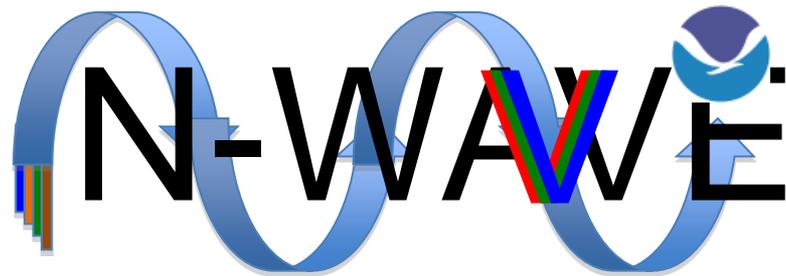




NOAA NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE



NOAA Research Network

Unidata Policy Committee Brief

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N-Wave Background

- BNOC “proof of concept” 1/10G L-2 circuits 2008-Present (SHiPSN) McLean, Seattle, Norman
- Supercomputer installations seeking less expensive power and space
- Early 2009-NOAA Receives Climate Modeling Stimulus Funds
- Portion of Funds go to new Supercomputer
- Question: How can we interconnect NOAA’s RDHPCS (Research and Development High-Performance Computing Systems) Supercomputers at:
 - Geophysical Fluid Dynamics Laboratory (GFDL in Princeton)
 - Earth Systems Research Laboratory (ESRL in Boulder)
 - National Weather Service's National Center for Environmental Prediction (NCEP in Gaithersburg)
 - New installations at ORNL
 - New Site B or Fairmont West Virginia

Answer: Engineer and build it ourselves= NOAA Research Network or N-Wave

Engineering N-Wave

Leverage our existing relationships

- NOAA's traditional research partners are the universities – work with this community
- Partner with Regional Optical Networks for end-site connectivity – keeps costs down
- Partner with the national Research and Education Networks Internet2/NLR- Keeps costs down
- Partner with the Global Research Network Operations Center (GRNOC) at Indiana University to tie the systems together – top tier engineering
- Maximize small portion of ARRA funding

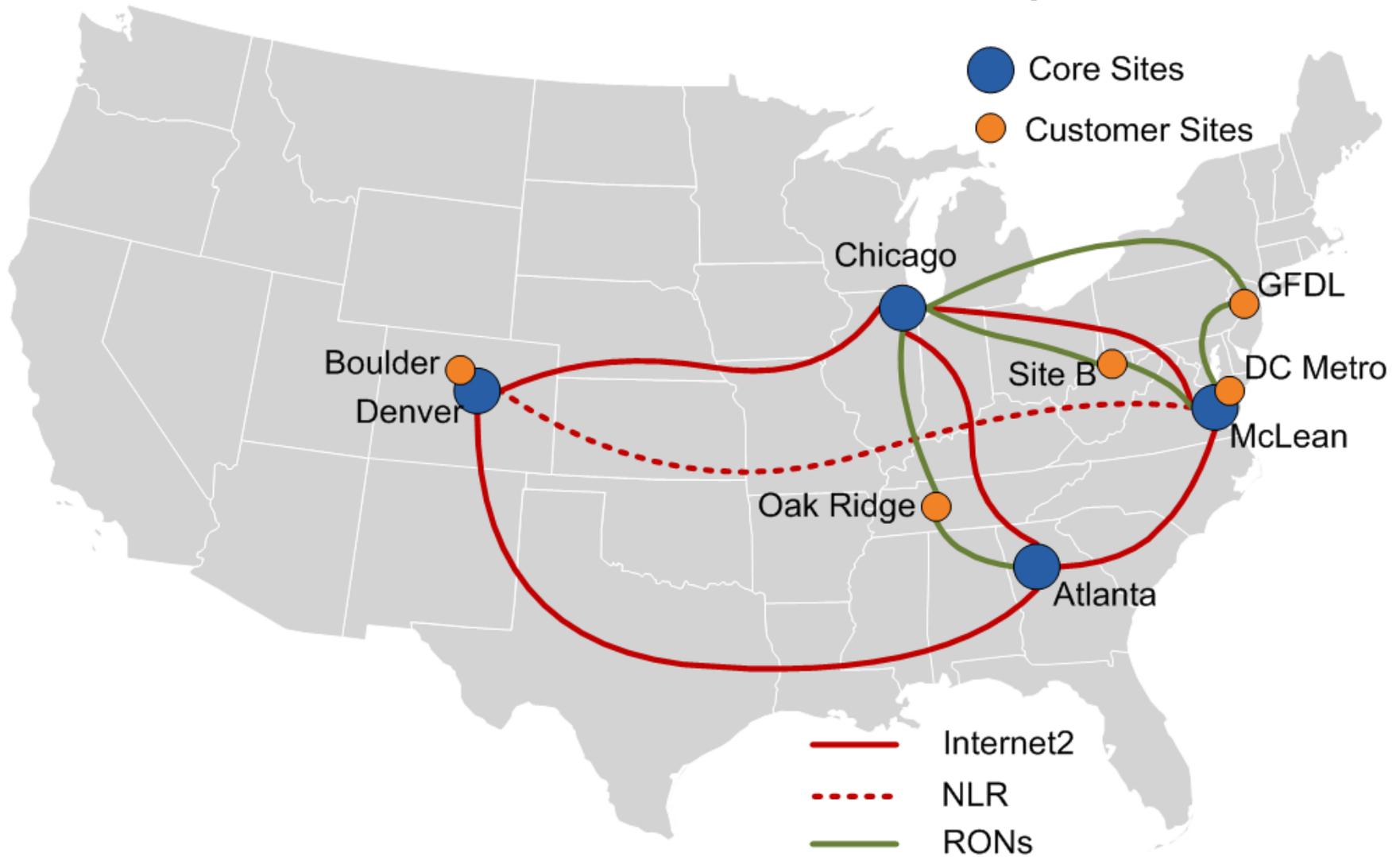


The N-Wave Mission

"Our mission is to enable NOAA science by interconnecting research resources through reliable high-performance networks.

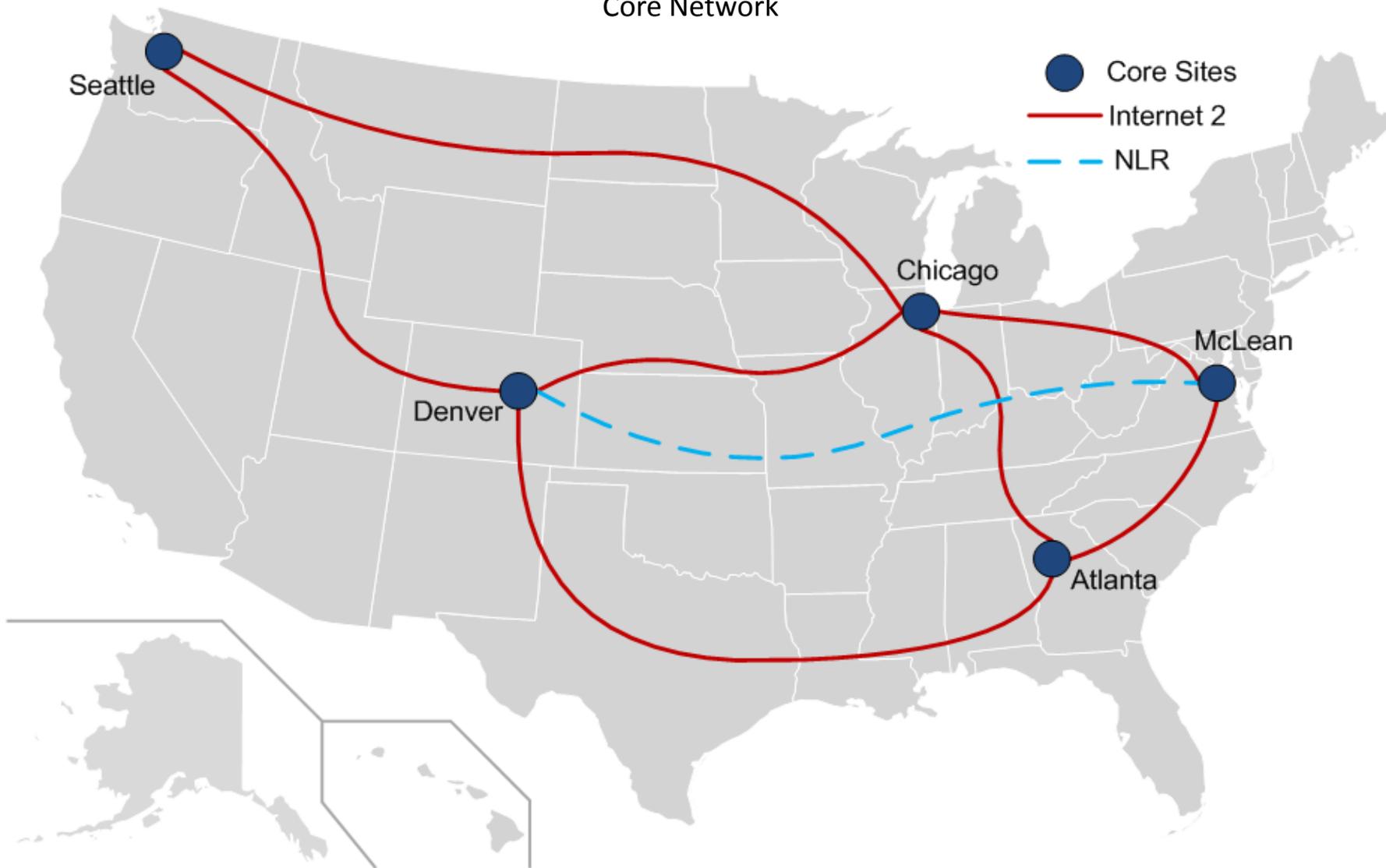
To satisfy our customers we are committed to integrity, excellence, value, and flexibility."

N-Wave R&D HPCS Network phase-1



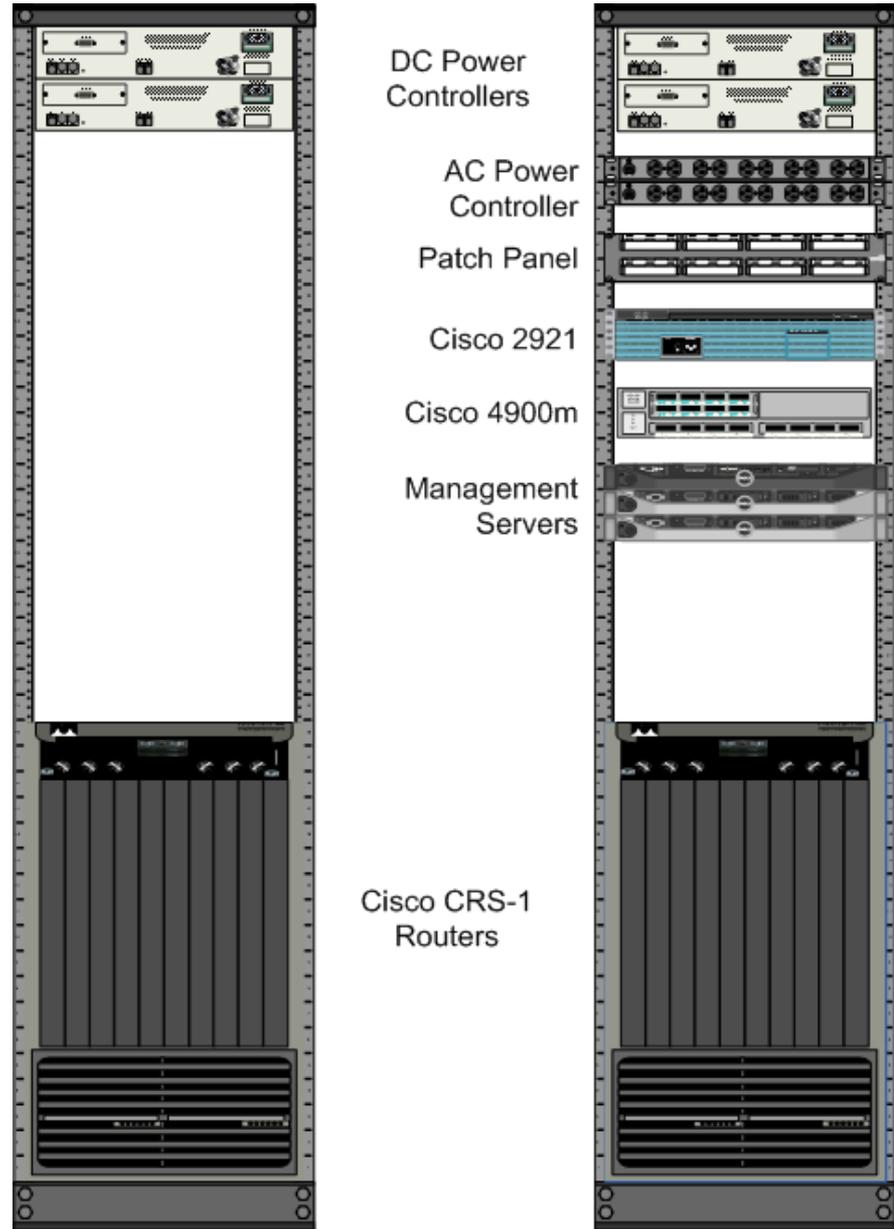
N-Wave

Core Network



Core Racks

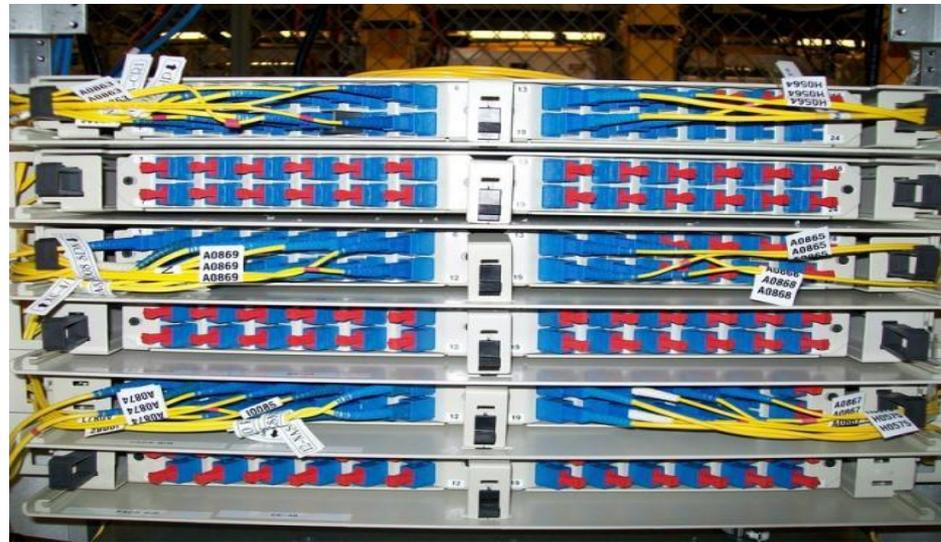
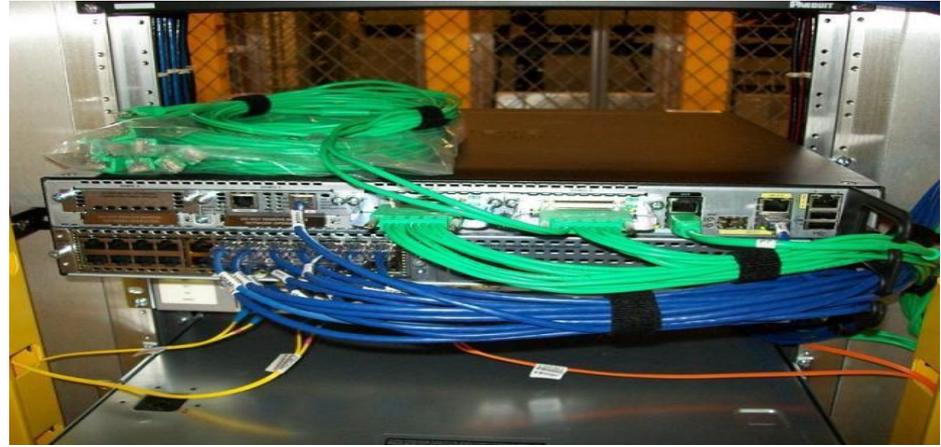
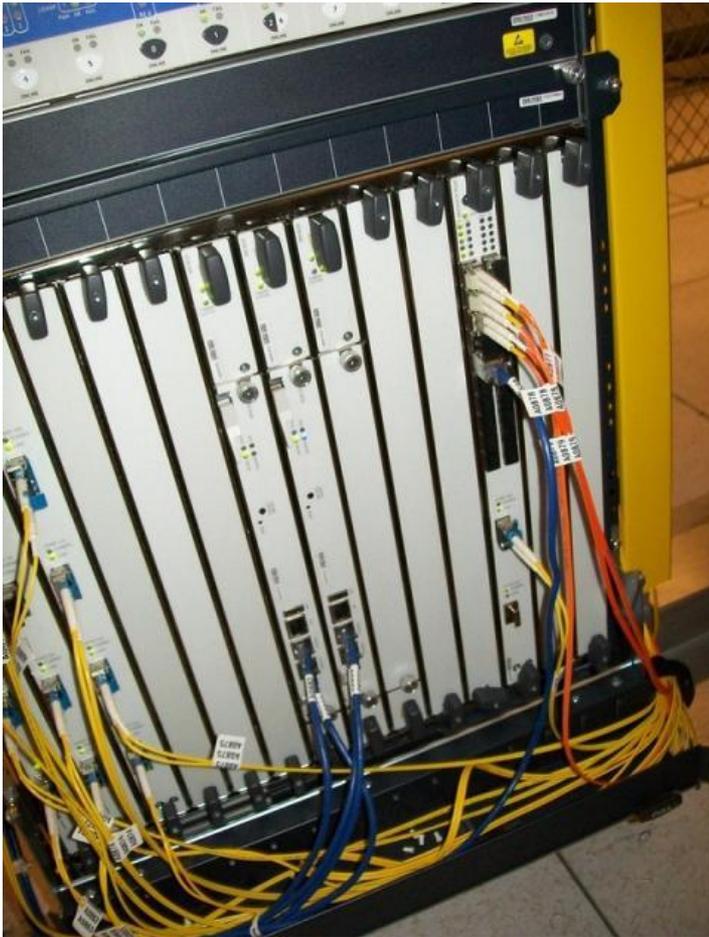
- Colocated at Internet2 PoPs
- Redundant Cisco CRS-1/4 routers
- Redundant, remote manageable DC power controllers
- Remotely manageable AC power controller (dual infeed)
- Cisco 2921 router
 - Secure OOB mgmt access
- Cisco 4900M provides 1 Gigabit connections and “dual” access to CRSs
- Management servers
 - BWCTL
 - OWAMP
 - Syslog/other



Chicago *(completed June 21 2010)*



Atlanta *(completed July 22 2010)*



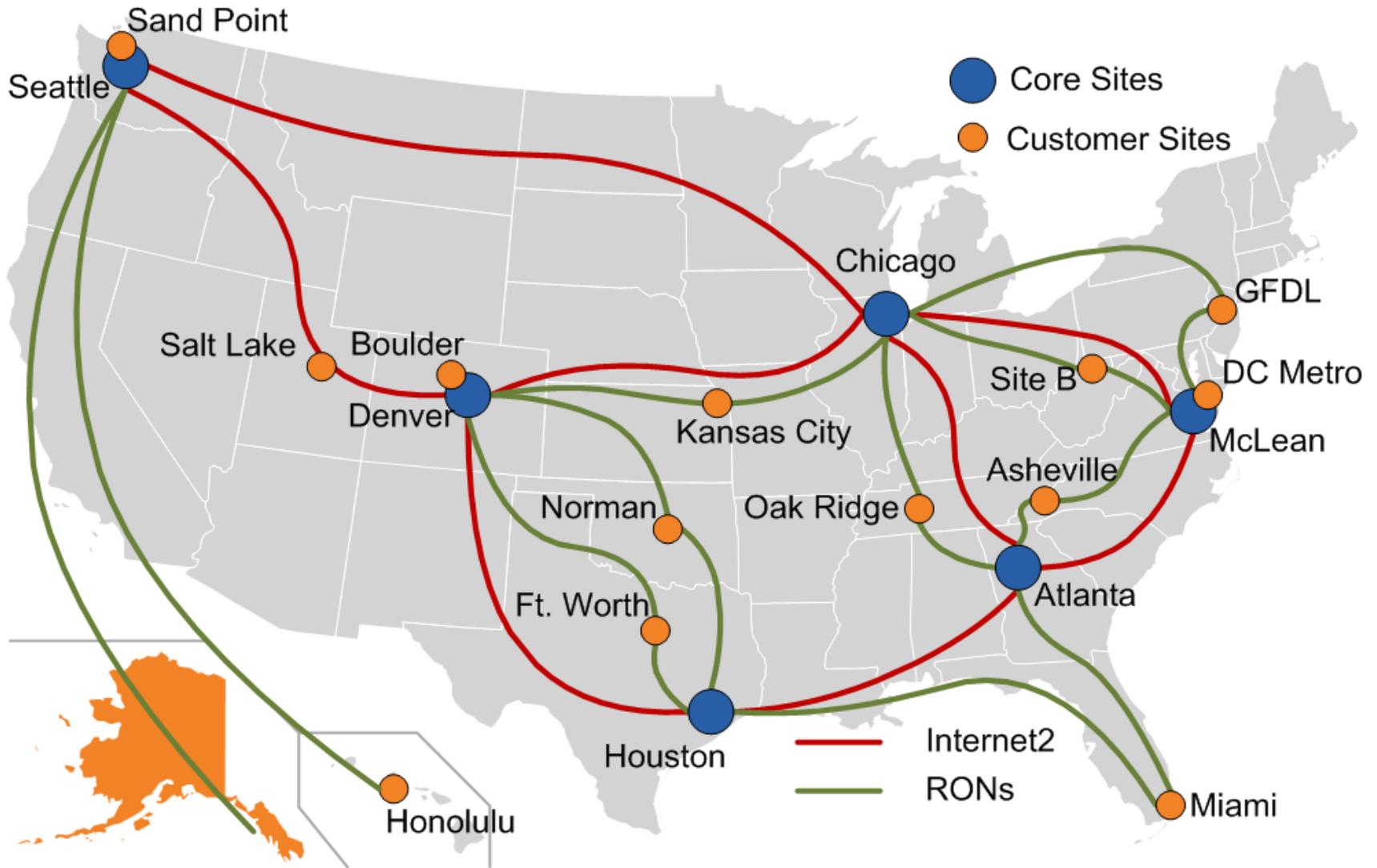
Denver *(completed Aug. 12 2010)*



Vision for N-Wave

- **A consolidated agency-wide network resource that meets NOAA's research connectivity requirements – and where appropriate, supplements NOAA's operational connectivity requirements**
 - Secure intra-NOAA connectivity at layer 3
 - Secure, private, flexible, low-latency, high-bandwidth circuit capabilities
 - Consistent high-bandwidth connectivity to the R&E community
 - Enhanced/simplified commodity Internet service

Vision



N-Wave Potential Customers

- OAR Intranet
- NESDIS Intranet
- NCEP Research connections
- NWS Web and Data services
 - Non Life & Property Operations
- NOAA Line Office Nets peering
 - Commodity Internet Connectivity
 - Trusted Internet Connections
- NMFS and NOS Net circuits
 - Between major NOAA Sites
- NIST Boulder to Gaithersburg circuit



Questions?

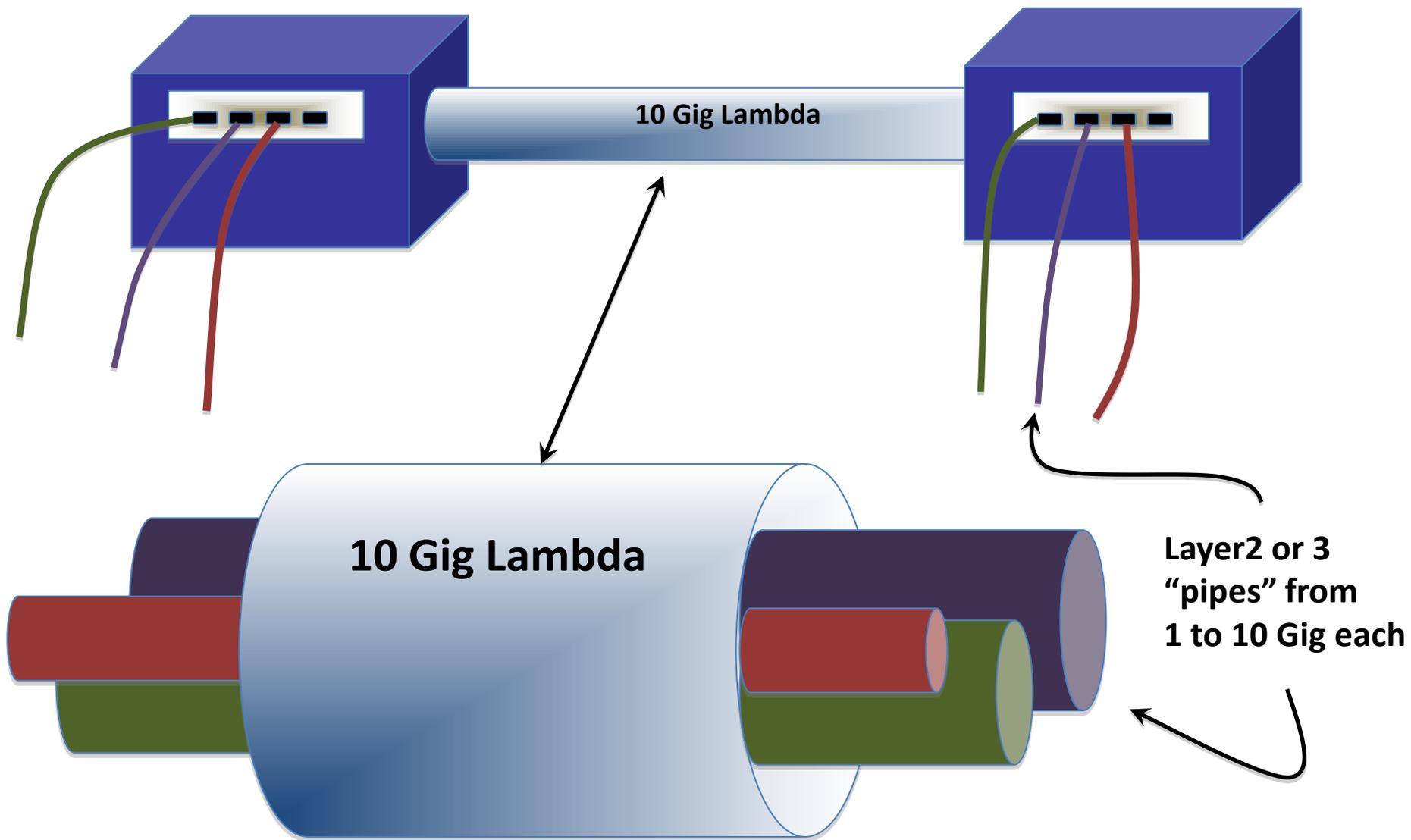


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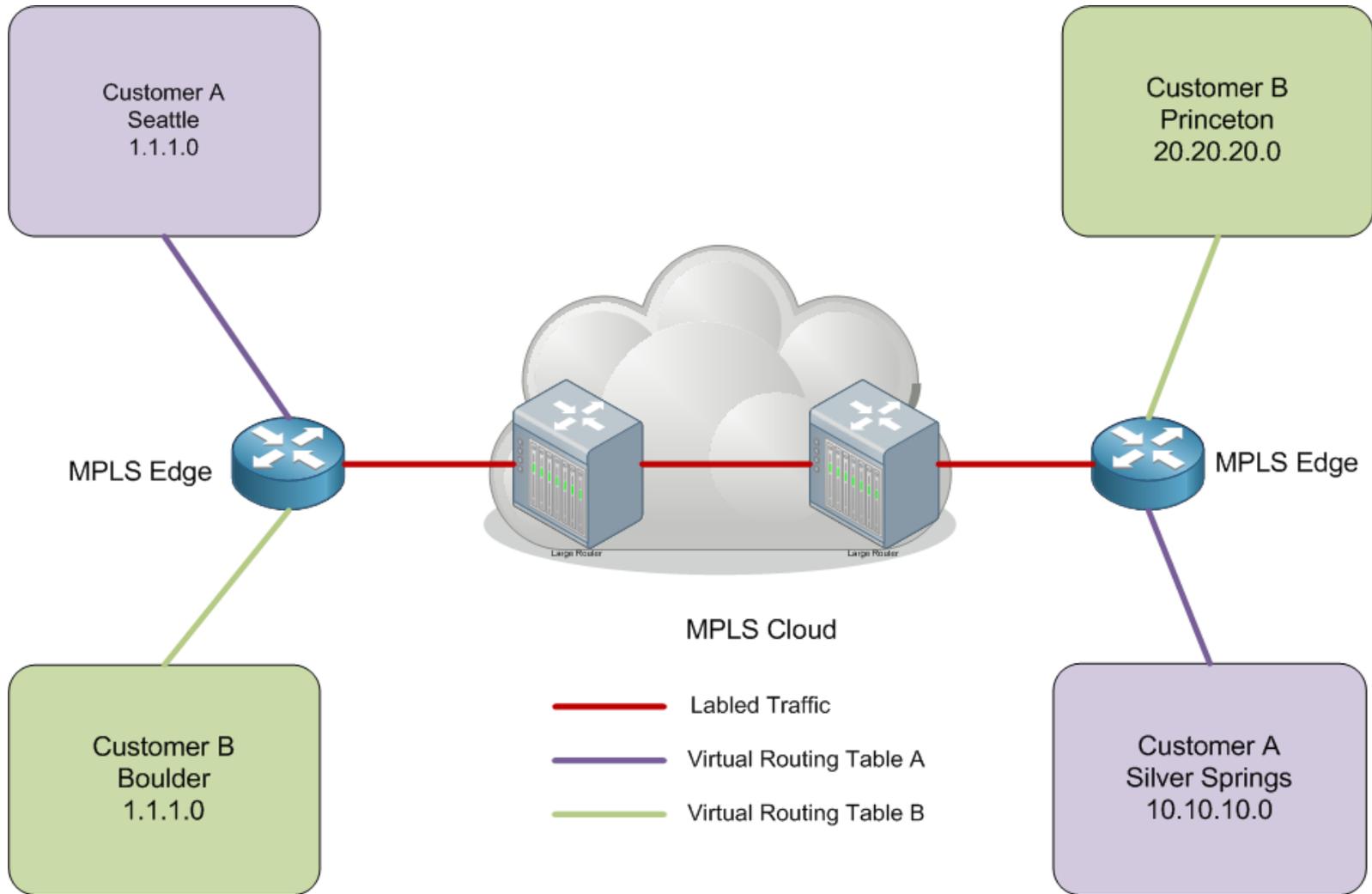
For Official Use Only



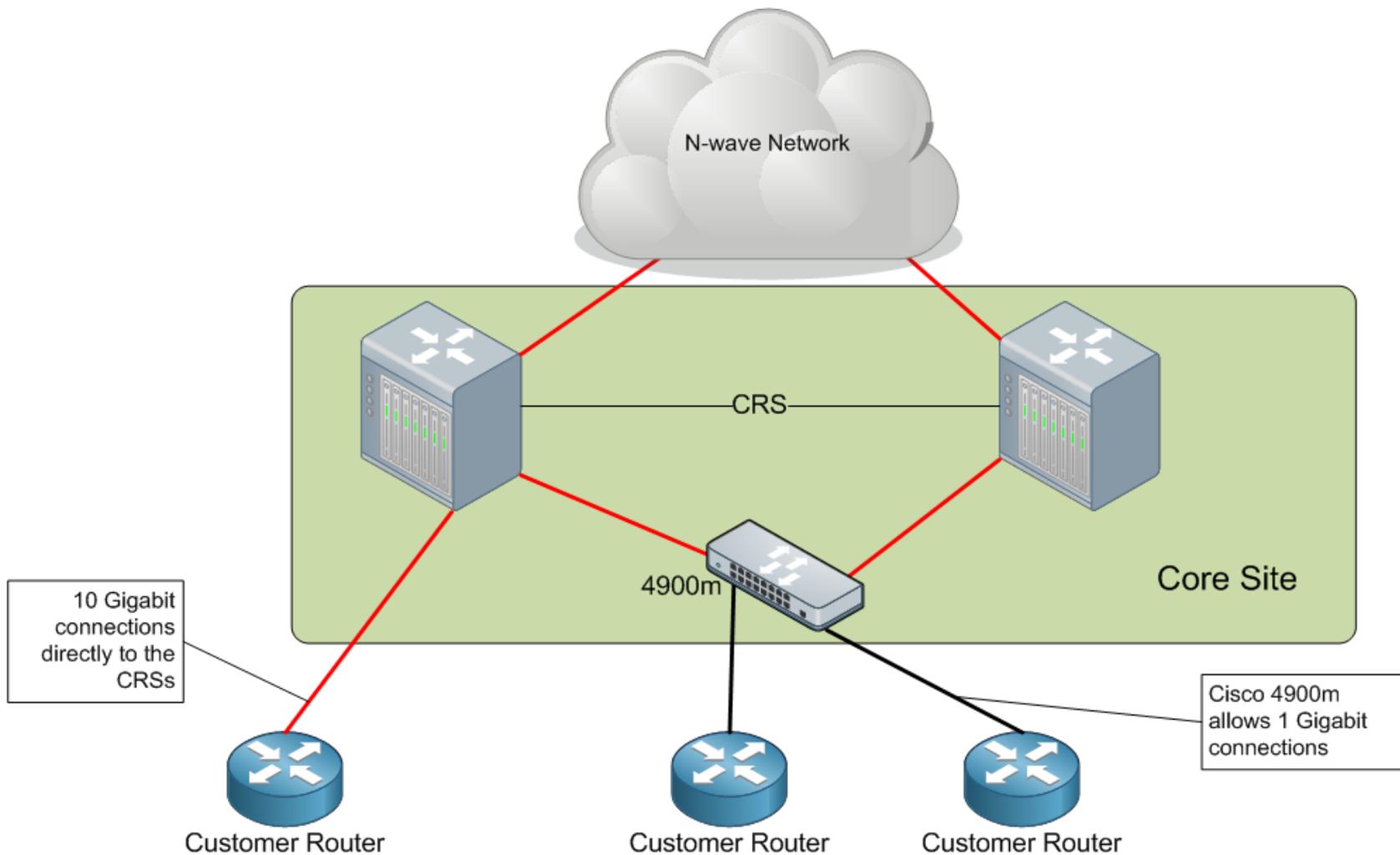
Backup Slides:



Layer 3 VPN



Small Sites Connect Directly to Core Nodes



Large Sites Connect through intermediate Routers

