Western Consortium of Idaho, Nevada, and New Mexico

Connectivity

Fred Harris, Component Lead

Team Members:

NV: Fred Harris

ID: Dave Lien

NM: Bill Michener

Outline

- Goals and Objectives
- Review Activities and Outputs
- Plans for Sustainability of this component.

Goals and Objectives
Connectivity Component

- **From the proposal:**
  - **Increase connectivity and bandwidth.** Significant effort will focus on promoting communication and collaboration by improving connectivity infrastructure within the Consortium.
    - Proposed and future Consortium efforts related to improving research competitiveness, STEM education, and economic development rely on this basic infrastructure.

Major Activities: Years 1-3 Connectivity Component

Activities (as per proposal)
ID-Upgrade connectivity to key labs and desktops
ID-IRON connectivity to Hagerman and Kimberly
NV-Increase connectivity into the state
NV-Increase connectivity within the state
NM-Establish portals at college campuses
NM-Increase portal connectivity

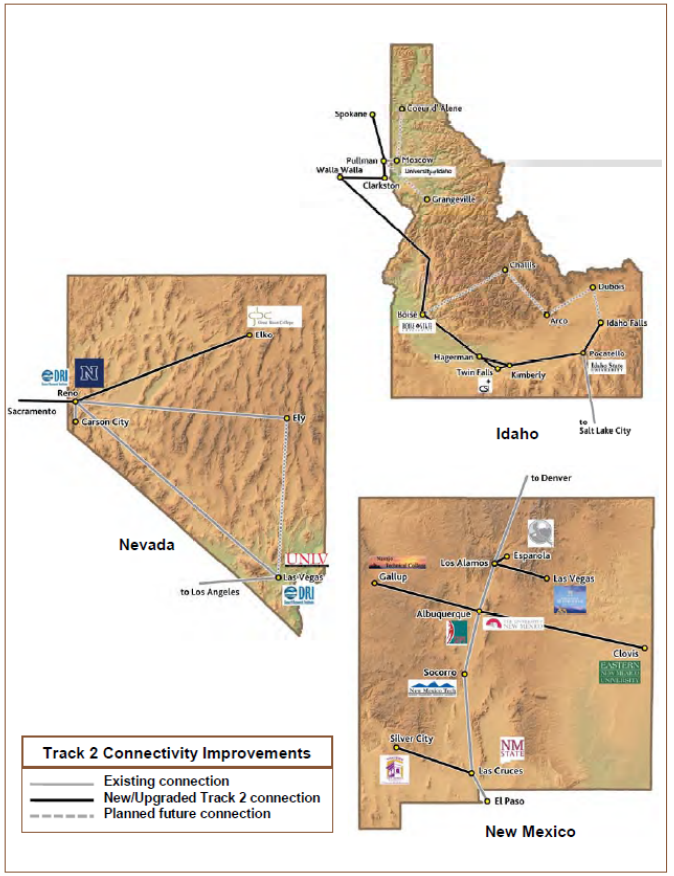

Figure 2. Proposed Track 2 improvements in connectivity and bandwidth, which will promote communication and collaboration within the Western Consortium. In addition to serving the major research universities and state colleges, these improvements will also help connect community colleges, tribal colleges, and minority serving institutions in geographically disadvantaged areas.

Review of Accomplishments: Idaho

- Activity 1:
  - Upgrade connectivity to key labs and desktops
- Activity 2:
  - IRON Connectivity to Hagerman and Kimberly

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Review of Accomplishments: Idaho

- Activity 1:
  - Upgrade connectivity to key labs and desktops
    - (ISU) LA 326 (Visual Communication and Cartography Lab) (100Mbps LAN to 1Gbps LAN)
    - (ISU) Upgrade from 100Mbps LAN to 1Gbps LAN for graduate student work stations in Historical Resources Management
    - (ISU) Upgrade the Inter-building backbone connection from the Liberal Arts Building to the network core at 1Gbps

Review of Accomplishments: Idaho

- Activity 1:
  - Upgrade connectivity to key labs and desktops
    - Purchase and install new gateway to support Metro Ethernet.
    - Upgrade WAN from 4.6Mbps to 100Mbps in Idaho Water Center (ISU BCAL)
    - Install VoIP (ISU BCAL)
    - Install new switches and hardware for improved communication/outreach (LCD digital signage)

Review of Accomplishments: Idaho

- Activity 1:
  - Upgrade connectivity to key labs and desktops
    - Lab 1: (ISU) LA 326 (Visual Communication and Cartography Lab)
    - Sarah Hinman – GIS in the Social Sciences
      - Historical geography and historical GIS
    - (100Mbps LAN to 1Gbps LAN)
      - The connectivity has allowed students and faculty working in the lab to download large web-based datasets and files stored on a campus server in ways that enhance research.

Review of Accomplishments: Idaho

- Activity 1:
  - Upgrade connectivity to key labs and desktops
    - Lab 2: (ISU) Upgrade from 100Mbps LAN to 1Gbps LAN for graduate student work-stations in Historical Resources Management
    - The connectivity has allowed research assistants employed by NSF funded grants to retrieve and report research conducted by a global team of scholars

HRM student, Dave Dixon,

Review of Accomplishments: Idaho

- Activity 1:
  - Upgrade connectivity to key labs and desktops
    - Lab 3: (ISU) Upgrade from 4.6Mbps to 100 Mbps in Geosciences
      - ISU Geosciences BCAL computer lab, Boise
    - The connectively upgrades have allowed sharing of LiDAR data with INL scientists (also on IRON) for fusing TLS and airborne data for a line of sight model.
      - Glenn and her students collecting ground LiDAR data for processing

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Review of Accomplishments: Idaho

- Activity 2:
  - IRON Connectivity to Hagerman
    - The Hagerman Fish Culture Experiment Station is located in the heart of Idaho's aquaculture industry in the Magic Valley, which follows a 40-kilometer stretch of the Snake River.

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Review of Accomplishments: Idaho

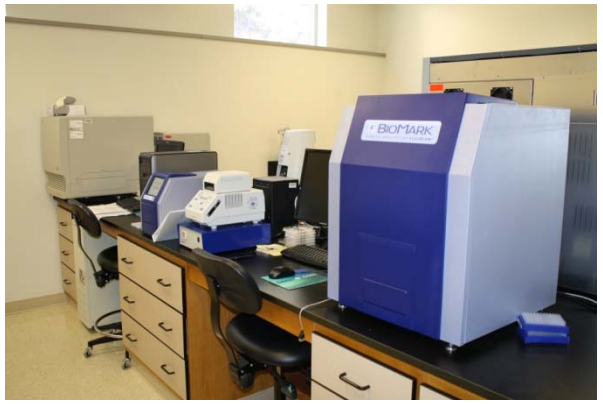
- Activity 2:
  - IRON Connectivity to Hagerman
    - The Center houses a genetics laboratory and a fish-rearing station

Review of Accomplishments: Idaho

- Activity 2:
  - IRON Connectivity to Hagerman
    - Local Area Network Upgrades
      - » New Router (replacing an 8 year old Cisco router)
      - » Wireless connectivity added
    - Outside Connectivity Upgrades
      - » From 2 T1 links (3 Mbps) into to a 300 Mbps fiber connection to Boise and the IRON Pop.
    - And they are saving $800 per month in networking costs.

Review of Accomplishments: Idaho

- Activity 2:
  - IRON Connectivity to Hagerman
    - "Our research is relying more and more on very large data sets generated by SNP marker testing of fish and modern gene sequencing. The latter can be as large as 30 terabits of data. The lab routinely sends large data files back and forth to Moscow and also to collaborators, such as Idaho Dept. Fish & Game."



Review of Accomplishments: Idaho

- Activity 2:
  - IRON Connectivity to Hagerman and Kimberly
    - The Kimberly Research and Extension (R & E) Center is located northeast of Kimberly about six miles east of Twin Falls

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Review of Accomplishments: Idaho

- Activity 2:
  - IRON Connectivity to Kimberly
    - The center has approximately 180 acres of irrigated farm, four greenhouses, a dry bean research facility complete with laboratories, a seed cleaning complex, seed warehouse, and a potato storage research facility.

Review of Accomplishments: Idaho

- Activity 2:
  - IRON Connectivity to Kimberly
    - What was changed
      - Local Area Network Upgrades
        - » From a 10 Meg (daisy chained Ethernet hubs) network to a 1 gig local network
      - Outside Connectivity Upgrades
        - » From a fractional T1 Link (700 K) to a 100 Mbps fiber connection
    - The effect of the networking upgrade has improved staff productivity and demonstrated weakness in the local file and print servers due to their age.

Review of Accomplishments: Idaho

- Activity 2:
  - IRON Connectivity to Kimberly – Impacts
    - Water Resources Research Program
      - The largest impact has been the ability to download satellite images from the USGS without impacting other users at the center. It used to take on the order of 4 to 6 hours to download one LandSat scene. If the user attempted to download during normal business hours, the compressed video service and other internet services used by staff at Kimberly were heavily impacted. To reduce that impact, our staff would come in after hours and on the weekend to download images. With the improvements in the network infrastructure, a LandSat image can be downloaded in less than thirty minutes ***without*** impacting other staff at Kimberly.

Review of Accomplishments: Idaho

- Activity 2:
  - IRON Connectivity to Kimberly – Impacts
    - Potato Physiology and Storage Research
      - Bin controllers can now be viewed on-line
        - » http://bin9.kimberly.uidaho.edu:8052/main.htm
      - Research and Outreach has been improved
        - » http://www.kimberly.uidaho.edu/potatoes/

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Review of Accomplishments: Nevada

- Activity 1:
  - Increase Connectivity into the state
- Activity 2:
  - Increase Connectivity within the state

Review of Accomplishments: Nevada

- Activity 1:
  - Increase Connectivity into the state
    - North Connectivity
      - Was 2-1 Gbps pipes
      - This grant changed it to 1-10Gbps pipe
    - South Connectivity
      - Was 1-1Gbps pipe
      - State leveraged changes in the North to get t
        1-10Gbps pipe
    - N/S Connectivity
      - Was 1-1Gbps pipe.
      - Now using North and South pipes.

Review of Accomplishments: Nevada

- Activity 1:
  - Increase Connectivity into the state
    - Network usage has already passed our original limits and continues to grow.
    - Without this connectivity increase into the state, all of the institutions within the state would have been hampered.

Review of Accomplishments: Nevada

- Activity 2:
  - Increase Connectivity within the state
    - Pipe from Reno to Elko upgraded. It had reached end-of-life and this upgrade enhanced the connectivity to a 4-year institution and several satellite campuses.
      - This pipe is now slightly over 50% capacity

Review of Accomplishments: Nevada

- Activity 2:
  - Increase Connectivity within the state
    - IP based Video Conferencing upgraded.
      - Better compression, Better quality, More connections.
      - Currently connected to 200+ sites across the state
      - Impacts Research and Education in the state heavily
        - » DRI - Science Talks.
        - » Satellite Campuses
          - video classes

Review of Accomplishments: New Mexico

- Activity:
  - Portal Installation
    - Original specs:

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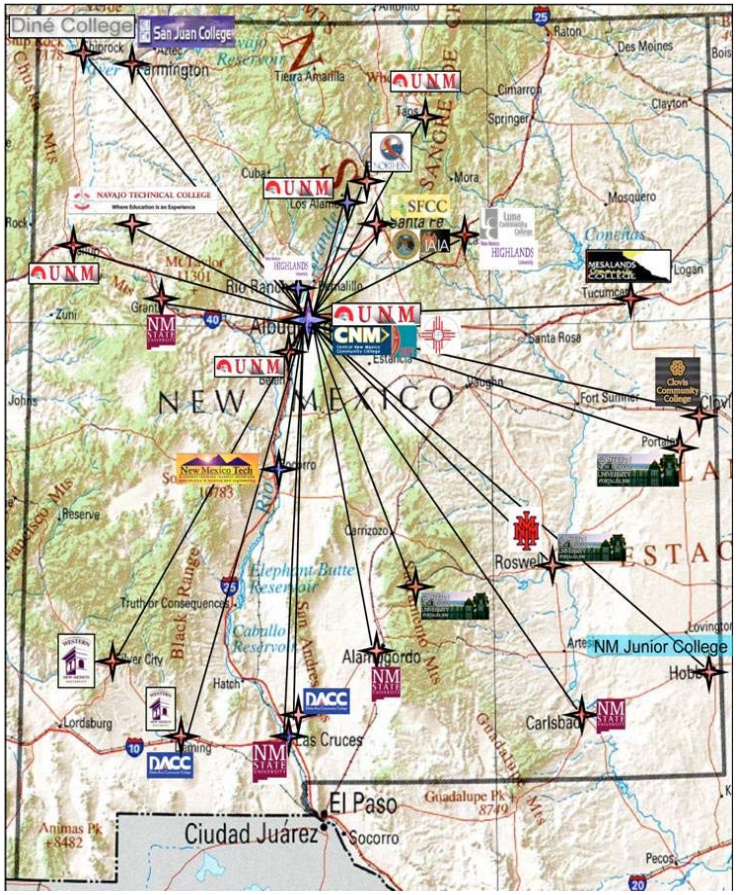
Review of Accomplishments: New Mexico

- Activity:
  - Education Gateway Portals at 27 NM University and College Campuses:
    - 8 installed - January 2010
    - 13 installed - May 2010
    - 6 installed - June 2011

  Total New Mexico state investment - $1.4M



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Review of Accomplishments: New Mexico

- Activity: Education Gateway Portals
  - **Impact: Distance Education**
    - Eastern New Mexico University – Portales, NM
    - Intel's "Think Parallel Workshops" and Encanto Access
      - **4-series workshops designed to teach basic parallel programming to undergraduate**

Review of Accomplishments: New Mexico

- Activity: Education Gateway Portals
  - **Impact: 3D Analysis**
    - Center for Advanced Research Computing (CARC) University of New Mexico - Albuquerque, NM
      - **3D Scientific rendering/display/analysis of output of data produced on Encanto Supercomputer**

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Review of Accomplishments: New Mexico

- Activity: Education Gateway Portals
  - **Impact: Collaborative Education**
    - Luna Community College – Las Vegas, NM and Eastern New Mexico University – Ruidoso, NM
      - **Students' Remote Film Editing with "Voorhees Films" and "Elevation Cinema"**

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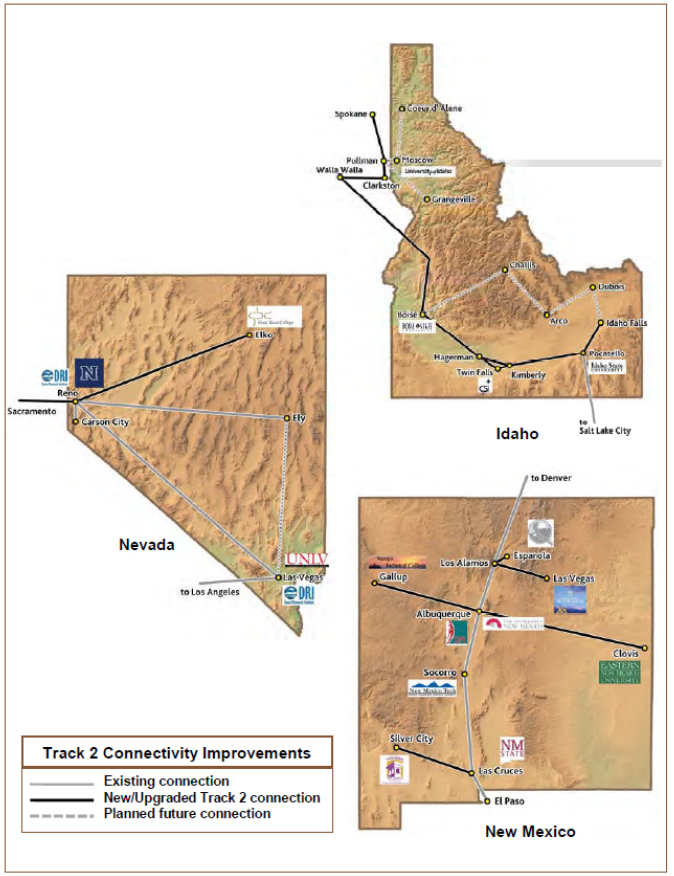
2011 EAC Recommendations

- Establish value to the tri-state STEM research enterprise
  - depict not only how the physical CI has improved research productivity, but especially, how it has given rise to new research capabilities and outcomes that were not possible before this deployment.
  - do this instead of usage metrics (# connections, …)

Plans for Sustainability of this Component

- All of the enhancements are integrated into the various IT divisions.
  - Idaho: Campus IT
  - Nevada: NevadaNet
  - New Mexico: Campus IT
- Therefore, ongoing maintenance is handled by them.



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Questions?