

# TransPAC

AMERICA CONNECTS TO ASIA



## LHCONE between Asia and US using TransPAC

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Science Engagement

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Apr 4, 2017 @ BNL



INDIANA UNIVERSITY

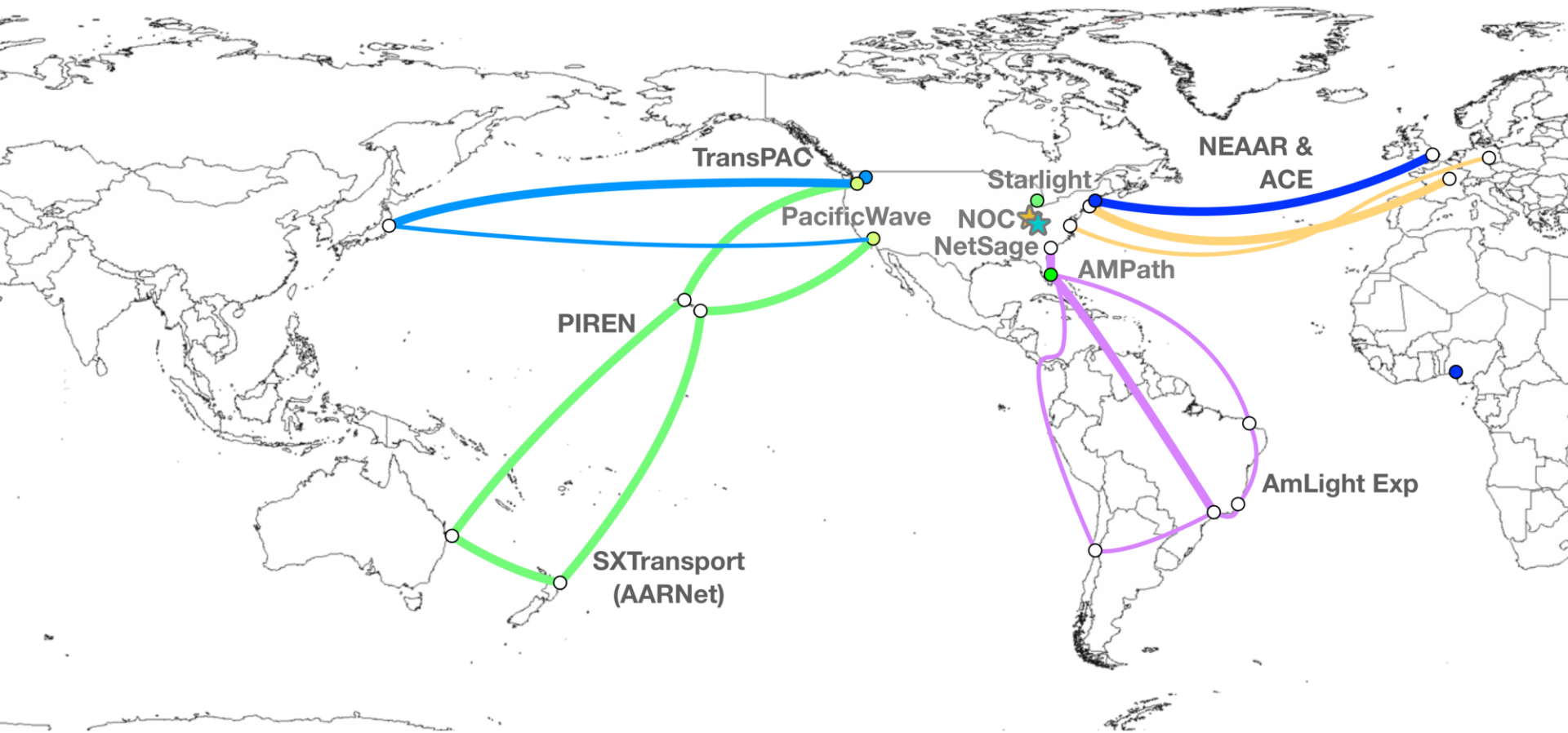
1



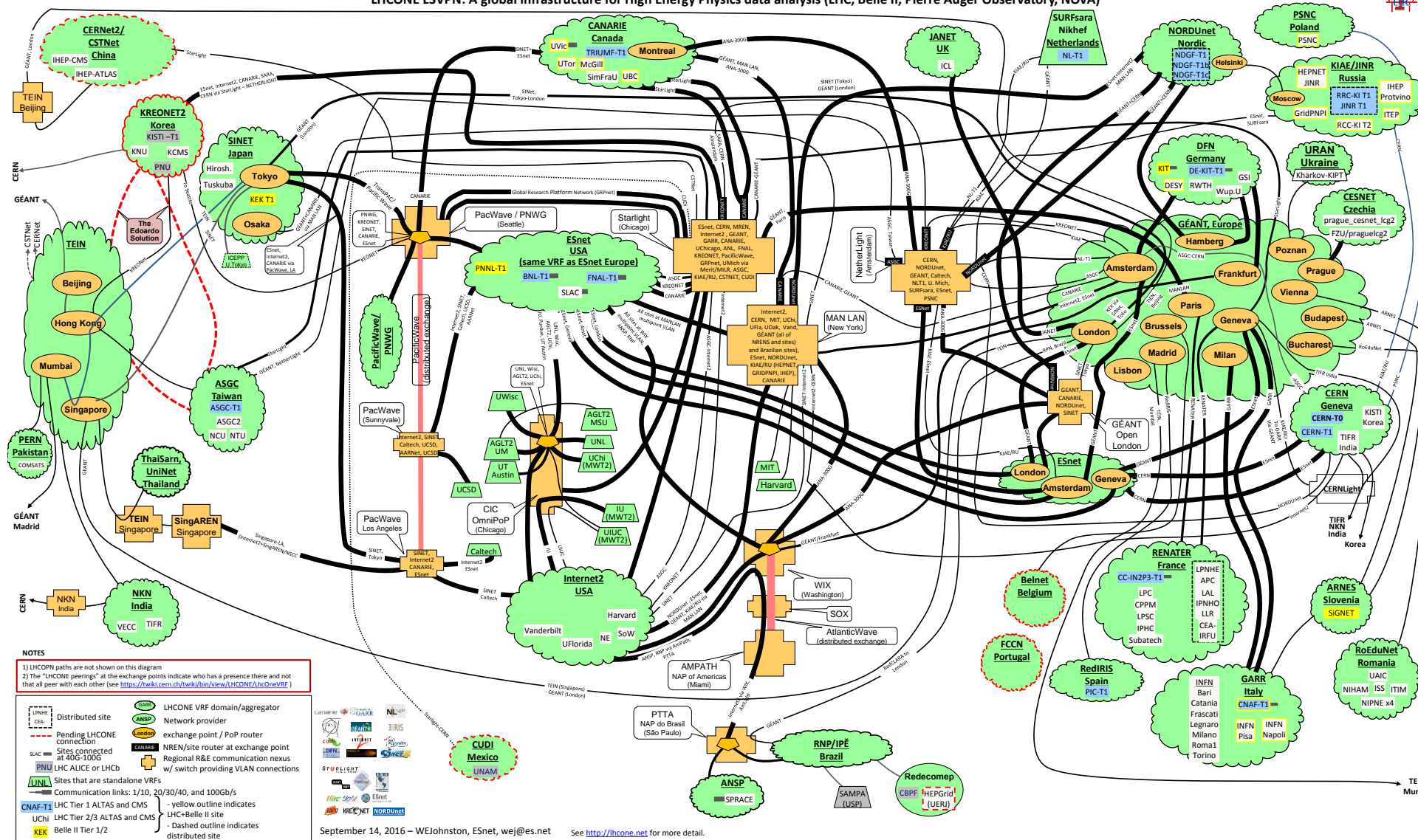
INTERNATIONAL  
NETWORKS  
At Indiana University

# TransPAC

- Original project started in 1998 w/ link between StarTAP-Chicago and Tokyo
- Cooperative partnership among Indiana University, APAN, TEIN, JGN/NICT-Japan, Nii-Japan, CERNET, etc.
- Current iteration: TransPAC4
- Started in March 2015, running through Feb 2020
- \$4.8M over 5 years
- Includes funding for circuits (100G), exchange points, application support/engagement, research
- Increased engagement with the wider community through groups such as APAN, TEIN/Asi@Connect, GNA, GLIF, LHCONe, Internet2, etc



# LHCONE L3VPN: A global infrastructure for High Energy Physics data analysis (LHC, Belle II, Pierre Auger Observatory, NOvA)

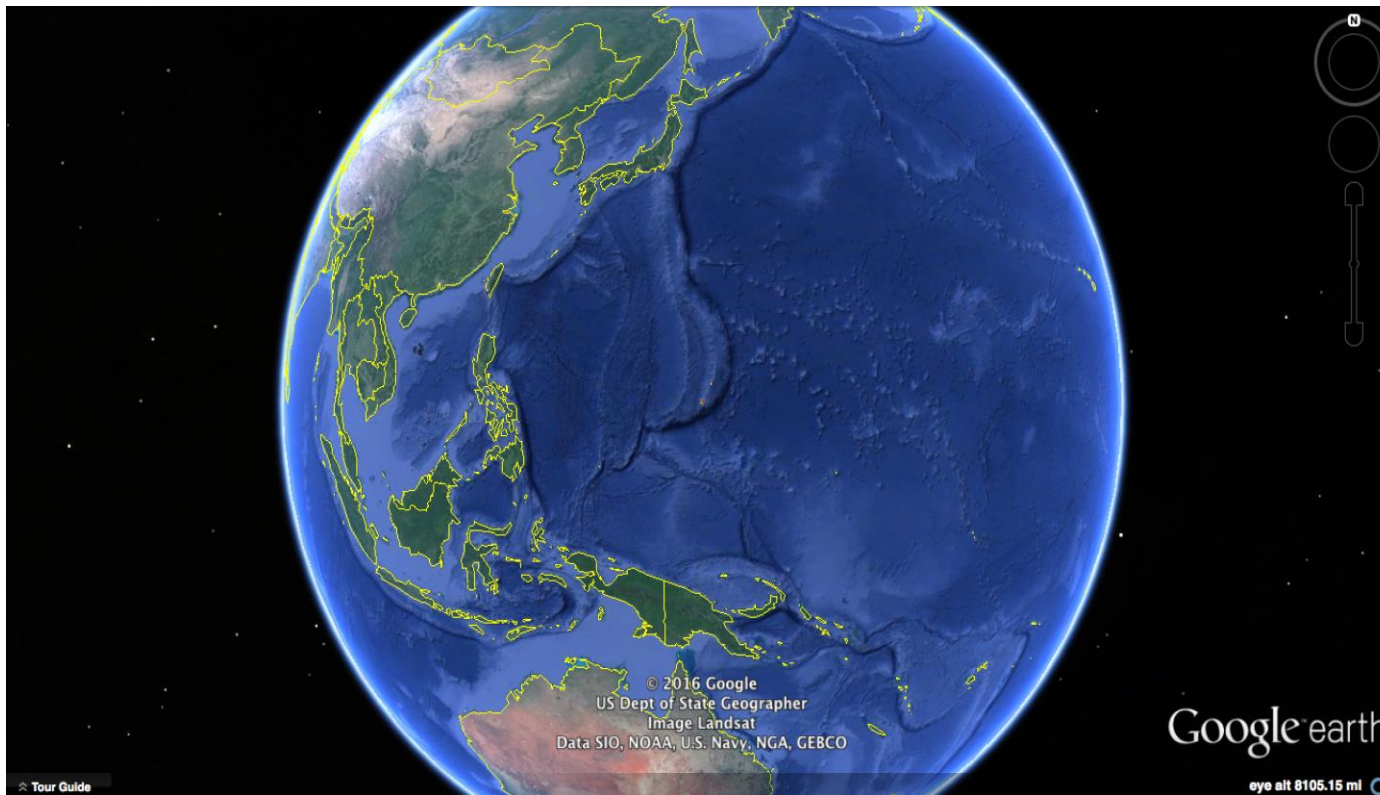


# Current Transpacific 100G links

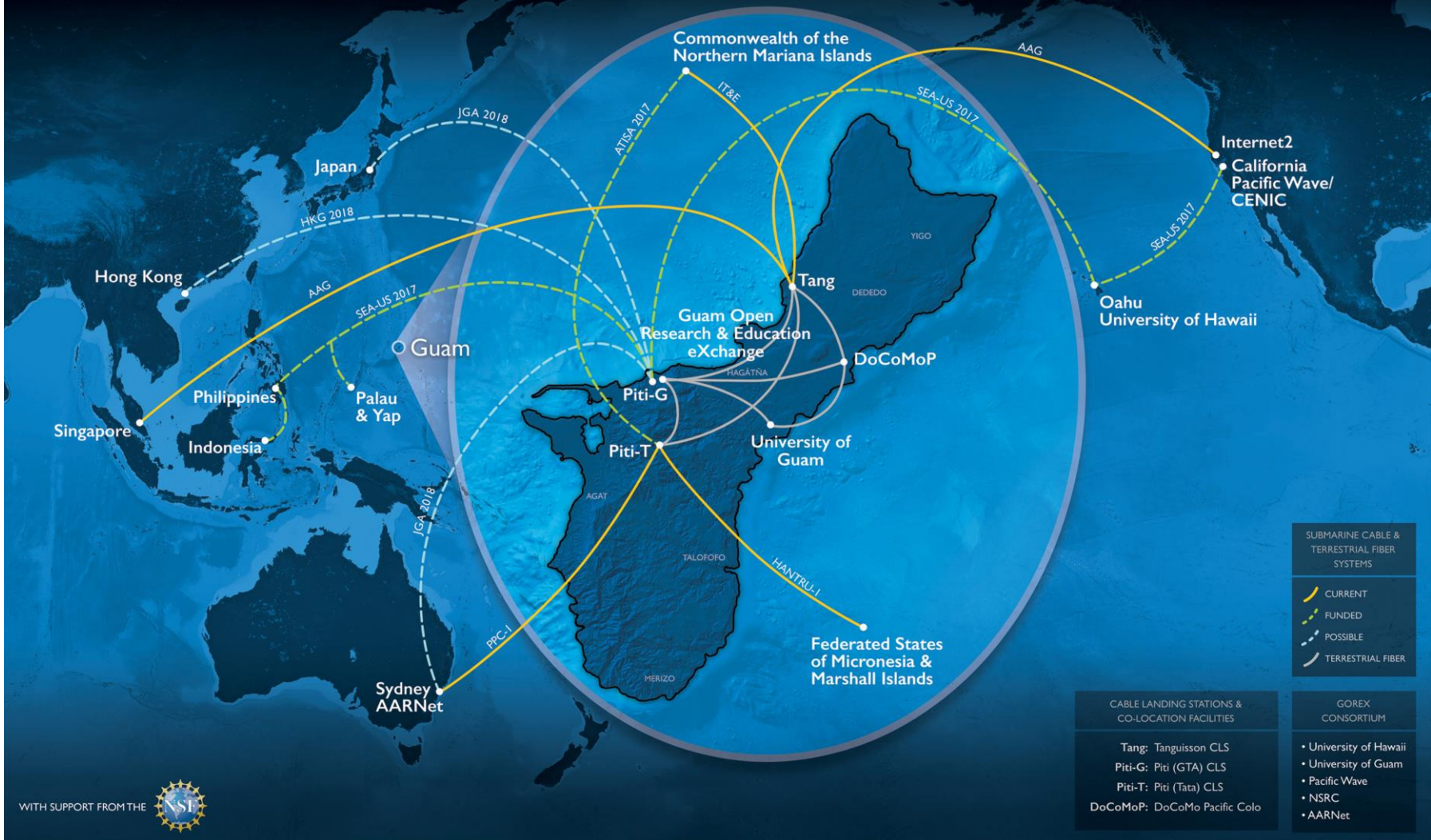


# New Developments: Guam - GOREX

- A consortium of organizations has been working towards establishing an Open Exchange in Guam



# GOREX: Guam Open Research & Education eXchange



WITH SUPPORT FROM THE 

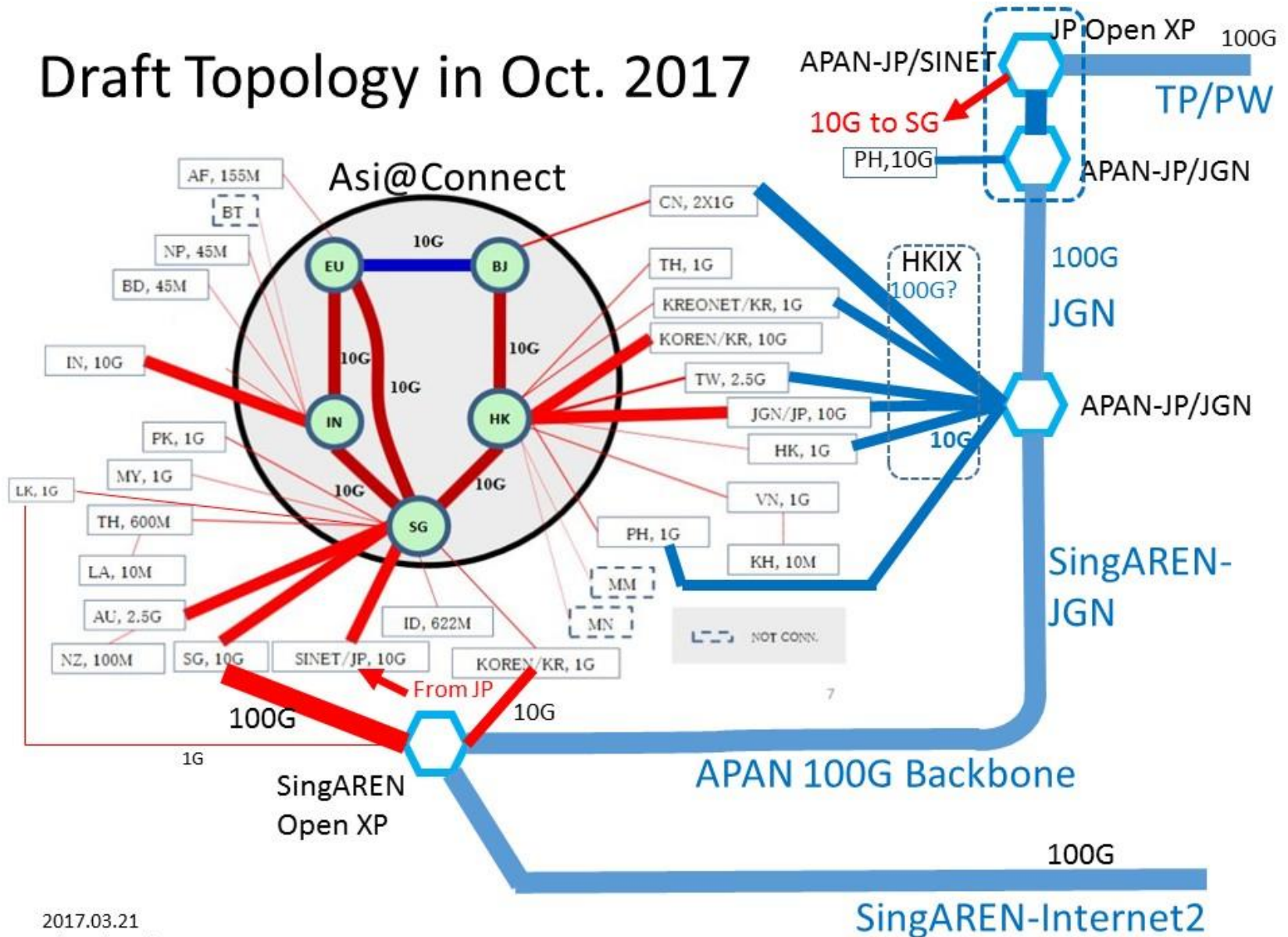


# Near future Transpacific 100G links





# Draft Topology in Oct. 2017

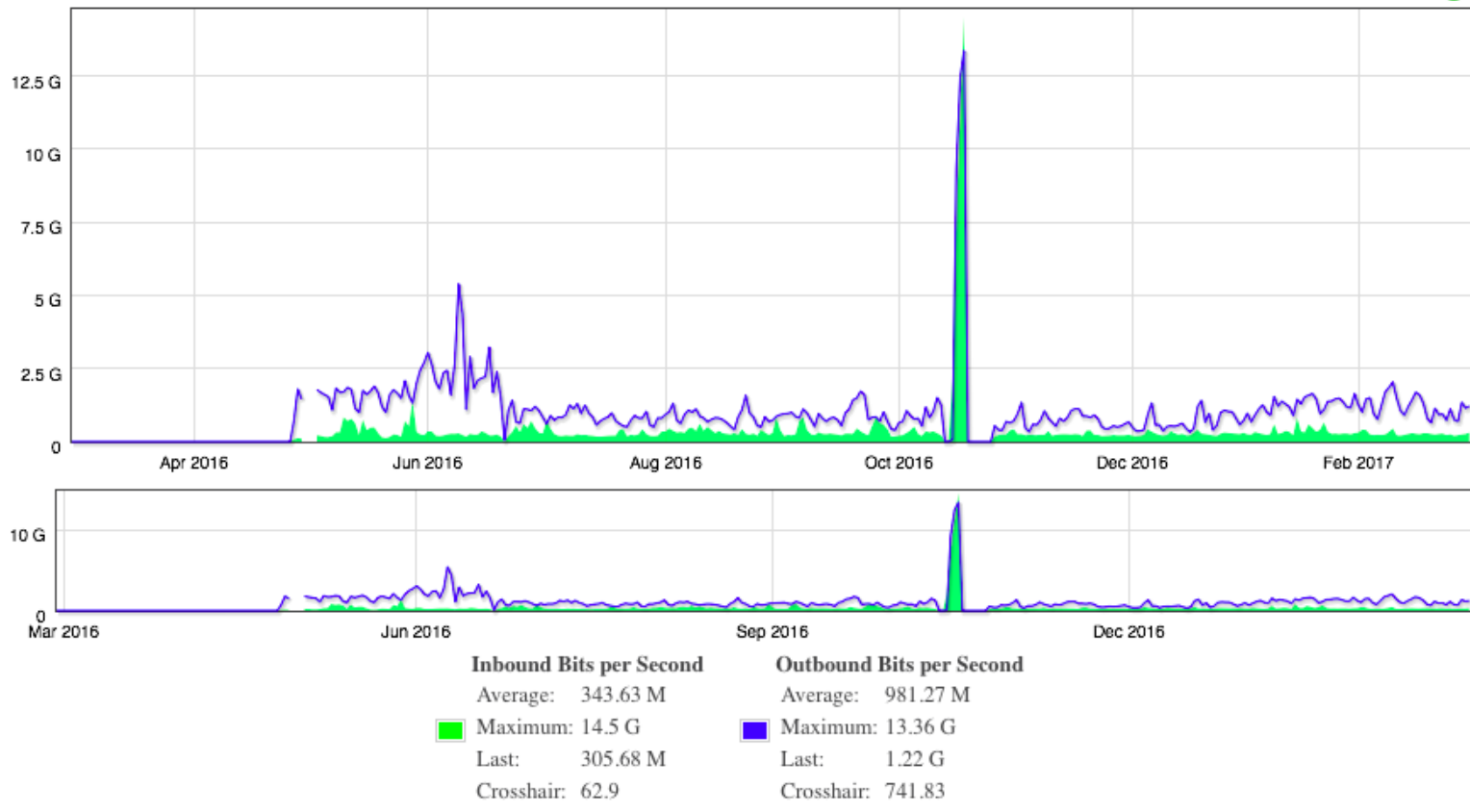


2017.03.21  
 Editor: konishi@jp.apan.net

# TransPAC/PW usage

sttl-pacwave-switch--ethernet15/2 -- TransPAC - Pacific Wave 100G Circuit (provided by PNW Gigapop)

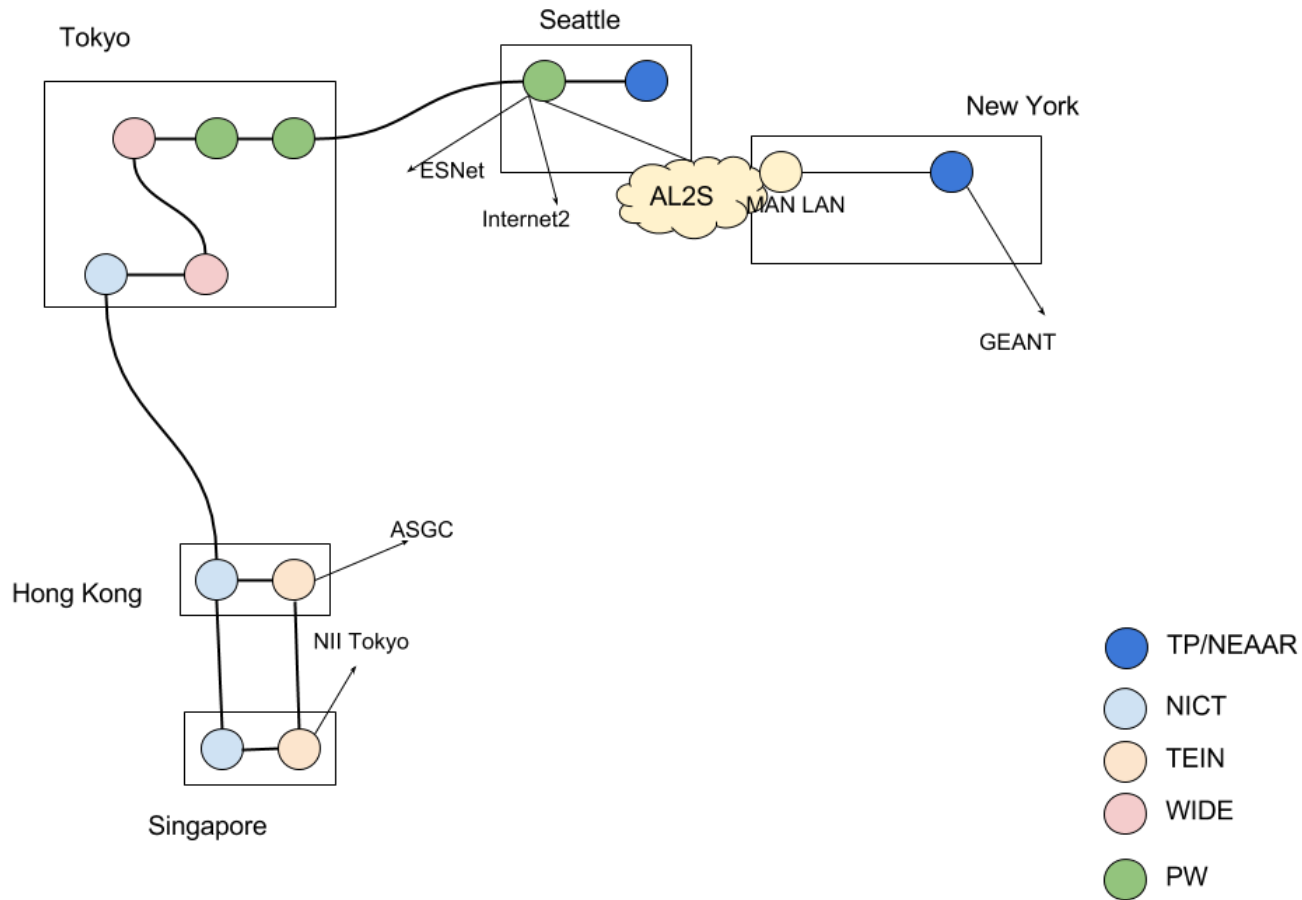
Wed 30 Mar 2016 10:52:43 PDT to Thu 30 Mar 2017 10:52:43 PDT



# Proposed Asian LHCONE connectivity via TransPAC

- Follow-up from ATCF2 and APAN 44 meetings
- Interconnect w/ TEIN/Asi@connect and others possible/easy in HKG
- TEIN/Asi@connect reaches most of Asia
- NICT agreed to allow use of 10G HKG-JP
- Use of VLAN(s) to facilitate peering(s)
- Not too hard to setup, all infrastructure, links, equipment, cross-connects in place
- Possibility of direct Asia peerings with Internet2, ESnet, etc, vs. peer w/ TransPAC AS22388, which would facilitate access (up to Asian networks)

# Proposed Asian LHCONE connectivity via TransPAC/PW (cont)



# Proposed Asian LHCONE connectivity via TransPAC/PW (cont.)

- **Hopeful to have this in place by ATCF3/LHCONE in the Fall**
- **Future possibilities: Tie 100G APAN links JP-HKG-SIN and SIngAREN-I2 link to US for added capacity/redundancy**
- **Connect and tie Asia connectivity via I2's AL2S and NEAAR 100G circuit to Europe for capacity/redundancy**
- **Future (~end of 2017) possibilities via HKG-Guam and Guam-US mainland links.**
- **Asi@Connect upgrades to 100G over next several years – for better intra-Asia connectivity**
- **Work on application engagement**

# Acknowledgements

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  - **US NSF award #1450904 for TransPAC4**
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- **Pacific Wave is partially funded by a NSF IRNC award to CENIC & Pacific NorthWest Gigapop**

# Follow us on Facebook:

- <https://www.facebook.com/InternationalNetworksatIU/>



# References:

- Group Website:

<http://www.in.iu.edu/>

- Predrag Radulovic – [pradulov@indiana.edu](mailto:pradulov@indiana.edu)

- Questions/Comments?