

# Global High-Performance Networking and TransPAC2

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# Topics to be discussed

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- TransPAC2 overview
- TransPAC2 engineering goals and objectives
- TransPAC2 service goals and objectives
- Some observations



# The TransPAC2 Project

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- Follow-on to the TransPAC project
- Funded by the US National Science Foundation (SCI-0441096)
- US partners are Indiana University and Internet2
- Asian partner is APAN
- About \$1M/year in funding for 5 years
- Encourages scientific collaboration between researchers in Asia and the US



# TransPAC2 Architectural Goals

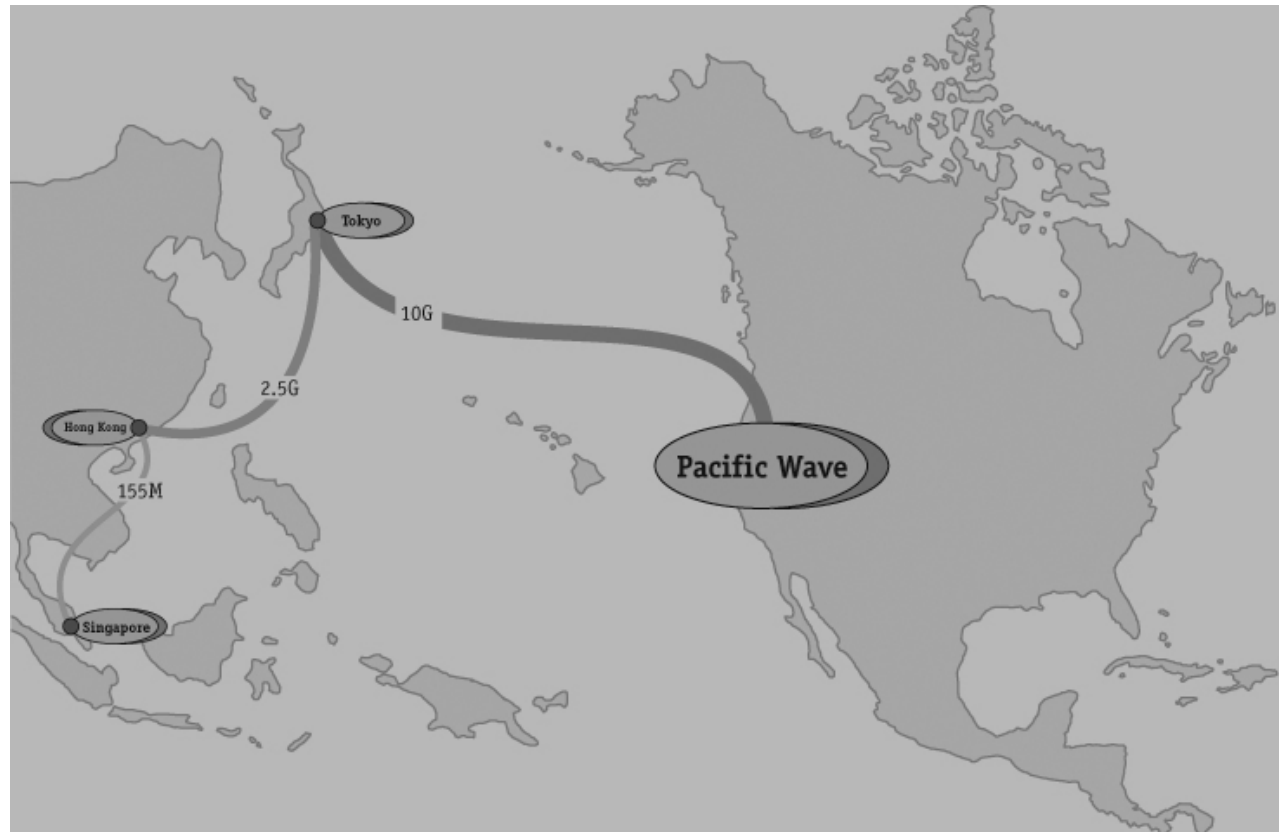
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- Continue high-performance connectivity across the Pacific Ocean [OC-192 connection between US and Tokyo]
- Enhance connectivity by assisting in the development of an inter-Asia backbone [Tokyo-Hong Kong-Singapore] or beyond



# TransPAC2 Architecture

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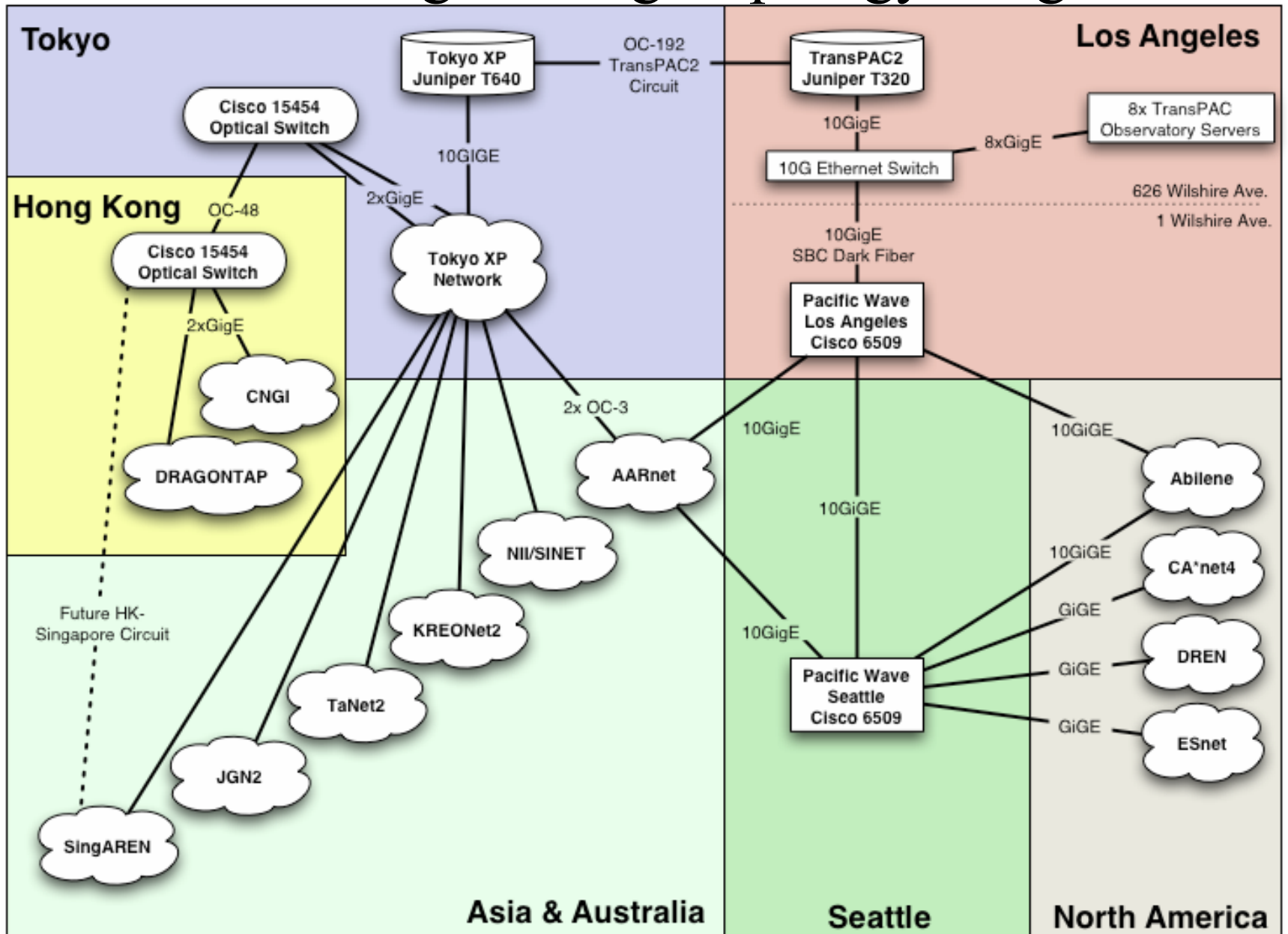
# TransPAC2 Engineering Topology

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- TransPAC2 OC-192 connects APAN Tokyo XP with TransPAC2 router in Los Angeles
  - LA TransPAC2 router maintains BGP peering with North American R&E Networks
  - Connectivity in US via Pacific Wave Ethernet Exchange Point
  - Pacific Wave nodes in LA and Seattle interconnected via 10GigE lambda on National Lambda Rail network
- Tokyo-Hong Kong connectivity via OC-48 circuit
  - Cisco 15454 SONET switches multiplex two GigE circuits to provide connectivity to both Hong Kong Exchange Points
- Hong Kong-Singapore link details to be worked out



# TransPAC2 Engineering Topology Diagram



# TransPAC2 Service Goals

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- Provide production networking to facilitate research cooperation between the US and Asia
- Cooperation with Internet2 HOPI project
  - US-Asian cooperation on “lightpath” technologies will be crucial in future development
  - Initial assets will allow for MPLS and GMPLS-like experimentation, with future equipment possibly supporting layer 2 and layer 1 services
- Security coordination
- Measurement coordination
- AAI development



# TransPAC2 Current Status

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- TransPAC2 has received NSF funding (SCI-0441096)
- James Williams – Indiana University –Principal Investigator
- Douglas Van Houweling – Internet2 – Co-PI
- APAN network owners are committed to the TransPAC2 effort.
- Purchase of OC-192c services is complete.
- OC-48 between Tokyo and Hong Kong is in place.
- Purchase of US end equipment to be located in Los Angeles is complete.
- We expect the OC-192 to be active 5/1/2005



# Interesting networking observations

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- The “bandwidth problem” between the US and Asia has been solved! >60Gbps available as of 4/1/05.
- The “access problem” within Asia continues. The Tien2 Project is one effort to address this problem.
- The “north-south” problem within Asia continues.

Now we have to address the network service infrastructure and scientific collaboration problem.



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