

# **HPR/XD Design Proposal: the HPR Next-Generation Network**

Presented to UCITPS  
Aug 1, 2007

(modified from 6/13/2007 presentation to the  
CENIC Board of Directors)



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## **HPR & XD Requirements**

- HPR “refresh” requirements were articulated by the HPR TAC:
  - “Design Requirements for the Next-Generation HPR Backbone Network” v. 2.02, 24 May 2007
- XD services articulated by XD/HPR Board committee :
  - “Beyond High Performance Research Networks: CENIC’s XD Network Services”



HPRng Design Proposal, UCITPS Presentation – 1 Aug 2007

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## “Hybrid” HPRng network

- HPR TAC agreed to include some XD services in a “hybrid” HPRng network, providing optical and packet services
  - “HPRng-L3” = routed IP network
  - “HPRng-L2” = switched ethernet network
  - “HPRng-L1” = switched optical network
- “XD” remains as a classification for services and capabilities beyond DC and HPRng
  - *e.g.* dark fiber between labs, dedicated lambdas between labs



## HPRng design committee (as of 6/13/2007)

Mark Boolootian, UCSC  
Brian Court, CENIC  
John Haskins, UCSB  
Rodger Hess, UCD  
Tom Hutton, SDSC  
ken lindahl, UCB  
Michael Van Norman, UCLA



# **HPRng-L3**

## *Routed IP Services*

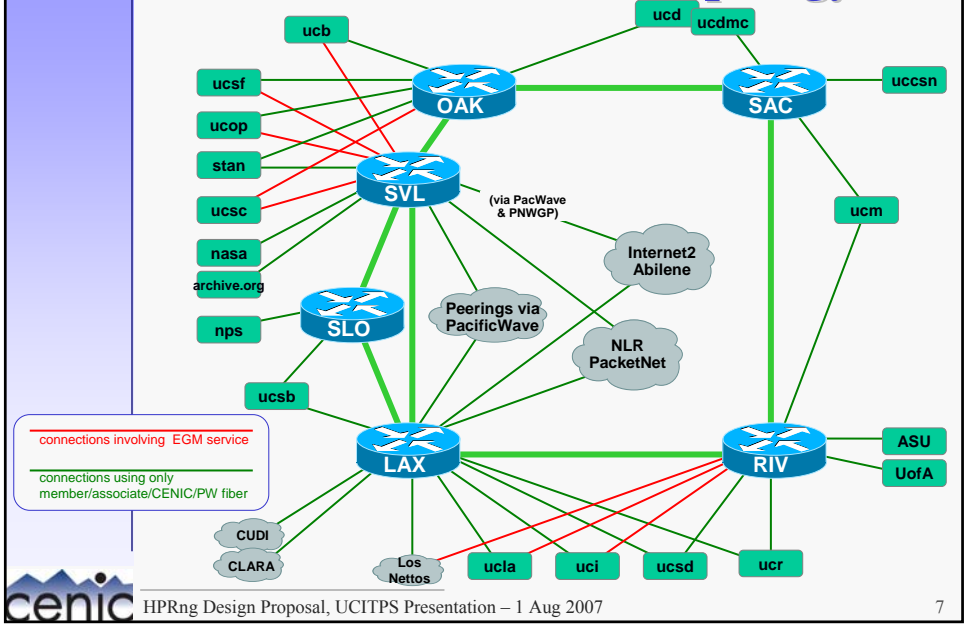


## **new HPRng-L3 Requirements**

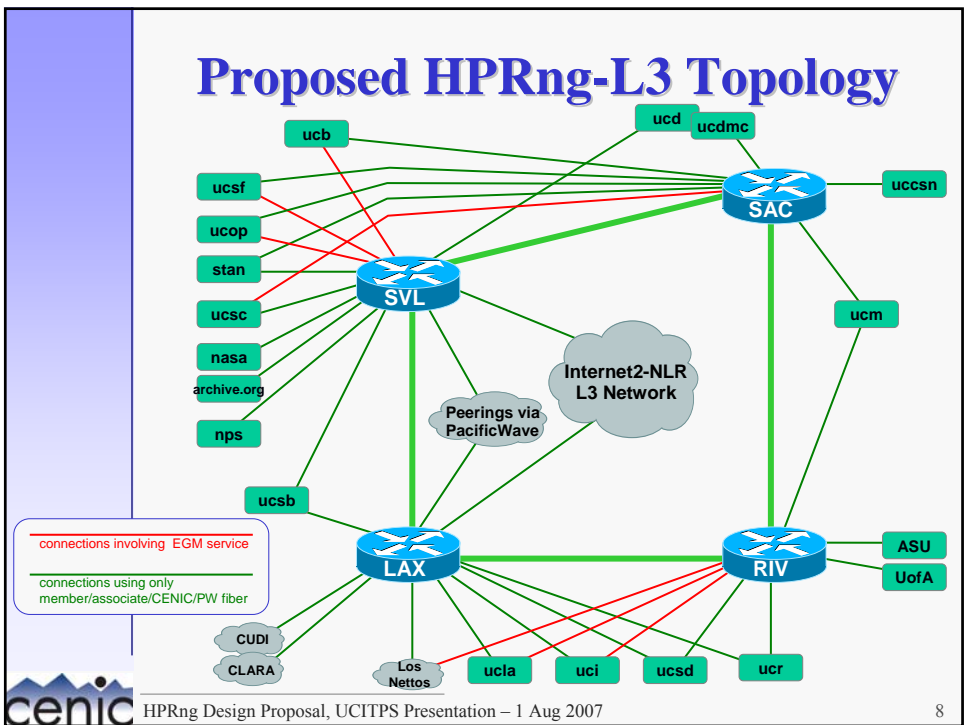
- > 10G on backbone segments
- up to two 10GE links to each campus
- IPv6 multicast
- QoS
- Jumbo frames ( $\geq 9000\text{B}$  IP MTU)
- L2VPN



# Current HPR L3 Topology



# Proposed HPRng-L3 Topology



## **HPRng-L2 & HPRng-L1**

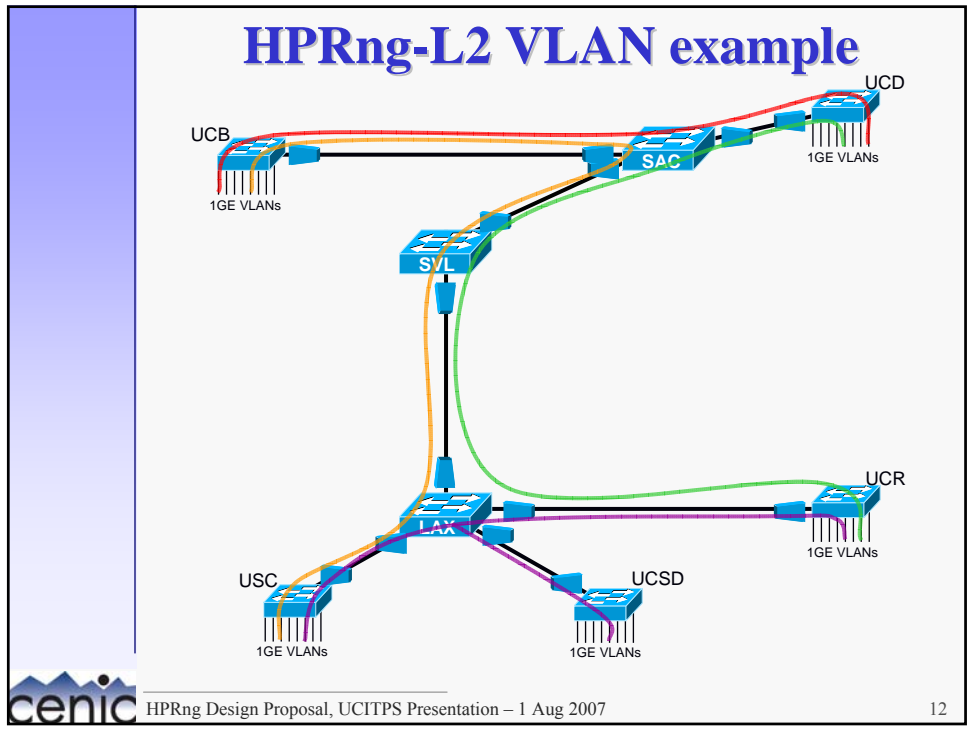
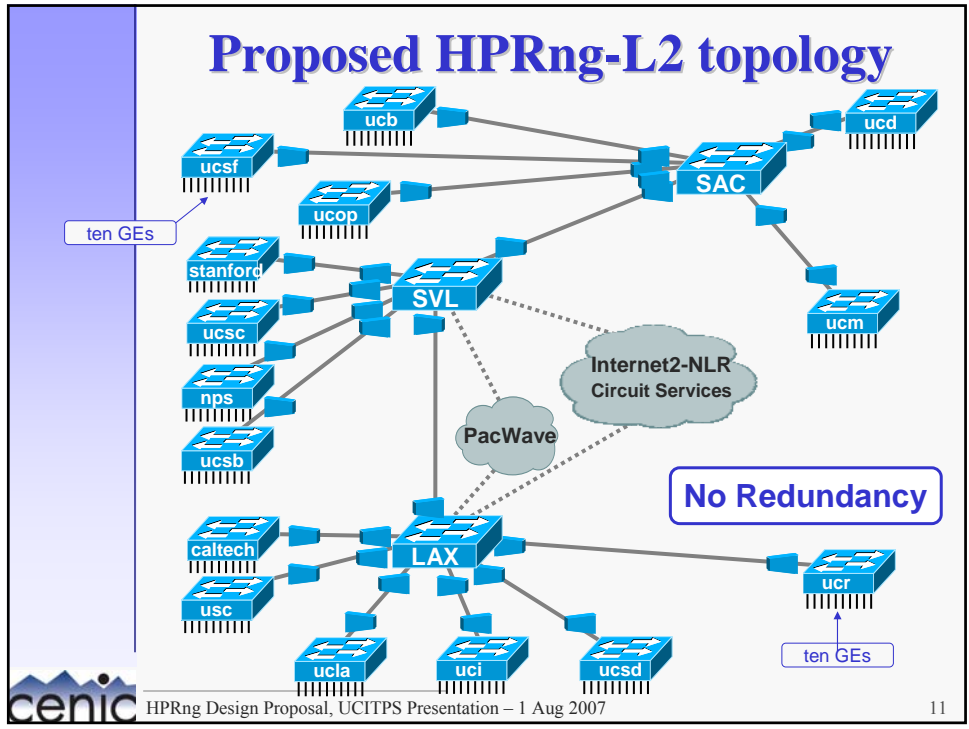
### *Circuit Services*



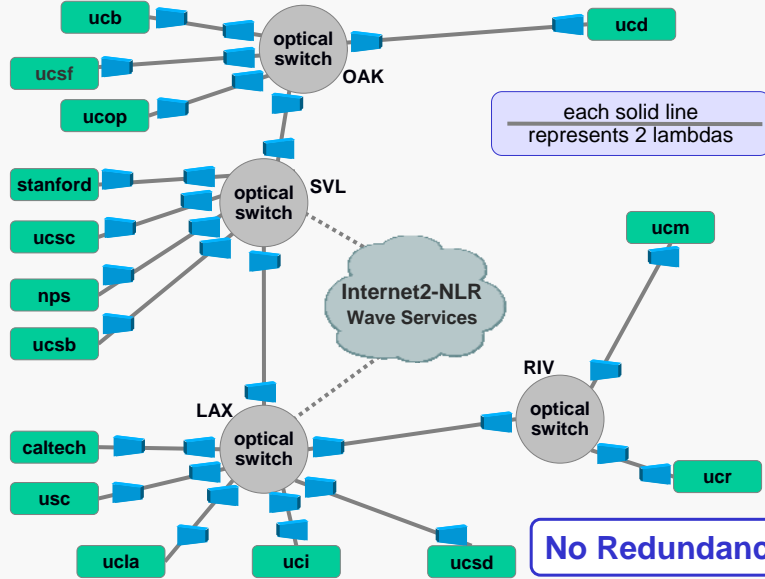
## **HPRng Circuit Services**

- 1Gbps switched Ethernet VLANs (L2)
- 10Gbps optically switched lambdas (L1)
  - 10GE or SONET termination
  - not ITU grid colored light (*i.e.* DWDM wavelength) remains an XD capability
- Rapid setup/teardown
- “Bypass networks”
  - bypass conventional campus networks, including intrusion detection/prevention systems and fearwalls and other network disruption devices

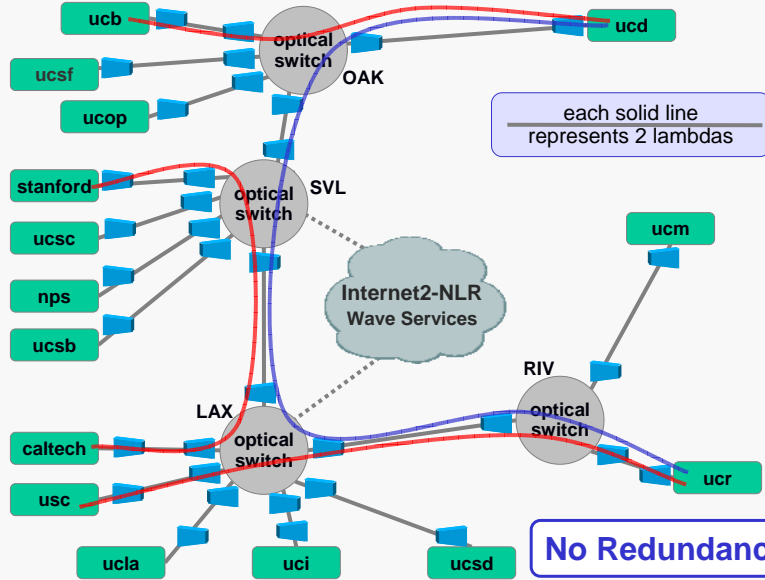




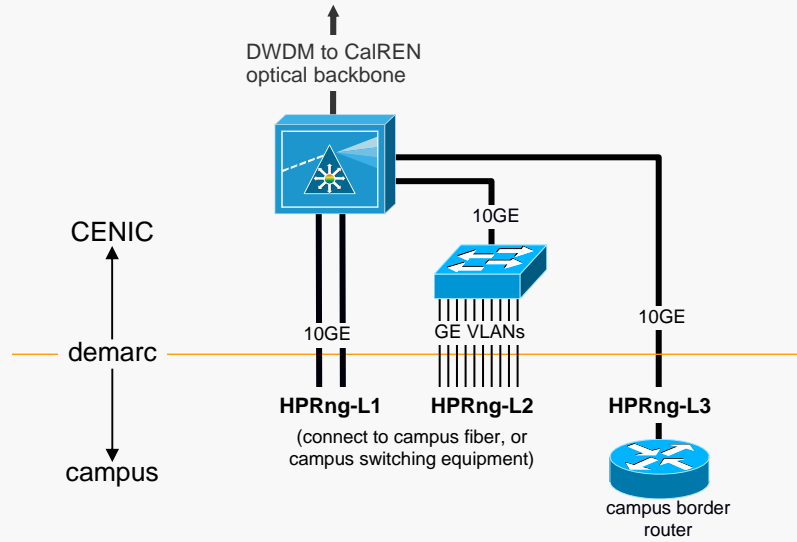
# Proposed HPRng-L1 Topology



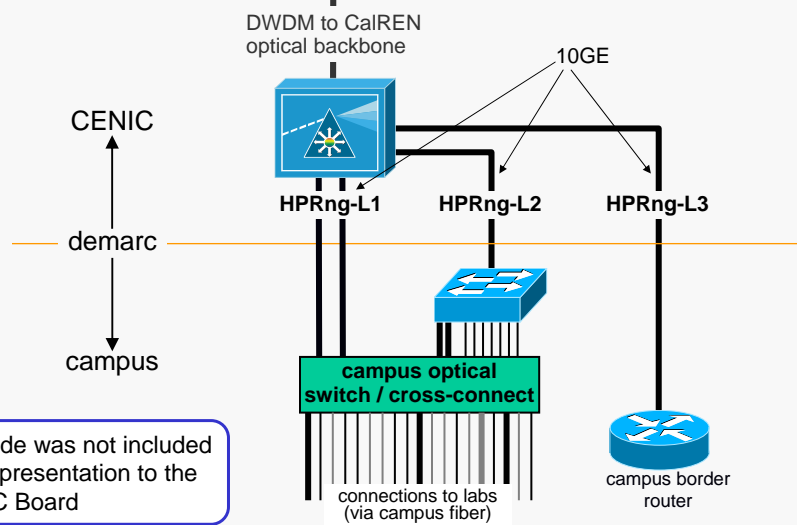
# HPRng-L1 example



## HPRng campus handoff



## alternate HPRng campus handoff envisioned by CPG members



this slide was not included in the presentation to the CENIC Board

