LONI 2.0 – Optical, Routers and HPC

Tuesday, October 8, 2013
LONI Management Council
9:55am – 10:15am
Agenda

- Current State
- How did we get here?
- Moving forward
- Participant participation
- Progress
- Services
Current Optical State
Optical Circuits
Layer 1
Current Router State
(Layer 2 and Layer 3)
Current Building Blocks

LONI Control

East

N x 10GE

West

N x 10GE

Router

10GE

Router

Campus Control

N x GE

Campus Router

Campus Control

N x GE
Current HPC State
How did we get here?
January 1, 2010
We watched the market and engaged others
What Happens in an Internet Minute?

- 204 million Emails sent
- 20 New victims of identity theft
- 1,300 New mobile users
- 639,800 GB of global IP data transferred
- 47,000 App downloads
- $83,000 In sales
- 61,141 Hours of music
- 20 million Photo views
- 320+ New Twitter accounts
- 100,000 New tweets
- 30 million Photo uploads
- 277,000 logins
- 2+ million Search queries
- 6 million Facebook views

And Future Growth is Staggering

Today, the number of networked devices = the global population
By 2015, the number of networked devices = 2x the global population
In 2015, it would take you 5 years to view all video crossing IP networks each second
100G drives the global revenue growth in the optical transceiver and transponder market.
40G
100G
Networks Are Coming
Research Proposals and Activity

- July 1, 2011
  LONI Fiber to Nicholls State University
- May 31, 2012
  NSF CC-NIE Proposal with Tulane
- May 31, 2012
  NSF CC-NIE Proposal with SUBR
- May 31, 2012
  NSF CC-NIE Proposal with LSU
- September 8, 2012
  NSF CC-NIE Award with LSU
- March 13, 2013
  NSF EPScoR C2 RII Rebudget
- April 1, 2013
  NSF CC-NIE Proposal with LSU
- April 1, 2013
  NSF CC-NIE Proposal with Tulane
- April 1, 2013
  NSF CC-NIE Proposal with SUBR
July 18-19, 2011
2011 LONI Technical Forum

- Fewer routers focused at external peerings
- More optical nodes
- Push MPLS down to optical nodes
- Provide managed CPE device that is MPLS configurable on every connection
- Move from optical rings to optical mesh
- Upgrade router backbone to 40GE
- Every connection supporting IPv6
- Network management via IPv6
Moving Forward
Network Architecture
LONI 2.0 – Optical
(Layer 0 and Layer 1)
Optical Transport (Layer 0) – NO CHANGE

Northern DWDM Ring

- Haughton (LONI DWDM)
- La Tech (LONI POP)
- Monroe (LONI POP)
- Tallulah (LONI DWDM)
- Edwards (LONI DWDM)
- Jackson, MS (LONI POP)

- Coushatta (LONI DWDM)
- Alexandria (LONI POP)
- Landry (LONI DWDM)
- Derry (LONI DWDM)
- NSU (LONI POP)
- Southern DWDM Ring

- Crow Indian (LONI POP)
- Ramah (LONI DWDM)
- Port Barre (LONI DWDM)
- Roanoke (LONI DWDM)
- ULL (LONI POP)
- Franklinton (LONI DWDM)
- Schriever (LONI DWDM)
- Tulane (LONI POP)

- LaPlace (LONI POP)
- Tallulah (LONI DWDM)
- Port Barre (LONI DWDM)
- La Place (LONI DWDM)
- Roanoke (LONI DWDM)
- Lake Charles (LONI DWDM)

Southern DWDM Ring

- Louisiana State University (LSU HSC Shreveport)
- Haughton (LONI DWDM)
- La Tech (LONI POP)
- Monroe (LONI POP)
- Tallulah (LONI DWDM)
- Edwards (LONI DWDM)
- Jackson, MS (LONI POP)

- Coushatta (LONI DWDM)
- Alexandria (LONI POP)
- Landry (LONI DWDM)
- Derry (LONI DWDM)
- NSU (LONI POP)

- Crow Indian (LONI POP)
- Ramah (LONI DWDM)
- Port Barre (LONI DWDM)
- Roanoke (LONI DWDM)
- ULL (LONI POP)
- Franklinton (LONI DWDM)
- Schriever (LONI DWDM)
- Tulane (LONI POP)

- LaPlace (LONI POP)
- Tallulah (LONI DWDM)
- Port Barre (LONI DWDM)
- La Place (LONI DWDM)
- Roanoke (LONI DWDM)
- Lake Charles (LONI DWDM)

LSU HSC Shreveport (LONI POP)
- Haughton (LONI DWDM)
- La Tech (LONI POP)
- Monroe (LONI POP)
- Tallulah (LONI DWDM)
- Edwards (LONI DWDM)
- Jackson, MS (LONI POP)

- Coushatta (LONI DWDM)
- Alexandria (LONI POP)
- Landry (LONI DWDM)
- Derry (LONI DWDM)
- NSU (LONI POP)

- Crow Indian (LONI POP)
- Ramah (LONI DWDM)
- Port Barre (LONI DWDM)
- Roanoke (LONI DWDM)
- ULL (LONI POP)
- Franklinton (LONI DWDM)
- Schriever (LONI DWDM)
- Tulane (LONI POP)

- LaPlace (LONI POP)
- Tallulah (LONI DWDM)
- Port Barre (LONI DWDM)
- La Place (LONI DWDM)
- Roanoke (LONI DWDM)
- Lake Charles (LONI DWDM)
Push MPLS down to optical nodes

select optical platform with native Ethernet capability
MPLS/Ethernet Layer 2

- Campus Device
- LONI Device

Diagram showing network connections and devices such as LSUHSC SP, LaTech, ULM, and others, connected through various network protocols and interfaces like 1GE, 2x10GE, and WAN.
Fewer Routers

6 core routers
Participant Participation

• Investment
• Discussion and Feedback
• Backbone connected
  – N x 10Gbps
  – 100Gbps
• WAN connected
  – 10/100/1000Mbps
Progress

• Community Technical Calls on 6/6/13, 7/11/13, 8/23/13, 10/18/13
• Ciena 100G to NOLA received and working on implementation services scope from Ciena
• Consolidating our existing routers in preparation for trade-in
• Budgeting 100G to ULL and implementation services from Ciena
• Budgeting Juniper router purchase
• Completed LCTCS Statewide WAN Redesign
• LONI Fiber to Nicholls to be completed very soon
• LONI Fiber to Tulane awaiting Tulane inside work
• LONI Fiber to DOTD in New Orleans complete
• LONI Fiber to DOTD in Baton Rouge approximately 8 weeks away
• Regents signed MSA with Internet2 for 100G and Net+ cloud services
Services

• WAN Management
• Equipment Rental
• Cloud Videoconferencing
  – HD Room Systems
  – HD Desktop
  – Federated Identity
• Cloud services from Internet2
• Cloud services from Venyu
• Cloud services from AT&T
Q & A

Lonnie Leger
lonnie@lsu.edu
225-578-8391