NSF Campus Cyberinfrastructure PI and Cybersecurity Innovation for Cyberinfrastructure PI Workshop

October 3-4 Albuquerque, New Mexico

NSF Program: Campus Cyberinfrastructure (CC-NIE)

Program Area: Small Institutions **Award Number:** 1541352

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Project Title: Northern's Network Expansion for Large Science and Engineering Data Flows

Project Goals:

- Address the severe LAN and WAN data movement limitation imposed by the current 100 Mbps capacity.
- Establish a 10 Gbps dedicated research network and Science DMZ.
- Increase the undergraduate research activities in Science and Engineering.
- Enhance undergraduate programs to address workforce needs and preparation for graduate schools.

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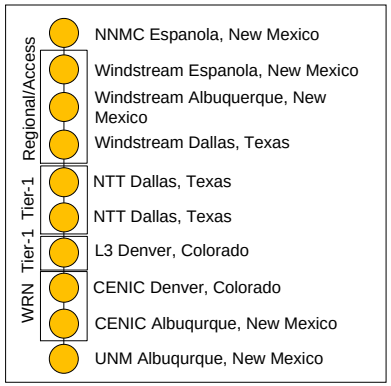
Quad Chart for: *CC*DNI Campus Design: Northern's Network Expansion for Large Science and Engineering Data Flows*

Northern New Mexico College

Challenges:

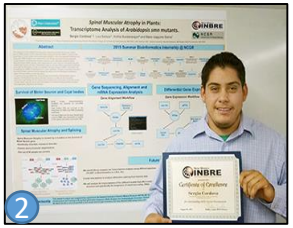
- The 100 Mbps intra-campus and Wide Area Network (WAN) capacity severely limited data movement.
- Poor WAN connectivity; e.g., 10 hops, 60 msec RTT, 50 Mbps to access a backbone and neighbor institution.

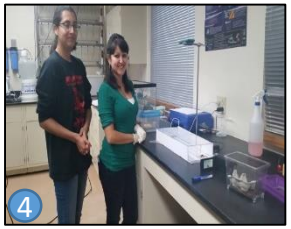


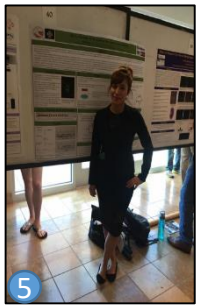
Solutions:

- Establish a 10 Gbps dedicated research network and Science DMZ.
- Moving 100 TBs intra-campus now takes just over a minute, instead of two and a half hours.
- 1 Gbps WAN connectivity through a layer-1 point-to-point service to the Albuquerque exchange point (ABQG).

Science & Engineering Undergraduate Research

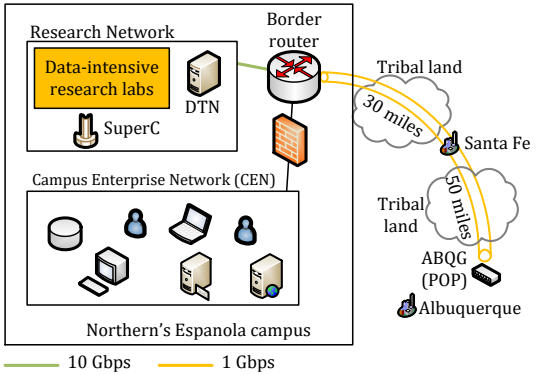






1. Edgar Ronquillo (left) during his 2nd place presentation on cyber-infrastructure at NM AMP Conference.
2. Sergio Cordova receiving the 1st place award during the 2016 Symposium NM-IMBRE, on bioinformatics.
3. Britney Martinez, second from the left, recognized at the 2016 Undergrad. Research Pipeline Network Symposium.
4. Gabriella Trujillo (left) at the 2016 Neuroscience Initiative at UC Davis.
5. Maria Orozco during her 2nd place presentation at the 2016 Research Symposium at Colorado State University.

Scientific and workforce development:

- Undergraduate research in RNA-sequencing analysis and technology
- Graduates entering the workforce in positions that were unattainable before
  - Full-time staff engineers at Los Alamos National Laboratories
  - Private and public industries in Santa Fe and Albuquerque
  - Accepted in PhD Science programs across the country
- Faculty applying for NSF Career Award and public and private funding opportunities (e.g., Google, NM's Service Companies) for the first time in the college's life.

Research Network and Science DMZ: