



# Internet2 IPv6 Update

Guy Almes <[almes@internet2.edu](mailto:almes@internet2.edu)>

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- IPv6 Status
- IPv6 Infrastructure Upgrade
- IPv6 Training for Campus Engineers
- The challenge to Campuses



# Internet2 Engineering Objectives

- Provide our universities with superlative networking:
  - » Performance
  - » Functionality
  - » Understanding
- Make superlative networking strategic for university research and education

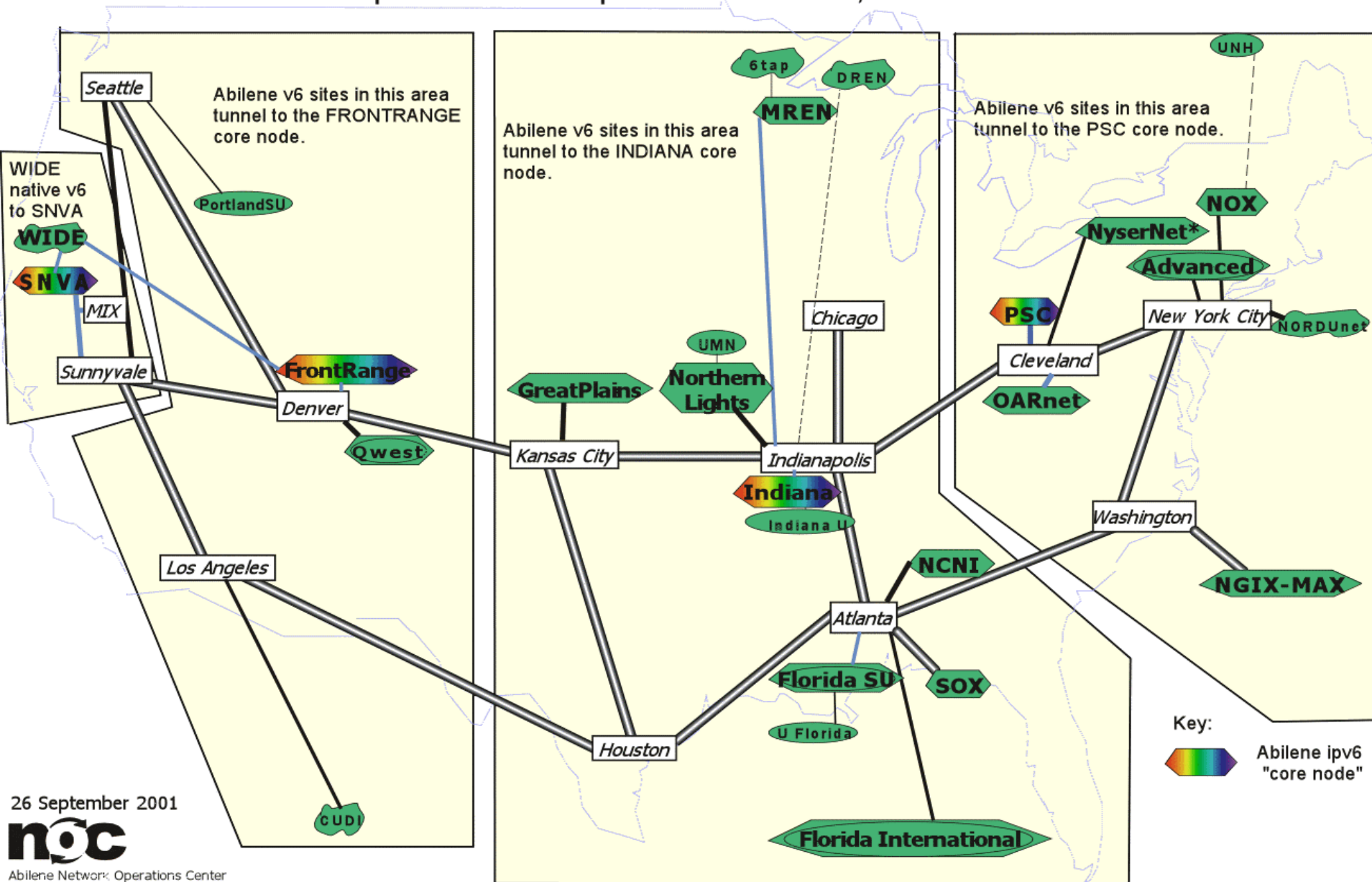
# Current IPv6 Status

- Clarify motivation for IPv6
  - » End-to-end transparency and global addressability
  - » Supports application innovation, e.g., peer-to-peer
  
- Four Cisco 7200 Routers
  - » Sunnyvale, Denver, Indianapolis, Washington DC
  - » IPv6-over-IPv4 tunnels among them
  - » IPv6-over-IPv4 tunnels to gigaPoPs and campuses
  - » Supports flexible early deployment
  - » Cannot support very high performance
    - DV teleconferencing support required Cisco IOS upgrades

# The Abilene Network IPv6 deployment



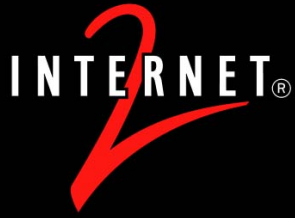
Four Abilene ipv6 "core nodes" peer with each other, and other nodes with them



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- Abilene 10 Gb/s Upgrade
  - » Dual IPv6 plus IPv4 on Juniper T640 routers
  - » Indistinguishable forwarding performance
- Challenge to gigaPoPs and Campuses
  - » Moving from tunneled to native connectivity needs to be coordinated
  - » Cisco 7200s will linger but provide second-rate performance
  - » Key wide-area connectivity and links will be upgraded
  - » Both Cisco and Juniper can now support IPv6 well, but planning needed
- Aspiration: IPv6 First-rate Infrastructure by end of 2002-03 Academic Year



# IPv6 Training for Campus Engineers

## ■ IPv6 Workshop Series

- » Two-day workshops hosted by gigaPoPs
- » Hands-on
- » Addressing, Routing, DNS, some applications
- » About 20 students at each

- Wide-area Infrastructure is (relatively) easy to upgrade
- Campuses have more routers, more servers, and more people to train
- But:
  - » Not an option
  - » Not all LAN segments need to be upgraded, since tunneling works well when performance not a major issue



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