

2-2 Asia-Pacific Information Infrastructure (APII) Testbed Project in Cooperation with JGNII

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APII Testbed Project is a joint project between Japan and Republic of Korea approved by APEC-TEL WG. Since APII Technology Center was established in CRL Kansai Advanced Research Center, Kobe City in 1997, this project has been conducting joint researches among countries in Asia-Pacific Region by using high speed R&D Internet that includes Korea-Japan APII Testbed of 1 Gbps initially starting from 2 Mbps.

Keywords

Internet, Research and development network, Asia-pacific information infrastructure

1 Introduction

Info-communications are beginning to play a crucial role in societal economic development. It is essential that we establish a cross-border information infrastructure in accordance with the globalization of info-communications in the Asia-Pacific Region taking into account societal, cultural, economic, and technological differences among the relevant countries. We are designating such an infrastructure as “APII”, an acronym for the Asia-Pacific Information Infrastructure.

The APII Technology Center was established at the CRL Kansai Advanced Research Center, Kobe City, in 1997 as the leading organization in APII construction. The APII Technology Center’s objectives are to promote international joint research and experiments in info-communications in the Asia-Pacific Region, with a particular focus on Internet technology, and also to contribute to the human resource development in the region[1].

2 APII Testbed Project

The APEC (Asia-Pacific Economic Cooperation) formed a Working Group to promote the APII Testbed Project. The Working Group consisted of Japan, the Republic of Korea, and the Republic of Singapore. The group agreed[1] in September 1997 to perform 12 joint experiments between Japan and Korea, and to perform nine joint experiments in February 1998 between Japan and Singapore. The joint experiments with Korea were conducted until March 2000 and those with Singapore were held until March 2001. A 2-Mbps network was also constructed in October 1997 to support these joint projects.

After the First Phase of experiments ended in March 2001, experiments between Japan and Korea continued by lease of the 8-Mbps submarine cable. Then, a new 1-Gbps submarine cable was laid between Kitakyushu and Pusan in January 2003, and Japan-Korea joint experiments were upgraded. Thirty-one joint projects of various types[1] were selected at the upgrade. The submarine cable is also connected to JGN2 domestic and international lines[2] and

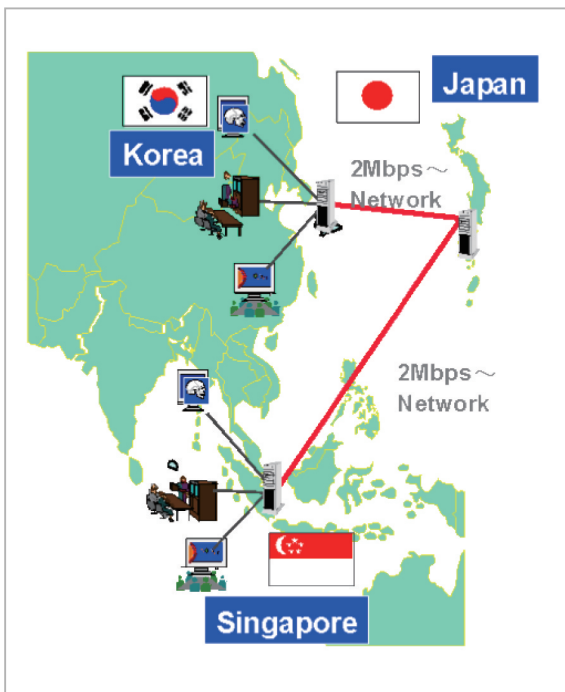


Fig.1 AP-II Testbed (First Phase)

linked to the AI3 satellite Internet[3]. Further, AP-II has developed cooperative relationships in various additional initiatives[5], including the NSF TransPAC2 project[4]. Resultant achievements are reported at the semiannual meeting of the Asia-Pacific Economic Cooperation Telecommunication & Information Working Group (APEC-TEL WG)[6].

Following are descriptions of some recent major experiments and demonstrations.

(1) Korea-Japan IP-Control Car Race 2003

At the CRL Open House Day on August 1 and 2, 2003, a racing event for remote-controlled (specifically, IP-controlled) model cars

took place through bi-directional transmission of DVTS images between CRL and Hanyang University in Korea[1].



Fig.3-1 Korean children (DVTS images)



Fig.3-2 Racecourse for IP-Control Car Race (Koganei site)

(2) Remote lecture experiment between Japan and Korea

In June 2003, an experimental remote lecture was given between Japan and Korea, using multi-site, bi-directional image transmission between Donga University (Korea), Makuhari Gigabit Research Center of the Telecommunication Advancement Organization (TAO), Hongo Campus of the University of Tokyo (Japan), and Tohoku University (Japan).

(3) Experiments on IP Streaming Delivery of HDTV

At the APAN Pusan meeting on August 15, 2003[5], HDTV transmission demonstrations were conducted connecting Portland, US, with the Pusan site at a transmission speed of 270-Mbps. Seventeen experiments were carried out simultaneously at the site.

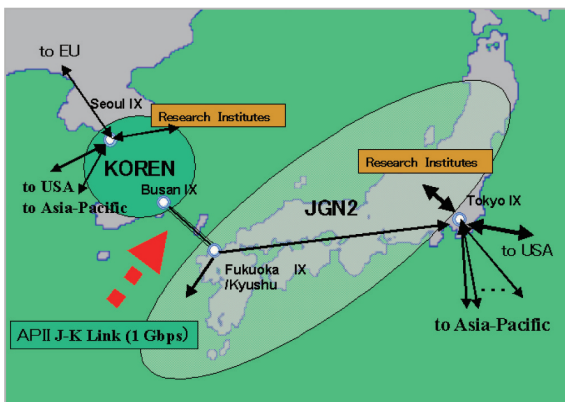


Fig.2 Configuration of present network

(4) Demonstrations between Korea, Japan, and Hawaii

At the 17th APAN Hawaii Meeting on January 26 and 27, 2004 [5], experiments were performed connecting Korea, Japan, and Hawaii by IPv4/v6 protocol. The experiments included demonstrations of IP-control car racing, Ruff Systems HDV transmission, HDTV telemedicine, and multicast DVTS delivery [1].

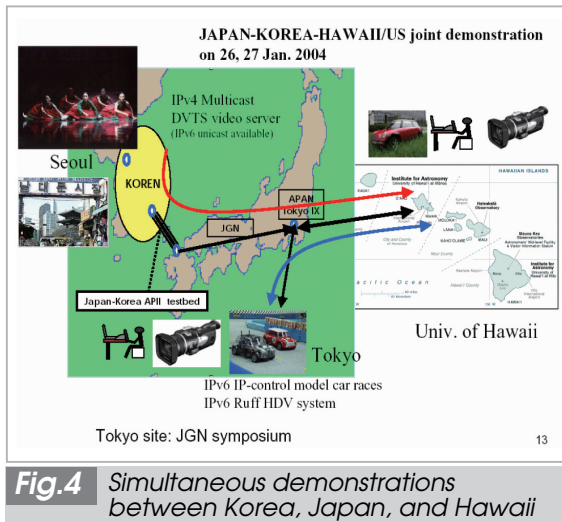


Fig.4 Simultaneous demonstrations between Korea, Japan, and Hawaii

(5) Ruff Systems HDV demonstrations

At the 14th KOBA held in Seoul, Korea, from May 19 to 22, 2004 (<http://koba.or.kr>), participants witnessed live display using the APII Testbed, based on the Ruff Systems HDV jointly developed by NICT and Tokyo Electron Limited.

(6) Telemedicine demonstrations

At the 18th APAN meeting held in Cairns, Australia, on July 2, 2004 [5], telemedicine demonstrations were conducted connecting Korea, Japan, and Australia.

(7) APII Workshop 2004

NICT and KISDI, Korea co-hosted a workshop on Internet R&D in the Asia-Pacific Region at NICT Koganei Headquarters on October 28 and 29, 2004. Of the 86 participants, 17 were from Korea, 21 from Japan, three from China, one from Thailand, and one from Singapore, with the remaining 43 from Japan as audience.

The workshop will be held in each of NICT and KISDI in turn; the second work-

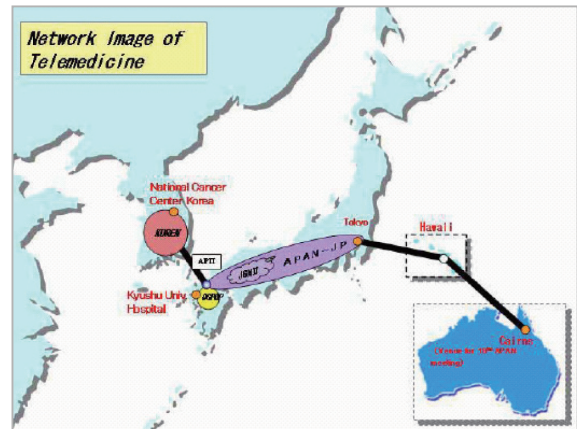


Fig.5 Telemedicine demonstrations



Fig.6 Keynote Speech (Telemedicine)

shop is scheduled to take place in Seoul, Korea, in September 5 and 6, 2005 [1].

Day 1:

- Keynote speech (Telemedicine, Kyushu University)
- Introduction of APII project
 - APII Technology Center (NICT)
 - APII Cooperation Center (KISDI)
 - Activities in Kyushu region
 - Activities in Korea
- International collaboration
 - China: Activities of CERNET and CST-NET
 - Research and education activities in Thailand
 - Activities in Singapore
 - Activities in Japan
 - Activities in Korea
 - GENOM Project (NCC, Japan)

Day 2:

- Group Meeting for APT Experiments between Kyushu and Korea
 - Remote education for foreign language lectures
 - Technology development for digital cultural exchange
 - Progress of HDTV@IPv6 Project in Korea
 - On-site test of simplified traffic measurement tools
 - Telemedicine by Hanyang University
 - Spread of Gigabit IPv6 network
 - Active and passive measurements in KOREN

3 Technical training concerning the Internet

Since 1997, we have been conducting ongoing international joint research and experiments on the next-generation Internet. We have also worked to contribute to the development of next-generation human resources, capitalizing on the particular advantages of the experimental facility. We provided technical training for the multimedia technology in the early stages and are now providing technical training in next-generation Internet technology in collaboration with the Japan International Cooperation Agency (JICA) and the Asia-Pacific Telecommunity (APT)[1].



Fig.7 JICA training participants in January 2005 and the authors

(Kazuyoshi Matsumoto is the second from left and Kiyoshi Igarashi is the fifth from right.)

3.1 Training program example

We sought people interested in the latest info-communication technologies and having the advanced skills they would need for potential participation in the joint activities of the APT Testbed project, as interns to be given the training program conducted in collaboration with APT. We selected the topics with a focus on lectures in cutting-edge technology. Table 1 provides a general summary of the five-day training program.

The training conducted in collaboration with JICA constitutes a part of the training course on the standardization of telecommunications and fills the first two days of the APT training schedule. Table 2 provides an overview of the training program.

Table 1

Topic	Minutes
Video on CRL activities	25
Overview of network R&D	90
BioGrid	90
BroadBand Network in the Asia-Pacific region	90
On international collaboration	35
Basic technology of the Internet	180
IT revolution and digital opportunities	90
Country Status Report	240
High-definition digital video on IP networks: Remote education between Japan and the US	90
Video on IPv6 promotion	15
Internet Governance: Mainly on resource management in the Asia-Pacific Region	90
IPv6	90
Mobile Internet	90
Video on remote lecture experiments	90

Table 2

Topic	Minutes
Video on CRL activities	25
Overview of network R&D	90
BioGrid	90
BroadBand Network in the Asia-Pacific region	90

Table 3

Number	Course	Dates	Number of participants
1	JICA	February 14–28, 1997	9
2	APT	December 1–12, 1997	14
3	JICA	April 17–24, 1998	10
4	APT	December 7–18, 1998	8
5	JICA	March 8–11, 1999	11
6	JICA	2000	8
7	JICA	February 26 – March 1, 2001	9
8	JICA	February 18, 19, 2002	8
9	APT	February 25 – March 1, 2002	12
10	JICA APT	January 17–21, 2003	18
11	JICA APT	January 16–20, 2004	19
12	JICA	January 14, 15, 2005	8

References

- 1 <http://www.tc.apii.net>
- 2 <http://www.jgn2.nict.go.jp>
- 3 <http://www.ai3.net>
- 4 <http://www.transpac.org>
- 5 <http://www.apan.net>
- 6 <http://www.apectelwg.org>

3.2 Past record of training programs

Table 3 lists the training courses provided between 1997 and 2005.

3.3 Examples of participating countries

Among the APT participating countries in the Asia-Pacific Region, twelve participated in APT training (February 2002): Bangladesh, China, Indonesia, Iran, Malaysia, Mongolia, Nepal, the Philippines, Samoa, Sri Lanka, Thailand, and Vietnam. The JICA training program was not restricted based on region, with a number of participants from South America, Africa, and East Europe.

4 Conclusion

NICT will continue with a range of joint projects to respond to the spread of the Internet in the Asia-Pacific Region and to promote network progress, and also intends to continue with training projects aimed at developing human resources in this area.

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