Broadband Webinar Series
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Network Nebraska – Connecting Community Anchor Institutions

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Websites:
http://www.networknebraska.net (Network Nebraska)
• Tom Rolfes’s background

  – Education
    • Completing a PhD in Leadership Studies
    • M.Ed in Educational Administration
    • M.Ed in Curriculum & Instruction
    • B.S. in Secondary Education (Natural Science)

  – Experience
    • 13 years with the Office of the CIO/NITC
    • 15 years middle school/high school science teaching & technology support
    • 2 years with the State Energy Office
Dec. 21 Webinar to Focus on Network Nebraska

• LINCOLN, Neb. -- The fourth webinar focusing on broadband adoption and use in Nebraska, scheduled Dec. 21, is titled "Network Nebraska -- Connecting Community Anchor Institutions."

• Network Nebraska aims to meet the telecommunications demands of local government, state government and education. So far, 213 school systems, 15 educational service units, 17 public and private colleges and 1 public library are participating in the venture.

• The group has reduced the state contract unit price for Internet access by 96 percent over the last six years; exchanges more than 400 semester high school courses between K-12 districts annually over Network Nebraska; and provides enrichment and training through videoconferencing.

• Today’s Agenda
  – Network Nebraska & NITC Organizational Structure
  – Network Nebraska-Education in detail
  – U.S. UCAN & Community Anchor Institutions (CAIs)
  – Q&A
Nebraska Information Technology Commission

Lt. Governor Rick Sheehy, Chair
Pat Flanagan (Omaha)
Lance Hedquist (South Sioux City)
Dr. Daniel Hoesing (Alliance)
Mike Huggenberger (Blair)
Doug Kristensen, J.D. (Kearney)
Dr. Janie Park (Chadron)
Trev Peterson, J.D. (Lincoln)
Dan Shundoff (Kearney)
Senator Galen Hadley, Ex-Officio (Gibbon)

http://www.nitc.nebraska.gov/nitc/members.html

State Government Council (Rick Becker)
Community Council (Anne Byers)
Education Council (Tom Rolfes)
eHealth Council (Anne Byers)
GIS Council (Larry Zink)
Technical Panel (Rick Becker)
(N.R.S. 86-5,100) The Chief Information Officer, in partnership with the University of Nebraska, shall develop and maintain a statewide, multipurpose, high capacity, scalable telecommunications network to be called Network Nebraska. The network shall consist of contractual arrangements with providers to meet the demand of state agencies, local governments, and educational entities as defined in section 79-1201.01. (LB 1208—2006 Session)
Brief Overview/History

- K-12 lobbied the Legislature for funding to replace their JPEG videoconferencing network in 2005 session
- “LB 1208” passed overwhelmingly by the Legislature in April 2006;
  - Defined the statewide network and tasked the State CIO (with assistance by the University of Nebraska) with providing access to all education entities in Nebraska by July 1, 2012;
  - Provided lottery funding of $3.8 million/year for distance education incentives and equipment, $3.4 million/year state aid subsidies for K-12 telecommunications, $1.4 million general fund support for a statewide clearinghouse and scheduling software;
  - Created and funded the ESU Coordinating Council to coordinate distance learning offerings
- The State Office of the CIO and the University of Nebraska formed the Collaborative Aggregation Partnership (CAP) and have worked cooperatively on this project ever since
Some Definitions

- (N.R.S. 86-5,100) The Chief Information Officer (CIO) shall provide **access** to each school district, ESU, community college, state college, and the University of Nebraska at the earliest feasible date and no later than July 1, 2012.
  
  - **Access** for education entities for purposes of LB 1208 was defined by the Chief Information Officer as: the ability to connect 10Mbps or greater transport WAN from each participant’s premise to a *Network Nebraska* aggregation point (Grand Island, Lincoln, or Omaha), either bid by the State of Nebraska or each local entity. For public school districts and ESUs wishing to be eligible for equipment and distance education incentives from the lottery fund, 30Mbps or greater was required.

- (N.R.S. 86-5,100) The network shall...meet the demand of state agencies, local governments, and **educational entities**, as defined in 79-1201.01.
  
  - (N.R.S. 79-1201.01) **Educational entity** means a school district, a private, denominational, or parochial school, an educational service unit, a community college, a state college, the University of Nebraska, or a nonprofit private postsecondary educational institution.
• Network Nebraska-Education CURRENT Partners (246)
  – 212 public school districts
  – 15 Educational Service Units
  – 7 nonpublic colleges
  – 1 nonpublic school
  – 1 public library
  – 10 public colleges
    • 6 community colleges
    • 3 state colleges
    • 1 University of Nebraska

• Network Nebraska-Education POTENTIAL Partners (470+)
  – 39 public school districts
  – 2 Educational Service Units
  – 7 nonpublic colleges
  – 160 nonpublic schools
  – 269 public libraries
  – 2 tribal colleges
• Network Nebraska-Education Cost Model
  – NN Participation Fee
  – NN Interregional Transport Fee
  – WAN transport (10Mbps-1000Mbps)
  – NN Internet Access @ $6/Mbps/month

• Traditional Cost Model
  – Commodity Internet (e.g. DSL) “delivered” from $15/Mbps/month to $200/Mbps/month
Network Nebraska-Education Finances

- Network Nebraska Participation Fees (2011-12)
  - $190.21/month x 246 entities = $559,000/year
  - Pays for staff support, routers, router maintenance, software, software maintenance, SEGP fee, State of Nebraska indirect costs

- Interregional Transport Fees (total of $298,000/year)
  - $101.09/month x 17 colleges = $20,600/year
  - $31.69/month x 229 K-12s = $86,700/year
  - Federal E-rate Reimbursement = $191,000/year (68% of backbone)
  - Pays for six transport and aggregation segments of the statewide backbone
• Network Nebraska-Education Achievements
  – Reduced the unit cost of Internet by 96% over 6 years through aggregation of demand and statewide bidding
  – Annually transports over 400 semester distance education courses for high school and college credit
  – Serves over 350,000 K-20 students across Nebraska
  – Has one of the lowest indirect cost ratios in the country among statewide networks; totally self-funded by partners
  – Nebraska public school districts are 99% fiber-connected at or above 40Mbps
  – Statewide/U.S. Intranet routing is superfast and affordable
  – Have had 100% partner retention through the first 5 years
• ESUCC Distance Education Course Breakdown by Subject

Agriculture (23 courses)
Arts (Music & Art) (26 courses)
Business (22 courses)
English (51 courses)
Family & Consumer Science (22 courses)
Foreign Language (92 courses)
Industrial Technology (5 courses)
Math (56 courses)
Other (5 courses)
Physical Ed/Health (5 courses)
Science (28 courses)
Social Science (47 courses)
Speech (4 courses)
Technology (24 courses)

• Nebraska Virtual Instruction Source (NVIS) currently has 410 Course Offerings available [http://nvis.esucc.org/](http://nvis.esucc.org/)
A couple words about the different types of videoconferencing

Software (desktop or laptop apps such as Skype, Yahoo!, Movip,)

Hardware (codec devices such as Polycom, Lifesize, Tandberg, etc...)
A couple words about the different types of videoconferencing

**Software codec applications**
- Fine for pt2pt, person2person
- Bandwidth only 128-384Kbps over commodity Internet
- Display limited to laptop or desktop monitor size or digital projection
- Sometimes susceptible to pixelation, latency, screen freezing, inferior audio quality
- Entry level cost $100 to $400 per unit (included on many laptops)
- Very portable, pick up and go

**Hardware codec devices**
- Better for large groups, classrooms, pt2multipoint
- Bandwidth up to 2Mbps per channel over H.323 IP Intranet
- No limit to size of display—42”+ LCD, Plasma, digital projection
- Superior SD or HD quality; allows tweaking of audio and/or video signals
- Entry level cost $3,000 to $15,000 per unit
- Static room placements, “mobile” carts not that mobile
• Critical Success Factors
  – Network Nebraska Codified by the Nebraska Legislature
  – Management was tasked to OCIO and UNCSN with a proven track record of managing large networks
  – Participation by public K-12 was incentivized by state lottery funds (e.g. equipment and distance ed incentives)
  – Cooperative, collaborative project was the product of NU, school districts, ESUs, colleges, and State working together
  – All backbone costs, administrative costs and annual rate setting is a very transparent process with partner input
  – Mantra since the beginning of the project has been: “Best service at the lowest price”
• Challenges/Obstacles
  – Still perceived as a “distance education network”
  – Has little or no budget or staff to do marketing or outreach; mainly a volunteer effort
  – Development of applications and services is slow because they must be requested and agreed to be funded on a pay-as-you-go basis
  – The potential of the IP Network is not fully realized (e.g. statewide directory services, learning management, content management, e-mail system consolidation, etc...)
  – Entry costs (WAN & annual NN fees) for most rural libraries and nonpublic schools are beyond their ability to pay
• What’s next?
  – Internet access costs keep going down because of aggregation of demand, competitive bidding, market forces
  – Implications?
    • More Internet access could be delivered to schools and classrooms paving the way for more education-related, high bandwidth applications
What’s next?

- ESU Coordinating Council is considering migrating all of its servers (Renovo, learning management, co-op purchasing, Student Records System, etc...) over to the Network Nebraska core network to serve K-12 education.

- Implications?
  - More direct transport for data exchange, thereby improving speed and reliability. Further, implementation of statewide directory services could allow for “single-sign on” by every student and staff member with assigned privileges into any application.
• What’s next?
  – The Office of the CIO has purchased two large enterprise MCU bridges for multipoint videoconferencing
  – Implications?
    • Network Nebraska-Education has purchased 10 port connections for use by any Network Nebraska members at any time, on a first-come, first-served basis. Further, these MCUs have the size potential to accommodate all the simultaneous, multipoint course exchanges that occur over Network Nebraska on any given day.
• What’s next?
  – The University of Nebraska has installed a toll-free number, 1-888-NET-NEBR, help desk software with 24/7 staffing, and an automatic notification system to use in case of system outages or maintenance alerts.
  – Implications?
    • Network Nebraska could be using the data warehouse of trouble ticket resolution to help solve future technical problems. Any problems with vendors concerning state contracts can be resolved by the Office of the CIO.
What’s next?

- Network Nebraska has purchased traffic shaper hardware and network management software for use by Network Nebraska partners.

Implications?

- This will create a more reliable and responsively managed network, with more expertise being developed at the regional and local level.
- It will enable our Network Nebraska partners to “shape” Internet bandwidth between and within regions for better load balancing.
Shifting gears...What is Internet2?

- An advanced networking consortium led by the research and education community; with a nationwide superfast backbone
- Internet2 has over 200 higher education members today, at least one in every state.
- Internet2 has over 50 Affiliate members: non-profit, research- or education-oriented organizations
- Internet2 has THOUSANDS of K-20 members distributed across 39 Sponsored Education Group Participation (SEGP) States, all interconnected through what are called GigaPops (Gigabit Points Of Presence)
What is the Internet2 K20 Initiative?

- Started in 2002 with the goal of extending access to the nationwide research and education network to K-12 and community colleges
- Today 39 education networks across the U.S. connect to the Internet2 Network via University sponsors in what is called the Sponsored Educational Group Participation or “SEGP” program
- Over 66,000 community “anchor institutions” connect to advanced network capabilities, most of them from K-12 and higher education
- Since Internet2 was awarded a BTOP grant from NTIA for $62 million to increase the capacity of the nationwide backbone, Internet2 was encouraged to “hook up” other community anchor institutions through a project called U.S. UCAN
39 Internet2 SEGP sister states
What is U.S. UCAN?

• UCAN stands for Unified Community Anchor Network
• A national infrastructure project to tie together all anchor networks funded by BTOP.
• Expands the R&E networking model used today.
• US UCAN glues the winning BTOP projects together as a whole. Simply put, this project does not compete with other BTOP projects; it completes them.
• Task Force on Community Anchor Network Economic Models
Nebraska Community Anchor Institutions (CAIs)

- Public, nonpublic K-12 schools and ESUs: About 85% of public schools and ESUs and 1% of non-public schools are on Network Nebraska-Education
- 2-year colleges: 75% are on Network Nebraska-Education
- 4-year colleges/universities: 71% are on either the Network Nebraska-Education network or the University of Nebraska Computing Services Network
- Public Libraries: Only 1 public library (.3%) on Network Nebraska-Education
- Museums/Science Centers/Zoos: Not mentioned in statute and 0% served by Network Nebraska-Education
- Telehealth: Not mentioned in statute and 0% served by Network Nebraska; Nebraska Statewide Telehealth Network has a separate private T-1 network supported in part by the University of Nebraska Computing Services Network
- Public Safety: Statewide public safety network coordinated by the Office of the CIO
- Local Government, including municipalities and counties: 100% of county courthouses served by the Office of the CIO, a few municipal governments.
Questions?

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We want to hear from you!

Share your evaluation of today’s Broadband Webinar. Click and complete:

http://go.unl.edu/bbevaluation

Please join our next session, January 18:
NebraskaLink – Shannan Heinzle
This Broadband Mapping and Planning Initiative is funded through a grant to the Nebraska Public Service Commission by the U.S. Department of Commerce’s National Telecommunications and Information Administration and aims to increase broadband adoption and utilization.

Our Partners