



Nebraska Information Technology Commission

STANDARDS AND GUIDELINES

Network Edge Device Standard for Entities Choosing to Connect to Network Nebraska

Category	Network Architecture
Title	Network Edge Device Standard for Entities Choosing to Connect to Network Nebraska
Number	

Applicability	<input type="checkbox"/> State Government Agencies <input type="checkbox"/> All..... Not Applicable <input type="checkbox"/> Excluding Not Applicable <input checked="" type="checkbox"/> State Funded Entities - All entities receiving LB 1208 funding for matters covered by this document..... Standard <input checked="" type="checkbox"/> Other: Educational entities electing to connect to <i>Network Nebraska</i> Standard Definitions: Standard - Adherence is required. Certain exceptions and conditions may appear in this document, all other deviations from the standard require prior approval of the <u>NITC Technical Panel</u> . Guideline - Adherence is voluntary.
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Status	<input type="checkbox"/> Adopted <input checked="" type="checkbox"/> Draft <input type="checkbox"/> Other: _____
Dates	Date: March 13, 2006 Date Adopted by NITC: Other:

1.0 Technical Standard

All education entities that receive state funding for telecommunications, and education entities that wish to connect to Network Nebraska with high bandwidth networking (≥ 10 Mbps) for purposes of transmitting data across the state shall comply with this standard. State agencies reach compliance through their services by the Division of Information Technology Services and are not directly affected by this standard.

1.1 Network Edge Device Specifications for new purchases

- QoS capabilities
- Sufficient ports for desired network design
- Security and/or firewall features
- Routing and/or routing protocol
- Traffic shaping and rate limiting
- VLAN (802.1q) support
- Secure remote management (SSH)
- Hardware based encryption acceleration
- Performance to meet anticipated usage demand
- Compatibility with central site router features
- Network Nebraska support team familiarity with equivalent devices

Option A:

Layer 3 Router (for basic site deployment)

Option B:

Enhanced Layer 3 Router (for larger site deployment or higher performance)

Option C:

Layer 3 Switch

1.2 Network Edge Device Specifications for existing equipment

- QoS capabilities
- Sufficient ports for desired network design
- Security and/or firewall features
- Routing and/or routing protocol
- Traffic shaping and rate limiting
- VLAN (802.1q) support
- Secure remote management (SSH)
- Hardware based encryption acceleration
- Performance to meet anticipated usage demand
- Compatibility with central site router features
- Network Nebraska support team familiarity with equivalent devices

2.0 Purpose and Objectives

The purpose of this standard is to set minimum standards and specifications for network edge devices that would perform the routing and switching functions of voice, video, and data across the network and assure that packets would get to their correct destination while maintaining the appropriate quality of service (QoS).

2.1 Background

Nebraska currently has about 200 local schools and campuses that use managed high-bandwidth interactive video and Internet services over 45 Mbps DS-3 circuits. As these contracts reach the end of their terms, it makes sense to retrofit the existing fiber so that it can be used to carry a variety of data applications using flexibly provisioned bandwidth. In order to accomplish this upgrade, more intelligent edge devices must be deployed at the school and campus level to be able to ensure an acceptable quality of service, packet prioritization, better security and firewall features, and remote management. The Technical Panel of the NITC, in cooperation with the operational staff of Network Nebraska, are naming these edge device standards for educational entities seeking to connect to Network Nebraska in order to comply with the provisions of LB 1208 (2006).

Approximately 100 other high schools have 100 Mbps or greater local connections that may opt to connect to Network Nebraska for reasons of statewide data exchange. This standard contains new equipment and existing equipment standards that would also apply to their edge device installation.

2.2 Objective

The objective of this standard is to prescribe the acceptable routing and switching device attributes that can be deployed at the local sites of Network Nebraska in order to achieve a multipurpose, converged network, capable of traffic prioritization and shaping, that performs reliably and ensures an expected quality of service.

The Specifications for purchase of new equipment affects those entities that will be upgrading existing fiber circuits and connecting to Network Nebraska in the 2007-2009 time frame.

The Specifications for existing equipment affects those entities that may have already upgraded to IP networking over high bandwidth circuits, have recently purchased or upgraded their edge equipment, and are connecting to Network Nebraska in the 2007-2009 time frame.

3.0 Definitions

3.1 IP

Internet Protocol. Packet-based protocol for delivering data across networks.

3.2 Mbps

Megabits per second. A unit of measure of data of 1,000,000 bits per second.

3.3 Network Nebraska

Network Nebraska is the term used to describe the statewide multipurpose telecommunications backbone and all of its associated service offerings and support. Network Nebraska is made possible through a consortium of public entities working together to provide a scalable, reliable and affordable infrastructure capable of carrying a spectrum of services and applications.

3.4 QoS

Quality of Service. The ability to define a level of performance in a data communications system.

3.5 router

A device or setup that finds the best route between any two networks using IP addressing, even if there are several networks to traverse. Like bridges, remote sites can be connected using routers over dedicated or switched lines to create wide area networks.

3.6 SSH

Secure Shell (SSH client) is a program for logging into a remote machine and for executing commands on a remote machine. It is intended to replace rlogin and rsh, and provide secure encrypted communications between two untrusted hosts over an insecure network.

3.7 switch

A mechanical or solid state device that opens and closes circuits, changes operating parameters or selects paths for circuits on a space or time division basis.

3.8 VLAN

Virtual Local Area Network. Virtual LANs (VLANs) can be viewed as a group of devices on different physical LAN segments which can communicate with each other as if they were all on the same physical LAN segment.

4.0 Applicability

4.1 State Funded Education Entities

Education entities that are not State agencies but receive State funding for telecommunications (i.e. Legislative appropriations, Education Innovation Fund, Nebraska Universal Service Fund, ESU Core Services, Infrastructure Fund, etc.) are required to comply with this standard, if connecting at 10 Mbps or greater to Network Nebraska.

4.2 Other Entities

Entities that are neither State agencies nor state-funded entities but choose to use the State-funded *Network Nebraska* for purposes of transmitting data or receiving Internet service must comply with this standard, if connecting at 10 Mbps or greater.

4.3 Exemption

Exemptions may be granted by the NITC Technical Panel upon request by an agency or education entity.

4.3.1 Exemption Process

Any agency may request an exemption from this standard by submitting a "Request for Exemption" to the NITC Technical Panel. Requests should state the reason for the exemption. Reasons for an exemption include, but are not limited to: statutory exclusion; federal government requirements; or financial hardship. Requests may be submitted to the Office of the NITC via e-mail or letter (Office of the NITC, 521 S. 14th Street, Suite 301, Lincoln, NE 68508). The NITC Technical Panel will consider the request and grant or deny the exemption. A denial of an exemption by the NITC Technical Panel may be appealed to the NITC.

5.0 Responsibility

5.1 NITC

The NITC shall be responsible for adopting minimum technical standards, guidelines, and architectures upon recommendation by the technical panel. (N.R.S. 86-516 §6)

5.2 Network Nebraska Operational entities

The Collaborative Aggregation Partnership, composed of the University of Nebraska Computer Services Network, the Department of Administrative Services--Division of Communications, and Nebraska Educational Telecommunications, will be responsible for sharing the responsibilities of the network operations portion of *Network Nebraska*. The responsibility for identification and mitigation of non-compliant entities with respect to the Network Edge Device Standard resides with the Collaborative Aggregation Partnership.