NWSC Networking Overview

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NWSC Networking

- WAN Connectivity via BiSON
  - Background
  - Current Capability
  - Planned Initial Connectivity
  - Potential Capacity
- LAN Connectivity
  - High performance computing 10G LAN
  - Low performance management LAN
BiSON Path
BiSON Current Capability

• The ring was recently upgraded to support 10G and up.
• Each member has access to a direct 10G lambda from their location to the FRGP in Denver.
• Older shared 1G links still in place. These will become backup-only once all 10Gs are active.
NWSC Initial Connectivity

- Two 10G connections back to Mesa Lab for internal traffic.
- One 10G direct to FRGP for general Internet2 / NLR / R&E traffic.
- One 10G to TeraGrid (or follow-on)
- BiSON will support dedicated 10G connections to other partners for minimal cost.
NWSC BiSON Lambdas
BiSON Capacity

- System is engineered for 40 individual lambdas.
- Each lambda can be a 10G, 40G, or soon a 100G connection.
- Independent lambdas can be send each direction around the ring.
- With a major upgrade system could support 80 lambdas.
  - 100Gbps \times 80 \text{ channels} \times 2 \text{ paths} = 16 \text{Tbps}
NWSC LAN Overview

- Multiple tiers of connectivity
  - High-performance connections primarily at 10GigE
  - Low-performance connections for various management, ILO, IPMI, etc. connections
  - HPC resources will likely have a dedicated non-IP interconnect as well
  - Office / workstation LAN design will be fairly conventional
  - Wireless 802.11 building-wide
High Performance LAN

• On the order of 100 10GigE ports
• Minimal over-subscription
• Current design Cisco Nexus based
• Highly reliable
  • Dual-chassis core
  • vPC ‘virtual port channel’
  • ISSU ‘In Service Software Upgrade’
Low Performance LAN

- Designed to handle the increasing number of Ethernet-based management ports
- Utilize separate cost-effective switches so low-bandwidth devices don’t consume slots and ports in high performance (and high cost) switches
- High-speed and low-speed networks will be routed to each other