



**State of South Dakota**

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Bureau of  
Information &  
Telecommunications

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July 15, 2008

To: Senator Orville Smidt, Chairman  
REED Appropriations Subcommittee

From:   
Otto Doll, Commissioner  
Bureau of Information and Telecommunications

RE: Bureau of Information and Telecommunications (BIT) Update on  
the Research, Education, and Economic Development (REED)  
Network

This document is in response to your request for a report on the current  
status of the REED Network.

OD:dh

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**I. Research Usage**

Site	Current Capacity (Mbps)	Minutes above 50% usage since 4/2007	%age of time over 50% utilization since 4/2007	Capacity Increase via REED
Northern Tier (Mpls)	155	676	.1%	6,452%
BHSU	5			200,000%
EROS	1,000	0	0%	1,000%
DSU	10			100,000%
NSU	10			100,000%
SDSMT	12			83,333%
SDSU	1,000	0	0%	1,000%
USD	17			58,824%
USDSU	9			111,111%

The above reporting period is approximately 620,000 minutes (from April 2007 to July 2008).

**II. Network**

Construction:

The placement of fiber optics and equipment is almost completed for Phase 1. The wet weather in the eastern corridor has consumed all of the weather-days built into the schedule. The wet weather is causing problems for the placement of fiber optics within the soggy ditches.

Optical equipment for the network has been received and is installed on schedule.

After a lengthy evaluation, Juniper was chosen on May 16 as the provider for the BIT-managed hardware in the network. The equipment was purchased at an approximate discount of 70% off of retail pricing.

That equipment has arrived and is being placed but not configured.

#### Out-of-State connections

For financial and technical reasons we are re-visiting the out-of-state network connections.

It is anticipated that the 1 Gbps backup connection through Wyoming will be replaced with an in-state connection. The connection through Cheyenne, Wyoming was an estimated \$450,000 annually + an unknown "subscription" cost to the Front Range Gigapop consortium.

The costs for the in-state connection should be approximately \$150,000 less + the cost avoidance on the subscription costs. Additionally – the opportunity to reinvest this funding in-state vs out-of-state is economically advantageous.

In early March, BIT coordinated a meeting with North Dakota government and university personnel to discuss connection logistics between our two states. North Dakota had made a decision to utilize Midcontinent Communications for their network. South Dakota has chosen SDN Communications. It was explained that the Northern Tier backbone passing from Spokane, Washington to Minneapolis, Minnesota would consist of 10 waves / lambdas. (For comparison, each university in South Dakota will have a minimum of 5 waves / lambdas. Furthermore, our original proposal for connecting into Fargo, North Dakota was to be 5 waves.) Obviously, the capabilities of our planned connectivity far exceeded what would be available from the Northern Tier network. (Sort of like connecting a garden hose to a fire hydrant...). It was briefly discussed how we could participate with such limited capacity. Financially, it was discussed that each state would pay a "fair share" of costs to a meet-me point which would happen as close to the North Dakota – South Dakota border as possible. Another key point in the discussion included where to make the network links at. Staff from BIT informed North Dakota that they could decide where and what telecommunications carrier could be used for the connection.

Soon after the meeting, North Dakota informed us that they chose to invest their budget in a connection via Canada and not South Dakota. If South Dakota wished to pass through Fargo for its connection to the Northern Tier network, they would permit that. The staff in BIT believe that the cost sharing for connectivity to North Dakota should be a shared cost to each state.

Of interest is that Canada is not currently a member of the Northern Tier network consortium yet will reap the benefits of the network far before South Dakota does. In fact, South Dakota's participation in the Northern Tier network will realistically add no value to our statewide networking. The existing connection via the Northern Lights consortium will be continued as will the high-capacity link to the Great Plains Network.

The fruits of the investment of time and money into the Northern Tier Network and Consortium taste somewhat sour these days.

The out-of-state connection to the Great Plains Network via Bellevue, Nebraska is currently funded within the REED budget. The out-of-state subscription to the Northern Lights network in Minneapolis will continue to be funded through existing non-REED sources.

Installation timelines

- August 2008: DDN, DSU, SDSU, USD, Eastern Hub (Sioux Falls)
- September 2008: Bellevue, Nebraska & EROS
- November 2008: BHSU, Pierre, NSU, SDSMT,  
Western Hub (Rapid City)
- January 2009: Sanford Underground Lab, University Center (Sioux Falls)

**II. Budget**

The REED budget is in good shape. Total expenditures for hardware and supply costs are \$3,180,584.70.

The budgeted network costs include a 15% indirect cost to pay for non-funded BIT costs. Including costs such as networking and personnel costs not directly included in the budget that must be paid for by the Board of Regents (BOR). A-87 federal auditing guidelines preclude BIT from charging other government agencies for REED-related costs.

**III. Data Center**

The Board of Regents originally requested four high performance computing clusters for SDSMT, SDSU, USD and a shared cluster at the University Center. (SDSU and USD currently have two clusters each – there is no available performance or metrics to measure their usage).

The Governor recommended a single high-performance cluster at DSU in the budget request.

The Board of Regents recognizes a savings of \$280,000 to place a high-performance computing cluster at the University Center in Sioux Falls. The Governor recognizes a savings of \$310,000 to place the technology at DSU. The staff at BIT feel that prudent savings of such a significant amount cannot be overlooked.

Researcher surveys are currently being performed. Some of the results of these surveys could indicate that existing cluster capacity may be utilized and the dollars allocated for the data center could be allocated elsewhere or returned.

#### **IV. Campus Networks**

The standards for the campus networking hardware, firewalls, intrusion detection systems, and security information management systems have been selected. The hardware and software has been ordered and is presently arriving on the campuses.

Installation of the campus upgrades are proceeding.

#### **V. Miscellaneous**

##### SDN Contract

The contract between BIT and SDN Communications has been completed. Signed copies have been exchanged.

##### Memorandum of Understanding

Discussions regarding the Memorandum of Understanding between the Bureau of Information and Telecommunications and the Board of Regents will begin in July. In general, BIT will be responsible for the technical operation of the network and the BOR will be responsible for recruiting researchers, identifying and generating research activities to utilize the network.

##### Non-REED sites

The BOR has several non-REED sites that need to have access to university technology resources (USD Medical School, satellite campuses, etc.). BIT has designed a solution to provide them connectivity and has ordered those circuits.