National LambdaRail: Towards a National Optical Research Network
And, Long Term

Evolution of Networking ‘Spiral’

Commercialization

Privatization

Today’s Internet

Research Nets

Research and Development

‘NGI’ efforts

Partnerships

Source: Ivan Moura Campos
Drivers and Motivations

- RESEARCH = Network research tools
- EXPERIMENTAL = Exp. infrastructure
- OPERATIONAL = 24/7 high performance

Aubrey Bush
NSF
Drivers and Motivations

“NSF must be prepared to assume a great S&E infrastructure role for the benefit of the Nation.”

An increasing number of researcher and educators, working as individuals and in groups, need to be connected to sophisticated array of facilities, instruments, and data bases.”

Science and Engineering Infrastructure for the 21st Century Report
Drivers and Motivations

“Develop and deploy an advanced cyber infrastructure to enable new S&E in the 21st century”

“Expand education and training opportunities at new and existing research facilities.”

“Develop interagency plans and strategies to provide high-end high performance computing and networking infrastructure.”

Science and Engineering Infrastructure for the 21st Century Report
Common Denominator, Advanced Services Research & Education Network

Bleeding-edge e2e services & facilities for key experiments, programs, projects, researchers & for next gen. tech., architectures, Grids, content, apparatus, etc. ‘Things that haven’t been done before; with, to, on or over networks’.

Research

Experimental & Developmental Networks

λ’s, P2p fiber, & >=10g ip ...

Operational High Performance Research Support Networks

Leading-Edge ip Services for demanding apps & middleware

Common Denominator, Advanced Services Research & Education Network

Advanced Services for R&E users

Commodity Internet

Business, Gov. & General Public

12/05/01
NETWORK DEVELOPMENT AND EVOLUTION
FOR CALIFORNIA RESEARCH AND EDUCATION COMMUNITY
Drivers and Motivations

- Cost
- Control
- Flexibility
- Responsiveness
- Innovation
- End-to-End networking
Goals and Uses:

- Research! (including Network Research:)
- Experimentation in networking and in education
- Regional fiber/λ efforts in edu & research sectors
- Education
- Academic Med. Center driven Clinical activities
- Development & implementation of network & computing technologies not otherwise likely to be generally available commercially as early as needed in R&E.
- Enabling deterministic and other e2e bandwidth/λ’s, dark fiber and conduit for Grid, eScience etc. & for ‘Regionals’ etc.
NLR Service Offerings

- Waves!!!!
- Dark Fiber
- ‘MetaPoP’ capabilities
- Dedicated OC-192c or 10GE waves
  - No wave can interfere with others
- Shared IP service
  - Must be able to tolerate outages
  - Supports experimental code
- Subdivided waves for dedicated uses
  - Delivered as gigabit Ethernet
Investor Participants

- Carnegie Mellon/PSC
- Virginia Tech
- Duke
- Georgia Tech
- Florida Group (FSU lead)
- Texas Group (UT Austin lead)
Investor Participants

- NCAR
- UCAID
- CIC-CIO Group
- PNWGP
- CENIC
- (Your Name)
Let’s Light Up NLR