

INTERNATIONAL NETWORKING



INDIANA UNIVERSITY

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AMERICA CONNECTS TO EUROPE (ACE) AND TRANSPAC3 (TP3):

SUPPORTING RESEARCH AND EDUCATION IN
SOUTH ASIA

TOPICS

- The US National Science Foundation and the International Research Network Connections Program [NSF IRNC]
- Indiana University, the GlobalNOC and International Networking at Indiana University [IN@IU]
- The ACE and TP3 projects
- Relevance for South Asian countries and their NRENs

International Networking



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THE US NSF AND IRNC

- NSF (National Science Foundation) – US government agency. Budget: \$8 billion focused on advancing “science” in the broadest sense. See: <http://www.nsf.gov/>
- IRNC (International Research Network Connections) – Program within the NSF Office of Cyberinfrastructure (OCI). Budget: \$40 million over 5 years [2010-2015]; focus on providing production quality network infrastructure to increase/advance international science collaborations. See: <http://irnclinks.net/>
- The ACE and TP3 awards are funded by the NSF through OCI and administered by Indiana University.
 - IU is an 8 campus state university system; core campuses in Bloomington and Indianapolis. See: <http://indiana.edu/>
 - International Networking [IN@IU]: International face of GlobalNOC; engineering and operational support for ACE and TP3; science and services outreach

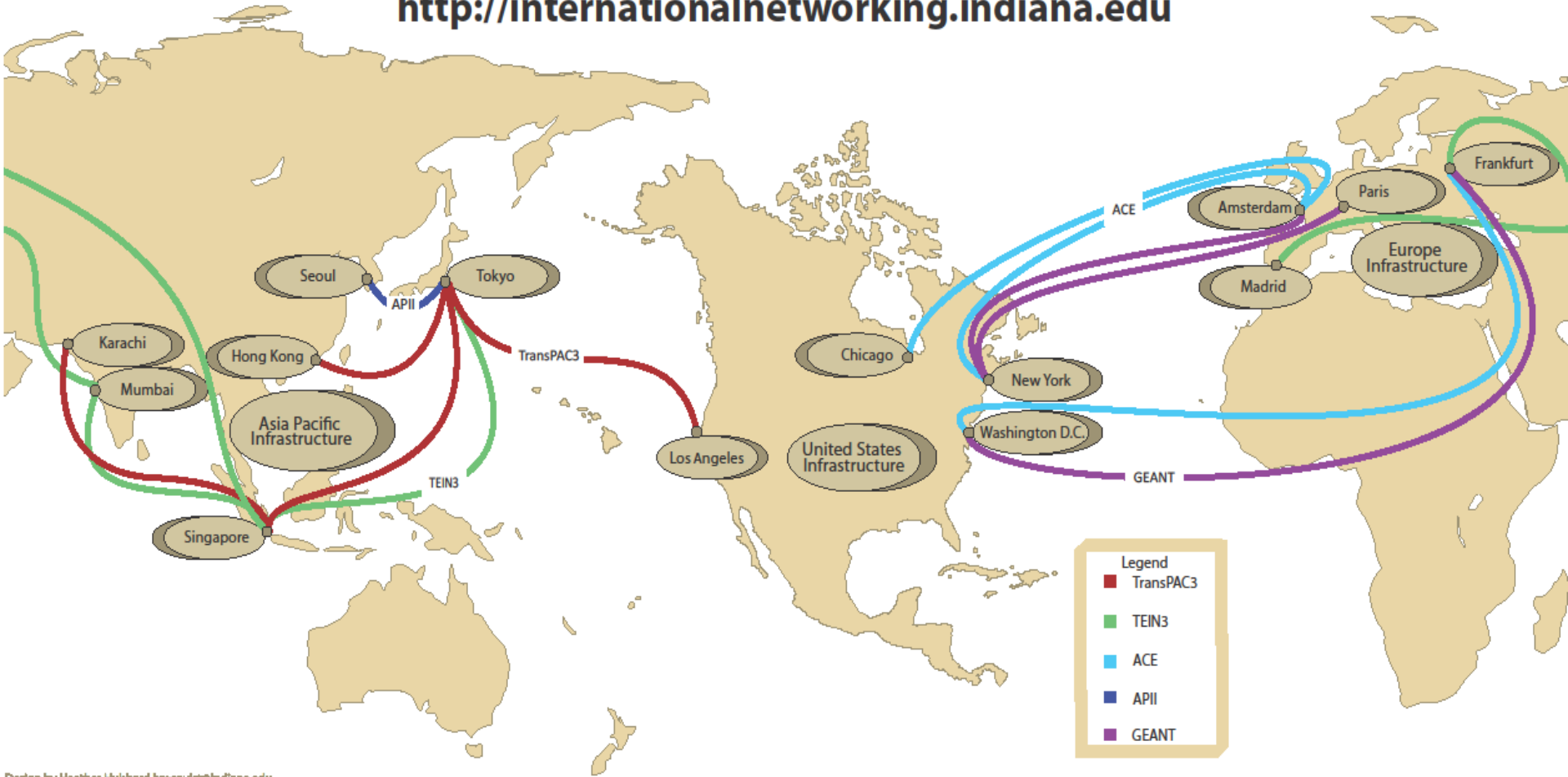
ACE AND TP3

- 5 year [2010-2015] NSF IRNC funded projects; \$1M/year each; focus on production networking in support of R/E, but with support for network research also.
- TP3: US-Asia connectivity (Tokyo-LA 10G); extended into South Asia and to Europe by TEIN3; partnering with JGN-X
- ACE: Multiple 10G connections US->EU; balanced by similar EU->US connections; cooperative engineering and operations; cooperative technical planning via DICE.
- ACE+TP3 combined with GEANT, TEIN3, APAN and Internet2 create a globe-spanning network ring.

Draft Topology

ACE TP3 TEIN3 GEANT

<http://internationalnetworking.indiana.edu>



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WHAT IT MEANS FOR SOUTH ASIAN COUNTRIES

- All except Maldives have at minimum shown interest or already have NRENs
 - Afghanistan: Silk Project connectivity, Kabul University, NATO interest
 - Bangladesh: BdREN (WB funding)
 - Bhutan: RUB
 - India: NKN, ERNET
 - Nepal: NREN
 - Pakistan: PERN2
 - Sri Lanka: LEARN

WHAT IT MEANS FOR SOUTH ASIAN COUNTRIES, CONT'D

- Ability to quickly connect to global NREN fabric is major motivator for investment in domestic infrastructure
 - All except Afghanistan and Maldives are part of TEIN3 project (European Commission-funded): provides first-step connectivity to global NREN fabric
 - ACE and TP3 provide Pakistan connectivity and next-step connectivity to East Asia, North America

SUPPORT FOR SCIENCE AND OTHER RESEARCH AND EDUCATION COLLABORATION

- Proving demand for and justifying investment in NREN domestic and international connectivity is critical
 - IN@IU has NSF funds to identify and develop India and Pakistan science collaborators and potentially others
 - 1st successful US-India Network-Enabled Research Collaboration Workshop
 - <http://internationalnetworking.indiana.edu/us-india-workshop>



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and

SCI – 0962973 - America Connects to Europe (ACE)



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