



INFORMATION TECHNOLOGY

GOSEX: Guam Open Research & Education eXchange

Rommel Hidalgo, Chief Information Officer, University of Guam

(via Dave Reese CENIC/Pacific Wave – Thank you, Dave!)

GLIF 2018 – GLIF Americas Working Group

September 19th, 2018



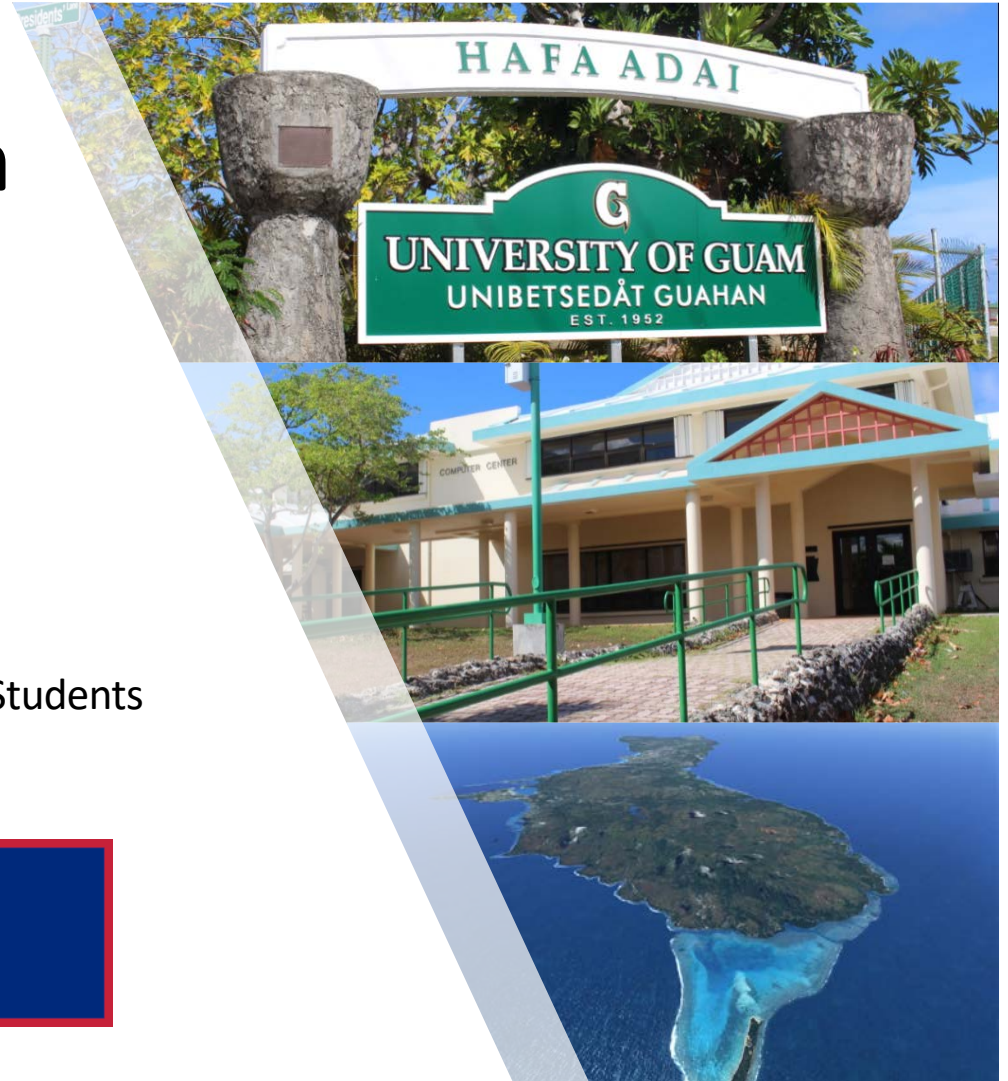
Educate. Innovate. Connect.



Background on Guam

U.S. Territory of Guam

- **Hafa Adai** : Hello, how are you?
- Population: ~ 172,365
- United States Territory since **1898**
- University of Guam (est. 1952): ~ 4,000 Students





Military Presence on Guam



Guam

■ Department of Defense land

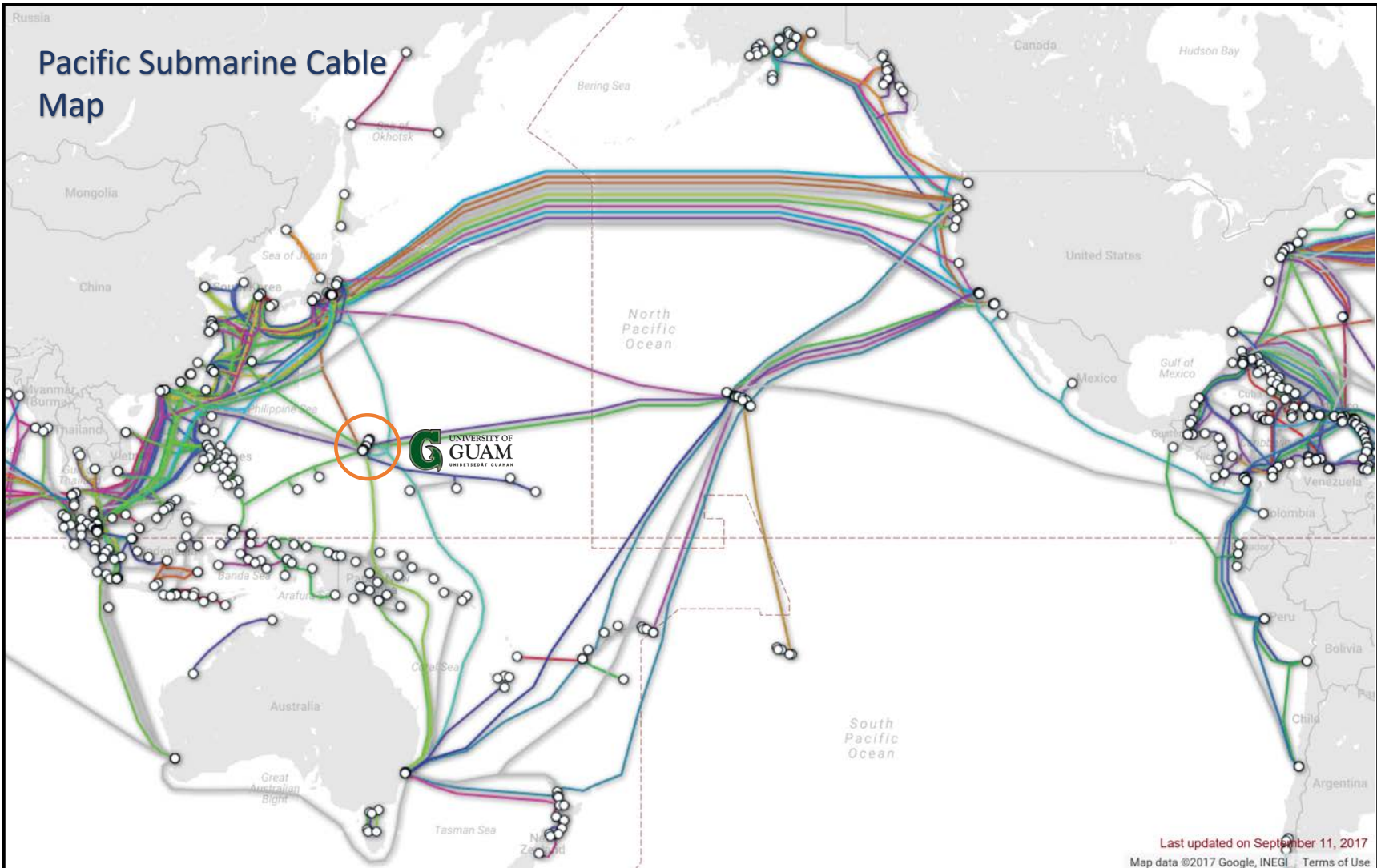


Guardian graphic

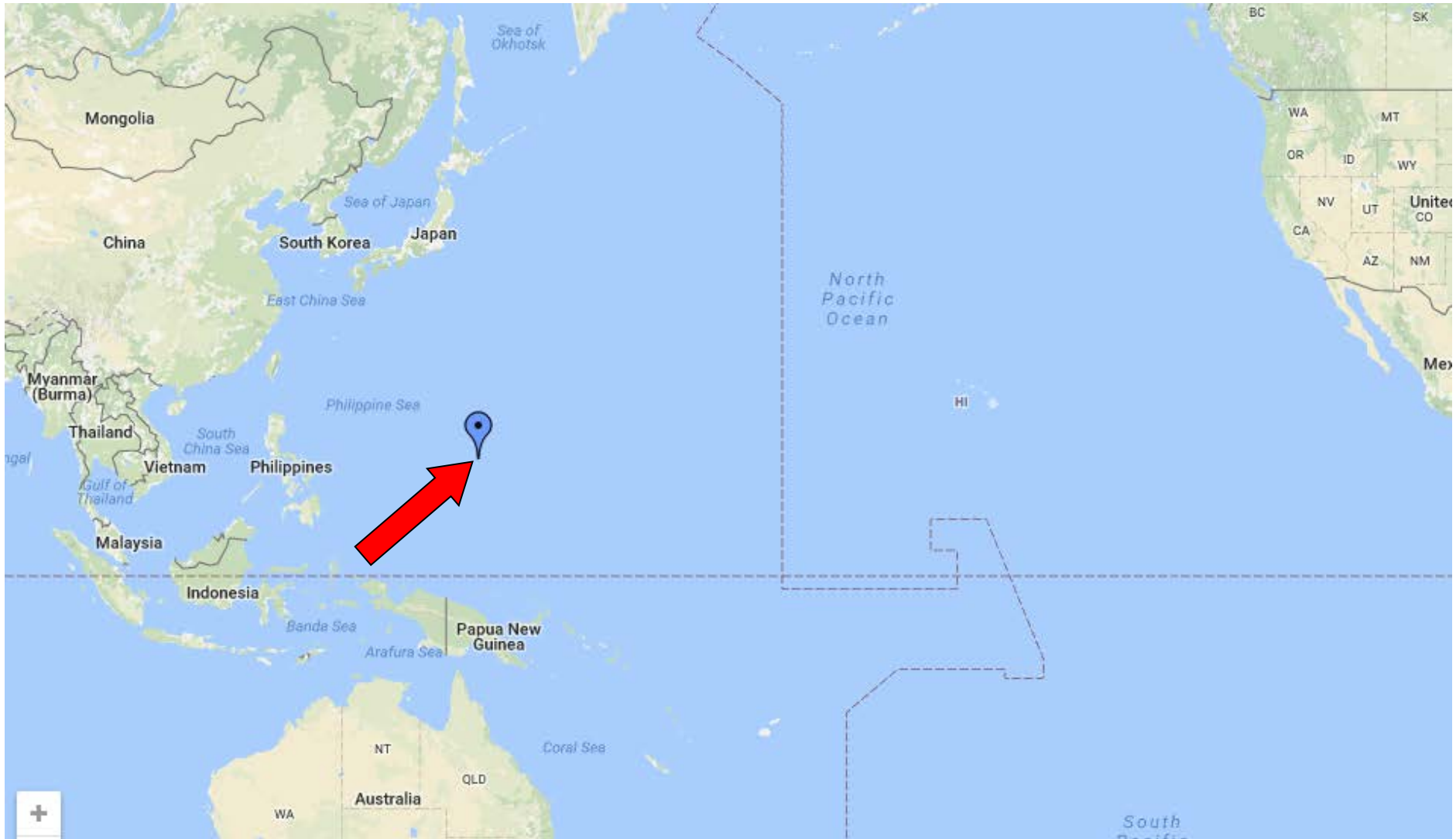


Guam Research & Education Network Connectivity

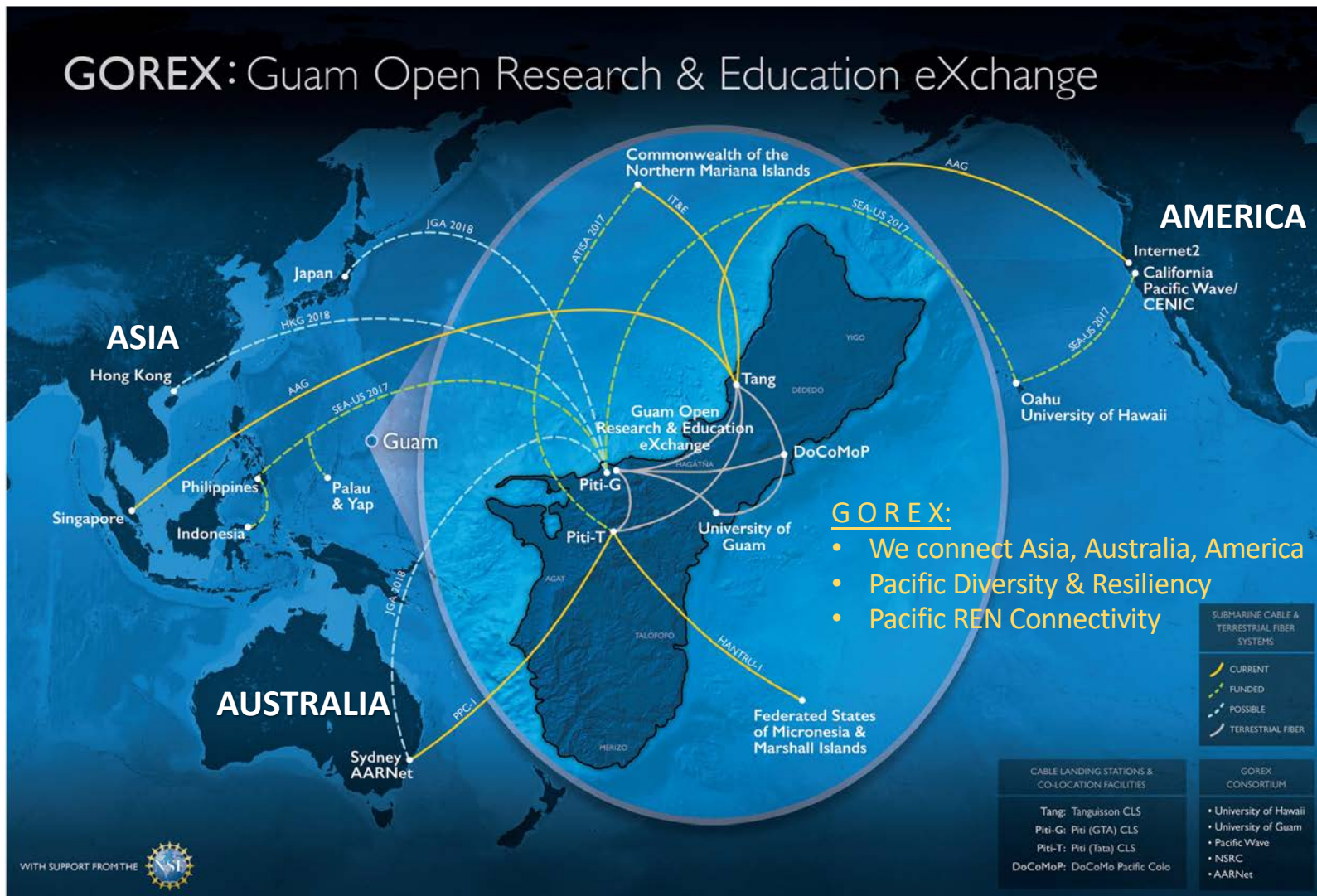
Pacific Submarine Cable Map



Last updated on September 11, 2017
Map data ©2017 Google, INEGI Terms of Use



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UNIVERSITY of HAWAI'I

NSRC
Network Startup Resource Center

PACIFIC WAVE

Internet2
California Pacific Wave/
CENIC
CENIC
Connecting California

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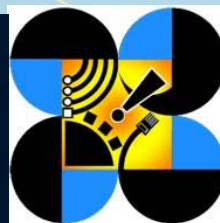
Australia's Academic
and Research Network

WIDE



**International
Networks**
at Indiana University

REANVZ



DOST-ASTI



INTERNET²
MEMBER



INTERNATIONAL PEERING EXCHANGE

Pacific Wave is a project of CENIC & PNWGP

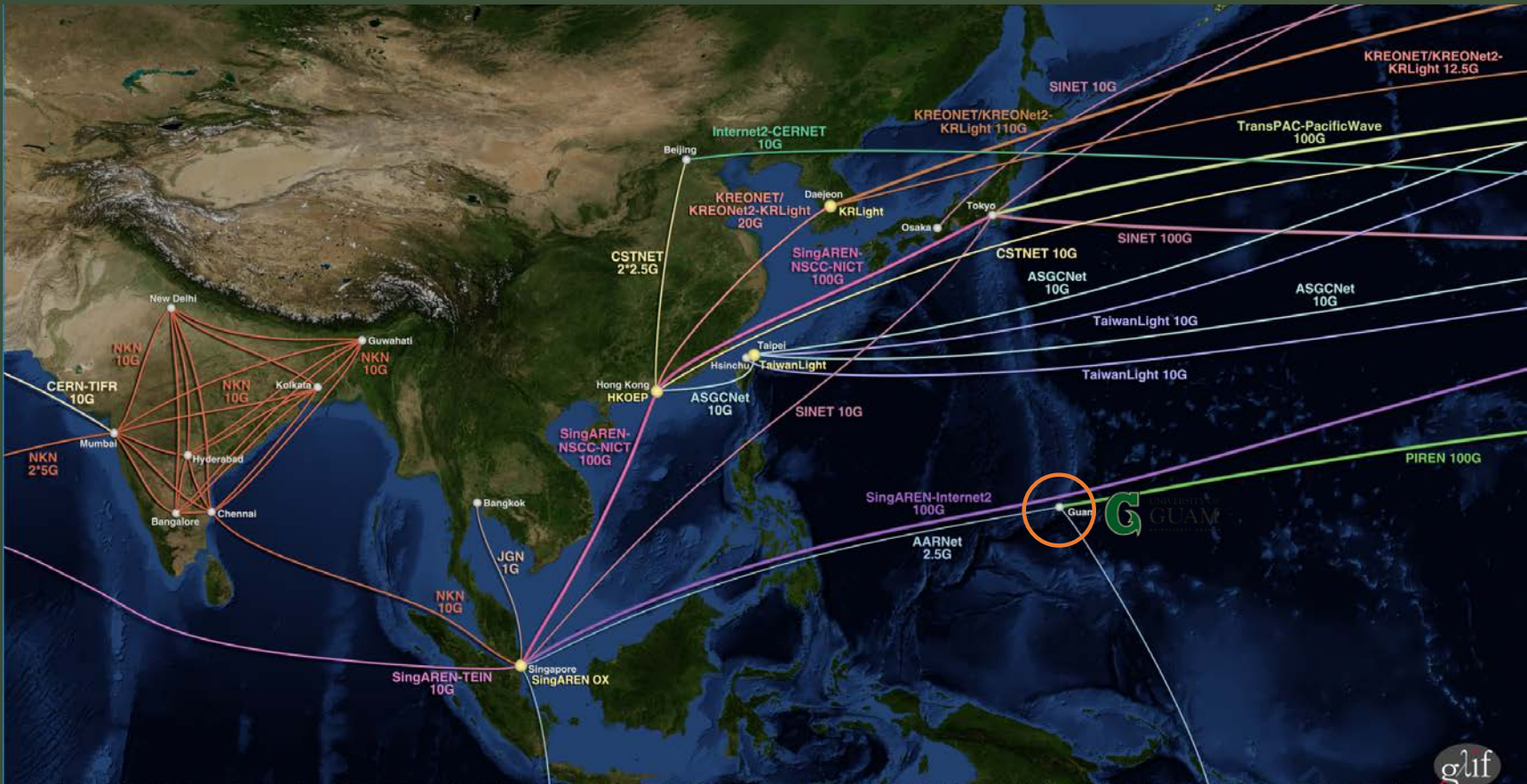


<p>SPEEDS/POPS</p> <p>10 Gbps</p> <p>100 Gbps</p> <p>CURRENT FUTURE</p>	<ul style="list-style-type: none"> ● Pacific Wave POPs ● Pacific Research Platform (PRP) ● PRP Science DMZ Fabric ● Software Defined Network ● Commercial Peering Points (Amazon, Google, & Microsoft) 	<p>WESTERN REGIONAL NETWORK</p> <p>States served by WRN members:</p> <ul style="list-style-type: none"> - ABQG: New Mexico GigaPoP - CENIC: California - FRGP: Colorado and Wyoming - PNWGP: Washington, Montana, Alaska, Oregon & Idaho - UH: Hawaii
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With support from the National Science Foundation





GOREX GOALS

- ❑ Leverage strategic geographic location of Guam
- ❑ Establish Open R&E Exchange
 - Inter-Connect existing, funded, and planned high capacity R&E trans-pacific circuits
- ❑ Improve Pacific-wide transport **diversity** and **resilience**
 - Support global R&E networks
 - Facilitate greater access to global R&E networks by Pacific Island nations and communities
- ❑ Overarching Goal:
 - Promote increased growth and effectiveness of data-intensive and highly collaborative research and education activities engaging the Asia-Pacific region with the global R&E community.

GOREX Implementation

- ❑ University of Hawai'i
 - 100Gb (SEA-US): Guam, Hawai'i, California – 25 year IRU
 - Approximately 4 racks in SEA-US Guam Co-Lo Facility
- ❑ Operated on a pure non-profit cost recovery basis
 - Costs will be shared fairly and transparently among participants
- ❑ Partners investing in GOREX will provide oversight and lead any governance activities
 - Initial costs to be borne by current consortium members: UH, Pacific Wave, CENIC, AARNet, and others
- ❑ Univ. of Guam CyberTeam will operate as local-hands for GOREX
 - UoG Data Center is connected to GOREX Co-Lo Facility

GOREX Status

☐ **GOREX / PIREN**

- Juniper MX-480 installed at GTA Upper Tumon Co-Lo Facility in Guam (**1.8.18**)
- University of Hawai'i SEA-US 100Gb Circuit (Guam-Hawaii-California): Went live on January 2018
- Indiana University's Hong-Kong 10Gb Circuits to Guam: Went live in August and September 2018.
- Additional new circuits? (Japan, Australia, Philippines, Singapore)

☐ **GOREX Local Hands – University of Guam**

- University of Guam team will continue to work with their NSF CC* Grant (OAC-1659182) leadership institutes, the NSRC and the University of Hawai'i, to continue to improve their technical capabilities to support and develop GOREX.



GOREX Installation – Jan. 2018



GOREX Installation – Jan. 2018



GTA Piti CLS

GTA Tumon CO
624 N. Marine Corp Dr.

Planned move

- GTA building new colo space on basketball court
- Adjacent to new Piti CLS
- GOREX will move from Tumon CO to Piti Colo 2019?
- Any circuits coming in should take this into account

GTA Piti CLS



GOREX Live - Jan 8, 2018

- Juniper MX480
- Cisco 2911 Terminal Server
- SuperMicro PerfSonar @ 40Gbps
- BeagleBone Delay Node



Growth

- MPC7-MRATE - up to 4 x 100G & 8 x 40G
- Add another MPC7-MRATE or other card later as requirements increase
- 4 more open MX480 slots
- Available power and space for additional equipment



Si Yu'os Ma'ase
(Thank You)

For more information regarding GOREX

❑ <http://www.hawaii.edu/piren/>

❑ <https://gorex.uog.edu>

❑ Email: uognoc@uog.edu

QUESTIONS?



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