Asia Pacific Advanced Network

2005.5.24.

Dae Young KIM
APAN vice-Chair
ANF Chair

APAN Asia Pacific Advanced Network

Agenda

1. APAN
   - ❖ History , management & Meetings
   - ❖ APAN regional networks
   - ❖ IRNC
   - ❖ Applications

2. ANF Activities
   - ❖ Korea's Global Links
   - ❖ HEP WG activity & applications

APAN History

❖1996.3   The idea of "APAN" was born at APEC

   Symposium in Japan, hinted 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

Management Team

Chair: Shigeki Goto (JP)

Vice Chairs: Jianping Wu (CN)

                     George McLaughlin (AU)
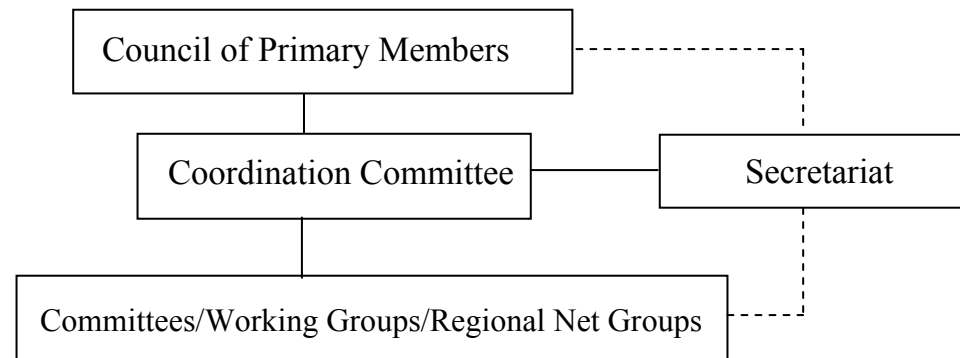
                     Dae Young Kim (KR)

Auditor: Lawrence Wong (SG)

Dir. of Sec.:   Wanchai Rivepiboon (TH)

APAN

Structure

❖Governance/Committee Structure

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┌─────────────────────────────────┐
│   Council of Primary Members    │- - - - - - ┐
└─────────────────────────────────┘           │
                 │                             │
         ┌───────────────────────┐   ┌──────────────┐
         │ Coordination Committee │───│  Secretariat │
         └───────────────────────┘   └──────────────┘
                 │                             │
┌──────────────────────────────────────────────────┐
│ Committees/Working Groups/Regional Net Groups      │- - ┘
└──────────────────────────────────────────────────┘
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Committee	Working Groups	Regional Net Groups
NOC, Backbone Election, Event IPv6 TF, CCIRN	Application Tech Area Net. Tech. Area Net. Research Group Natural Resource Area	North Asia Net Group South East Asia Net G. South Asia Net G. Oceania Net G.

APAN

ICFA Workshop 2005 in Daegu

Working Groups

❖ Application Tech.
  - Education , Multimedia, HDTV, eScience WG

❖ Network Tech.
  - IPv6, Measurement, Satellite, Security,
    SIP H.323 WG
  - Lambda BoF

❖ Network Research Group

❖ Natural Resource Area
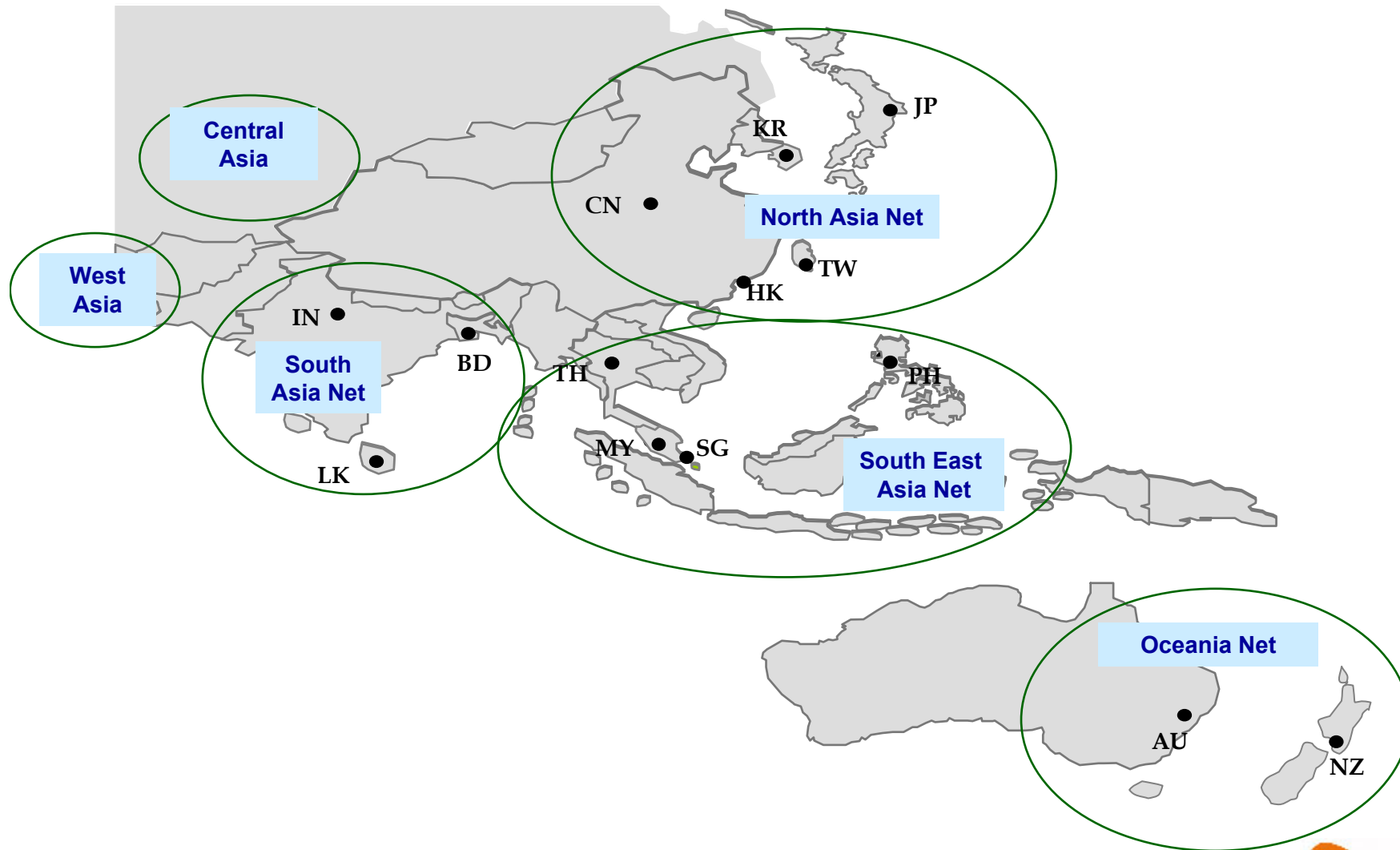 - Agriculture , Earth Monitoring, Earth System WG

APAN

Meetings in 2005

❖ 19th APAN meeting
  - 2005. 1.24 ~ 28
  - Amari Watergate Hotel, Bangkok, Thailand.
  - 341 delegates from 22 economies
  - Tutorials, Workshops
  - WG, Committee meetings

❖ 20th APAN Meeting
  - 2005.8.23 ~ 27
  - Howard Plaza Hotel, Taipei, Taiwan

APAN

Regional Networks

North Asia

North Asia is the core region of APAN:

- fat intra-regional pipes shown left

- inter-regional links of APAN

- backbone links to USA

  JP: *TransPAC*. JGN2, SINET, **IEEAF**

  TW: TWAREN

  KR: APII/KREONet2

  HK: *Gloriad*

- peering with DANTE

  KR:APII/KOREN(TEIN)

  ??: *TEIN2*

< Blue links are (co-)funded by US or EU.>

South East Asia

Bangkok ◎

Kuala Lumpur ◎
◎ Singapore

South East Asia networks are developing.

Inter-regional links are provided by North Asia.

Each country has her own link to US; some are commercial links.

SG, MY and TH are working for intra-regional links, meeting with TEIN2.
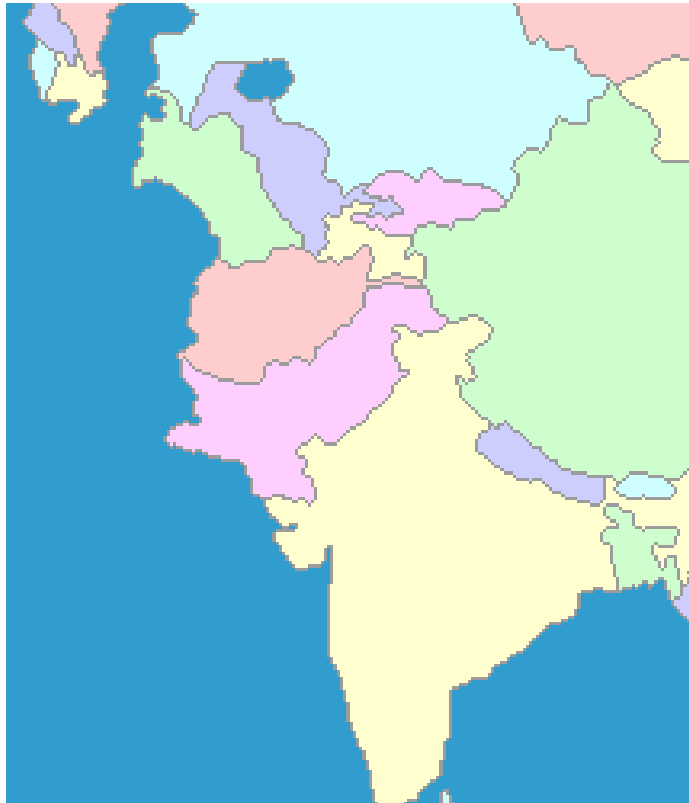
Satellite links are required to cover islands.

APAN

Oceania

AARnet has the fat pipes to USA, via Hawaii (10G)

The link to APAN is via Hawaii or USA.

The direct link between AU and JP is being studied by both governments.
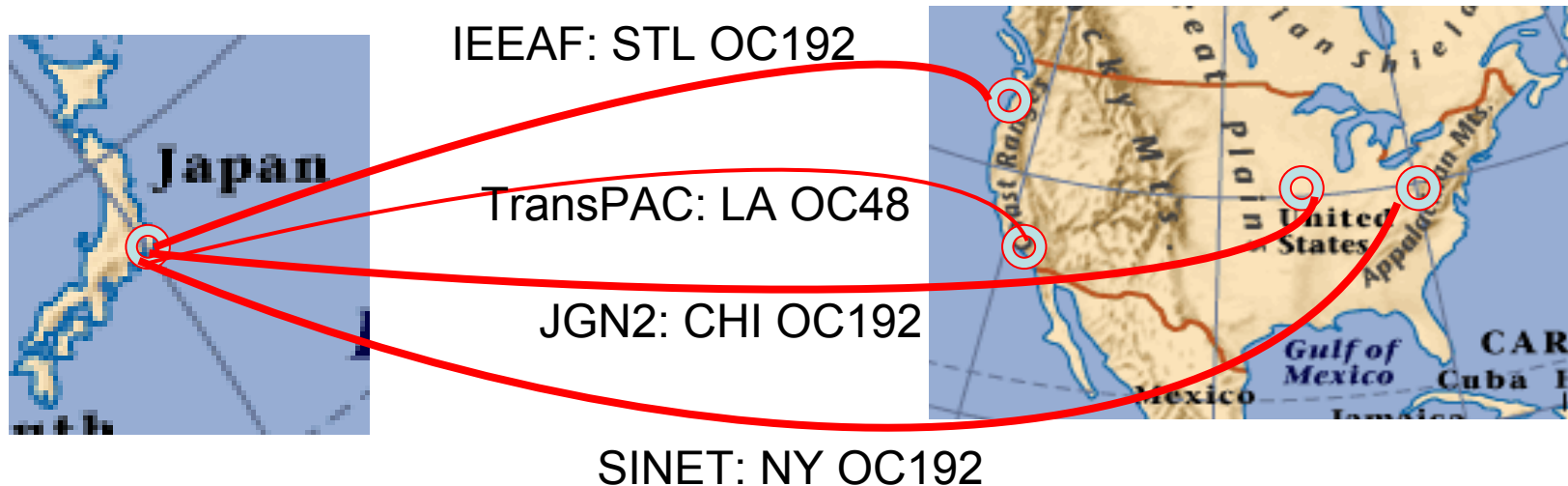
APAN

Other regions

- North Asia will make efforts to connect these regions, together with South East Asia; satellite links might be a solution at the initial phase.

- Efforts from EU & US are also expected.

APAN

Links between US and JP

IEEAF: STL OC192

TransPAC: LA OC48

JGN2: CHI OC192

SINET: NY OC192

- TransPAC Layer 3 link and JGN2 link are the main APAN links.

- SINET Layer 3 link will provide the backup service for APAN.

- IEEAF 8 X GbE links are for GLIF project.
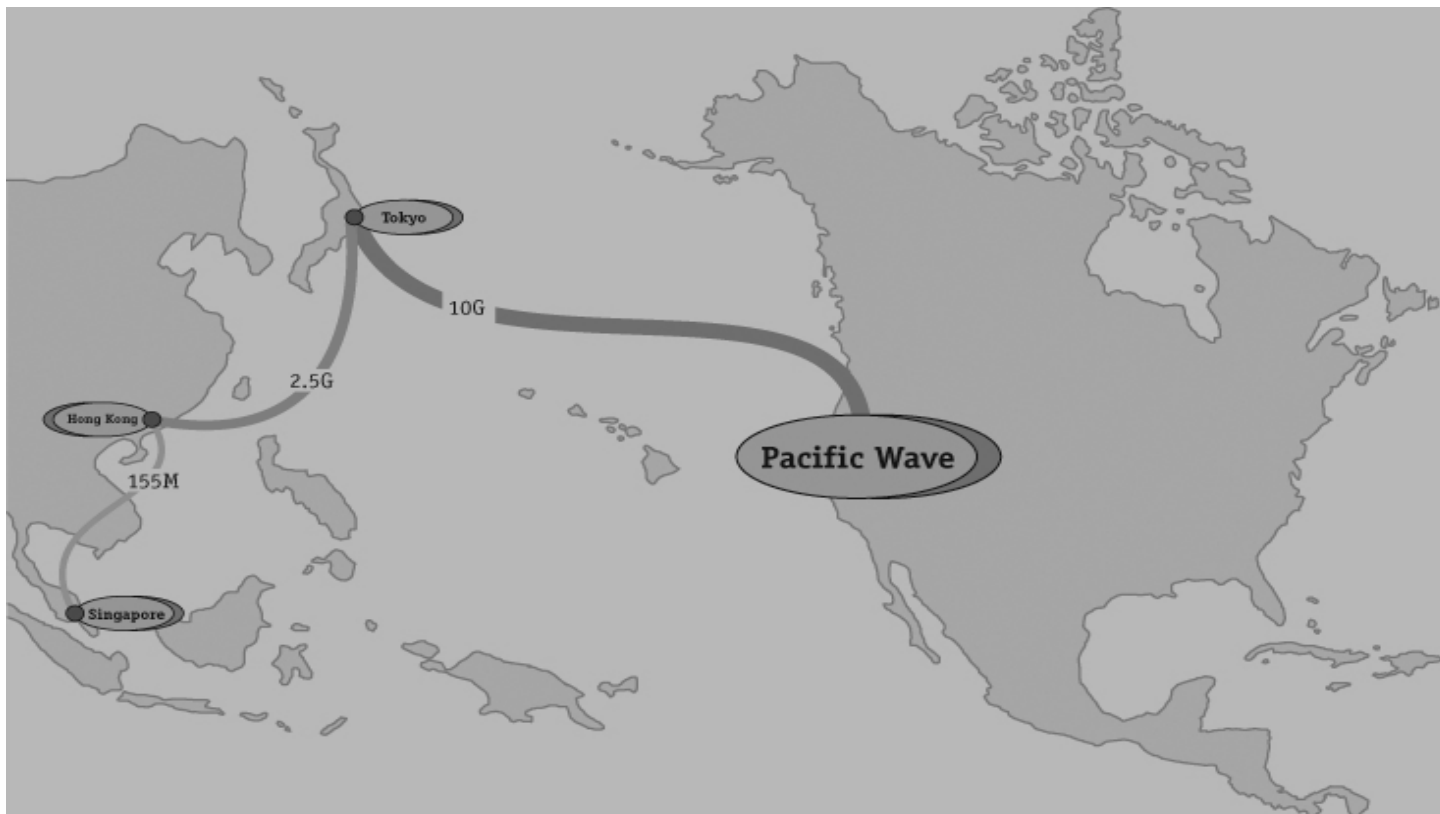
APAN

IRNC

❖APAN is a loosely-coupled network consort
ium, and didn't adopt a single proposal to N
SF's IRNC solicitation.

  - APAN-JP & most APAN members have joined a
  proposal led by Indiana Univ., TransPAC2

  - CSTNet & KREONet2 have joined NCSA's propo
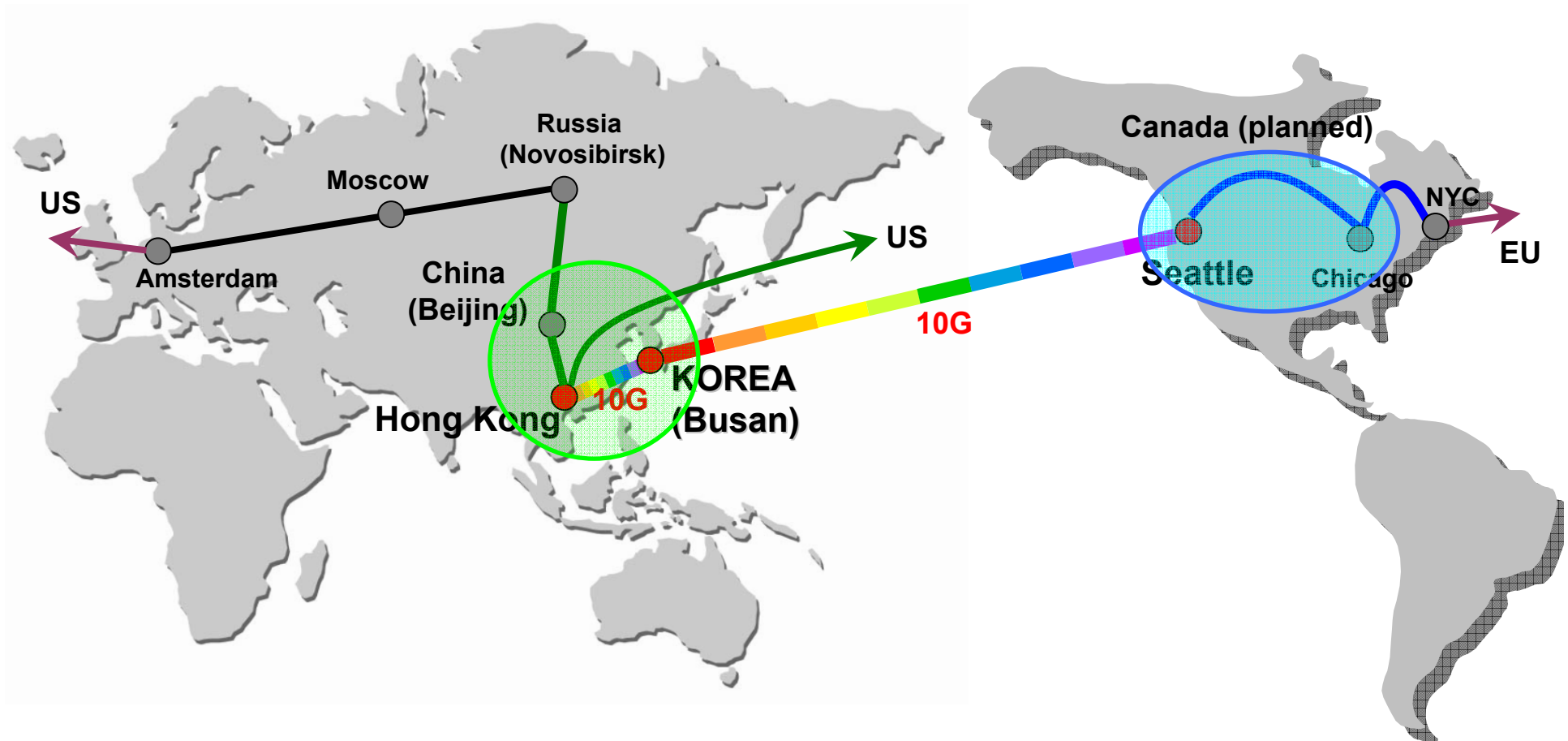 sal, Gloriad.

  - AARNet & WIDE have joined UIC's proposal.

TransPAC2

❖Encourages scientific collaboration between researchers in Asia and the US

❖ High-performance connectivity across the Pacific Ocean (OC-192)

❖ Assist development of inter-asia backbone (Tokyo-Hong Kong-Singapore or beyond)

Gloriad

TEIN2

❖Inter-regional network
 - Enhance global connectivity (2nd phase)
 - Establish intra-connectivity (1st phase)
 - Avoid cost duplication & promote R&A activities
   jointly, in a more widened way

❖ Cooperation/coordination
 - TEIN2: TC2(Mar in SG), TC3(May in KR)
 - Transpacific : IRNC collaboration(TransPAC2)

❖TEIN2 Ph1 completed & endorsed @ EC
   - 9 APEC Economies: KR, JP, SG; CN, ID, MY, PH, TH, VN
                      + EU & APAN...
   - promote & support inter-regional and intra-regional,
     esp for LDCs ("direct beneficiaries")

APAN

GRAPE-Data Reservoir 2004 Experiments

❖**Disk to disk data transfer speed**
  - Full utilization of 10Gbps for iSCSI disk transfer
  - High-speed disk to disk data transfer

❖**TCP network speed record**
  (single and multiple stream)

❖10Gbps NIC

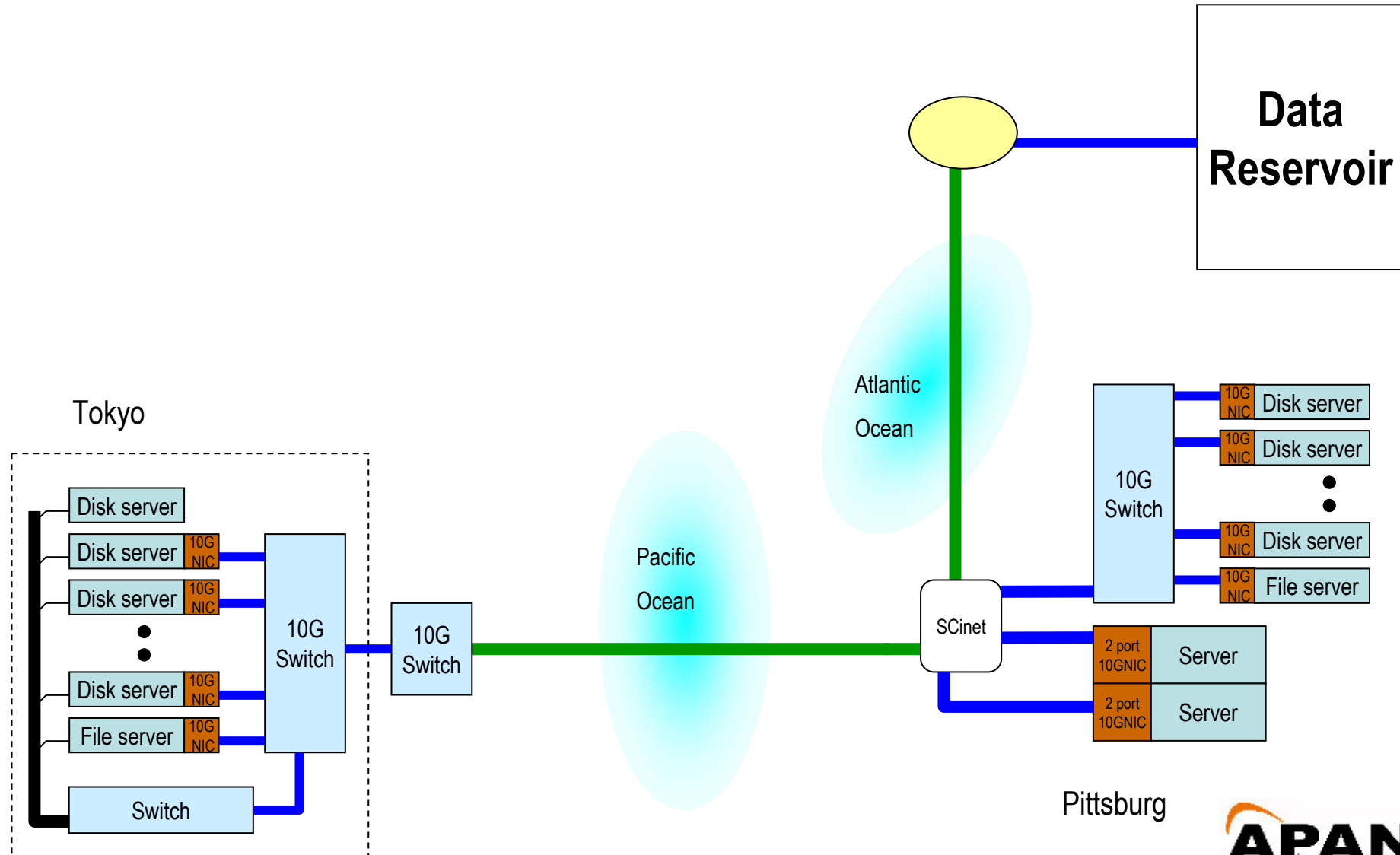❖Parallel TCP optimization for LFN (Long Fat Pipe Net work)
  -FPGA (Field Programmable Gate Array) based
    hardware approach
  - Software approach

❖Dual ported FPGA based intelligent NIC
  - Developed by Univ. of Tokyo

APAN

DR demo at SC2004

Data Reservoir

Atlantic
Ocean

Pacific
Ocean

Tokyo

Disk server
Disk server | 10G NIC
Disk server | 10G NIC
Disk server | 10G NIC
File server | 10G NIC

10G Switch

Switch

10G Switch

SCinet

10G Switch

10G NIC | Disk server
10G NIC | Disk server
10G NIC | Disk server
10G NIC | File server

2 port 10GNIC | Server
2 port 10GNIC | Server

Pittsburg

APAN

ICFA Workshop 2005 in Daegu

Uncompressed High Definition Video

❖ 1920x1080/60i

❖ 1.4 Gigabits per second

❖ That equates to 1 DVD being transmitted in both
   directions every 7 seconds
   Or 8.5 DVD's every minute

❖ First leg of 10 Gigabit SXTransport Link Sydney to
   Seattle activated and run at 30% capacity for 5 days
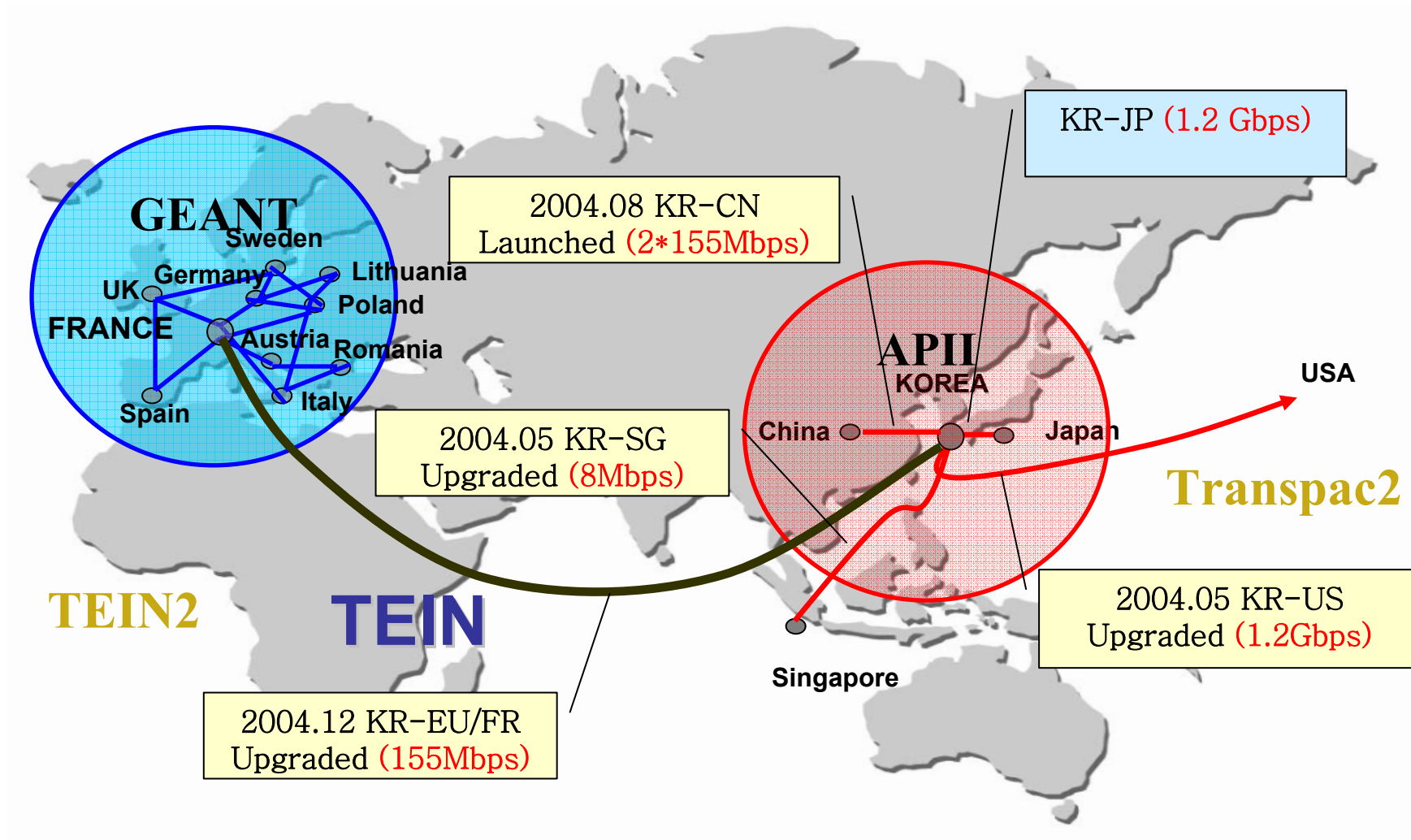   to support SuperComputing 2004

❖ Built from "off the shelf" components

APAN

Uncompressed HD demo

APII/TEIN

GEANT

Sweden
Germany | Lithuania
UK | Poland
FRANCE
Austria | Romania
Spain | Italy

2004.08 KR-CN
Launched (2*155Mbps)

KR-JP (1.2 Gbps)

APII
KOREA

China | Japan

USA

Transpac2

2004.05 KR-SG
Upgraded (8Mbps)

2004.05 KR-US
Upgraded (1.2Gbps)

TEIN2

TEIN

Singapore

2004.12 KR-EU/FR
Upgraded (155Mbps)

APAN

HEP Activities

❖ **HEP WG Goal**

  - Sharing experiment data taken from sites in domestic and abroad.

  - Active global collaboration

    with generating simulation data

❖ **Large File Transfer Activities**

  - KNU-Caltech (916Mbps)

  - KNU-CERN (930Mbps/v4,
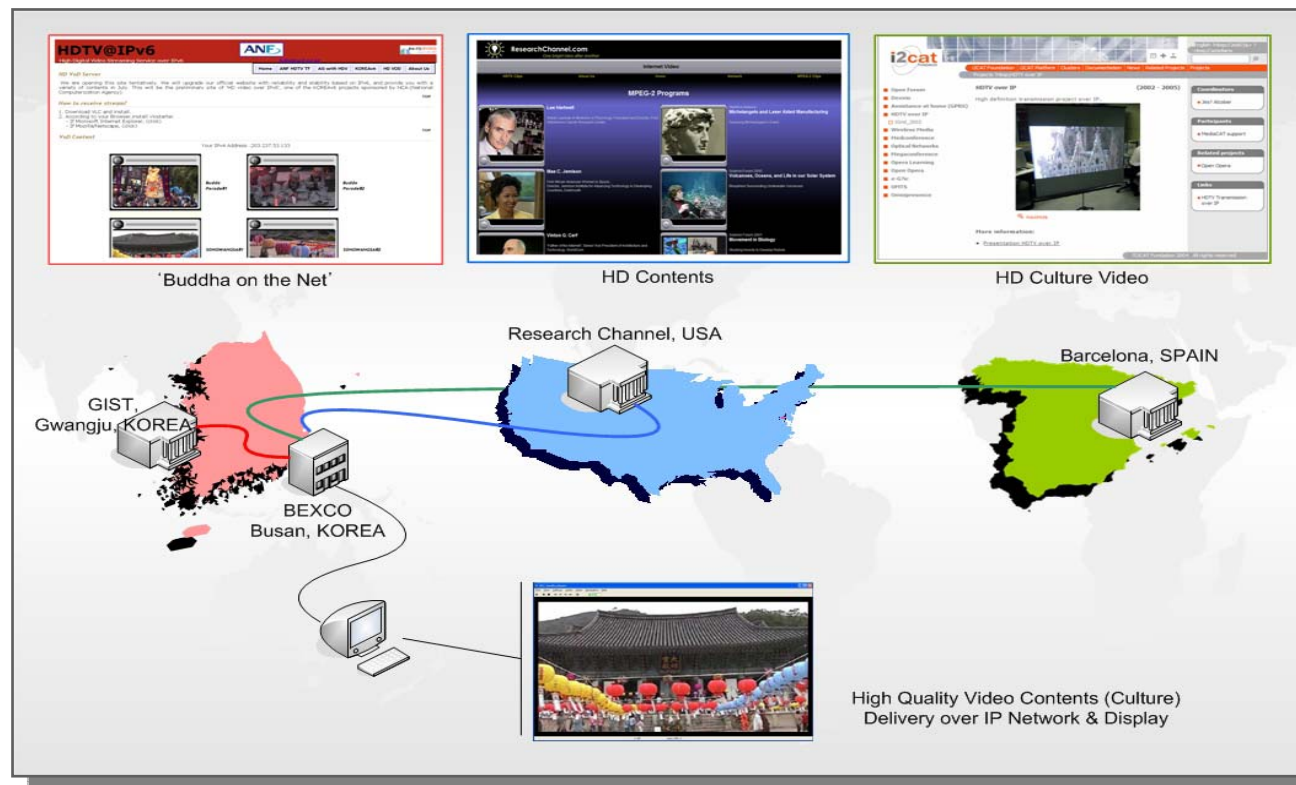
    800Mbps/v6)

  using FastTCP and TCP Reno

APAN

Digital Heritage Exchange

❖DVTS/HDTV over IP with KR, JP, US and other partners

APAN

DHX Activities

❖ 'Buddha on the net' VOD Service on KOREAv6
❖ ITU asia 2004 Demo
❖ 8th Advanced Network Workshop

eScience Applications

❖ HEP: KNU/CHEP
❖ Fusion/ITER: KBSI
❖ Virtual Astronomy/ SDSS: KAO, KIAS
❖ Atmospheric Science: KMA
❖ NEESGrid: SNU/KoCED
❖ Bio Informatics: KRIBB/KISTI
❖ OptiPuter: KISTI
❖ BIRN: KBSI/KAIST/KISTI
❖ Medical Science
❖ GeoScience
❖ Other Applications…..

APAN

Thank You !
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