Internet2 Update

Heather Bruning
Abilene Program Manager

2004 Gathering of State Networks
Tempe, Arizona
4 February 2004
Fundamental Questions

- What does higher education (and the rest of the world) require from the Internet and its applications?
- What should the Internet2 community do to address those requirements?
- What specific steps should we take to move forward?
Strategic Foci

- Address the advanced networking needs and interests of the research & education community
- Provide leadership in the evolution of the global Internet
- Leverage strategic relationships among academia, industry and government
- Catalyze activities that cannot be accomplished by individual organizations
- Implement a systems approach towards a scalable and vertically integrated advanced networking infrastructure
- Focus on financially feasible, affordable, and deployable technologies and solutions
Internet2 Today (and Tomorrow)

- Networks
- Middleware
- Services
- Applications

Motivate
- End-to-end Performance
- Security

Enable
2004 Priorities

- Engage with the NSF Cyberinfrastructure Initiative
- Establish security initiatives which enable Internet2 applications and leverage Internet2 capabilities
- Ensure availability of production infrastructure and the migration of activities or initiatives from development to production for the Internet2 community
- Enhance Internet2’s role as a leader in advanced networking
Core Values

- Address the advanced networking needs and interests of the research & education community
- Provide leadership in the evolution of the global Internet
- Leverage strategic relationships among academia, industry and government
- Catalyze activities that cannot be accomplished by individual organizations
- Implement a systems approach towards a scalable and vertically integrated advanced networking infrastructure
Abilene Upgrade – Completed!

![Map of the United States with network connections](image-url)
Abilene Participants
February 2004

- IP-over-DWDM (OC-192c) and IP-over-SONET OC-48c Backbone
- 47 direct connections (OC-3c → 10 GigE)
  - 2 10 GigE connections
  - 6 OC-48c
  - 2 GigE connection
  - 23 connections at OC-12c (13) or higher
  - Cost recovery model reduced to encourage upgrades
- 226 participants – research universities & labs
  - All 50 states, District of Columbia, & Puerto Rico
- Expanded access
  - 95 sponsored participants
  - 33 state education networks
<table>
<thead>
<tr>
<th></th>
<th>Original</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC-3c (155 Mbps)</td>
<td>$110k (1998)</td>
<td>($110k)</td>
<td>($110k)</td>
</tr>
<tr>
<td>OC-12c (622 Mbps)</td>
<td>$320k (1998)</td>
<td>$270k</td>
<td>$240k</td>
</tr>
<tr>
<td>Gig E (1 Gbps)</td>
<td>$325k (2001)</td>
<td>$325k</td>
<td>$280k</td>
</tr>
<tr>
<td>OC-48c (2.5 Gbps)</td>
<td>$495k (2000)</td>
<td>$430k</td>
<td>$360k</td>
</tr>
<tr>
<td>10 Gbps (SONET/ Ethernet)</td>
<td>$490k (2003)</td>
<td>$490k</td>
<td>$480k</td>
</tr>
</tbody>
</table>
Sponsored Education Group
Participants as of February 2004
K20 Initiative – Goals 2004

- Broaden the participation in the formal structure of the K20 Initiative by including representatives from library, museum, science center, zoo, aquarium and ESD communities in the advisory structure.

- Continue to deepen participation in the K20 Initiative by rolling out the new web-based relational database, called "myK20", for project queries, information sharing, and collaboration among the SEGP community.

- Create "showcases" by K20 community to illustrate what various constituent groups are doing. Form a small working group to explore various projects for showcases including JASON and Read Across America.

- Administer an updated connectivity survey to all SEGP states, working with BNI staff to add usage data, and possibly working with the Center on Digital Government.
- Continue to work with Federal and corporate groups interested in supporting the development of advanced networks, applications, and middleware in the SEGP/K20 community; help them develop K20 strategies, including RFPs, whenever possible.

- Continue to develop a K20 middleware strategy with the Internet2 Middleware Working Group, working with Lee Zia of NSF and Ken Klingenstein of Internet2.

- Develop a follow-up workshop on advanced applications and middleware with the American Library Association to be held in summer 2004.

- Develop an initial workshop on advanced networks, applications, and middleware for the K20 Museum community, with an appropriate partner (tbd) for fall 2004, perhaps in conjunction with the museum effort.
K20 Initiative Contact Information

- **On the Web**
  - http://k20.internet2.edu/

- **Email**
  - lfox@internet2.edu
  - jwerle@u.washington.edu

- **Phone**
  - (206) 685-4745
  - (206) 616-8155
Some part of Abilene reserve recently was used to provide capital for initial FiberCo dark fiber acquisition

- Separate LLC established with Internet2 as the only member
- Membership open to other non-profit organizations interested in advanced networking
- Timed to exploit trough in dark fiber pricing and aimed to established national scale acquisition capability

Already >97% of this initial investment has been covered through anticipated allocations of dark fiber to NLR and RONs

FiberCo charges a transaction fee to recover costs (e.g., legal, RFx response)
Tool designed to support optical initiatives
  • Regional
  • National

Not an operational entity – supporting project
  • Does not light any fiber

Fiber options
  • Holding company & market maker for optical initiatives
  • Assignment vehicle for both Regional & National initiatives

Internet2 took responsibility for formation
  • Nat’l R&E Fiber Co. incorporated in Delaware
  • First FiberCo agreement with Level3 (committed to buying IRUs)
  • Open to compatible agreements with other providers
  • First fiber pair assigned to Indiana Univ.; others in progress
How is the fiber distributed?

- FiberCo assigns both the fiber IRU asset and recurring O&M agreements through an assignment agreement
  - Assignee has option to waive preferred provider relationship
  - Transaction fee charged to recover costs
    - 2004: $20,000

- Ongoing bilateral relationship directly between Level 3 and assignee

- LLC investment by a non-profit organization is also an option in lieu of assignment
  - ‘fiber bank’ model

- Assignees advised to keep recurring IRU tax liabilities and possible exemptions in mind
More Information

- Heather Bruning, Abilene Program Manager
  - 734-352-4955
  - heather.bruning@internet2.edu

- [http://abilene.internet2.edu](http://abilene.internet2.edu)
- [http://www.fiberco.org](http://www.fiberco.org)
- [abilene@internet2.edu](mailto:abilene@internet2.edu)