



# LOUIS System Administrators Meeting

## *LONI Update for LOUIS*

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# What is LONI?

**One of the Board of Regents recent initiatives supported by the Governor and Higher Education is the establishment of a high-speed fiber optic network connecting our major research institutions to foster expansion in academic and private sector research for the betterment of the citizens of the State.**

**The Louisiana Optical Network Initiative (LONI) is this high speed computing and networking resource supporting scientific research and the development of new technologies, protocols, and applications to positively impact higher education and economic development in Louisiana. LONI is a statewide asset administered under the authority of the Board of Regents.**

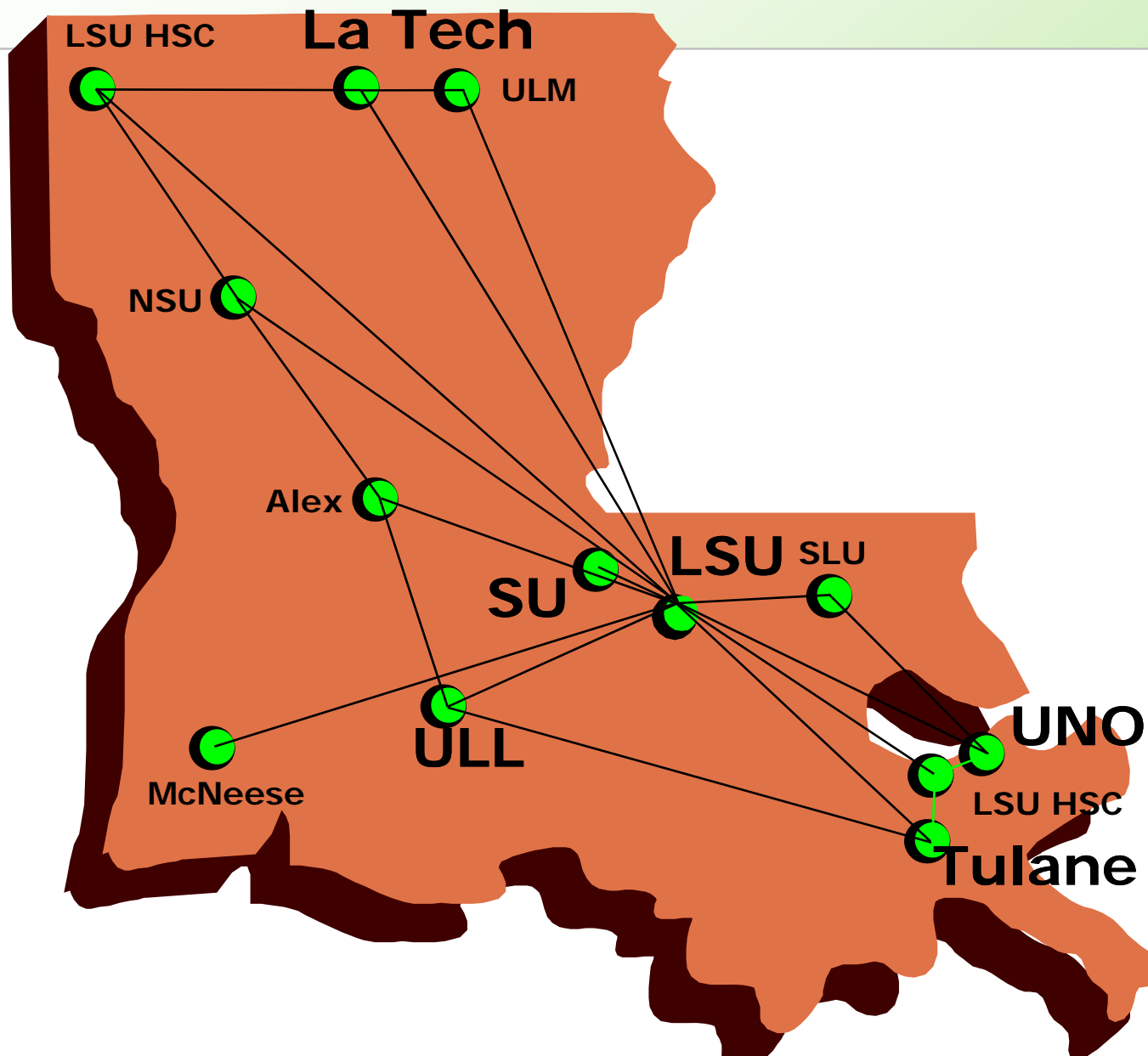


# LONI Image



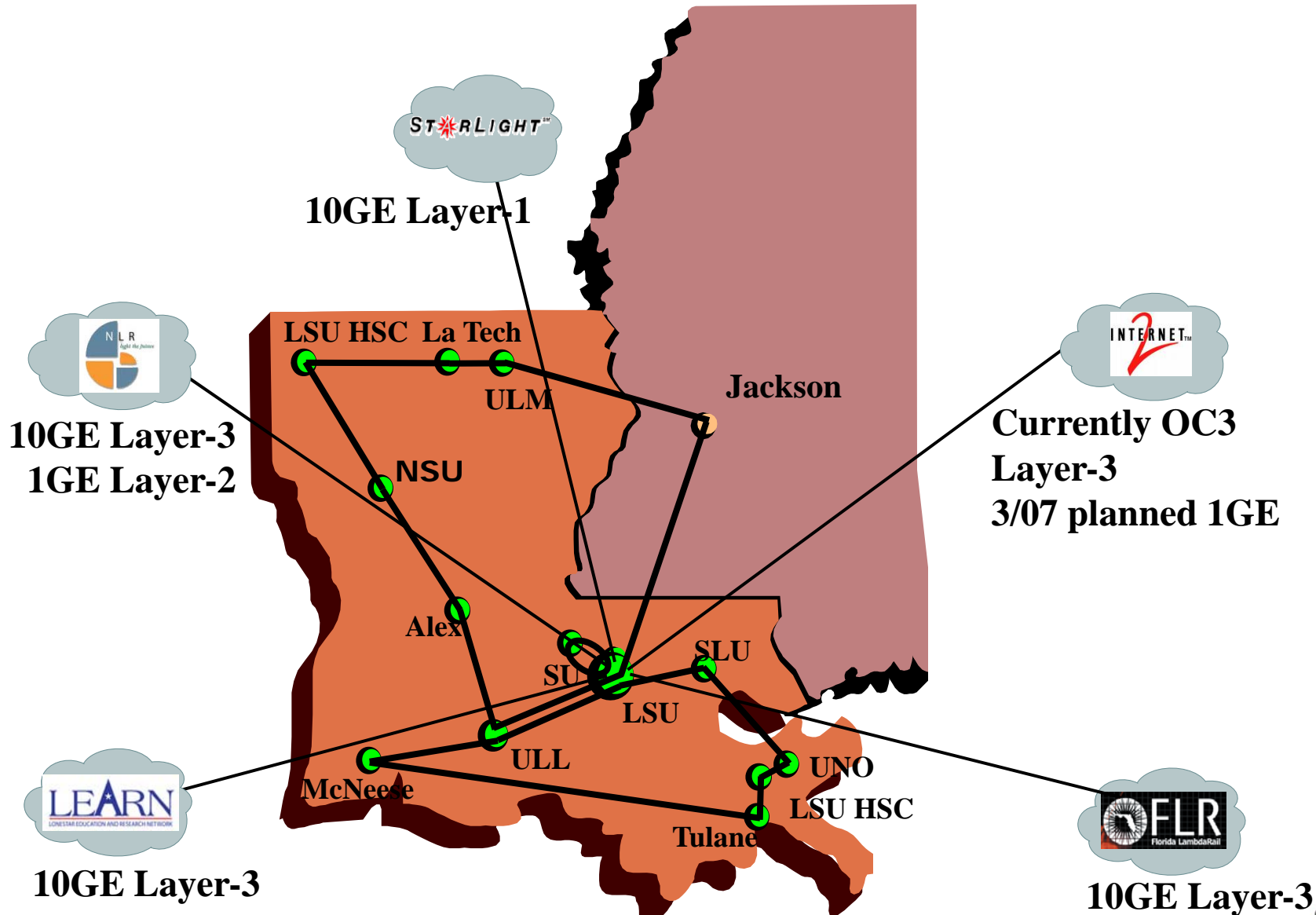


# Major Research Institutions



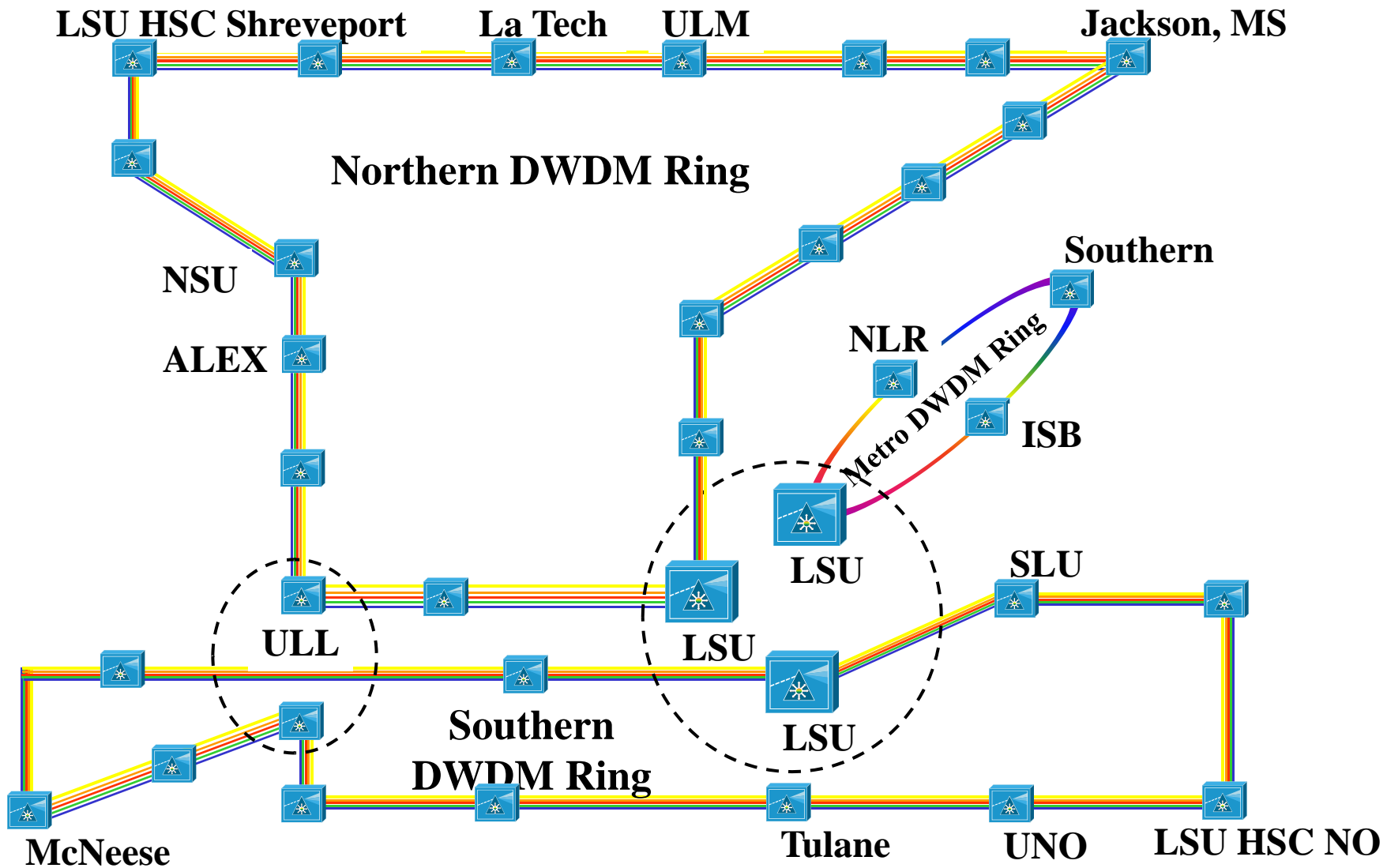


# LONI External Connections





# LONI Fiber Network





# LONI Network Facts

- Minimum of 4x 10 Gb waves (10 Gb Ethernet over fiber optics) to each major research university
- ~1120 route miles of dark fiber
- Phase I for LONI will have 870 Gb/s of aggregate transport capacity (it would take about 3 minutes to transport every book in the Library of Congress of about 28936 DVDs)
- 
- Approximately 45% of the aggregate capacity has been designated for research



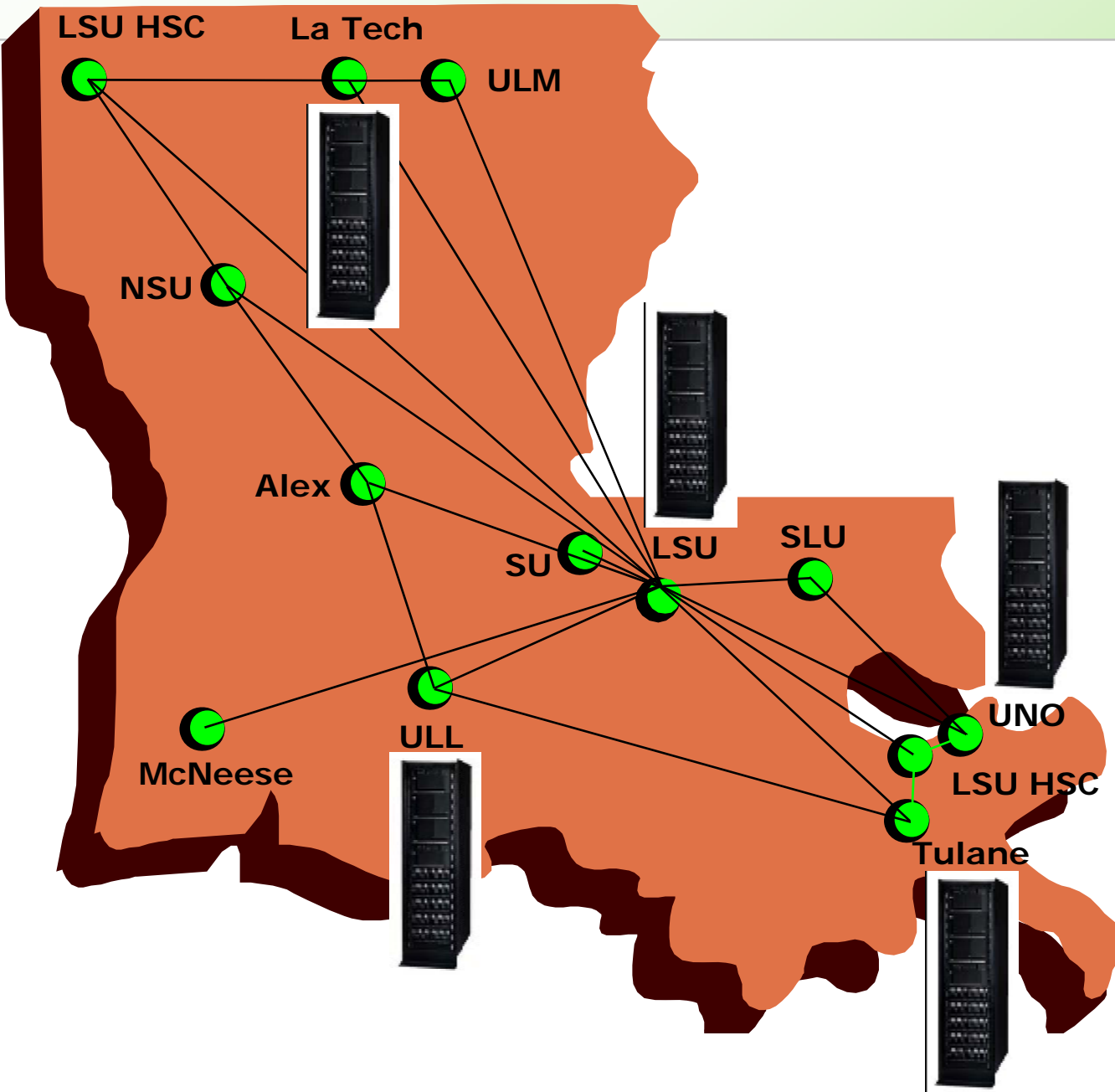
# LONI Network Facts

- 16 PoPs housed on university campus' managed by the LSU NOC
- 51 Cisco 15454 ROADMs and 38 Cisco 6509 Switch/Routers
- 6x supercomputer installations, centrally maintained by HPC @ LSU
- State project funded by the Board of Regents, contracted out to LSU





# LONI IBM Clusters





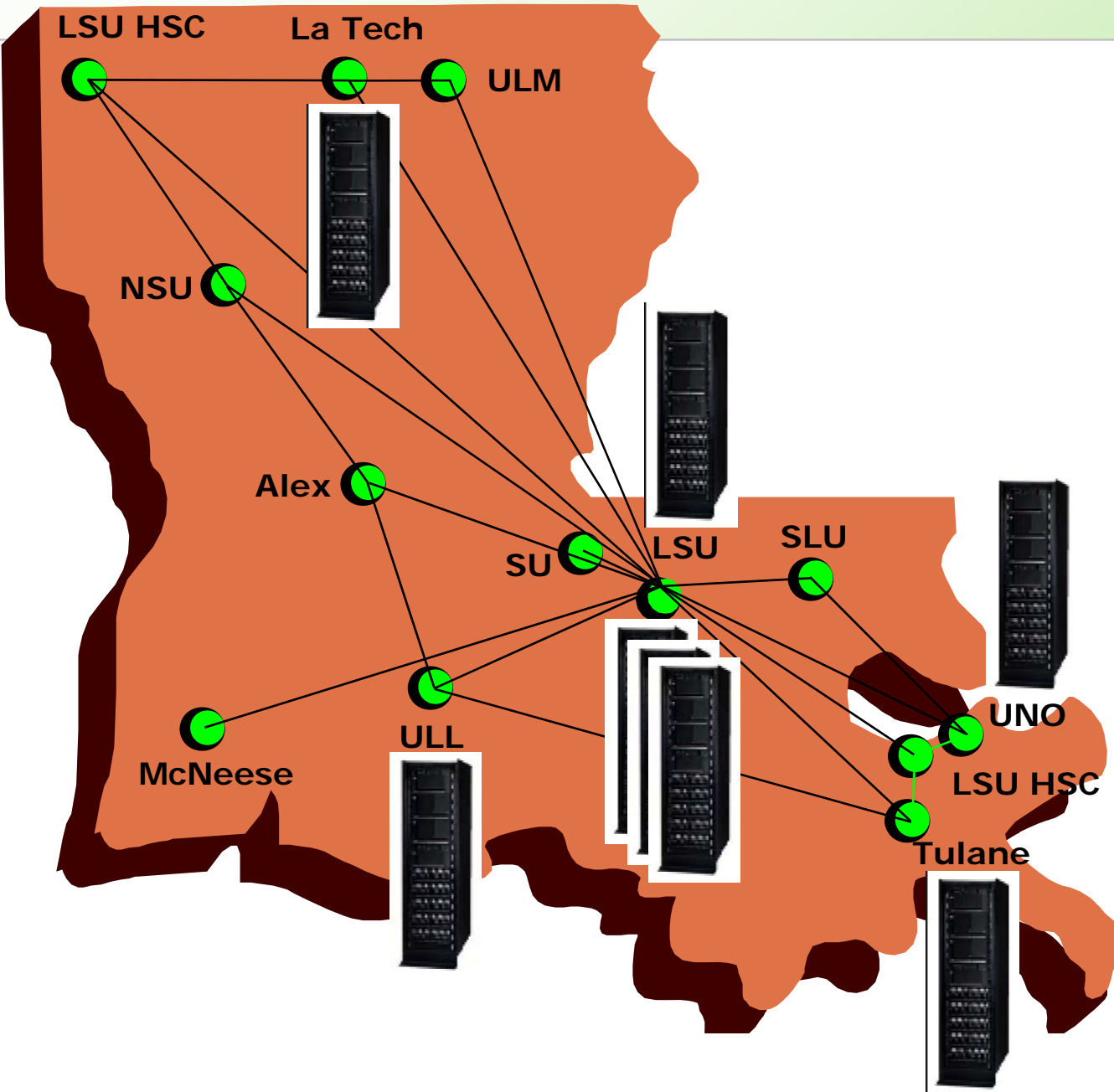
# LONI HPC Systems

- Five IBM System p5 p575-IH Clusters
  - 14 nodes with 8-way IBM Power5's @ 1.9 GHz, 16 GB RAM, 146 GB HDD, 4x10/100/1000 Ethernet
  - AIX 5L v5.2 / v5.3
  - IBM Federation high-speed switch
  - Head and storage
- 851.2 GF theoretical peak; 4.256 TF total
- Currently deployed





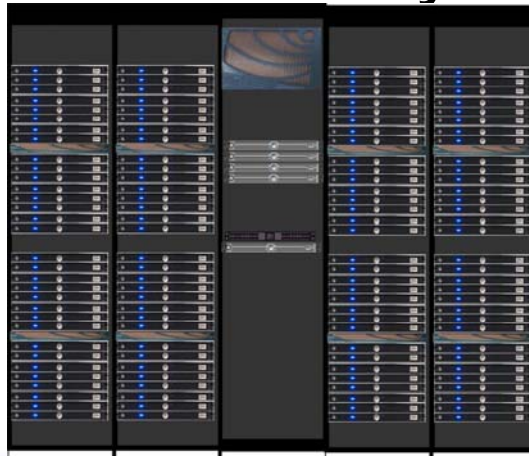
# LONI Dell Clusters





# New LONI HPC Systems

- Six Remote Dell Linux Clusters
  - 132 nodes with dual socket Intel “Woodcrest” Xeons (4 cores) @ 2.33 Ghz,
  - 4 GB RAM, 80 GB HD, Gb Ethernet
  - Red Hat Enterprise Linux (RHEL v4)
  - Cisco (Topspin) InfiniBand high-speed interconnect (4xIB), non-blocking
- 4.92 TF theoretical peak; 528 GB RAM
- Deployment expected January 2007





# New LONI HPC Systems

- Central Dell Linux Cluster
  - 680 nodes with dual socket Intel “Clovertown” Xeons (8 cores) @ 2.33 GHz, 8 GB RAM, 80 GB HD, Gb Ethernet
  - Red Hat Enterprise Linux (RHEL) v4
  - Cisco (Topspin) InfiniBand high-speed interconnect (4xIB), 50% blocking
- 50.7 TF theoretical peak; 5.44 TB RAM
- Deployment expected March 2007





# Storage

- Central site will have:
  - 225 TB raw, 192 TB usable from Data Direct Networks (DDN)
  - Will provide central `/home` storage as well as global `/scratch` space
  - Using Cluster File Systems' Lustre file system
- Remote sites will have:
  - 14.0 TB raw, 12 TB usable from DDN
  - Additional local `/scratch` storage per system



# Storage

- PetaShare – Dr. Tevfik Kosar's \$957,678 NSF grant (Award #957678)
  - “an innovative distributed data archival, analysis and visualization instrument for data intensive collaborative research. PetaShare will enable transparent handling of underlying data sharing, archival, and retrieval mechanisms; and will make data available to the scientists for analysis and visualization on demand.”
- ~40 TB plus ~500 TB archival



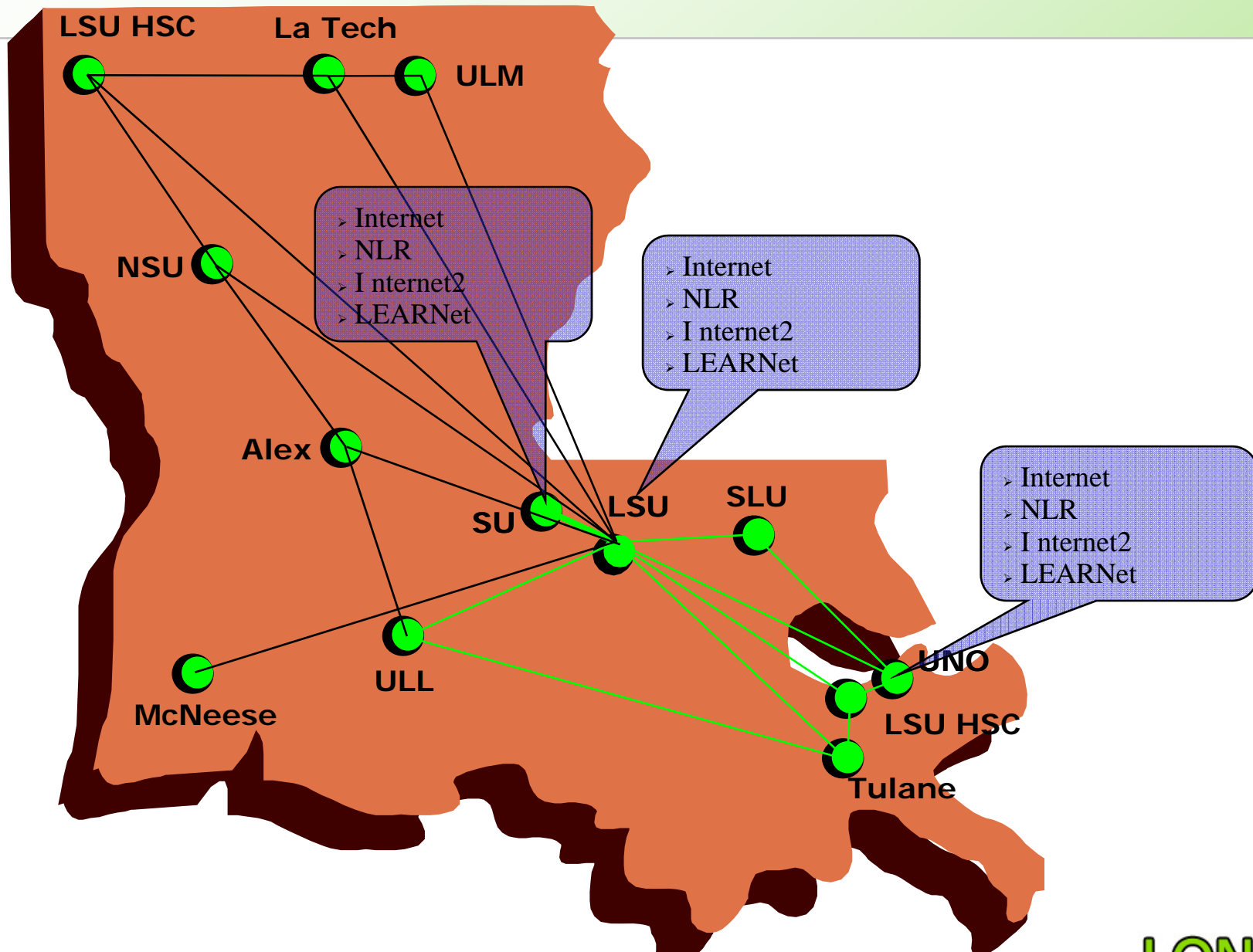
# Software

- Standard development tools and libraries
- IBM's LoadLeveler RM; Moab scheduler
- Globus v4.0.3 pre-WS
- MPICH-G2 installs for running across multiple systems
  - Successful runs via LoadLeveler
- Portal is operational:
  - Uses GridSphere and MyProxy
  - LONI Certificates via Globus Simple CA
- <http://portal.loni.org/>





# Current Deployment







# www.loni.org

## LONI

Louisiana Optical Network Initiative

[Prospective Researchers](#) | [Education](#) | [Corporate Visitors](#)

### ABOUT LONI

**What is LONI?**  
The Louisiana Optical Network Initiative, or *LONI*, is a fiber optics network that connects supercomputers at Louisiana's major research universities, allowing computation speeds more than 1000 times the rate previously possible, and transforming the research capability of Louisiana's educational institutions. With an anticipated 85 teraflops of computational capacity, LONI will be one of the nation's largest grid computing environments. Governor Kathleen Babineaux Blanco has pledged \$40 million over ten years for the development and support of LONI. [\[more...\]](#)

[Click here for LONI PowerPoint presentation.](#)



### SPOTLIGHT/LONI NEWS LINKS

- [Louisiana to Construct One of the Nation's Largest Supercomputing Environments](#)
- [Louisiana, Dell Team](#)
- [LONI Will Add Six Dell HPC Clusters](#)
- [New Global Grid Computing & Communications Technology](#)
- [Six-Cluster HPC Grid on Tap for Louisiana](#)
- [Dell, Tech Deal Boosts Louisiana Research](#)
- [LA Recovery Conference Highlights LONI](#)

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