

# GpENI

## Great Plains Environment for Network Innovation

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# GpENI Overview



- GpENI [dʒɛ'pi ni]  
Great Plains Environment for Network Innovation
- Regional network part of Cluster B in GENI Spiral 1
  - exploiting new fiber infrastructure in KS, MO, and NE

# GpENI

## Participants: Universities

- KU: The University of Kansas
  - James P.G. Sterbenz (lead PI),  
Joseph B Evans (co-I), Ronqing Hui, Gary Minden
- KSU: Kansas State University
  - Caterina Scoglio (PI), Don Gruenbacher (co-PI),  
Tricha Anjali
- UMKC: University of Missouri – Kansas City
  - Deep Medhi (PI), Baek-Young Choi (co-I)  
Cory Beard, Khosrow Sohraby, Jim Schonemann
- UNL: University of Nebraska – Lincoln
  - Byrav Ramamurthy (PI), Dale Finkelson

# GpENI

## Participants: Research Networks

- GPN: Great Plains Network (consortium)
  - Greg Monaco (PI)
- KanREN: Kansas Research and Education Network
  - Cort Buffington
- MOREnet: Missouri Research and Education Network
  - Hank Niederhelm

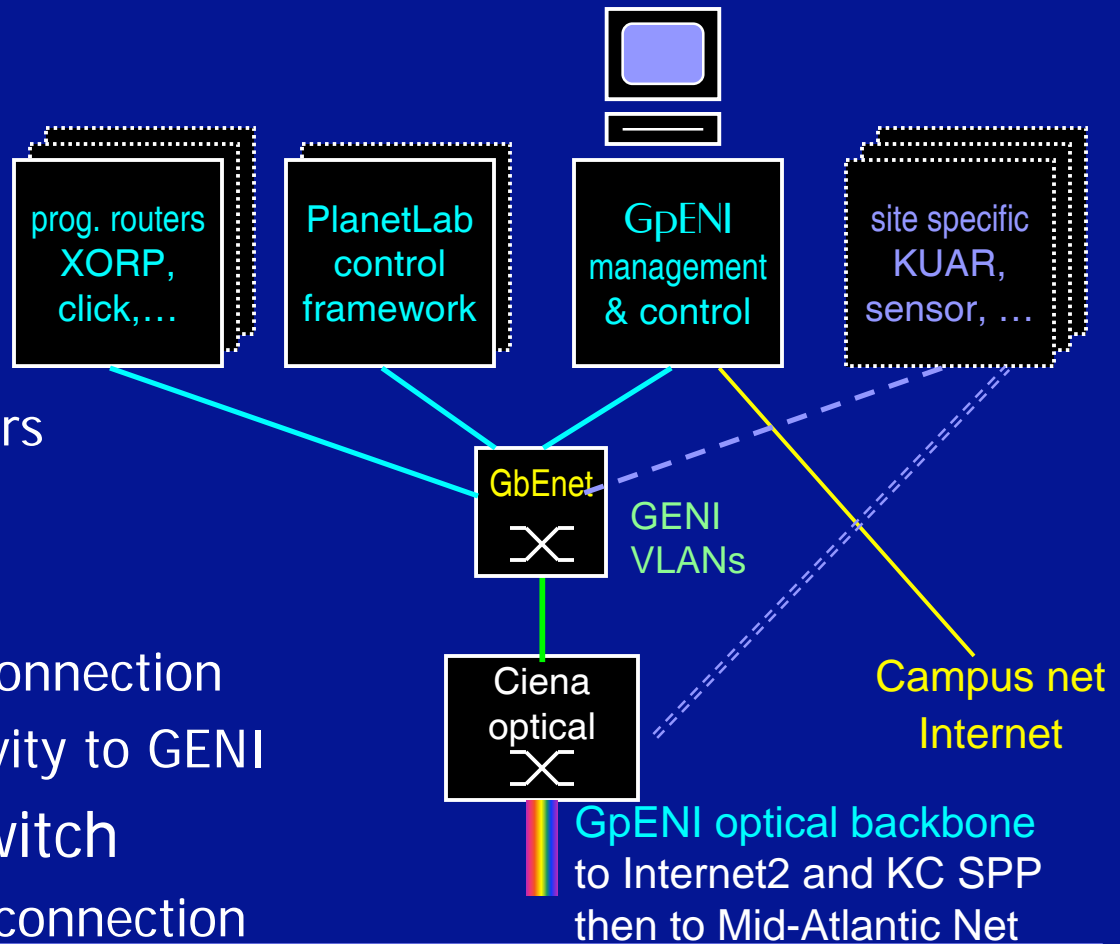
# GpENI

## Participants: Industry

- Ciena
  - Jeff Verrant (PI), Jim Archuleta (co-I)
- Qwest
  - Wesley Kaplow (PI)

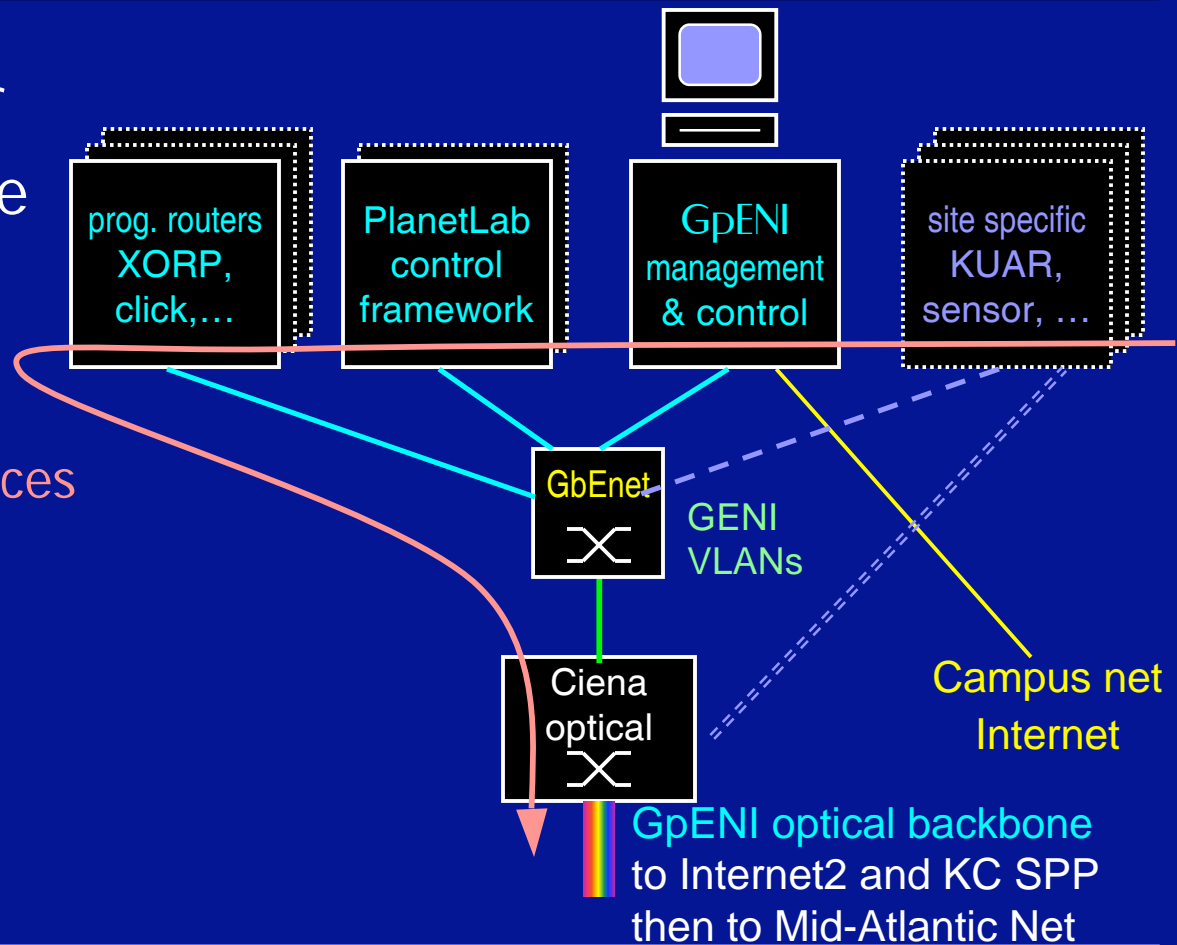
# GpENI Node Cluster

- GpENI cluster
- 5–10 PCs
  - GpENI mgt.
  - L4: PlanetLab
  - L3: prog. routers
  - site-specific
- GbE switch
  - arbitrary interconnection
  - VLAN connectivity to GENI
- Ciena optical switch
  - L1 GpENI interconnection



# GpENI Node Cluster

- GpENI cluster
- Programmable at *all* layers
  - PlanetLab control of L3, L2, L1 slices



# GpENI

## Initial Capabilities and Technology Roadmap

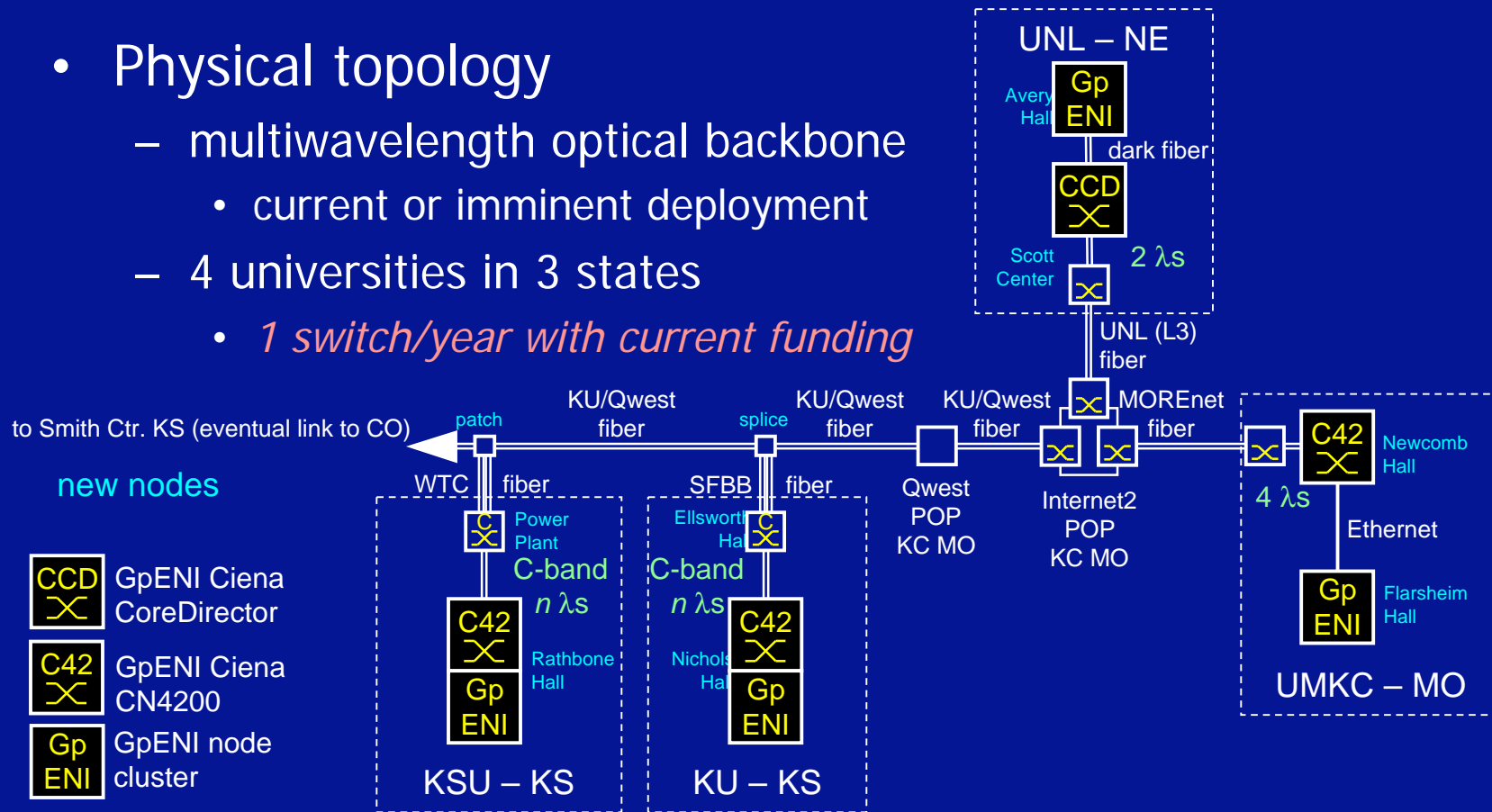
- Programmability at all layers
- Quickly available to the community
  - private PlanetLab experiments as soon as connected
  - GUSH tools when available
- Development and integration of layers
  - GpENI experiments → PlanetLab → XORP,Click → Ciena
- Spiral development toward new integrated platforms
  - processor(s) to deploy evolving platforms
  - open access to research and experimentation community
  - scalable per cluster and number of clusters
    - others invited to install and run GpENI L3–7 clusters



# GpENI

## Physical Topology and Network Infrastructure

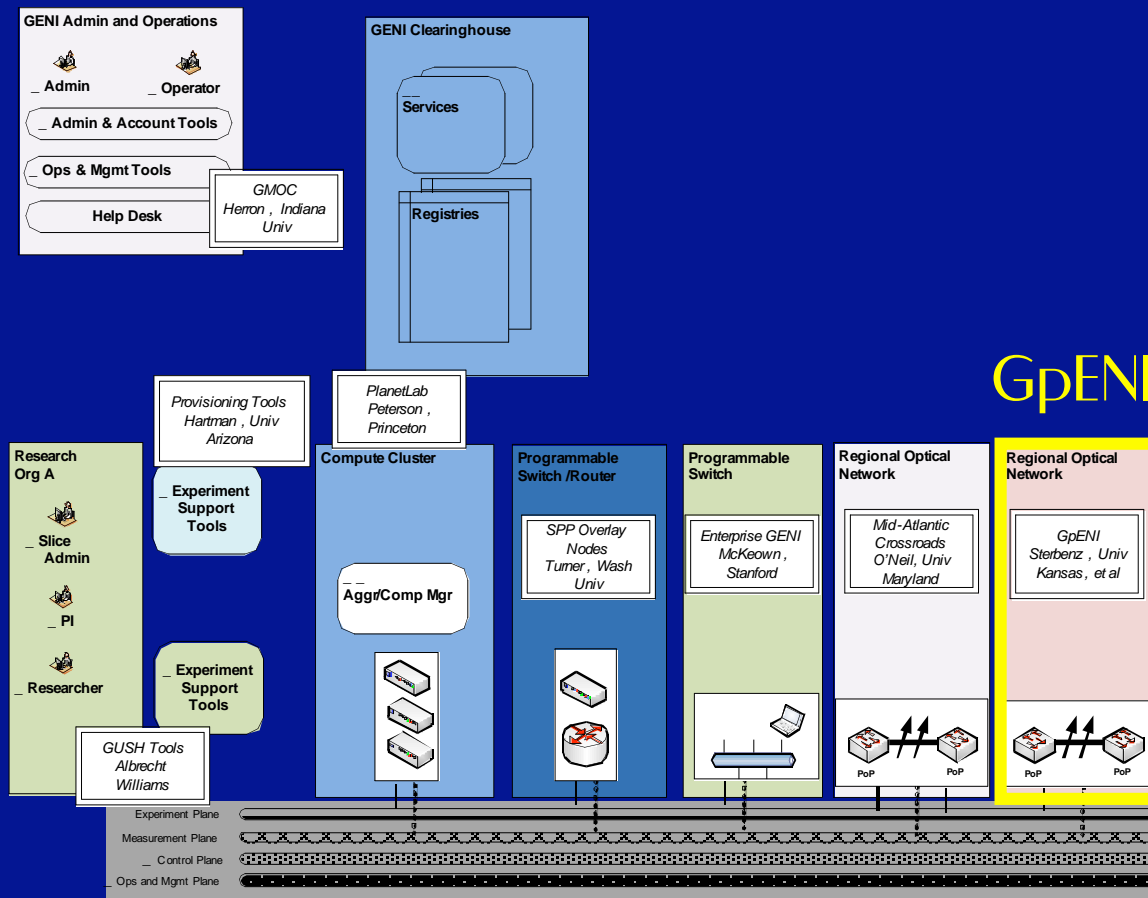
- Physical topology
  - multiwavelength optical backbone
    - current or imminent deployment
  - 4 universities in 3 states
    - 1 switch/year with current funding*



# GpENI

## Relationship with GENI Cluster B

- GpENI
  - regional optical network
  - Cluster B PlanetLab control framework
  - GUSH tools
  - link to SPP
  - I2 to MAN
  - ...



# GpENI Deployment

## Current Status

- Fiber generally deployed
  - but not yet patched together
- First Ciena optical switch operational at UNL
  - second switch may be installed this year
- First node cluster in place at KU
  - need to sort out many network engineering issues:
    - DNS: \*. <institution>.gpeni.net
    - IP: private, institutional, Internet2, GENI?
    - VLAN administration and management
    - external connectivity and public PlanetLab connectivity?
- MyPLC up at KSU; VINI in progress

# GpENI

## Outreach

- Outreach beyond Cluster B
  - open to experimentation by research and GENI community
  - expansion within GPN to additional institutions
    - anyone with L2 VLAN connectivity can join
  - deployment of additional platforms in GpENI clusters
    - within reason, we'll host your box with a GbEthernet port
  - federation with similar initiatives in the US and worldwide
  - wiki at [www.gpeni.net](http://www.gpeni.net)

# GpENI

## Broader Collaboration

- Projects that may benefit from GpENI
  - PoMo: PostModern Architecture (NSF FIND)
  - MiMANSaS (NSF CyberTrust)
  - High Bandwidth Multimedia Applications (NSF CCF)
  - ResumeNet (EU FP7 FIRE)

# End of Foils