



# Pacific Wave International Exchange

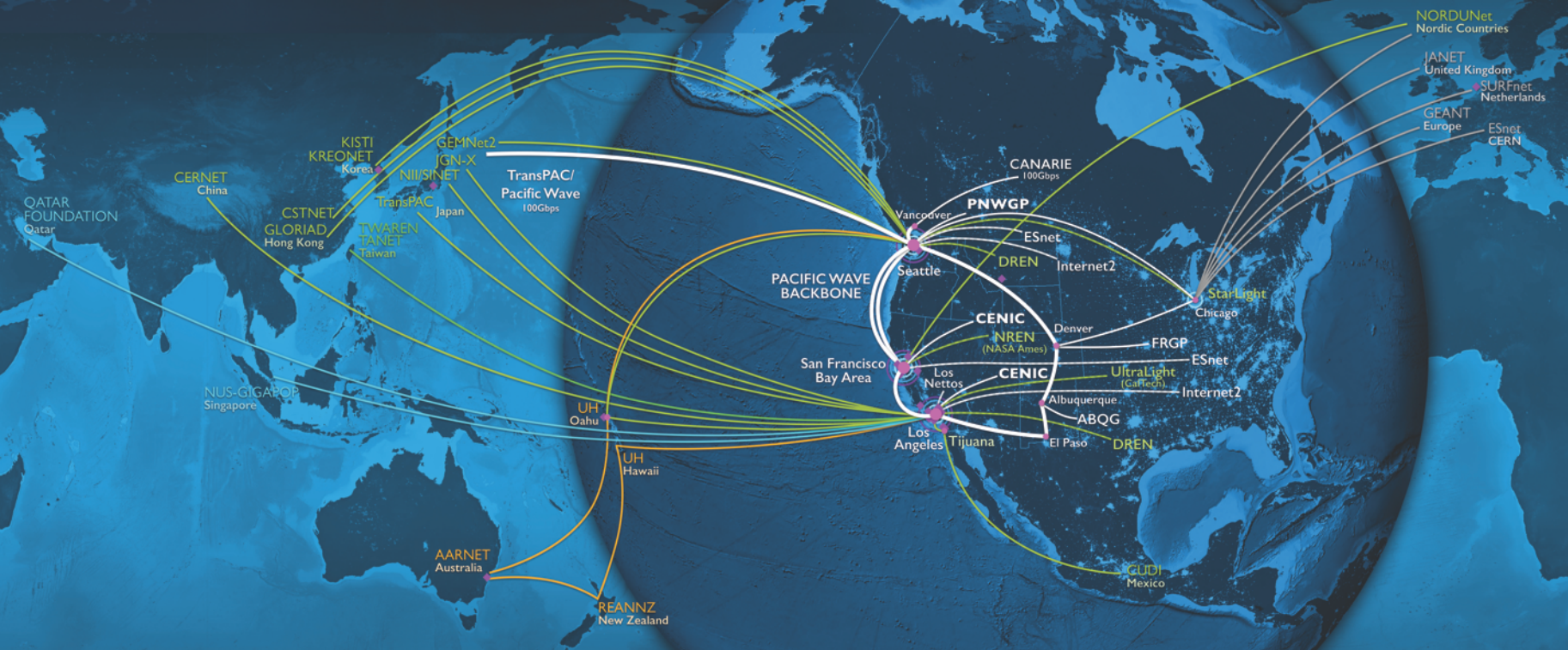
David Reese

Managing Director, Pacific Wave



# Pacific Wave

- Collaboration between CENIC and PNWGP
- Began as first geographically distributed exchange in 2004
- Pacific Wave is an open exchange supporting both commercial and R&E peers
- Currently serves 29 countries peering across the Pacific and Western United States
- With PNWGP and TransPac, announced the first 100Gbps Trans-Pacific link from Tokyo to Seattle in 2015



**SPEEDS/POPS**

- 1 Gbps
- 2.5 Gbps
- 10 Gbps
- 40 Gbps
- 100 Gbps

- Pacific Wave POPs
- Pacific Research Platform (PRP)
- PRP Science DMZ Fabric
- Software Defined Network
- Commercial Peering Points (Amazon, Google, & Microsoft)

**WESTERN REGIONAL NETWORK**

States served by WRN members:

- PNWGP: Washington, Montana, Alaska, Oregon & Idaho
- FRGP: Colorado and Wyoming
- ABQG: Albuquerque GigaPoP
- UH: Hawaii
- CENIC: California



## Connecting California

CENIC is a non-profit created to serve California's K-20 research & education institutions with cost-effective, high-bandwidth networking

### Six Charter Associates:

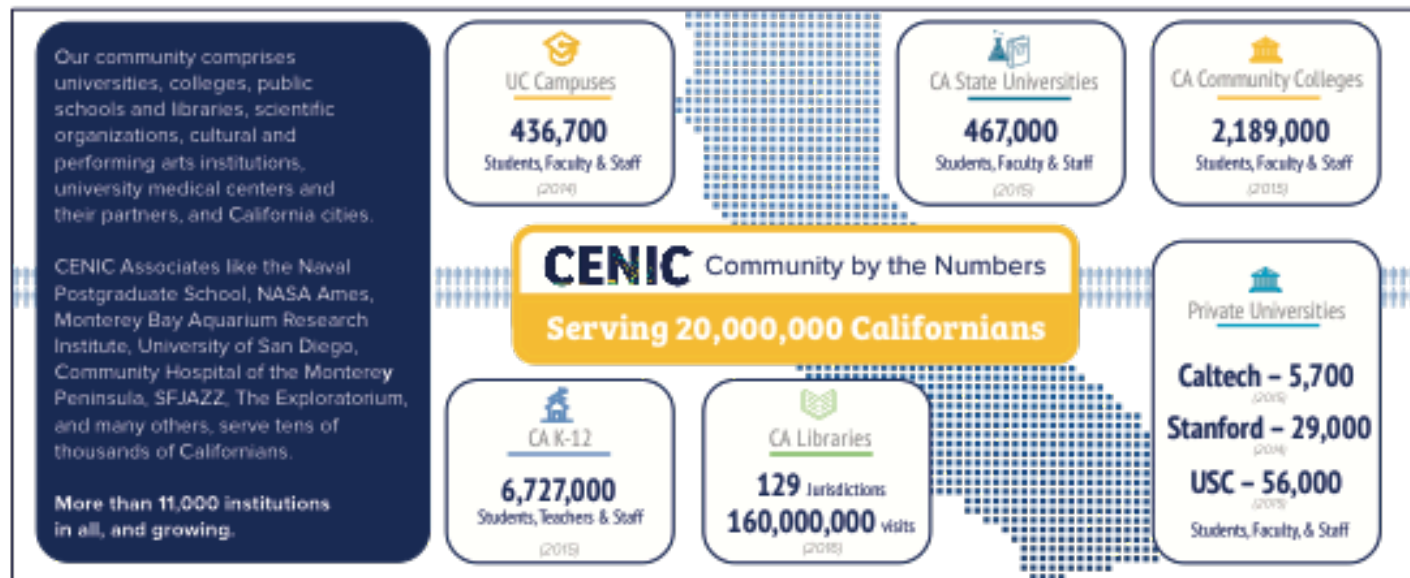
- California K-12 System
- California Community Colleges
- California State University System
- Stanford, Caltech, USC
- University of California
- California Public Libraries



*California*  
**STATE LIBRARY**  
FOUNDED 1850  
PRESERVING OUR HERITAGE. SHAPING OUR FUTURE



# CENIC in California



**CENIC Provides a World Class Network** | CENIC connects the state's research and education institutions to peers around the world, with an estimated 20 million Californians using CENIC's services. CENIC is part of a global ecology of research and education, government, and commercial networks, and manages a vast portfolio of integrated networks on behalf of its members and partners, delivering quality, efficiency, and value for all.

# Pacific Wave and GNA

- Pacific Wave:
  - has always operated open exchange points
  - has initially listed Seattle, Sunnyvale and Los Angeles as GNA Exchange Points
  - is including backbone links between exchange points
  - is including (with TransPac) 100G link from Seattle to Tokyo

# Pacific Wave and GNA

- GNA compliance means various policies and documentation readily available online
  - PW is working to draft and publish: Privacy Policy, PW backbone link AUP, Service Expectations

# Nx100G Across the Pacific

- CURRENT:
  - TransPac/Pacific Wave (Tokyo-Seattle)
  - SINGAREN/Internet2 (Singapore-Los Angeles)
  - SINET/SoftBank/Pacific Wave (Tokyo-Los Angeles)
  - AARNET/PIREN/Pacific Wave (Australia-SEA)
  - AARNET/PIREN/Pacific Wave (Australia-LA)
- FUTURE:
  - UH/PIREN/Pacific Wave (Guam-Hawaii-LA)



# Pacific Wave and NSF/IRNC

- Pacific Wave has been partially supported through three separate five-year National Science Foundation grants supporting growth, connectivity and innovation
- Current award promotes 100G expansion and implementation of SDX capabilities within Pacific Wave (ACI-1451050)



# QUESTIONS AND COMMENTS

Please direct questions regarding Pacific Wave to:

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