APAN Asia-Pacific Advanced Network

APAN Update

Shigeki Goto
APAN Chair

APAN Asia-Pacific Advanced Network

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APAN Asia-Pacific Advanced Network

Short History of APAN

1996.3 The idea of "APAN" was born at APEC Symposium in Japan, inspired by Dr. Steve Goldstein.

<Kilnam Chon@KAIST & Michael McRobbie@ANU took the lead for realizing the regional broadband networks, APAN.>

1997.6 APAN was established, chaired by Kilnam Chon.

1997.8 Michael McRobbie@IU submitted "TransPAC" proposal to NSF's HPIIS solicitation.

1998.8 TransPAC was granted as an HPIIS project.

<APAN expanded the members as well as the networks.>

2004.6 Most APAN members joined an IU-lead proposal for NSF's IRNC solicitation.

2004.7 Shigeki Goto was elected APAN Chair.

APAN Asia-Pacific Advanced Network

Management Team

Chair: Shigeki Goto (JP)

Vice Chairs: Jianping Wu (CN)
George McLaughlin (AU)
Dae Young Kim (KR)

Treasurer: Lawrence Wong (SG)

Managing Dir.: Wanchai Rivepiboon (TH)

Secretary: sec@apan.net

APAN Asia-Pacific Advanced Network

APAN Members

- Primary Members (15)
  AU, CN, HK, JP, KR, SG, MY, TW, PH, LK, TH, BD, IN, NZ, PK
- Associate Members
  TransPAC, PWAVE
- Affiliate Members
  APNG, APRU, APBioNet, etc.
- Liaison Members
  CANARIE, DANTE, TERENA, Internet2, CLARA
- Industry Members
  Cisco, Juniper

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Example: APAN-JP members

- MIC, internal affairs and communications NICT
- MOE, education culture sports and science and technology NII
- METI, economy trade and industry AIST
- MAFF, agriculture forestry and fisherly MAFFIN
- MHLW, health labor and welfare NCC
- WIDE

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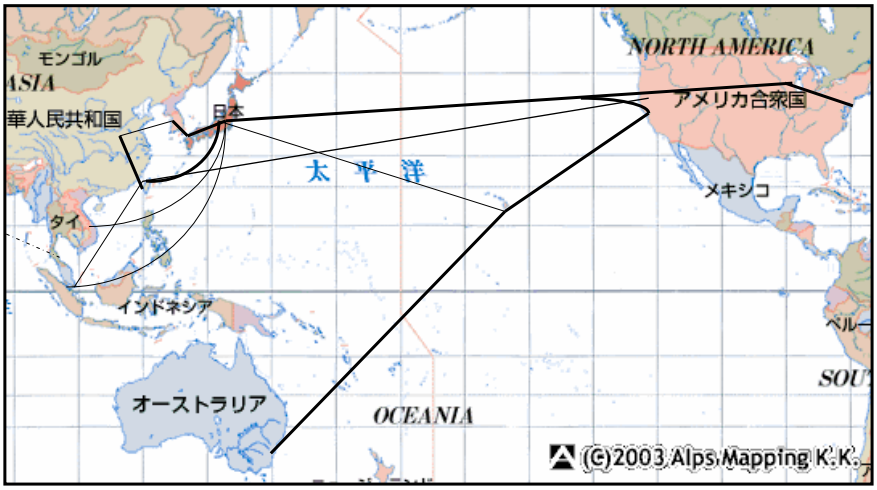
APAN Network Topology



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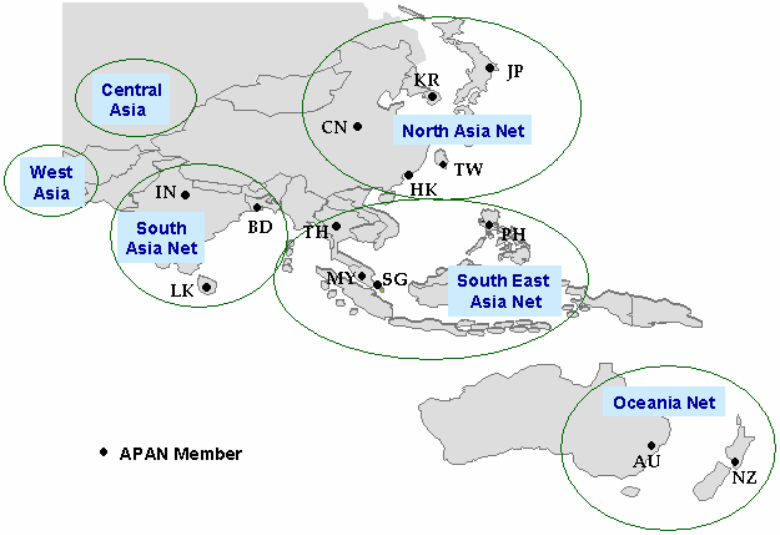
APAN Regional Groups



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APAN Link Info (#1)

Countries	Network	Bandwidth(Mbps)	AUP/Remark
AU-US (thru Suva-HNL-Seattle)	AARNet	155	R&E and commodity
AU-US (Seattle)	AARNet	155	R&E and commodity
AU-US (Palo-Alto)	AARNet	622	R&E and commodity
AU-US (LA)	AARNet	622	R&E and commodity
AU-US (HNL-Seattle)	AARNet	10 Gbps	R&E
AU-US (LA)	AARNet	10 Gbps	R&E
CN-HK	CSTNET-HKIX	1 Gbps	R&D
CN-US	GLORIAD / CSTNET-STARLIGHT	155	R&D
CN-RU	GLORIAD / CSTNET-RRC Kurchatov	155	R&D
CN-JP	CERNET-CIAJ	45	R&E
CN-UK	CERNET-JANET	45	R&D
CN-US	CERNET-STARLIGHT	45	R&D
CN-HK	CERNET-HARNET	155	R&D
CN-TW	CERNET-ASNET/TANET	100	R&D
HK-US	HARNET	45	R&E
HK-TW	HARNET/TANET/ASNET	100	R&E
ID-ID	AI3 (ITB-UNIBRAW)	0.128/0.128	R&E and commodity
IN-US/UK	ERNET	70	R&E
JP-CN	NICT-CERNET	1 Gbps	R&E
JP-CN	NICT-CSTNET	1 Gbps	R&E
JP-ID	AI3 (ITB)	0.5/1.5 (From JP / To JP)	R&E and commodity
JP-KR	APII	2 Gbps	R&E
JP-LA	AI3 (NUOL)	0.128/0.128 (From JP / To JP)	R&E and commodity
JP-LK	AI3 (IOIT)	0.5/0.5 (From JP / To JP)	R&E and commodity

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APAN Link Info (#2)

Countries	Network	Bandwidth(Mbps)	AUP/Remark
JP-MY	AI3 (USM)	0.5/0.5 (From JP / To JP)	R&E and commodity
JP-PH	AI3 (ASTI)	0.5/0.5 (From JP / To JP)	R&E and commodity
JP-PH	MAFFIN (ASTI)	6	R&E
JP-SG	AI3 (TP)	0.5/0.5 (From JP / To JP)	R&E and commodity
JP-TH	AI3 (AIT)	0.5/1.5 (From JP / To JP)	R&E and commodity
JP-TH	SINET (ThaiSarn)	45	R&E
JP-US	IEEAF	10 Gbps+622	R&E
JP-US	JGN2	10 Gbps	R&E
JP-US	SINET	10 Gbps	R&E
JP-Any	AI3 UDL links (* listed below)	9	R&E and commodity
KR-CN	APII-CERNET	155	R&E
KR-CN	KREONet2-CSTNET	155	R&E
KR-US	KREONet2/APII	2*622	R&E
KR-FR	TEIN	155	R&E
MY-SG	NRG/SICU	2	Experimental
SG-US	SingAREN	155	R&E and commodity
TH-NP	AI3 (AIT-TU)	0.128/0.128	R&E and commodity
TH-US	UniNet	155	R&E
TW-JP	ASNET/TANET	622	R&E
TW-HK	ASNET/TANET/TWAREN	622	R&E
TW-SG	ASNET/SingAREN	155	R&E
TW-US	ASNET/TANET/TWAREN	6.6 Gbps	R&E
(TW)-US-NL	ASNET/TANET/TWAREN	2.5 Gbps	R&E
US-JP	TransPAC	2.4 Gbps	R&E
US-JP	U-Hawaii (NCC)	155	R&E

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Links between JP and US

4 x 10Gbps!

- TransPAC2 Layer 3 link and JGN2 link are the main JP-US links.
- SINET Layer 3 link provides the backup service for JP-US.
- IEEAF 8 X GbE links are for GLIF project.

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Collaborations among multiple Links between JP and US

- The links have their own objectives as well as the policies, defined by the budget.

  APAN-JP is using 3 JP-US links as the following preferences: TransPAC, JGN2 and SINET.
- Integrated network environments will be discussed by the engineers, followed by the understandings of the administrators to meet the users' requirements .
- HOPI will be adopted for the smooth developments to Lambda Networks.

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Eample: collaboration

SC2004

Nov. 6-12, 2004 in Pittsburgh

- Five groups participated in the Bandwidth Challenge.
- One group, e-VLBI made the global demonstration.

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SC2004 Bandwidth Challenge

- **Three groups got the awards**, and one group assisted the award:
  - (1) Univ. of Tokyo: Third Generation Data Reservoir
    - Award: Single Stream, Longest Path, Standard MTU TCP Throughput
    - Description: 7.2 Gb/s around the world
  - (2) Kyushu Univ., KISDI & CERNET: Showing Bandwidth of CJK (China, Japan, Korea)
  - (3) JAXA: Effective Rapid Remote File System For Supercomputer Users Who Are Not Network Expert
  - – UIC assisted by JGN2 Kyushu: National Center For Data Mining SC04 Bandwidth Challenge

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Third Generation DR

Network used in the experiment

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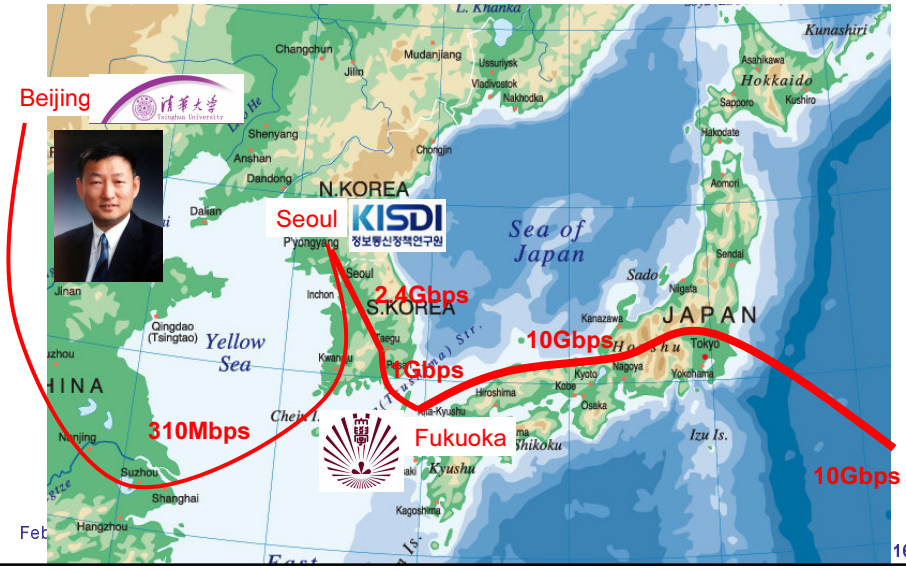
CJK Bandwidth Challenge

The Network Topology (L1)



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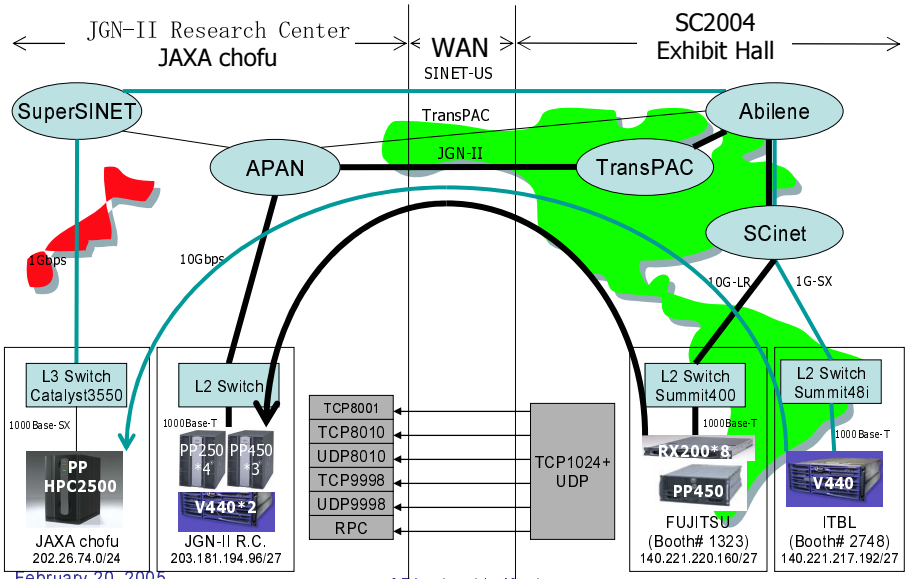
Remote File System at SC2004



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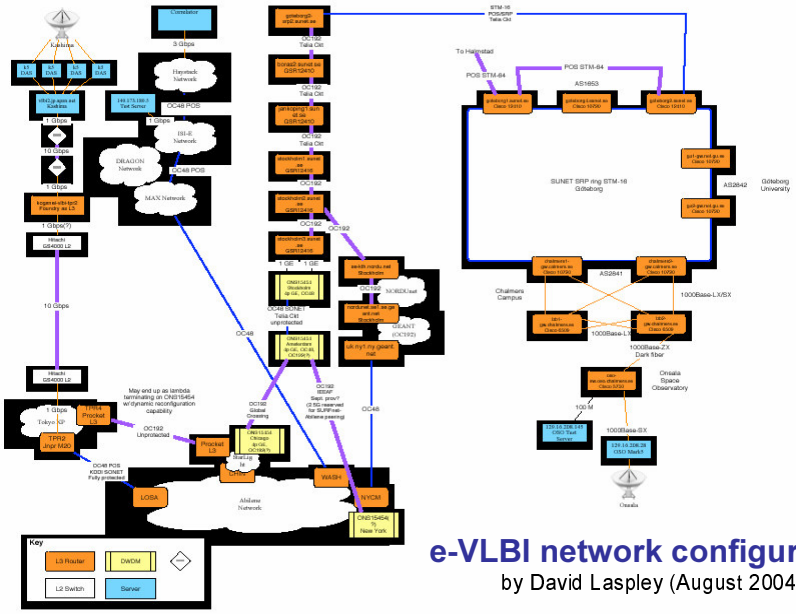

e-VLBI network configuration

by David Laspley (August 2004)

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Observatory: Measurement Infrastructure

1. Performance Measurement
   - Throughput
   - One-Way Latency
2. Flow Analysis
   - P2P traffic, inter-AS traffic, etc.
   - Security tools
3. Usage
   - High Resolution: SNAPP by Global NOC
4. Others

   Router, Routing, Syslog, etc.

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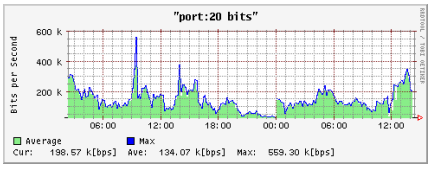
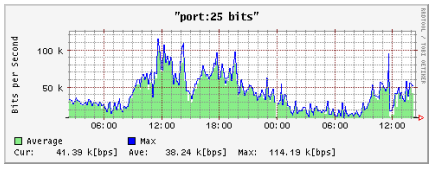
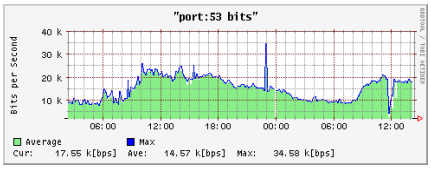
Flow Data with Observatory



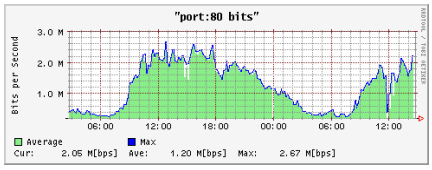
ftp-data



smtp



DNS



http

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NSF's IRNC projects

- APAN is a loosely-coupled network consortium, and multiple NSF's IRNC projects will be granted to APAN members:
  - TransPAC2: APAN-JP & most APAN members lead by Indiana Univ.& Internet2
  - Gloriad: CSTNet & KREONet2 lead by Greg Cole@UTK
  - Pacific WAVE: AARNet & U-Hawaii lead by USC
- These projects are required to have the good collaborations.
- All groups will surely work together under the flag "APAN", though we might belong to different IRNC projects.

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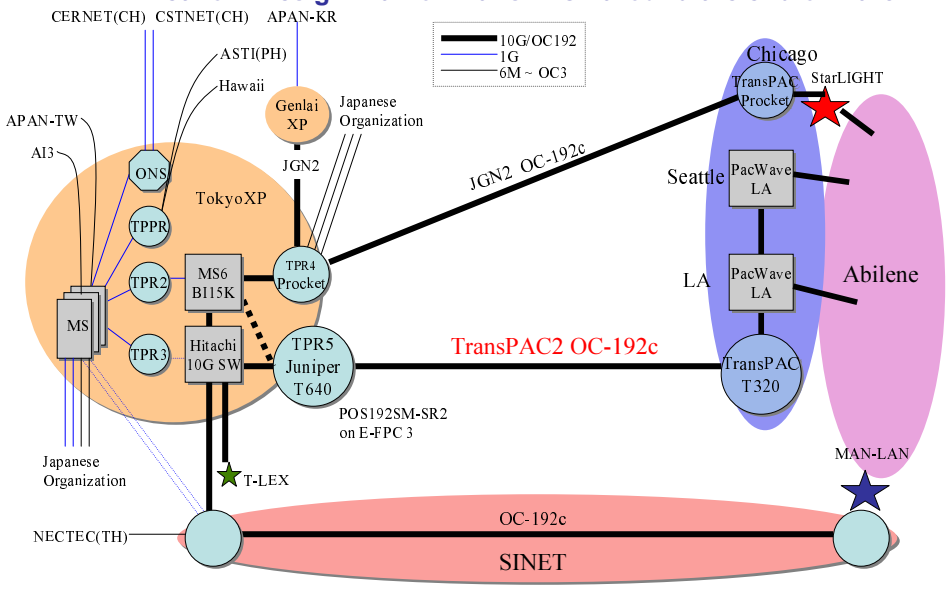
Network Design Plan of TransPAC2 around the end of March



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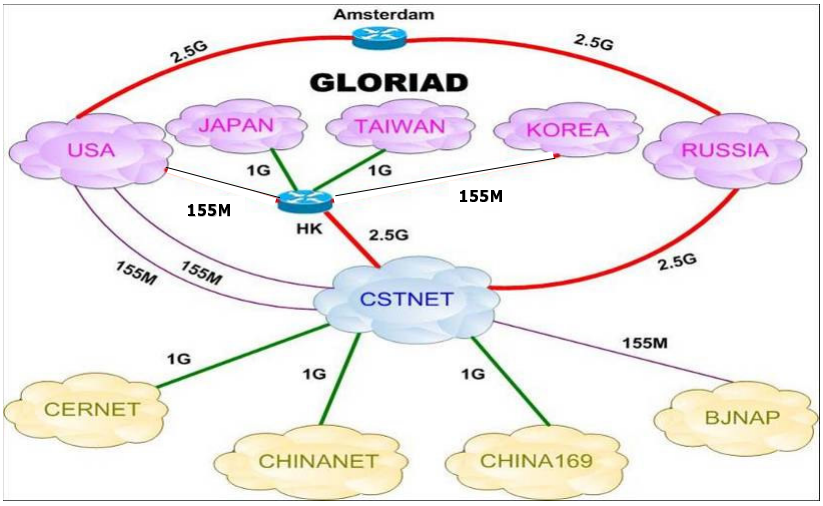
CSTNet Internet Connections (today)



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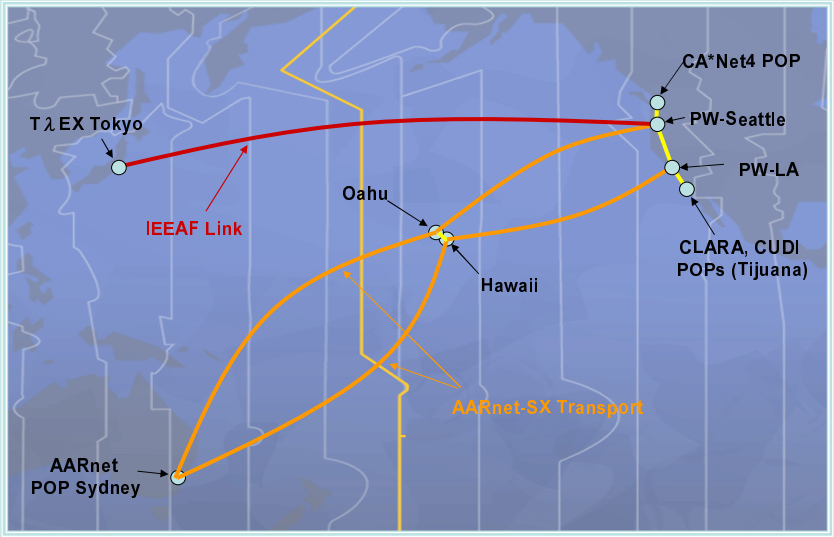
TransLight / Pacific WAVE



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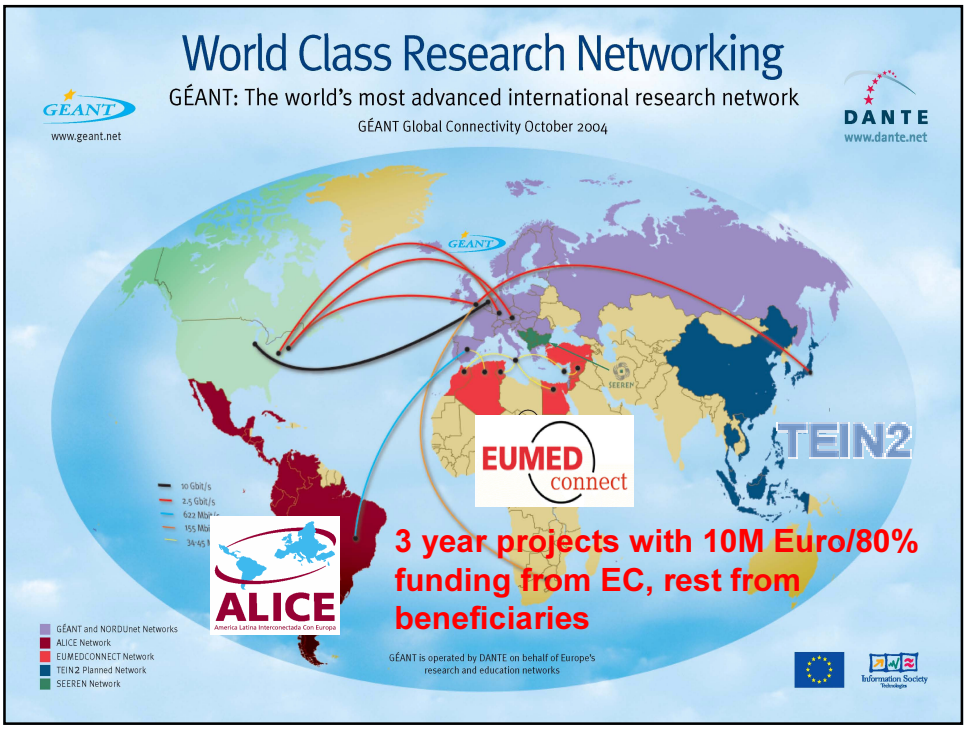
Collaborations have started:
TransPAC2 and Gloriad

- Routes “RU-Beijing-HK-Tokyo-US” will be established.
- Joint research projects between Russia and Japan will be promoted. 16 joint research projects are listed:
  - 6 HEP projects
  - 6 Global environment projects
  - Others (Science Policy, e-VLBI, Biology, Distance Learning)



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TEIN2 Project

Objective: To improve SEA intra-regional and global connectivity

Partners:

- China (CERNET)
- Indonesia (ITB)
- Malaysia (MDC)
- Philippines (ASTI)
- Thailand (ThaiREN)
- Vietnam (MOST)
- Korea (KISDI)
- Singapore (SingAREN)
- Australia (AARNet)
- France (RENATER)
- Netherlands (SURFnet)
- UK (UKERNA)
- DANTE

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Planned activities

- Network procurement underway:
  - Connectivity tender responses mid Feb
  - NOC tender responses April
  - Equipment donation sought
- Contracts Q2/3, operational Q4 2005 (to end 2007)
- Exploring collaborations with existing and planned initiatives

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APAN Meetings

No.	Date	Place	Participants /Economies
18th	2004.7.2-7	Cairns	306/28
19th	2005.1.24-28	Bangkok	341/22
20th	2005.8.23-27	Taipei	?
21st	2006.1.23-27	Tokyo	?

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19th APAN Meetings in Bangkok

Date: 2005.1.24-28
Venue: The Amari Watergate Hotel, Bangkok

Schedule:

1.24 (Mon) - 1.25 (Tue) Tutorials
1.25 (Tue) Reception (evening)
1.26 (Wed) Plenary (am)
1.24 (Mon) - 1.28 (Fri) Workshops (Network Technology, Application Technology, Natural Resource/ e* etc.)
1.24 (Mon)- 1.28 (Fri) WG and Committee meetings
1.28 (Fri) Special Session and General Assembly

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19th APAN Meetings in Bangkok

January 24 - 28, 2005

Total Number of Participants
= 341 from 22 economies

(Data provided by the local organizing committee)

Details:

AU - 10 / BD - 3 / CA - 3 / CN - 14 / GB - 2 / ID - 2 / IN - 4 / IT - 1
JP - 63 / KR - 14/ LK - 2 / MY - 14 / NL - 2 / NP - 1 / NZ - 2 / PH - 3
PK - 2 / SG - 7 / TH - 152 / TW - 19/ US - 20/ YE - 1

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20th APAN Meetings in Taipei

- **Date:** **Tuesday ~ Saturday, 23~ 27 August, 2005**
- **Venue:** **Howard Plaza Hotel, Taipei**
- **Local Contact:** **Academia Sinica Computing Centre (Secretariat)**
  - **Stella Shen, stella@ccweb.sinica.edu.tw**
  - **Vicky Huang, vichuang@ccweb.sinica.edu.tw**

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References

1. APAN: www.apan.net or www.jp.apan.net
2. History: http://apan.net/meetings/cairns2004/presentation/assembly-mcrobbie.ppt
3. JGN II: http://www.jp.apan.net/meetings/0407-cairns/JGN2.ppt
4. SINET: http://www.sinet.ad.jp/english/index.html
5. e-VLBI: http://www.jp.apan.net/meetings/040831-noc/masaki.ppt
6. DR: http://data-reservoir.adm.s.u-tokyo.ac.jp/
7. SC2004: http://www.sc-conference.org/sc2004/awards.html
8. Observatory: http://www.jp.apan.net/NOC/Observatory/