

# NCCS Network Roadmap



Presented by

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# NCCS network roadmap

**Summary: Continuous improvement projects in both high-speed wide-area connectivity and ultra-high-speed local-area data movement are finding and fixing bottlenecks to meet the data management demands of groundbreaking scientific simulations**

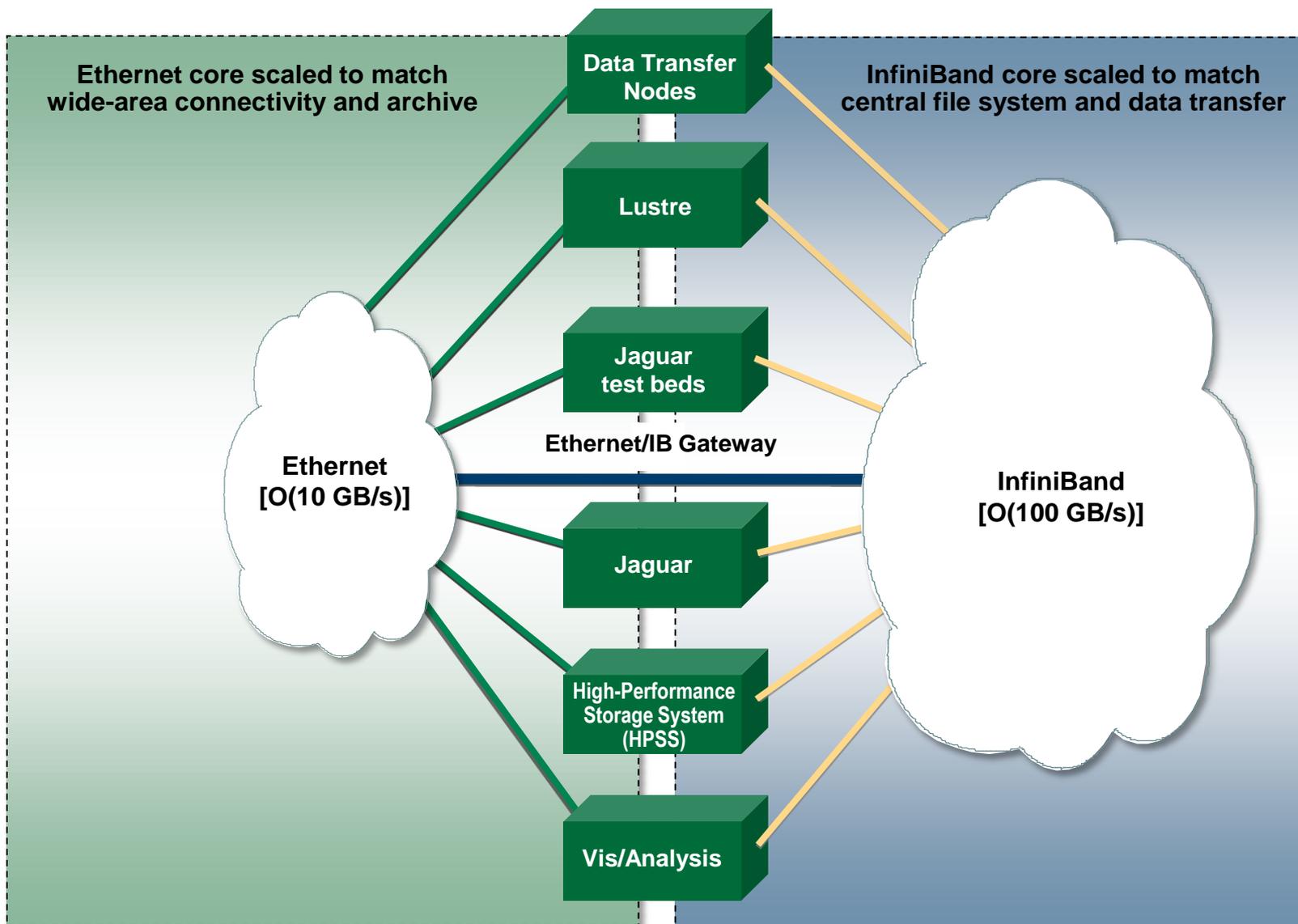
- **2010**

- Demonstrated 243 GB/s with Lustre file system
- Deployed WAN optimized data transfer nodes
- Deployed network and infrastructure to support CMRS

- **2011**

- Evaluate IB/Ethernet gateways for HPSS
- 10 Gig line rate firewall
- Enhance 10 GB WAN monitoring and security capabilities

# NCCS network roadmap summary



# NCCS – CMRS Network

## Juniper SRX 5600

The SRX5600 Services Gateway supports up to 60 Gbps firewall with 8 10 Gigabit Ethernet ports, 350,000 new connections per second and 9 million concurrent user sessions. Exhibiting extraordinary scalability, the SRX5600 Services Gateway is ideal for securing large enterprise data centers, service provider infrastructures, and next-generation services and applications, as well as enforcing unique per-zone security policies.

## Cisco Nexus 7010

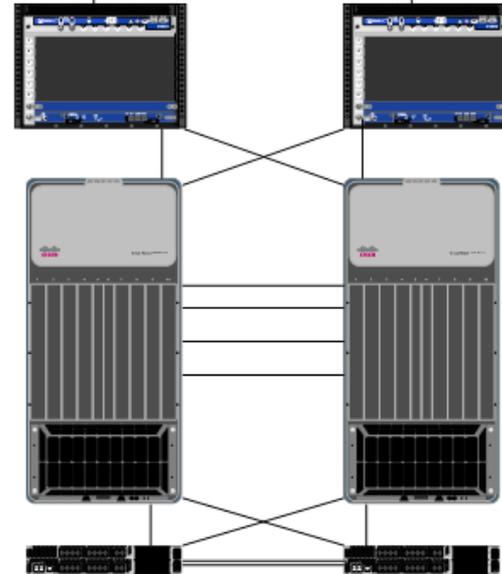
Scalable to 15 terabits per second (Tbps).

Support up to 256 10 Gigabit Ethernet or 384 10/100/1000 Ethernet ports in a single 10-slot chassis. Support for 40 Gbps and 100Gbps line cards. Highly scalable fabric architecture supporting up to five fabric modules for load-balanced, fault-tolerant operation and designed to deliver 230 Gbps per slot of bandwidth at release for 4.1 Tbps of forwarding capacity, with future support for more than 500 Gbps per slot.

ORNL



NCRC

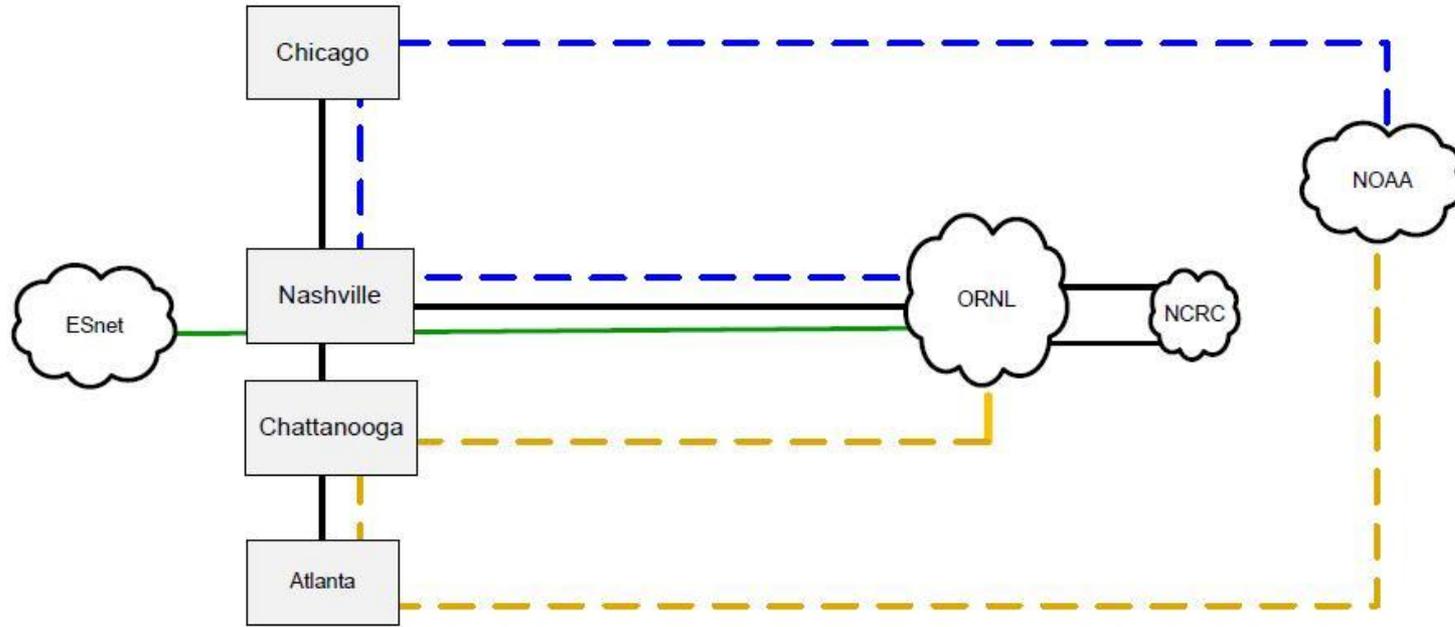


## Cisco Nexus 5020

The Cisco Nexus 5020 is a two-rack-unit (2RU), 10 Gigabit Ethernet switch built to provide 1.04 terabits per second (Tbps) throughput or 773.8 million packets per second (mpps) It has 40 fixed 10 Gigabit Ethernet Small Form-Factor Pluggable Plus (SFP+) ports with line-rate traffic throughput on all ports

# CMRS WAN

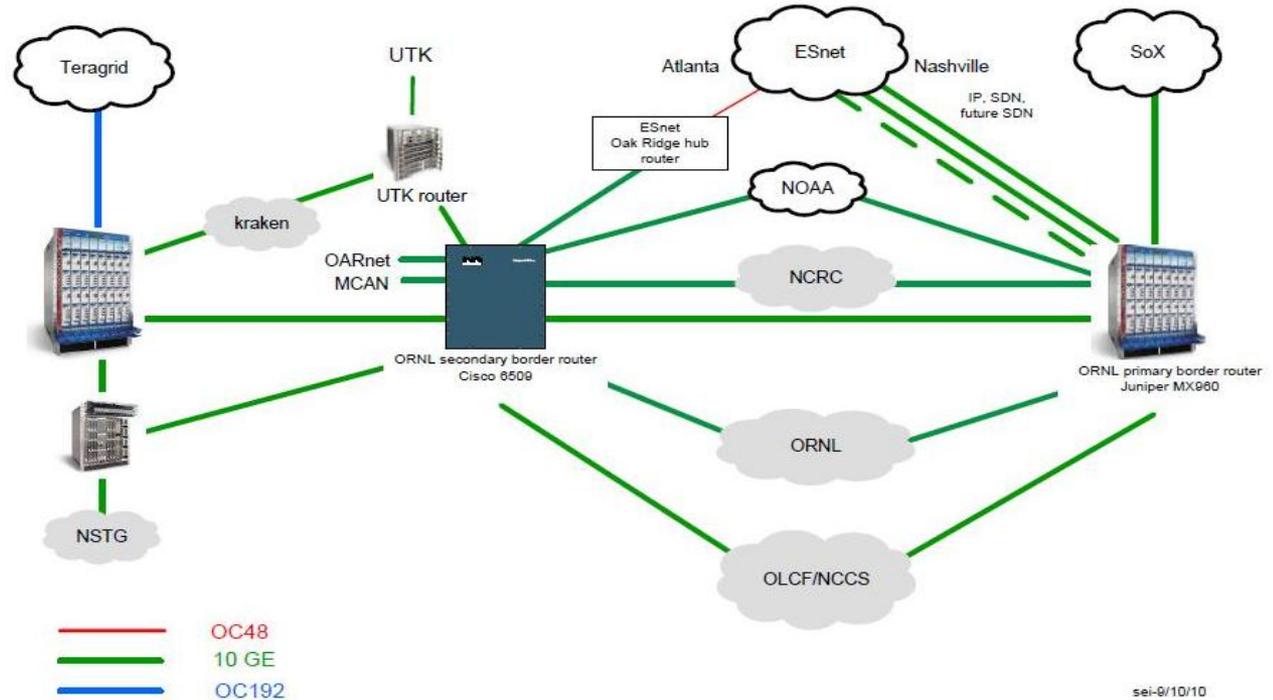
## ORNL/NOAA WAN Circuit Connectivity



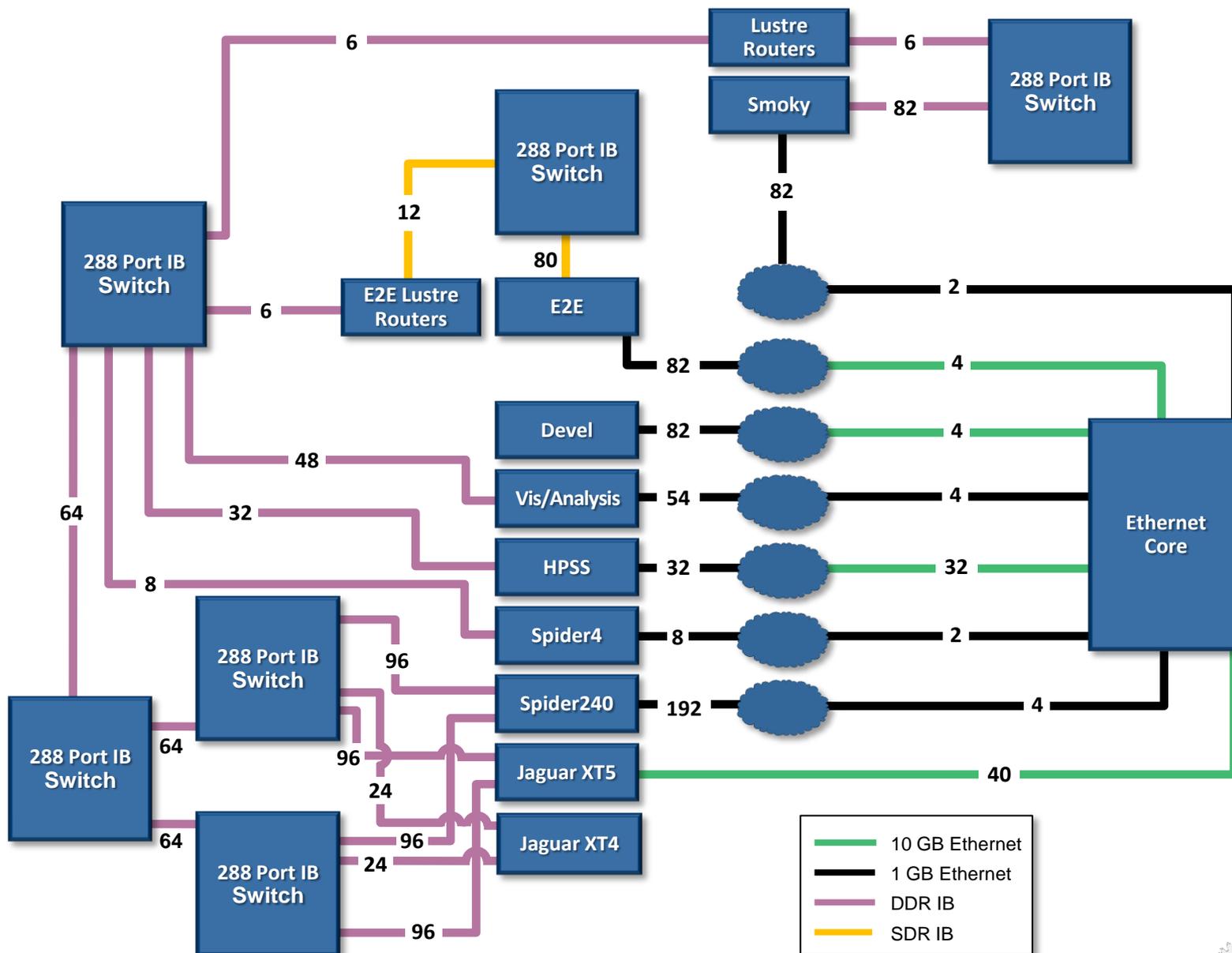
ORNL Wide Area Optical Infrastructure  
ORNL ESnet IP 10GE  
ORNL ESnet IP Secondary  
NOAA WAN 1  
NOAA WAN 2

# NCCS WAN

- ORNL has redundant 10GE connections to the ESnet hub in Nashville and the local ESnet router that serves the Oak Ridge area
- The local ESnet router has an OC-48 to the ESnet Atlanta hub
- Additional external 10GE peerings include the Southern CrossRoads in Atlanta, the University of TN, the Teragrid in Chicago, ESnet SDN in Nashville, and redundant dedicated circuits to NOAA in Atlanta and Chicago
- With the exception of the local ESnet peering, all wide-area circuits are supported on the ORNL-owned and -managed optical infrastructure



# 2010 NCCS network



# 2010 milestones

March–April 2010: Deployed Earth Science Grid server

April–September 2010: Deployed CMRS network and infrastructure

Late 2010: Evaluate and procure 10 Gig line rate firewalls

Late 2010: Deploy new 10 Gig infrastructure

# 2011 milestones

Spring 2011: Deploy 10 GB line rate firewall for infrastructure

Spring 2011: Deploy packet/flow analysis system with six 10 Gb ports

Summer 2011: Deploy 10 GB infrastructure capable of future 40/100 Gb

Late calendar year 2011: Upgrade network infrastructure to support HPSS systems transferring 6 GB/s to 24 GB/s

# Contact

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