A Pacific View of International Networking

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(with A LOT of help from my friends!)
Pacific Wave International Connections
Pacific Wave: Flexible International Connectivity

- Pacific Wave is a joint project between CENIC and the Pacific Northwest Gigapop (PNWGP)
- Pwave pioneered a novel architecture, an open distributed exchange
- Participants at any PWave connection point (LA, Sunnyvale, Seattle) can interconnect in multiple transparent ways of their own choosing using
- PWave sites support: layer 2 interconnect (private VLANS); layer 3 peering over layer 2 infrastructure (VLANS); layer 2 peering over a layer 1.5 interconnect (SONET/SDH, Internet2/DCN)
The GLIF is a virtual organization that provides lambdas internationally as an integrated facility to support data-intensive scientific research, and supports middleware development for lambda networking.

www.glif.is

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Pacific Wave GOLE
Current NSF International Research Network Connection Projects

- Global Ring Development for Advanced Application Development (GLORIAD) & (GLORIAD-Taj)
- TransPAC/APAN
- Western Hemisphere Research and Education Networks (WHREN)
- TransLight/StarLight
- TransLight/Pacific Wave
TransLight Pacific Wave Proposal Pending

Map courtesy of FIU/Ampath
Looking Ahead

- More 10-Gbps connections expected
- More dynamic provisioning of capacity
- Integration of 40- and 100-Gbps technologies as appropriate
- Continuing focus on R&E applications, service to communities
- Connecting more of the developing world...
The Pacific is one of the last regions of the world with no initiative to develop a regional Research & Education Network. Historically, infrastructure limitations have made serious networking infeasible. New network infrastructure being implemented over the next two years will provide the Pacific with the first real opportunity to join the global R&E Network community.
Pacific Islands View of Fiber Systems
Benefits of R&E Networking in the Pacific

- Expand distance learning opportunities and improve educational capacity: Business, Health Care, Education, Science / Technology / Engineering / Math (STEM)...
- Develop workforce for local telecommunications and ICT industries
- Enable economic development through new information- and communications-based opportunities
- Build community demand for higher speed broadband and sponsorship for higher capacity infrastructure
- Support strategic research
  - environmental studies, climate change & sea level rise, island sustainability, cultural preservation, agriculture, public health, coral reef, disaster management, fisheries...
New Connection Opportunities

Currently available fiber
- AU - Fiji/USP – Hawaii – Seattle @ 155Mbps
- Guam – Hawaii
- New Caledonia – AU
- Hawaii - American Samoa – Samoa

Fiber projects underway
- French Polynesia – Hawaii
- Pohnpei & Majuro – Guam

Fiber projects under consideration
- PNG, Solomons – Guam & AU (via PIPE)
- Tonga – Fiji (WB, ADB)
- Vanuatu – Fiji or New Caledonia

Plus O3B Satellite
- MEO / Ka Band
- High Speed
- Low Latency
- Extensive Pacific Coverage
Possibilities

Univ of Hawaii & PWave via Honotua

Berkeley, NSF, U.S. Stakeholders

Univ of French Polynesia (Tahiti)

Renater (France)

AARNet via Gondwana

Univ of New Caledonia

Gump Station (Moorea)

Gump Facilities
Possibilities

American Samoa Comm College

National University of Samoa

Univ of Hawaii, PWave & Beyond
New global satellite system designed to serve the “Other 3 Billion”

Medium Earth Orbit (MEO) / Ka Band
- Lower latency (8000 km – 120 ms)
- Higher speeds (gigabit-class connections)
- Native IP

Funding mostly locked down (Google, HSBC, Liberty, SES, France)

Inherent global coverage
Stakeholders for a Pacific R&E Network

- Pacific colleges and universities: PPEC...
- PITA members
- Pacific research institutions
- Owners of the new infrastructure (Cable, Satellite systems)
- Pacific Island governments & leaders
- Pacific Islands Forum
- Existing R&E Networks in the U.S., Australia, NZ, France, Japan: Internet2, AARNet, KAREN, Renater, WIDE...
- PacNOG, PICISOC, NSRC, APNIC...
- National and international development agencies: AUSAid, JICA, WorldBank, ADB...
Questions? Suggestions? Ideas?

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