



Building a Statewide Information Technology Infrastructure

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Building a Statewide Information Technology Infrastructure Hablamos Juntos Lessons Learned

At the same time Central Nebraska Area Health Education Center (CN-AHEC) wanted to improve communication between Spanish speaking patients and healthcare providers, the Nebraska Information Technology Commission (NITC) Subcommittee on Telehealth wanted to determine how to utilize technology to help rural hospitals increase the quality, availability and accessibility of healthcare throughout the State of Nebraska. Video conferencing was a common ground both groups could utilize to reach their goals. It was particularly important for both groups to find an economical solution to eliminate disparities in healthcare in allowing patients and healthcare providers access to other healthcare professionals and information without the need for extensive travel.

Nebraska Telehealth Mission

The Nebraska Telehealth Network's initial goals were to bring together the hospitals within the State of Nebraska into a single, connected system that can provide patients clinical consultations give healthcare providers continuing education and provide administrative connections. Not only could the hospitals connect but it would also be important to connect with the public health agencies, the state government and the state bioterrorism labs in order to facilitate emergency alert capabilities preparedness as well as educational activities. For CN-AHEC connecting the hospitals would permit facilities to share qualified medical interpreters which are not readily available in rural areas.

The long term goals of a statewide telehealth network go beyond just those of healthcare to create an environment of sharing of resources through the State of Nebraska. Within rural communities the hospital and the school is the life blood keeping the town alive. It is critical for the hospital survive if the community is to survive.

A wide variety of entities are involved to insure the network develops as a cost effective, efficient, and sustainable project. Members met as a group at least once per month with additional meetings to deal with specific tasks. One individual was hired through the Nebraska Hospital Association to coordinate the network design and keep the momentum going.

Nebraska Telehealth Project Partners

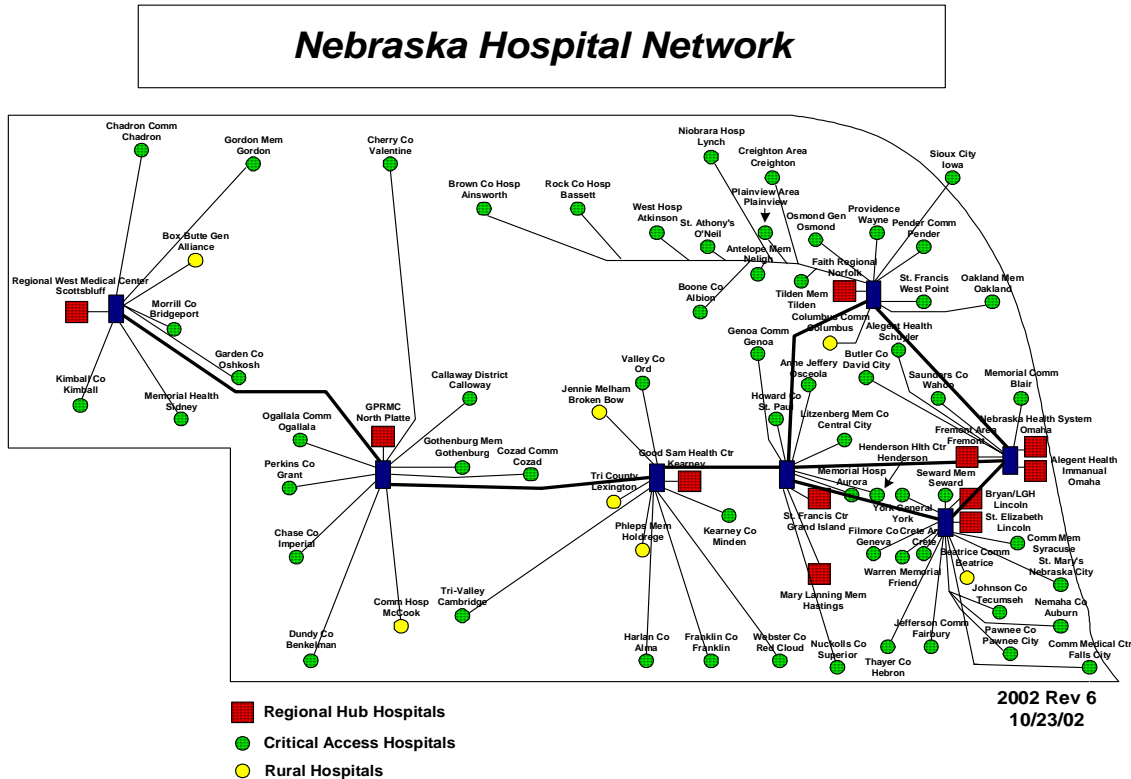
- ◆ Nebraska Information Network
- ◆ Lt. Governor's Office
- ◆ Nebraska Hospital Association
- ◆ Nebraska Hospitals
- ◆ Nebraska Medical Association
- ◆ Central Nebraska AHEC
- ◆ University of Nebraska System
- ◆ Nebraska Office of Rural Health
- ◆ Nebraska Department of Education
- ◆ University Nebraska Medical Center
- ◆ Nebraska Information Technology Commission
- ◆ Nebraska Office of Chief Information Officer
- ◆ Nebraska Division of Communications
- ◆ Nebraska Health & Human Services
- ◆ NHHSS Bioterrorism Preparedness & Response
- ◆ Nebraska Public Health Departments
- ◆ Nebraska Public Service Commission
- ◆ Nebraska Telecommunications Providers
- ◆ Nebraska Educational Telecommunications
- ◆ Universal services Administrative Company

Network Design

The network is designed to be as efficient as possible given the topography of the State. The network is a private network using TCP/IP network protocol. Voice over IP nor

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public internet will not be allowed on the network. This was a conscience decision in order to insure the network would not have ill effects on the over 40 telephone companies within the State of Nebraska. A spoke and wheel design with seven hubs across the state provided a more cost effective manner to link the over 80 hospitals and 21 health departments to the network. Connections are also possible to the Nebraska State Capital, the Nebraska State Office Building, and the state bioterrorism lab so that the network can serve as a communication vehicle in the case of a state wide natural disaster or bioterrorism alert.



Each location will have firewalls and routers with the same technical specifications. Depending upon the number of sites connected to each hub, the hub site will be equipped with a multiple conferencing unit (MCU) or a router. The amount of bandwidth between hub locations increases as the network moves from west to east. As the network grows additional bandwidth will be allocated to the network.

The quality of the video and audio system of a network is in direct relationship to the amount of bandwidth you devote to the infrastructure. The audio is perhaps more significant than the video. Think back to your first internet connection which at best may have been at a speed of 56 kbps and compare it to the speed that you use today. The same principles apply to a video connection. In video the more bandwidth used the better the video and audio signal will be during transmission.

The most economical infrastructure would be the use of the public internet. The downside to using this type of connection is packet loss which equates to poor picture quality and sound, as well as loss of connection. There is also a problem with security when using public internet although most video conferencing equipment now comes with encryption software. A digital subscriber line (DSL) technology transmits data over phone lines at a rate of 1.5 Mbps. In Nebraska, DSL was not available everywhere since distance

Building a Statewide Information Technology Infrastructure Hablamos Juntos Lessons Learned

proved to be a problem from central telephone offices and where it was available we still experienced packet loss as well as the signal dropping.

Network Funding

The Universal Services Administrative Company (USAC), Washington, D.C. will be the major contributor in terms of funds to support the transmission costs. The exact amount of their anticipated contribution is still being calculated; however, as an example, they will pay all of the costs of a T-1 line down to a net of approximately \$267 per month cost to the user hospital. The USAC funding also contributes approximately 90% plus towards the fees charged by the Nebraska Universal Service Fund.

The Nebraska Public Service Commission issued an order in September, 2004 authorizing support for the Network activities in the amount of up to \$900,000 per year for three years, beginning in July, 2003 and running until June, 2006. This amount is subject to renewal dependent on the performance of the Network. This funding covers a portion of the rural hospitals' line costs, the network backbone line costs and services provided by the telecommunications carriers such as routers and firewalls. As an example, this funding will pay approximately \$167 per month of the cost of a T-1 line. The hospitals themselves are required to provide \$100 per month toward the Network's transmission costs.

Funding for the technical and administrative costs of the network vary at each hub location. For example in Grand Island, CN-AHEC is providing support for these functions, utilizing a mix of grant funds. At other locations the individual hospital is providing funding for personnel and other resources at their local level. Efforts are underway to locate financial support for uniform coverage of technical support across the state. The technical support would aid individual sites on how to install an internal network, problems with video switches and to determine efficient utilization of bandwidth throughout the network.

Video Conferencing Equipment

There are several manufacturers of video conferencing equipment. One manufacturer was chosen for Nebraska so that network difficulties could be easily identified as a network or hardware issue. This also allows technicians to have greater knowledge on one specific platform. For medical interpreting, the most popular model, The Polycom Practioner Cart, is also one of the more expensive units produced. The Practioner Cart is easy to move from department to department and easily supports a wireless card. The single monitor system retails for \$30,000 includes the ability to by-pass a bridge. This feature originally was considered important in case there is an external network problem. The unit can also support additional peripheral equipment such as scopes.

The most economic unit, Polycom VSX300 listing for \$4,300, is a desktop unit that is for small examination rooms and lacks many features of the mobile unit. The most popular unit has been the Polycom VSX7000, a unit which has a separate camera unit from the monitor. The size of the monitor can be chosen to fit the size of the room. A statewide purchase agreement was signed with one vendor permitting hospitals and public health departments to receive the best possible price. Many hospitals are also using the network for the transfer of radiology images, but there was no attempt to form a state bid for this equipment.

Utilization of the Network

The Nebraska Statewide Telehealth Network provides for a wide variety of uses, including:

- Patient consultations including specialty areas such as cardiology, endocrinology, oncology and others
- Provide Spanish medical interpreting to improve communication between LEP patients and health care providers.
- Integrative work with other areas of patient interaction such as dentistry, interpretive services for all languages, etc.
- Behavioral Health video consultations
- Teleradiology and the transmission of other digitized clinical images in areas such as cardiology
- Trauma and emergency room care
- Continuing medical education for health care professionals
- Education leading to licensure or certification of health care professionals
- Education for emergency services providers
- Administrative meetings
- Support groups and community education programs
- Emergency communications and bioterrorism preparedness training
- Video medical interpreting services for persons who do not have English as their first language

The Network provides value to rural areas of the State of Nebraska in a number of ways by improves the access of the public to medical consultation resources, thus improving the quality of care available. The Network serves as an aid in the training, retention and recruitment of the rural healthcare workforce. In fact, the network was used to train medical interpreters. The Network, through its ability to help strengthen the rural healthcare resources, helps strengthen the local economy. The Network provides an additional resource in case of an emergency caused by a man-made, natural or bioterrorist threat as well as providing another avenue for education on how to deal with these emergencies. Finally, the Network provides an avenue for bringing together entities in public health, the healthcare field, education and government as well as other quasi-public and private agencies and helps eliminate healthcare disparities within rural areas.

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