

NASCIO 2013 State I.T. Recognition Awards

Section 1: COVER PAGE

Title: **Network Nebraska-Education**

Category: **Cross-Boundary Collaboration and Partnerships**

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State: **Nebraska**

Project Initiation Date: **July 1, 2006**

Project Completion Date: **July 1, 2012**

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Section 2: EXECUTIVE SUMMARY

Network Nebraska-Education became a project of the State CIO's Office on July 1, 2006 as the Nebraska Legislature passed Legislative Bill 1208, which added the following assignment to the State CIO's duties: *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. The Chief Information Officer shall provide access to each school district, each educational service unit, each community college, each state college, and the University of Nebraska at the earliest feasible date and no later than July 1, 2012.*

The State CIO, Brenda Decker, in cooperation with the University of Nebraska and other state agencies, began formulating a project plan in 2006 to complete the 'ability for education entities to connect' to a statewide network as early as feasible, but no later than July 1, 2012. The Legislature further directed that all network and administrative costs be assumed by the participants, that participation in Network Nebraska is strictly voluntary, and that the State of Nebraska may file for E-rate and bid for the participants, if requested. Without any upfront state funding to implement the actual network, the project proved to be very challenging.

In the fall of 2006, a core group of 92 school districts and colleges from the northeast part of the state approached the State CIO with the request that they become the first implementation group. The State of Nebraska conducted the procurement for the backbone and WAN circuits and in July of 2007, 100% of the eligible entities joined Network Nebraska. Drawn by the promise of better telecommunications service and lower costs and incentivized by state lottery dollars, more education entities opted to join the network in succeeding summers and work together for the common good.

Six years later, on the legislative benchmark date of July 1, 2012, the Network Nebraska-Education project had grown to include 89% of public K-12 education, 100% of public higher education, and 50% of private colleges in the state on a single IP network, and the network continues to grow. High quality video distance learning classes have increased to over 500 semester classes per year. The unit cost of Internet is one of the lowest in the country. The statewide backbone has doubled in length and tripled in bandwidth and the network participants are now requesting shared services to include statewide Internet, network management, traffic shaping, and intrusion prevention. Network Nebraska-Education has emerged as an exemplary collaboration project involving multiple state agencies and multi-sector educational partnerships.

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Section 3: BUSINESS PROBLEM AND SOLUTION

The topography of Nebraska K-12 networking prior to 2007 was anything but organized. Nebraska was an early adopter of video distance learning, beginning as early as 1992. For the first 15 years, analog and motion JPEG systems sprouted up locally and school districts and community colleges formed 12 separate consortia of various sizes with little adherence to political or service area boundaries. The result was a hodge-podge of video and networking topologies, no statewide transport, and consortium isolationism. School districts were only able to send a single videoconferencing stream over 45Mbps DS-3 circuits and their Internet access was limited to two T-1s (3Mbps). Delivery of distance learning classes was not able to keep pace with the demand to sparsely populated rural districts and 3Mbps of Internet was woefully inadequate for the future.

In 2005, motion JPEG technology was announced as having reached end of life and that caused the K-12 consortia great concern. School districts lobbied the Legislature to fund a statewide technology replacement. The Legislature's Education Committee, instead, tasked the State CIO to create and manage a statewide network to be called Network Nebraska, and incentivized the school districts to join the network by rewarding them with lottery funding for equipment reimbursement and distance learning course exchange.

At first, K-12 school districts and intermediate service agencies (ESUs) felt threatened by the concept of a statewide network. In a fierce local control state such as Nebraska, citizens and public entities had always treasured their independence and pioneering attitude. But after thousands of miles of travel and dozens of focus group sessions facilitated by the CIO's Office to help explain the groundbreaking legislation, the education entities began to throw their support behind the statewide network. The result was a statewide consortium of K-12 and higher education entities working together over a common IP network to aggregate demand, drive down prices, and develop shared services.

Several networking models were considered but ultimately the best solution set involved the LAN and WAN circuits being the financial responsibility of the participating entities, and the backbone and statewide Internet being the financial responsibility of the State CIO's office. Procurement, accounting, vendor relations, E-rate filing, legal services and customer satisfaction are performed by the CIO's Office. Network management, help desk, trouble ticketing, and other network services are performed by the University of Nebraska Computing Services Network (UNCSN) on an 'hours billed

as needed' basis. Core routers and other network equipment are shared costs between Network Nebraska-Education and the UNCSN, based on a proportional use basis.

In order to build trust and confidence in the project, the State CIO enlisted the cooperation of the Collaborative Aggregation Partnership (CAP), an operational management group that involved the State Office of the CIO, University of Nebraska, Nebraska Educational Telecommunications Commission, Public Service Commission, Nebraska Department of Education, and the Nebraska Information Technology Commission (NITC). In addition, a Network Nebraska Advisory Group was chartered in 2009 that indirectly represented all the education entities participating in the network and empowered them with advisory responsibilities for operational and budget decisions. A Memorandum of Fees and a customer satisfaction survey is distributed annually to every participant with the survey responses returned at a high rate.

Since the Legislature required that “the Chief Information Officer establish a cost structure based on actual costs, including necessary administrative expenses but not including administrative travel or conference expenses, and shall charge participants according to such cost structure”, a transparent fee-setting process was established that allowed cost recovery of the administrative fees and statewide backbone on an equitable and affordable basis. Large and small education entities pay the exact same fees for the network to recognize the net import (small districts) and net export (large district) value of educational opportunities.

Project management reports are submitted monthly to the NITC Technical Panel and the summer circuit upgrades are monitored using Clarity software. Vendors, participants, and management staff participate in the weekly project update calls during the summer circuit upgrades. The CAP meets monthly to address the project task list, risks and issues, and to recognize accomplishments. The active bidding and brokering of the most cost effective transport and Internet services for the education entities involve every middle-mile and last-mile telecommunications company in Nebraska, which stimulates competition and lower pricing.

Network security is a partnership between Network Nebraska-Education implementing enterprise security and intrusion prevention services and the regional and local education entities implementing complementary network security and filtering services. Accessibility is assured through the State of Nebraska's Accessibility Access Clause and Section 508 compliance.

By keeping network costs in check and aggregating demand into shared services, Network Nebraska-Education has been recognized as a sustainable and cost effective partnership, with one of the lowest per-entity administrative costs in the nation. The 259 educational participants are now exhibiting pride and ownership in this project.

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Section 4: SIGNIFICANCE OF THE PROJECT

The significance of Network Nebraska-Education is best captured in the words of one of the Educational Service Unit staff, “None of these statewide applications or directory services architecture would have been possible, had it not been for *Network Nebraska*.” Not only has the statewide network united an overwhelming majority of the Nebraska education entities on a single IP network, it has also provided them a vehicle to purchase and distribute educational applications, content delivery, distance learning exchange, and administrative videoconferencing. From the get-go, it was explained that Network Nebraska-Education was not the State CIO’s network, it was the participants’ network. If applications and services were to be developed and deployed, the impetus for those applications and services must originate with the participants, themselves. This has brought about a climate of ownership and self-governance in *Network Nebraska* quite unlike the state networks in other states.

The Nebraska Department of Education has also selected Network Nebraska as its longitudinal data system host and this also allows this agency direct Intranet access to 89% of its public schools. The University of Nebraska CIO regards its institution’s involvement in *Network Nebraska* one of the most successful collaboration with which he has ever been involved, a win-win for the University and the State of Nebraska.

The Legislature should be credited with the original statutory definition and scope of *Network Nebraska* and naming the responsible operational entities, the State CIO’s Office and the University of Nebraska to achieve the goal of providing access to every education entity in the State. Network Nebraska is considered one of the Office of the CIO’s most successful projects. In addition, the Nebraska Information Technology Commission selected *Network Nebraska* as one of its eight strategic initiatives. It also branded *Network Nebraska* as a statewide enterprise project, which has permitted additional project management oversight and monitoring over the life of the project. Network Nebraska is also addressing several of the Governor eight education goals by reliably transporting the State’s online assessment system and increasing the number of college courses available to high school students through video distance education.

The Network Nebraska-Education project also addresses the following NASCIO Top 10 Priority Strategies, Management Processes and Solutions: 1) Shared Services; 2) Consolidation /Optimization; 3) Budget and Cost Control; 4) Security; and 5) Disaster Recovery/Business Continuity. Network Nebraska-Education is also in the process of addressing a key NASCIO Priority Technology of Identity and Access Management through an Internet2 InCommon pilot project to achieve federated identity management and single sign-on for every K-12 student, staff member and administrator.

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Section 5: BENEFITS OF THE PROJECT

The Office of the CIO, assisted by the University of Nebraska, achieved its legislative benchmark of “providing access (the ability to connect) to each school district, each educational service unit, each community college, each state college, and the University of Nebraska on July 1, 2012” and can thus declare the project completed and entering into maintenance mode.

Above the ability to connect, the measure of actual participation in this completely voluntary, self-funded network includes:

- Public School Districts: 222 of 250 (89%)
- Educational Service Units: 15 of 17 (88%)
- Community Colleges: 6 of 6 (100%)
- State Colleges: 3 of 3 (100%)
- University of Nebraska: 1 of 1 (100%)

In addition, 7 independent colleges, 2 tribal colleges, 3 private schools, and 1 public library also are participating in Network Nebraska-Education.

Over the past 6 years, by aggregating demand and working together, Network Nebraska has decreased the unit cost of commodity Internet by 97% to one of the lowest rates in the nation, and through state procurement, dropped the statewide average price of WAN circuits by 39%. Nebraska education entities have responded by turning those dollar savings into higher bandwidth access for their schools and campuses. Not only has the cost of commodity Internet decreased, but the reliance on commodity Internet has decreased as well through an intelligent core routing system. Each of Network Nebraska’s core routers are programmed to find the fastest, most reliable data transport route in the following priority order: 1) Intranet cloud exchange; 2) statewide backbone within the State; 3) Internet2 SEGP routing to other education entities in other statewide networks; 4) Internet2 Content Peering Services to 60,000 commercial companies; and finally, 5) Commodity Internet service at \$2.50/Mbps/month (\$.77/Mbps/month for E-rate entities).

By uniting public school districts and intermediate service agencies on a single statewide IP network, it has permitted these entities to form regional consortia for technical support and commodity Internet purchases. In northeast Nebraska in a 21-county region encompassing 27% of Nebraska’s land area, 90 K-12 entities (mostly small rural districts) have joined together to cooperatively purchase 1,860Mbps of commodity Internet from the State master contract. This enables the regional staff to jointly manage the intrusion prevention, content filtering, and traffic shaping so that each

district may burst above its allocated share without penalty. This consortium purchasing and management model has been replicated successfully in three other consortia on Network Nebraska, thereby saving tens of thousands of dollars per year.

Between 2007 and 2013, Network Nebraska has assisted in increasing the number of fiber-connected K-12 districts from 93.2% to 99.6%. The successful and reliable implementation of the State's K-12 online assessment system over the past four years in four core subject areas has been a key cornerstone of Network Nebraska's success. The number of video distance learning classes between and among high schools and colleges has grown steadily to over 500 semester courses per year, with many unique offerings being delivered to our most rural and sparsely populated areas, enabling more students to graduate with the required coursework for college admission.

Network Nebraska's creative approach to labor allocation includes the purchase of "hours needed" from current full-time professionals rather than hiring new under-utilized, full-time employees that would create excess overhead costs, both at the State and University. This indirect cost-savings principle is applied within the areas of accounting, legal, billing, purchasing, help desk, network management, E-rate filing, and administration. This practice has contributed to keeping the participants' administrative costs low and affordable and assisted in the recruitment and retention of education entities onto Network Nebraska.

A significant intangible benefit of Network Nebraska is the degree to which the local education agencies have begun to trust state-sponsored services that tend to be more enterprise-based or centralized. The parochialism of local control often contributes to higher costs when telecommunications and application services are purchased individually. Slowly, over time, Network Nebraska has changed the mindset of the local education entities and they have begun to shift their thinking to "What can we do together?" Examples of this evolution have been the move to statewide procurement for commodity Internet, WAN circuits, backbone transport, traffic shaping, intrusion prevention, and network management tools. Over time, even E-rate filing has become more centralized and now, all of the State's commodity Internet is purchased off of one statewide master contract and jointly filed as a statewide consortium with a 70% discount rate from the Federal Universal Service Fund (E-rate).

Most recently, the Educational Service Unit Coordinating Council, which encompasses the 17 regional service units of Nebraska, approached the Nebraska Legislature for funding for statewide learning management, statewide content management, and statewide directory services for 250 K-12 districts and 300,000 students. Their project proposal mentioned Network Nebraska as the necessary transport and hosting service to make their project successful, which echo the NASCIO priorities of Shared Services and Budget and Cost Control.