'It’s an NREN World’; so... what’s an NREN these days?
What an NREN (v2) is not—what it must become

- specialized regional ISP—essential global platform
- afraid to take risks and experiment—innovation incubator
- supply-side market player—demand-side market maker
- contract broker—market aggregator
- knowledge carrier—knowledge multiplier
- provider of shrink-wrapped solutions—economic development engine
- business-as-usual partner—transformation vehicle
- neutral collaboration connection—collaboration enabler
- disinterested community service—community developer
- political tool—political stabilizer
So what does the NREN (v2) look like?
Essential *global platform* for R&E institutions

- Essential to global representation and leadership
- Innovation platform encourages the development of new technologies
- Transparent operations mean easier solutions, avoidance of problems
  - Supporting ‘end-to-end’ domain science and education
- Collaborative environment for solving common challenges, developing common solutions
Innovation incubator

• Facilitates development of advanced applications supporting global R&E
  - Distributed lab environments
  - Remote access to rare scientific instruments
  - Large-scale computation and data access
  - Medical and biological research
  - Teaching and learning
• Delivers abundant bandwidth, setting stage for next generation of innovation
• Provides testing “playground” for new technologies that hold enormous value for current (and future) constituents

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Innovation is born from research and education
• Many companies have been created or re-invented through R&E community innovations
• Students capitalize on network-rich platform to create new technologies
• In the U.S., this has created fast-growing economic impact
• Now contributes over $8 trillion dollars annually to the global economy
R&E networking ROI has been staggering

Total 30-year U.S. federal investment to enable the precursors of the Internet is very small compared to the massively successful businesses it sparked.

Earth 3963 mi 10,842,768 mi 22,573,248 mi Venus

ARPAnet, CSNET & NSFnet < $250 million total investment

Contribution of Internet to U.S. economy: $684 billion annually, 4.7% of all economic activity in 2010 (CNNMoney, 2012)

Value of Internet to U.S. economy — Employment: $300 billion Payments: $444 billion and Time: $680 billion

Total: $1424 billion annually (Harvard Business School/ Hamilton Consultants, 2009)
Market aggregator

- Research and Education is a large market but not large enough to gain leverage over suppliers.
- R&E network aggregation enabled access to advanced services for lower cost, enabling R&E to benefit from the most advanced capabilities.
- Efforts are now being launched to apply network aggregation success to services above the network.
  - Internet2 ‘Net+
  - Surfnets ‘SurfConnects’
  - JANET ‘Brokerage’
Knowledge multiplier

- NRENs don’t just enable access to knowledge, their services increase the pace of knowledge development.
- Knowledge enables economic, social and cultural development.
- Technology, networks and the explosion of knowledge spur development.
  - The Roman Road System.
  - 18th – 20th Centuries
    - Canals, railroads, telephone & telegraph
  - 20th & 21st centuries
    - The Internet
Buying power: NREN uniquely positioned to bring advanced ICT service

Innovation engine: Does not take shrink-wrapped solutions for granted

New market creator: Creates new markets

Market pull creator: Students exposed to high-end ICT demand the same afterward

Trusted party: As member of the family, can act in joint buying role
Transformational vehicle

- Enables big changes across the spectrum
- Empowers R&E responses to challenges in funding, pedagogy and online resources, technology, “consumerization”
- Refactors fundamental business operations and productivity across entire supply chain
- Equips constituents to accomplish their missions to serve and transform global communities
Collaboration enabler

- Provides key enabling technologies, like global video services
- Provides broad range of participatory opportunities, including training
- Provides expertise to help solve technology challenges
- Provides transparent, favorable environment for cooperation
  - Identity Federations like In-Common
Community developer

- Provide connectivity to satisfy growing needs
- Changes the way content, applications, and services are delivered
- Fosters regional and international anchor collaboration
- Ultimately, transforms communities
Political stabilizer

- NRENs create collaborative relationships in the international R&E communities that transcend cultures and outlast political regimes
- Open, reliable avenues of communication foster a safe haven for political dialogue and intellectual freedom
National Research & Education Networks: Not just networks anymore
‘It’s an NREN World’

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Thank you! For more information, please visit www.internet2.edu