distributed around the state.

The state chose the TOP grant as the pilot project as we begin to install and implement the network. Quality of Service is a real challenge, and the network architects are working hard to insure QoS. Hettinger, Dickinson, and Minot are now on the network, along with NDSU. Since NDSU is an Internet2 site, we have good access both within the state, and to other Internet2 sites. We have been testing between the sites, and the connection is excellent. One of our TOP sites will not join the state network right away

because they already have a high-speed connection provided by their local phone company. They are also included in the pilot project and will be used to test between state network sites, and those that are not on the network. This pilot will also used to help establish policies and procedures and test network performance. By July we plan to have ten RECs and County Extension Offices using videoconferencing to communicate with each other and provide an added new service to these rural areas.

Multipoint Conferencing

NDSU has purchased a RADVision MCU. This will allow us to connect up to nine sites in a 384K videoconference. However, it cannot connect to sites that are using another technology, like ISDN (H.320). The state's large Accord MCU will be used to bridge the current Interactive Video Network that uses H.320 technology over dedicated lines to the H.323 videoconferencing units. This will provide the greatest savings to the state as we continue to use our present system, augmenting it with the newer technology. NDSU's MCU will be used for our Internet2 events, as a testing area for videoconferencing units, and to cascade into the Accord MCU. It may also be used by ad-hoc videoconferences where QoS is not an issue. We have joined ViDeNet, an Internet2 initiative that provides information and access to MCU administrators. We will have attended a workshop to assist us use this equipment, and better participate in other Internet2 initiatives.

Of course, everyone worries most about the hardware side of things, when it's the people portions that are likely to "get" you. Policies, training and scheduling are major topics we are currently struggling with.

Policies

Along with the planning for the layout and structure of the network, several groups are working to identify and write policies to help everyone use this resource successfully, without causing someone else a problem. Some of these policies deal with the use of the network itself. For example, the policy that all state agencies (county and state government, higher education, and K-12) will go through ITD for their network connection and the policy that if a videoconferencing event, even a point-to-point event, wants QoS they must go through the Accord MCU.

Other policies deal with scheduling events. Along with a policy that states, for example, that classes have first priority if you are a higher education or K-12 site, we are working with the RECs to have them help us identify their issues when they are hosting events. For example, will they accept non-higher education events, will a technician be needed, who will train people at each site, will the building be available during non-working hours, will they handle materials (receiving and sending), are there charges, and how many people will they be able to accommodate. The answers may be different at each site, so contacts at each site need to be identified so appropriate agreements and working

relationships can be established. The lessons we learn together will help the rest of the network as more sites join.

Training

A group of people from the RECs, NDSU's School of Education, SENDIT (K-12), and ITS are putting together training materials. The goal is to develop a core set of materials that can be used by all groups, but able to be modified to fit the needs of a particular group requiring instruction. The biggest problem we are having is that people are not waiting. They want the equipment and training now!

Scheduling

IVN is researching scheduling software that will be used to connect the various videoconferencing devises around the state. This information must also be accessible to the videoconferencing coordinators at each site, so that rooms and technicians can be assigned. The plan is that classes will be scheduled centrally, before meetings and other events are scheduled. The coordinators will probably be trained to schedule meetings and other non-class events.

We have found that the current scheduling software IVN uses does a good job of scheduling and connecting the sites in the desired configurations, but it does not take care of scheduling technicians in rooms and identifying special needs associated with an event. We therefore use Corporate Time to handle our local needs. We hope that as we grow this network, we all can decide and use the same software to assist us to better work together and see what resources are available.

Conclusion

IP-based videoconferencing is rapidly evolving. The products are improving and the prices are dropping. This is causing a tremendous increase in and interest in IP-based videoconferencing. As a result, many states, including North Dakota, are developing IP-based videoconferencing networks. There are many challenges, but the rewards are great, especially for North Dakota where the rural nature of the state resulted in poor communication structures in the past. Now we have the opportunity to develop a cohesive, planned network to serve the citizens and their interstate connections, as well as their connections worldwide.