Broadband, Higher Education and Rural New Mexico

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Background
UNM students enjoy reliable, resilient high-speed internet access, just as students in populous states and urban areas around the country do. New Mexico is also home to two national laboratories in Los Alamos (Los Alamos National Laboratory) and Albuquerque (Sandia National Laboratories). The Interstate I-25 / Rio Grande corridor, as the route from Denver to El Paso, is also the path for the National Lambda Rail (NLR) and Internet2 (I2). And there are on-ramps used by the research institutions of the state, New Mexico Institute of Technology (NM Tech) and New Mexico State University (NMSU), as well as UNM.

However, UNM is a state as large as two Pennsylvanias stacked on top of each other with a population under 2,000,000. Large geographic areas with minimal broadband penetration by household contribute to the US dropping in ranking from 22nd to 23rd in 2011 with 30.4% of its population on broadband1.

Internet2 and the new National Lambda Rail (NLR) provide high-speed internet access between national network aggregation points.

UNM IT’s approach to Improving State Broadband Access
UNM IT works with national high-speed networks (NLR and Internet2) to ensure this connectivity through New Mexico. Through the Albuquerque Gigapop (ABQG) network aggregation point, IT offers connectivity, message routing and peering services for many in-state public K-20 academic, municipal, county, state and tribal entities to obtain the best network service value for public dollars spent. In late 2010, UNM co-founded the Western Regional Network (WRN); a private, regional, optical network (RON) established with other university networking aggregation points. WRN connects aggregation points and provides peering to reduce costs and share services in support of advanced research, operations, academics, economic development and inter-regional services.

Using these strong national and regional networking relationships, and building on National Science Foundation (NSF), National Telecommunications and Information Administration (NTIA) (who administer broadband grand programs funded by the American Recovery and Reinvestment Act: Broadband Technology Opportunities Program (BTOP) and State Broadband Initiative (SBI)), UNM is extending broadband connectivity and improving services throughout rural New Mexico.

Progress
The maps below show the contrast between fiber available in New Mexico in 2010, and the expansion of broadband connectivity just in the northwest quadrant of the state in 2012 alone. This expansion connects the Navajo Nation and Zuni Pueblo through Navajo Technical College and the UNM Gallup Branch campus and its building in Zuni. At the same time, capacity and resilience are ensured through alternative pathways to ABQG.

Through projects like this throughout the state, the advantages of high-speed network access and traffic management are extended into communities previously dependent on very limited or no connectivity. In this specific quadrant, extensions and affiliations being established with Zuni tribal leadership, Navajo Nation leadership and municipal leaders in Gallup and the educational institutions are the warp of community fabric, connecting people and supporting health care, K-12 education and economic development.

Public entities such as UNM can extend these services at a lower cost, with government pricing and access to federal funding, than private entities. For example, the United States Unified Community Anchor Network (U.S. UCAN) with I2 is connecting community anchor institutions, including public libraries, schools, community colleges, research parks, public safety and health care institutions with advanced broadband capabilities. Utilizing the Internet2 Network and in collaboration with regional research and education networks across the country, U.S. UCAN will enable these anchor institutions to serve their communities with telemedicine, distance learning and other life-changing applications. Also, NLR in 2009 announced a National Health Intranet for secure, high-performance access to a “medical information superhighway”. Finally, UNM is one of over 30 leading research universities participating in community-led innovation in research and entrepreneurship toward the rapid deployment of ultra-high-speed networks to universities and their surrounding communities in the 2011 Gig.U initiative to drive economic growth, stimulate innovation, and address critical community needs.

Conclusion
By public institutions extending broadband into areas where service is not cost-effective for private providers, the digital divide is narrowed in rural areas. UNM’s increasing affiliations with national, regional and higher education research networks enables the expansion of broadband the final miles into schools, libraries, hospitals and municipalities in rural New Mexico. This supports UNM’s community service mission, as much as it is integral to the academic and research missions of the State’s flagship institution.