BiSON – Enabling HPC along the Colorado-Wyoming Front Range

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BiSON Partnership

• 5 year old partnership between NCAR, NOAA-Boulder, University of Wyoming, University of Colorado and Colorado State University

• Goal: create an optical WDM network connecting Boulder, Denver, Laramie, Fort Collins and Longmont
BiSON Evolution

- Began as Lariat network in 2004
- Connected the University of Wyoming to the Front Range GigaPop in Denver, CO
- Movaz equipment used to extend the distance of Gigabit Ethernet links.
- Only a single lambda with no multiplexing.
BiSON Evolution

- In 2005 expanded into the BiSON ring.
- Connected Boulder, Longmont and Fort Collins CO.
- All of the individual spans were point to point links with no pass-through lambdas.
- Ethernet switches at each site passed VLANs instead.
BiSON Evolution

- In 2006 upgraded Boulder – Denver span to support 10G.
- Provided a dedicated 10G connection to connect the National Center for Atmospheric Research to the TeraGrid
- The TeraGrid link is still operational today.
- An additional 10G lambda on the span provides other commodity and R&E connectivity.
BiSON Evolution

• In 2010 the remainder of the ring was upgraded to be 10G capable.
• Existing Movaz hardware upgraded with better amplification and dispersion compensation.
• New Adva FSP3000-R7 based shelves added to support new 10G lambdas.
• Pass-through lambdas enabled to allow direct connections between any two sites.
Current Deployment

- Six 10G lambdas lit from Denver.
  - 1 new 10G to UW
  - 1 new 10G to CSU
  - 2 new 10G to NOAA in Boulder
  - 2 old 10G from Boulder

- ADVA hardware
  - Amplifiers and older lambda on the RayExpress platform
  - New 10G lambdas on the FSP3000 platform.
Future Plans

- Expand dark fiber plant to include NCAR Wyoming Supercomputing Center (NWSC)
- Initially at least four 10G circuits will be active.
- Expansion to 40G and 100G a possibility
- Direct connections for HPC to other BiSON members also a possibility.