LONI 2.0 – Optical, Routers and HPC

Thursday, July 11, 2013
WebEx
9:00am – 10:00am
Agenda

• Current State
• How did we get here?
• Moving forward
• Campus participation
Current Optical State
Optical Transport (Layer 0)
Optical Circuits
Layer 1
Current Router State
(Layer 2 and Layer 3)
Current Building Blocks

LONI Control

DWDM

N x 10GE

East

N x 10GE

West

N x 10GE

N x 10GE

Router

10GE

Router

Campus Control

N x GE

N x GE

N x GE

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

- 20 new victims of identity theft
- 204 million emails sent
- 47,000 app downloads
- 20 new mobile users
- 61,141 hours of music
- 20 million photo views
- 6,141 new Dropbox users
- 320+ new Twitter accounts
- 277,000 logins
- 6 million Facebook views
- 2+ million search queries
- 100 new LinkedIn accounts
- 6 new Wikipedia articles published
- 135 botnet infections
- 1,300 new mobile users
- $83,000 in sales
- 20 million photo uploads
- 3,000 new YouTube videos
- 100,000 new tweets

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.
1989: Kalpana introduces “EtherSwitch,” the first Ethernet switch
1990: First commercial 2.5G optical systems deployed
1995: Fast Ethernet (100 Mb/s) adoption
1995: First 10G optical system introduced by Nortel
2001: Metro Ethernet Forum (MEF) founded to define Ethernet services
2004: First converged packet-optical platform, reducing the amount of equipment required in the network
2008: First 40G solution, increasing traffic carrying capacity fourfold
2009: First operational 100G solution by Ciena
2011: MEF launches CE 2.0 certification program
2012: Comcast becomes first provider to achieve MEF CE 2.0 certification for its services
2012: First software-programmable coherent solution, scaling from 100G to 400G
2013: Ethernet turns 40

1993: Mosaic Web browser and webpages born
1994: Television and radio Internet broadcasting begin
1996: First DVD video released in the United States
1998: Google search engine launched
2004: Facebook invented
2005: YouTube created
2007: First iPhone released to the public
2009: First operational 100G solution by Ciena

PACKETS AND LIGHT DONE RIGHT
100G drives the global revenue growth in the optical transceiver and transponder market

© Infonetics Research, 10G/40G/100G Optical Transceivers Biannual Market Size and Forecasts, Nov. 2012
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
Moving Forward
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
LONI 2.0 – Optical
(Layer 0 and Layer 1)
Optical Circuits
Layer 1
Push MPLS down to optical nodes

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

Campus Device

LONI Device
Fewer Routers

6 core routers
Layer 3

LONI Device

LSUHSC SP

Jackson, MS

ULL

LSU-1

LSU-2

LSU-3
Only 10Gbps and higher offered to directly connected campus
Backbone Campus Participation

- Investment
- N x 10Gbps
- 100Gbps
- Discussion and Feedback
WAN Campus Participation

• Investment
• 10/100/1000Mbps
• Discussion and Feedback
HPC

Eric @ LSU

Louie @ Tulane

Oliver @ ULL

Painter @ LaTech

Poseidon @ UNO

Starlight

LIGO

LITE

LCRC

LDMC

CRON

SuperMike II @ LSU

Queen Bee Replacement

LONI Science
DMZ Backbone
Q & A

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