# NETWORK NEBRASKA



## OBJECTIVE:

To develop a broadband, scalable telecommunications infrastructure that optimizes the quality of service to every public entity in the State of Nebraska.

## DESCRIPTION:

Network Nebraska interconnects several hundred education entities to a multipurpose core backbone extending between Omaha, Lincoln, Grand Island, Norfolk, and Scottsbluff that provides aggregated Internet and commercial peering services extending out to the furthest corners of the state.

## COLLABORATORS:

Collaborative Aggregation Partnership: Office of the CIO, University of Nebraska, Nebraska Public Media, Public Service Commission, Nebraska Department of Education, Nebraska Information Technology Commission, Network Nebraska Advisory Group.

Network Nebraska Advisory Group: 8 K-12 members; 8 higher education members.

Educational Service Unit (ESU) Coordinating Council, ESU-Network Operations Committee, ESU-Distance Education Advisory Committee, higher education chief technology officers.

## STRENGTHS/ASSETS:

- Nearly every K-12 public school district, educational service unit, and public college and university participate in Network Nebraska and share in its annual costs.
- Network Nebraska is a completely voluntary, self-funded project, which contributes to its resilience, sustainability and focus on customer service.
- Shared personnel support within the Office of the CIO, Administrative Services, and the University of Nebraska contribute to its ultra-low operational costs and affordability.
- With the collaborative management style utilized by Network Nebraska, there is a sense of ownership and pride in its continued development and growth.

## CHALLENGES/ISSUES:

- The absence of full-time network employees reduces the capacity for such services as marketing, communications, research & development, and customer follow-up.
- The Network Nebraska cost recovery rates, although small in comparison to other state networks, are still above what small rural public libraries and private K-12 schools are accustomed to paying for Internet service provision alone.  And prices continue to rise as the need for technological solutions in the learning space expand in both complexity and scope.
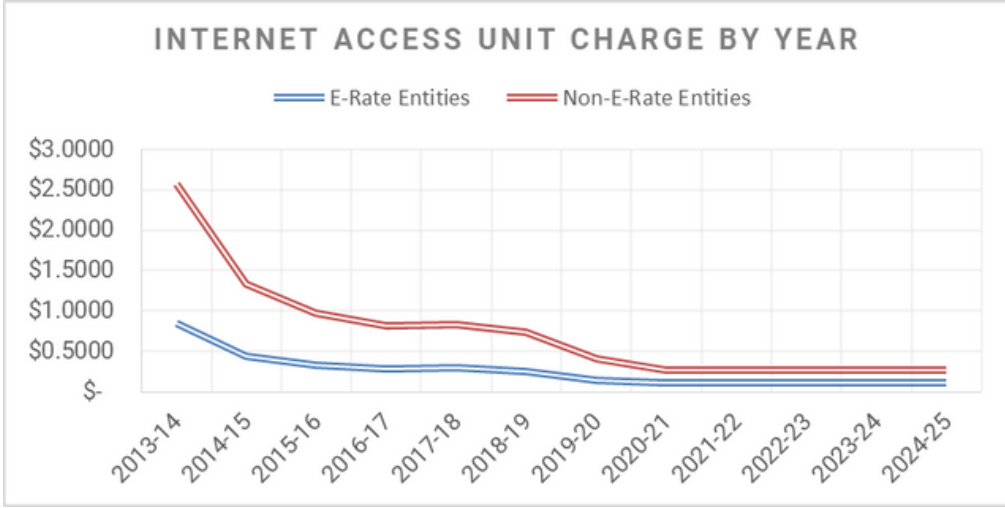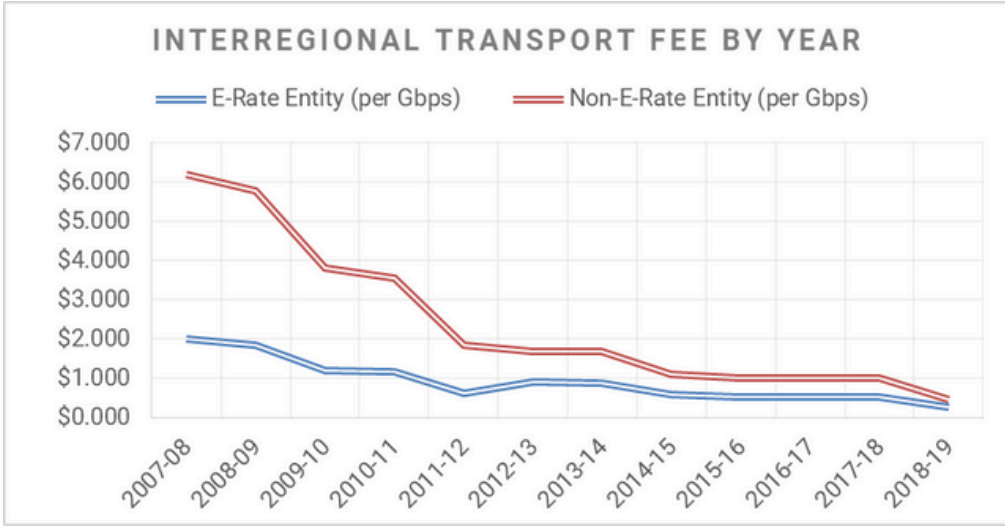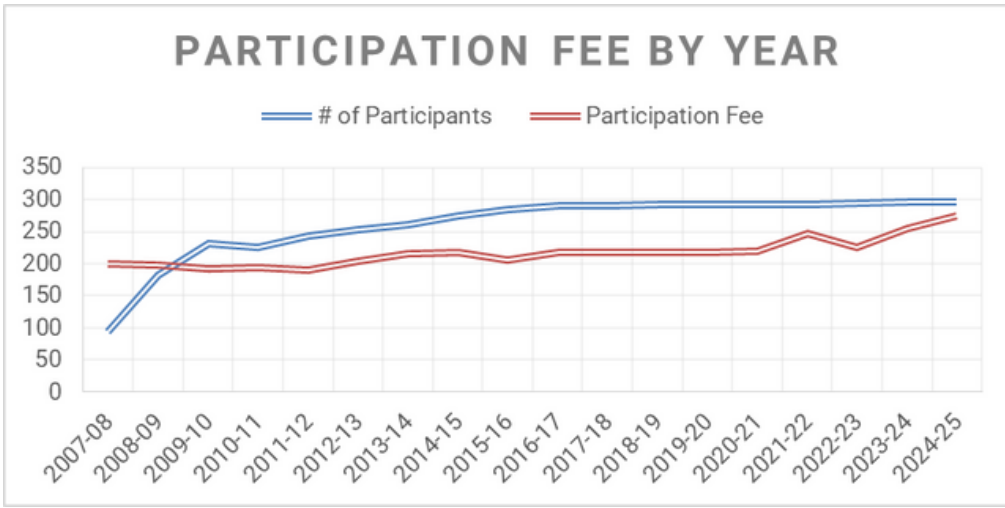
## RECENT ACCOMPLISHMENTS:

- Maintained public school district participation at 99.6%.
- Achieved 100% membership among public and tribal colleges, and universities.
- Network Nebraska became one of the first research and education networks in the country to expand the use of eduroam© in the elementary and secondary educational settings.  It has been widely accepted by members with over 70% of public K-12 school utilizing the service within the state.
- Achieved one of the lowest commodity Internet rates in the entire country, made possible through aggregation of demand and statewide bidding.

## RECOMMENDATIONS:

- Continue this initiative.
- Position Network Nebraska to continue to expand its offered services, and implement strategies to offset the rising cost associated with network management, thus providing additional stability to the consortium.

# METRICS



**PARTICIPATION FEE BY YEAR**

— # of Participants    — Participation Fee



**INTERREGIONAL TRANSPORT FEE BY YEAR**

— E-Rate Entity (per Gbps)    — Non-E-Rate Entity (per Gbps)



**INTERNET ACCESS UNIT CHARGE BY YEAR**

— E-Rate Entities    — Non-E-Rate Entities

# ACTION ITEMS

## Develop a scalable, secure plan for Network Nebraska to meet statewide needs of agencies, local governments, and schools per section 79-1201.01.

- Lead: Education Council

- Participating Entities: Collaborative Aggregation Partnership (CAP); Network Nebraska Advisory Group (NNAG), OCIO/NITC staff

- Timeframe: 2024-2026

- Funding: Additional funding and/or resources will be required for this action item out of the Network Nebraska Participation Fee, which is a participant-funded budget.

- Targets/Deliverables:
  - 1.1 Liaison with, NNAG, CAP, to provide insight and guide decision-making regarding services, identified initiatives and associated business models.
    - 1.1.1 Measurables: A) NNAG co-chairs will attend monthly CAP meetings and share information. B) CAP liaisons will attend bi-monthly NNAG meetings and share information.
  - 1.2 Continue to evaluate the effectiveness of the current Network Nebraska fee structures and address changes related to the associated business models as related to core functions and additional services.
    - 1.2.1 Measurable: A) NNAG will convene a retreat and present suggested modifications to the Education Council's Network Nebraska task group and to the Chief Information Officer

## The Education Council, OCIO/NITC staff, and Network Nebraska support staff will sufficiently and appropriately communicate to, and in support of, current and potential Network Nebraska Participants

- Lead: Education Council; OCIONITC Staff, Network Nebraska support staff

- Participating Entities: Collaborative Aggregation Partnership (CAP); Network Nebraska Advisory Group (NNAG)

- Timeframe: 2024-2026

- Funding: Additional funding and/or resources will be required for this action item out of the Network Nebraska Participation Fee, which is a participant-funded budget.

- Targets/Deliverables:
  - 2.1 Develop and implement a communications strategy.
    - 2.1.1 Measurables: A) Specific data and reports in an online newsletter or other form of communication to members outside of the annual fee memo. B) Designated representatives send timely notifications of changes in procedures affecting member relations with the Network Nebraska Support Team.
  - 2.2 Conduct a periodic survey of Participants to guide direction and service development.
    - 2.2.1 Measurable: A) Survey is conducted, and data from the survey is compiled for sharing with NNAG, CAP, and the NITC Education Council.
  - 2.3 Develop, publish, and maintain a catalog of Network Nebraska services comprised of services offered directly by Network.
    - 2.3.1 Measurable: Catalog of services is published and updated annually
  - 2.4 Enhance communications regarding change control events affecting Network Nebraska membership.
    - 2.4.1 Measurable: The Network Nebraska Support Team use AlertSense and NN_INFO listserv to communicate change control events to Network Nebraska members.

# ACTION ITEMS

## Enhance Network Nebraska to meet member needs with advanced security, cloud computing, and educational infrastructure, prioritizing innovation and efficiency.

- Lead: Education Council; CAP; NNAG; UNS IT Staff

- Participating Entities: ESU-NOC; Higher Education CIOs

- Timeframe: 2024-2026

- Funding: Additional funding and/or resources will be required for this action item out of the Network Nebraska Participation Fee, or from consumption-based billing.

- Targets/Deliverables:
  - 3.1 Develop strategies for advanced service delivery, integrate them into Network Nebraska's business model, and implement value-added services to enhance offerings, membership growth, and membership satisfaction.
  - 3.1.1 Measurable: A) liaison with NNAG and CAP to formulate a Strategy document complete with target dates while tracking progress. B) Additional services added to Network Nebraska services list.

## Identify, define, and promote the statewide cybersecurity practices for Nebraska K-20 education.

- Lead: Education Council; CAP; NNAG; UNS IT Staff

- Participating Entities: ESU-NOC; Higher Education CIOs

- Timeframe: 2024-2026

- Funding: Additional funding and/or resources will be required for this action item out of the Network Nebraska Participation Fee, or from consumption-based billing.

- Targets/Deliverables:
  - 4.1 A) Establish recommendations for cybersecurity best practices within K-20 community.
  - 4.1.1 Measurable: A) The creation of best practices based on input from educational stakeholders throughout the state. B) Regular communication as the cybersecurity climate continues to adapt.

# ACTION ITEMS

## Encourage K-20 participation in cyber-related industry events.

- Lead: Education Council; CAP; NNAG; UNS IT Staff

- Participating Entities: ESU-NOC; Higher Education CIOs

- Timeframe: 2024-2026

- Funding: Additional funding and/or resources will be required for this action item out of the Network Nebraska Participation Fee, or from consumption-based billing.

- Targets/Deliverables:
  - 5.1 A) Leverage available resources and communicate recommendations to reach as many stakeholders as possible.
  - 5.1.1 Measurable: A) The creation of a listserv, or utilization of the existing Network Nebraska website to communicate upcoming events with other relevant information.

## Other Recommended Measurables:

- Network Nebraska backbone uptime
- Network Nebraska Internet access uptime
- Network Nebraska backbone bandwidth utilization (actual)
- Network Nebraska membership growth
- Network Nebraska Internet growth (purchased and actual)
- Network Nebraska unit cost of Internet
- Number of public, non-public, and non-education entities connected to Network Nebraska

# DIGITAL EDUCATION

## OBJECTIVE:

To promote the effective and efficient integration of technology into the instructional, learning, and administrative processes and to utilize technology to deliver enhanced digital educational opportunities to students at all levels throughout Nebraska on an equitable and affordable basis.

## DESCRIPTION:

The Digital Education initiative will involve the coordination and promotion of several major systems and applications that heretofore have either been developed mostly at the local level or have not been replicated statewide.

Initiative progress will be dependent upon adequate Internet connectivity and transport bandwidth for learners, instructors, administrators, and for educational attendance sites. A minimum acceptable level of classroom technology will have to be established for the initiative to be successful.

## COLLABORATORS:

• Educational Service Unit (ESU) Coordinating Council and advisory groups
• Public and private K-12 schools
• Nebraska Department of Education
• University of Nebraska
• Nebraska State College System
• Nebraska Community College System
• Council of Independent Nebraska Colleges Foundation

## STRENGTHS/ASSETS:

- The enhancement of Digital Education is the combined focus of public and private K-12 entities and public and private higher education entities working together through Network Nebraska.
- The recent developments in learning management software, content management software, and longitudinal data tracking and depiction make it a particularly important time to improve on the statewide deployment of these systems.
- The high bandwidth transport and Internet capacity of Network Nebraska makes it possible to implement private cloud and public cloud applications to every education entity on Network Nebraska.

## CHALLENGES/ISSUES:

While collaboration among entities is strong, the initiative lacks a "champion", and any additional implementation funding is a scarce commodity.

## RECENT ACCOMPLISHMENTS:

- The Nebraska Library Commission, in partnership with the State Office of the CIO, has assisted the Nebraska Public Service Commission with utilization of the Nebraska Special Construction Matching Fund grant program to incentivize new fiber construction for schools and libraries.

## RECOMMENDATIONS:

- Continue and refocus this initiative.
- Encourage and/or incentivize collaborators and stakeholders to be more results-oriented using project management techniques.
- Build on the excellent foundation and success of Network Nebraska to deliver high quality digital educational opportunities that provide a framework for student success.

# ACTION ITEMS

## Help ensure the success of Nebraska digital education.

- Lead: Education Council;

- Participating Entities: K-12 and Higher Education professional and advisory groups , Nebraska Department of Education, and the Coordinating Commission for Postsecondary Education.

- Timeframe: 2024-2026

- Funding: Additional funding may be required for this action item

- Targets/Deliverables:
  - 1.1 Establish a common definition and understand the current state of Nebraska Digital education.
    - 1.1.1 Measurable:  Collaborate with existing take holders to formulate a cohesive definition for digital education, and take an inventory of existing digital education practices within Nebraska.
  - 1.2 Promote effective practices, determine factors relevant to measuring the success of digital education.
    - 1.2.1 Measurable:  Utilize reliable communication methods to convey advancements in digital education.
  - 1.3 Connect constituencies to promote improvement.
    - 1.3.1 Measurable: Organize conferences for stakeholders to collaborate on effective solutions.

## Identify, define, and promote the statewide cybersecurity practices for Nebraska K-20 education.

- Lead: Education Council; CAP; NNAG; UNS IT Staff

- Participating Entities: ESU-NOC; Higher Education CIOs

- Timeframe: 2024-2026

- Funding: Additional funding and/or resources will be required for this action item out of the Network Nebraska Participation Fee, or from consumption-based billing.

- Targets/Deliverables:
  - 4.1 A) Establish recommendations for cybersecurity best practices within K-20 community.
  - 4.1.1 Measurable: A) The creation of best practices based on input from educational stakeholders throughout the state. B) Regular communication as the cybersecurity climate continues to adapt.

# ACTION ITEMS

## Expand awareness and address the need for equity of access as it relates to digital education.

- Lead: Education Council;

- Participating Entities: NITC Community Council, K-12 and Higher Education professional and advisory groups

- Timeframe: 2024-2026

- Funding: Additional funding may be required for this action item

- Targets/Deliverables:
  - 2.1 Address professional development for teachers broadly and collaboratively.
    - 2.1.1 Measurable: Coordinate with the Nebraska Department of Education to identify professional development opportunities throughout the state, or available digitally.
  - 2.2 Focus on affordability initiatives.
    - 2.2.1 Measurables: Research digital equity funding opportunities; coordinate with the NITC Community Council to develop a collaborative solution.

## Other Recommended Measurables:

- Number of K-12 students who have gained home Internet access through Digital Inclusion initiatives
- Number of public libraries that have gained faster Internet access by reaching Network Nebraska, either directly or indirectly

# NETWORK NEBRASKA

Participants in Network Nebraska are reducing costs and stimulating investment in Nebraska's telecommunications infrastructure. Network Nebraska is represented as a compilation of three major sub-networks: The University of Nebraska network, State and County Government network, and the K-20 Education network. Each network has its own management staff, but takes advantage of co-location facilities, Internet and telecommunications contracts, and shared infrastructure wherever possible.

To develop a broadband, scalable telecommunications infrastructure that optimizes quality of service to public entities, the State of Nebraska and the University of Nebraska began aggregating their backbone network services into a core network backbone in 2003. In 2006, the Nebraska Legislature passed LB 1208 which named the statewide network as Network Nebraska and tasked the Chief Information Officer (assisted by the University of Nebraska) with "providing access to all education entities as soon as feasible, but no later than July 1, 2012." Network Nebraska is also expected to "meet the demand of state agencies and local governments…Such network shall provide access to a reliable and affordable infrastructure capable of carrying a spectrum of services and applications, including distance education, across the state."

Network Nebraska has succeeded in lowering the unit cost of Internet service to participating entities through aggregated purchasing power. By combining Network Nebraska's K-20 Internet purchases and peering into five state contracts of over 320 Gbps, the K-12 E-rate-eligible price has remained steady for this biennium at prices effective as of July 1, 2024, $0.08/Mbps/month. Prices are expected to fall in the next biennium. This continues to benefit all current and future Network Nebraska schools, ESUs and colleges that purchase their Internet service from the statewide master contract.

Benefits of Network Nebraska also include flexible bandwidth utilization, Intranet routing, lower network costs, greater efficiency, interoperability of systems providing video courses and conferencing, increased collaboration among educational entities, new student learning opportunities, enterprise network management software, and better use of public investments.

Network Nebraska has also stimulated investments and competition in telecommunications infrastructure. As the State bid connectivity to large regional areas of schools and colleges, the telecommunications companies responded with fiber Ethernet service pricing that greatly reduced the costs to educational entities.
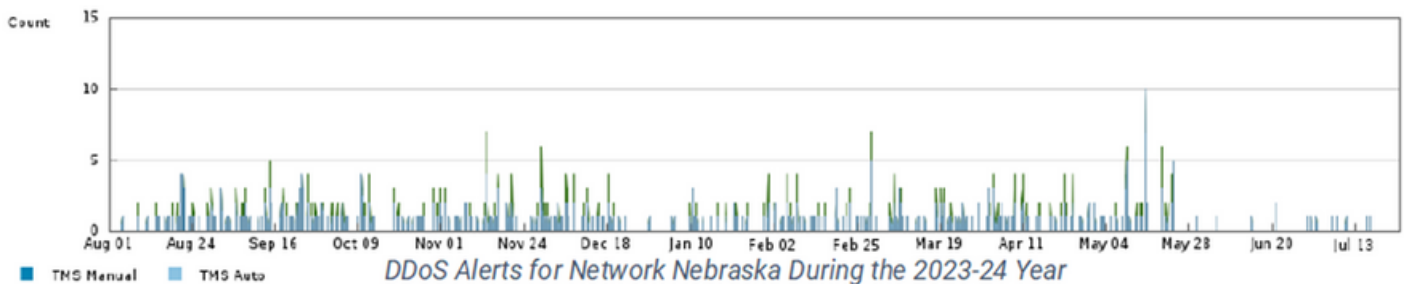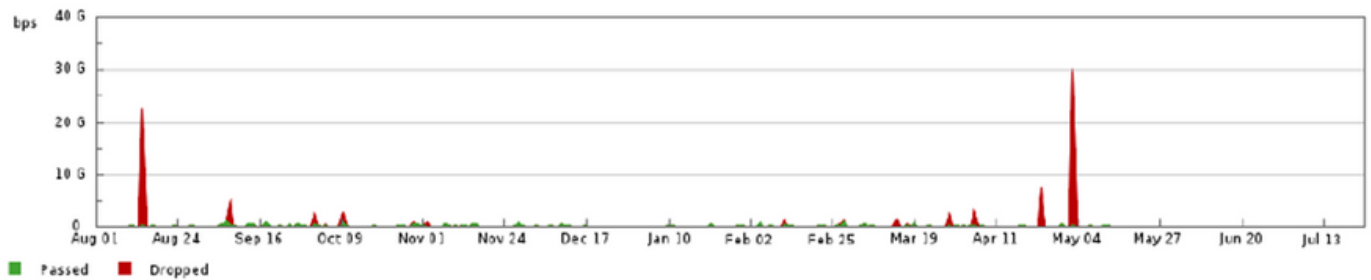
PThe development of the K-20 education network has increased the number of distance education courses available to Nebraska students. Through Zoom interactive videoconferencing, Nebraska high schools and community colleges exchange approximately 250 courses per year (2024-2025) with an additional 177 virtual field trips available to educational entities across the state.  Highest concentration of courses are in English, Foreign Language, and Mathematics, however, offerings also include Agriculture, Technology, and Industrial Technology.

Due to the continued expansion of the Network Nebraska backbone, we are now able to reach every education entity in the State through seven core aggregation points: Grand Island, Kearney, Lincoln, Norfolk, Scottsbluff, and two locations in Omaha.

The development of the K-20 Education network has increased the number of customers served by Network Nebraska. Data and Internet customers currently include the three state colleges, all six community colleges, two tribal colleges, the University of Nebraska system, 40% of private colleges and universities, and nearly 100% of public school districts under 17 different educational service units. Likewise, non-public school district participation has continued to expand. The Nebraska K-20 Education network is completely funded by Participation and Interregional Transport Fees from its 296 members.

Cybersecurity continues to be a priority area of the Education Council with a refocus of action items in the most recent update to the Statewide Technology Plan. The Education Council and Network Nebraska Advisory Group continue to promote and provide cybersecurity training experiences for Network Nebraska members.
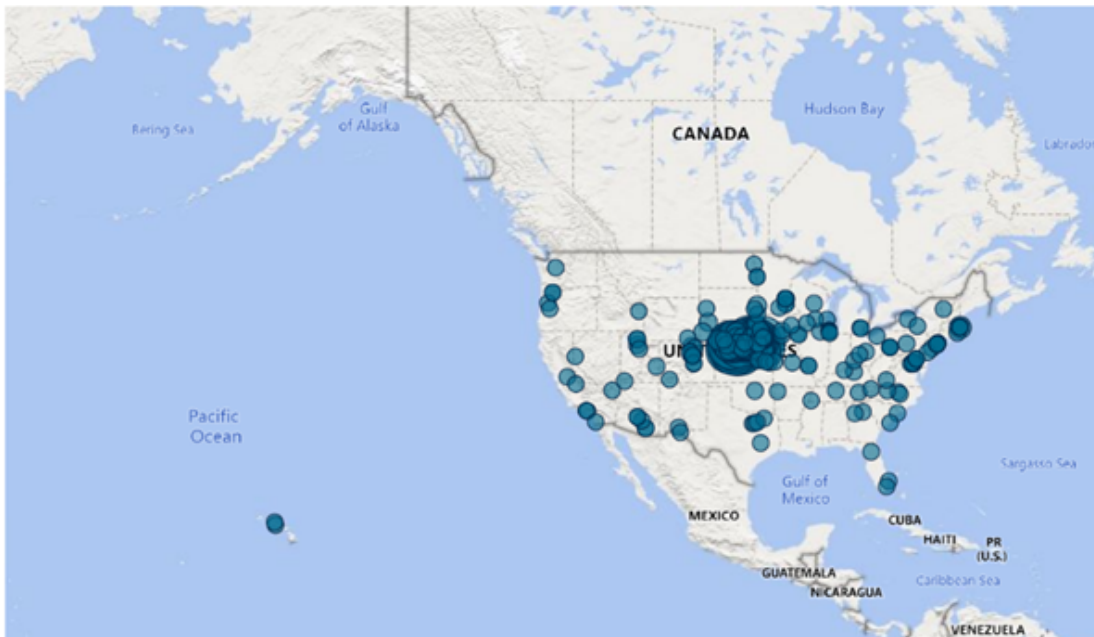


DDoS Alerts for Network Nebraska During the 2023-24 Year

DDoS Dropped Traffic for Network Nebraska During the 2023-24 Year

Establishing a robust digital education environment is critical to Nebraska's future. So much of what teachers, students, and administrators do today is dependent upon Internet-based information and communication. To assist with facilitation of digital education, and in efforts to combat the 'homework gap,' in 2021 Nebraska was selected as one of only three initial states to pilot a K-12 global Wi-Fi program called eduroam®.

eduroam® is a service that allows students, researchers, teachers, and staff from participating universities, colleges, K-12 schools, libraries, and museums to obtain secure Internet connectivity when visiting participating schools and partners by simply opening their computing device. ConnectEd Nebraska was created through a collaborative effort between Network Nebraska, the Nebraska Department of Education, the University of Nebraska, and ESU leaders.  The objective of ConnectEd Nebraska is to enable participating teachers, staff, and students in Nebraska to have anywhere, anytime wireless access at all educational sites in the state and in other eduroam-participating sites throughout the U.S. and other countries.  eduroam is available to all Network Nebraska participants, and saw a steady increase in school utilization of public school districts enrolled in the eduroam program to 70% of Network Nebraska members.



15

*Snapshot of Network Nebraska eduroam Users throughout the United States January – June 2024*

Student equity of access to the internet continues to be a high priority action item; the Office of the CIO partnered with the Nebraska Library Commission and Public Service Commission continue to promote the Nebraska Special Construction Matching E-Rate fund for schools and libraries. The matching funds from the FCC's E-Rate program and the Nebraska Universal Service Fund will increase the discount for special construction of fiber by as much as 20%, which could dramatically reduce costs and increase transport speeds for the participants.

Network Nebraska has been made possible through a cooperative effort of the Collaborative Aggregation Partnership (CAP). CAP is composed of several operational entities: Office of the CIO, University of Nebraska, and Nebraska Educational Telecommunications with policy assistance from the Nebraska Department of Education, Public Service Commission, and the NITC.

In 2009, the NITC Education Council chartered the Network Nebraska Advisory Group (NNAG). These 16 members, representing all the major K-12 and higher education communities, have been instrumental in helping guide Office of the CIO decisions concerning network infrastructure, services, and fees.

Network Nebraska is not a state-owned network. Facilities and circuits are leased from private telecommunications providers in the state, allowing the State of Nebraska and members of Network Nebraska to act as anchor tenants.

# DIGITAL EDUCATION

The primary objective of the Digital Education Initiative is to promote the effective and efficient integration of technology into the instructional, learning, and administrative processes and to utilize technology to deliver enhanced digital educational opportunities to students at all levels throughout Nebraska on an equitable and affordable basis.

The initiative is dependent upon adequate Internet connectivity and transport bandwidth for learners, instructors, administrators, and for educational attendance sites. A minimum acceptable level of classroom technology will have to be established for the initiative to be successful.

The primary components of the Digital Education Initiative include:

- A statewide telecommunications network with ample bandwidth capable of transporting voice, video, and data between and among all education entities (See Network Nebraska.);
- Distance insensitive Internet pricing for all Nebraska education entities;
- Development of a statewide eLearning environment so that every teacher and every learner has access to a web-based, digital curriculum;
- Development of a statewide digital resource library so that any teacher or learner will be able to retrieve digital media for use in instructional and student projects;
- Synchronous videoconferencing interconnections between all schools and colleges;
- The means to coordinate and facilitate essential education opportunities for all students through a statewide student information system; and
- Regional Pre-K-20 education cooperatives that vertically articulate educational programs and opportunities.