

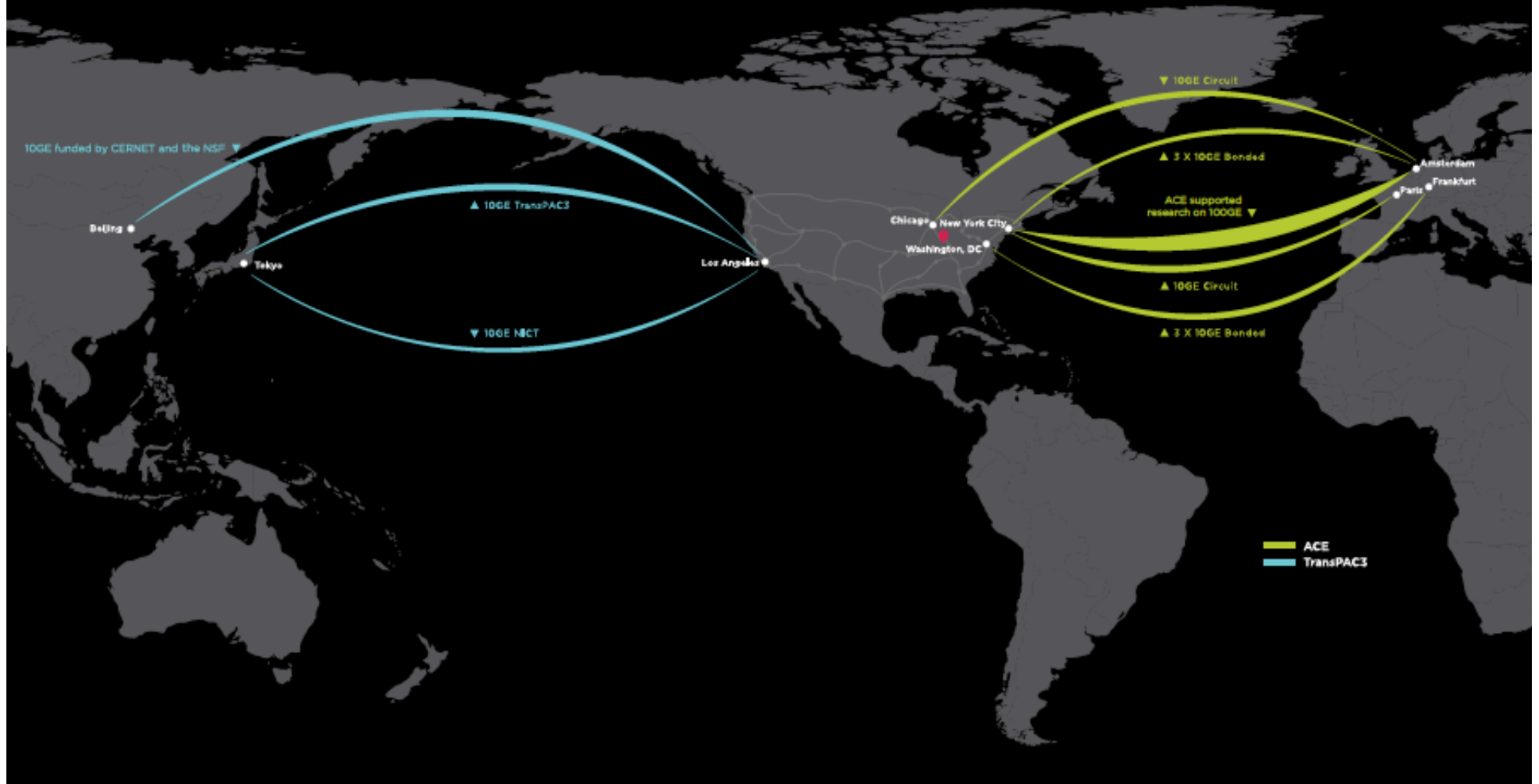
TransPAC: More than Just a Network

GLIF 2015, Prague

Andrew Lee

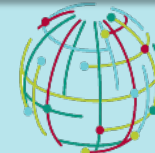
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Supporting Global Research and Education Collaboration



TransPAC Today

- **15+ year history**
- **Cooperative partnership among Indiana University, APAN, TEIN*CC, JGN-x/NICT-Japan, NII-Japan, CERNET, and others**
- **20Gbps deployed between US and Asia**
 - **10Gbps LA-Tokyo funded by NSF**
 - **10Gbps Tokyo-LA funded by NICT**
 - **10Gbps LA-Beijing was funded by TransPAC3/ CERNET but is now funded by Internet2/CERNET**



We have been awarded

- **TransPAC4: Pragmatic Application-Driven International Networking**
- **To run March 2015-Feb 2020**
- **\$4.8M over 5 years**
- **Includes funding for circuits, exchange points, application support, research**
- **Press Release: <http://go.iu.edu/nSf>**



Letters of Support From:

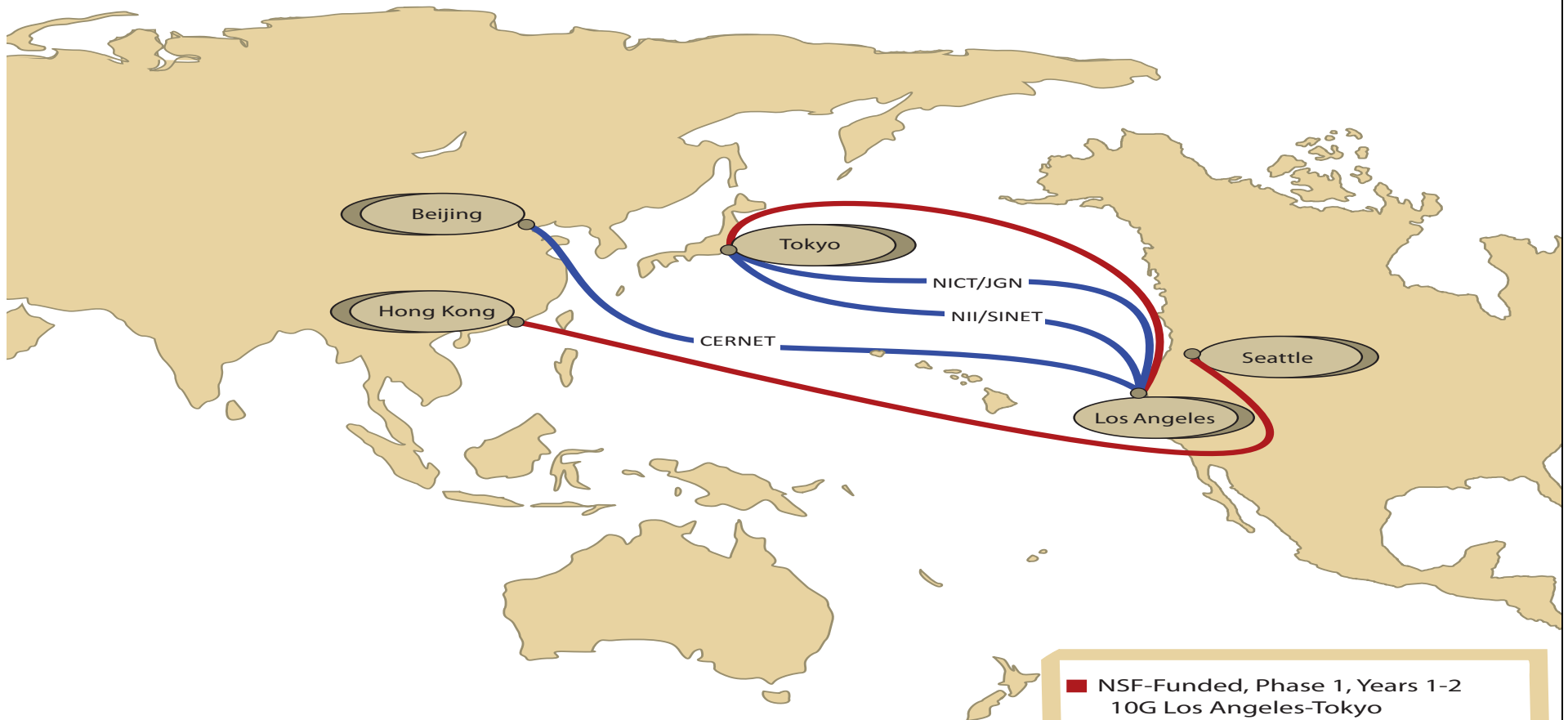
- TEIN
- APAN
- DANTE
- NICT
- NII
- CERNET
- SingAREN
- Academia Sinica

But we'd love to have more partners!

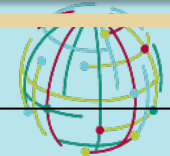
System Design

- **Built-in redundancy and alternative paths**
- **Easy transition from the current TransPAC3 circuits**
- **Complementary paths and approaches to our partners' sister circuits**
- **Full support of production traffic**
- **Ongoing support for experimental traffic**
- **Fiscally responsible approaches**
- **Two Phase Approach**

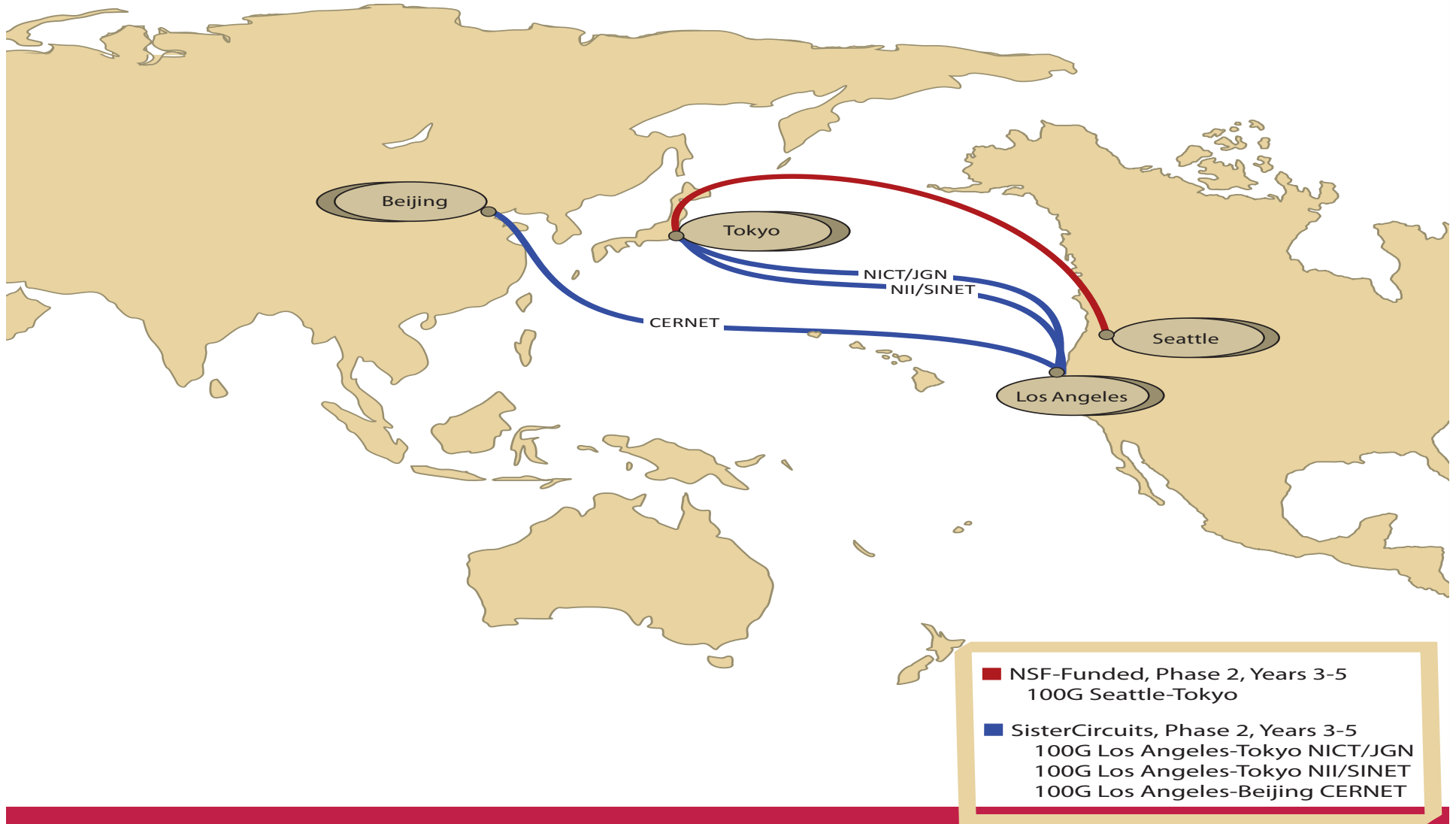
TransPac4 Phase 1



- NSF-Funded, Phase 1, Years 1-2
 - 10G Los Angeles-Tokyo
 - 10G Seattle-Hong Kong
- Sister Circuits, Phase 1, Years 1-2
 - 10G Los Angeles-Tokyo NICT/JGN
 - 10G Los Angeles-Tokyo NII/SINET
 - 10G Los Angeles-Beijing CERNET



TransPAC4 Phase 2



Transport

- **Support for Layer 3 peering**
- **Multiple mechanisms for dynamic Layer 2 circuits**



Open Exchange Points

- Based on the IREN definition
 - <https://fasterdata.es.net/nsf-iren/>
- Operated by the countries and/or NRENs in which they are located
- At least two connections to the Backbone for redundancy and reliability
- Allow additional international links to NRENs, aggregators, and regional consortia
- Provide an experimental platform
- Provide layer 1-3 connectivity services with policies supporting bi-lateral peering at layers 2-3
- Share measurement and monitoring data (active and passive)
- Have a “reasonable” cost model

Experimental work

- **Software Defined Networking and InterDomain Controllers**
 - **What do applications really need here?**
 - **How can we support a production infrastructure?**
 - **How can we move beyond special set-ups for demos?**



End User Engagement

- **Directly engage with user communities**
- **Focusing on end-to-end performance**
- **Application Advocacy Specialists will work closely with end users with network needs**
 - **including US branch campuses in Asia**



Questions/Comments?

- **Take aways:**
 - **TransPAC4 is more than just circuits**
 - **Looking forward to working with all our partners!**
 - **We have resources especially to work with people transferring data to the US**
- **Group Website:**
 - <http://internationalnetworking.indiana.edu/>**
- **Jennifer Schopf – jmschopf@indiana.edu**
- **Andrew Lee – leea@indiana.edu**

