

## Case Studies of Advanced Applications between Japan and Korea using APII

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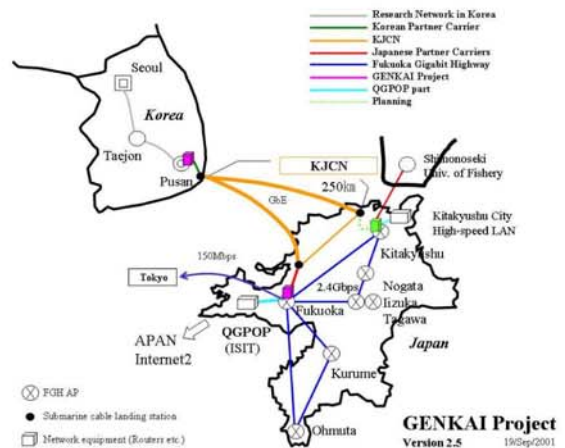
**TITLE:** Case studies of Advanced Applications between Japan and Korea using APII  
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Summary

We have been researching for various advanced applications between Japan and Korea for several years using APII, for example remote lecture for the students of graduated school and university, international exchange of junior and high school students and e-learning for medical. Currently we propel cooperation researches with Korean partners about advanced Internet technologies. This is based on these advanced applications. In this paer, we report these various advanced applications and future of academic cooperation researches between Japan and Korea.

1 Introduction of Our Project

Recently, local regional network, so called community network has been made in Yamaguchi prefecture as well as in Kyushu district. For example, Fukuoka prefecture has begun to use "FUKUOKA Giga-Bit High Way". And a 250 km-long submarine optical cable connects between Korea and Japan through the project called "Japan-Korea IT Corridor Project". This optical cable connects Pusan-Fukuoka and Pusan-Kitakyushu, and has already been used since March 2003. Genkai Project is an international next generation ultrahigh speed optical network project, and named after Genkainada where the Japan-Korea optical cable is constructed.



2 ITWeek

A main purpose of Genkai project has been to open Japan and Korea ultrahigh speed network. Surely, as I said before that Japan and Korea optical cable service itself has already started, so the "open" here means that we can use the Japan and Korea optical cable for our research project as Internet between Japan and Kore.



But, the processes related to open the Japan and Korea ultrahigh speed optical Internet would include political matter a lot, so I have to omit the detail here, and then what I can tell right now is that we would be able to use the Internet so soon. At the beginning of this project, we had been looking for a way that we did not have to rely on our central government and whether we could manage to promote the institutes or communities in Japan and Korea but finally, the project has been achieved in negotiations between centered Ministry of General Affairs of Japan and MIC (Ministry of Information and Communication) of Korea.

Therefore, now as MPHPT (Ministry of of Public Management, Home Affairs, Posts and Telecommunication) of Japan is involved in the Genkai project, so this project can be found by Ministry of Japan and Korea. The foundation comes from one of e! Project plan called e-Japan. The e-Japan plan is too famous not to need to mention about it here, which is the plan to upgrade IT by 2005, e! Project is the plan to take in advance high quality IT society in 2005 and mainly the showcase of IT society that will be common in 2005 will be demonstrated. Our project plan given is that “ international exchange using high quality IT ”, that is our research activity itself which is about to start using Japan and Korea ultrahigh speed network. On the beginning of 2003, we planed to ITWeek between Japan and Korea as an event involved in e! Project of Genkai project. The schedule was from February 10th to 17th, and during this event, we planned to have some intensive experiments such as an international remote lecture between universities, an international exchange between high schools and junior high schools, a seminar for adults, a remote lecture for vocational school, and cooperation with international companies by using Japan and Korea ultrahigh speed network. the one of authors was charging of the entire ITWeek and gave international remote lectures between universities.

The following is the brief schedule for the ITWeek.

10 Feb.	Monday	Remote Lecture for Graduated School
11 Feb.	Tuesday	Business Gate
12 Feb.	Wednesday	e-Learning for Medical and Medical People Exchange
13 Feb.	Thursday	Culture Exchange over Internet
14 Feb.	Friday	Culture Exchange over Internet
15 Feb.	Saturday	Junior High School Exchange
16 Feb.	Sunday	Art College Exchange
17 Feb.	Monday	Remote Lecture for Graduated School

In this paper, we pick up main events from these ITWeek events and explain.

## 2.1 Remote Lectures for Graguated School

This lecture was the regular course’s lecture and not the special lecture for ITWeek. The name of lecture is “Distributed System” and the detail is following.

- every Monday and 90min. (Remote Lectures are only 10th and 17th Feb.)



- one or two students have presentation of RFC or Internet-Drafts with showing the implementation applications based on the documents for the specification.
- Discussion (Question and Answer)

The theme of one of these remote lectures was about “PPP over Ethernet” which was explained Japanese student but many Korean students use PPPoE for CATV modem than Japanese students usage then there were many interesting discussions.

These are snapshot pictures of these remote lectures.



## 2.2 e-Learning for Medical

It is difficult to learn advanced new surgery ways with dealing daily medical examinations. Information from papers and edited video are limited and it is impossible to visit to see the other surgery. The aim of this theme is that Japanese and Korean doctors can learn new surgery ways of each other by transmission of each real-time surgery video. We use extremely precise video transmission system that can be adapted to general medical area which requires precise video. We hope that developments of medical technologies could be accelerated if we can exchange our advanced surgery ways at any time and daily over Internet.

Transmission of high quality moving-image is essential for telemedicine, which needs standardization of medical techniques and healthcare beyond geographical borders. The aim of this

study is to establish a broad-banded medical network between hospitals in Korea and Japan using Digital Video Transport System (DVTS) over Internet protocol. We used Asia Pacific Internet Infrastructure (APII) and Kyushu GigaPOP (QGPOP) (Japanese side), the Korea Advanced REsearch Network (Korean side), and the Korea-Japan Cable Network (international line). We performed Korea-Japan medical teleconferences with bi-directional transmission of live surgery by DVTS streaming on IPv4 network.

The teleconference with surgical transmission with DVTS over Internet protocol was successfully performed. We could keep enough bandwidth of 30 Mbps for a line of transmission. The quality of the transmitted moving image had no frame loss with the rate of 30 per second. The sound was also clear and the time delay was less than 0.01 sec. We have established an international medical network with high-quality video transmission over Internet protocol, which reliable and useful for education. This will be a promising tool in remote medicine for the two countries and for world wide telemedical communication in the future.

These are snapshot pictures of this e-Learning for Medical.



During ITWeek, the exchange between nurses was also completed with DVTS and automatic language translation CHAT system. It was also very interesting international culture exchange.

### 2.3 Exchange Class for Junior High School

Students of Genkai Junior High School and Staffs of Busan National University had the international culture exchange. During this ITWeek event, following three systems were mainly used.



### 1. DVTS (Digital Video Transfer System)

DVTS is the system which can translate the Audio and Video data as Digital Video quality over Internet. During this Junior High School event, this DVTS system was mainly used.

### 2. Virtual Lecture

Virtual Lecture is the system which support remote presentation. The students of Genkai Junior High School used this system to introduce about their school and Genkai island to Korean participants.

### 3. Automatic language translation CHAT system

Students of Junior High school were not good at English and Korean then they used this high function CHAT as the communication tool when they had the real-time conversation.

These are snapshot pictures of this Junior High School exchange.



## 3 Conclusion

During this ITWeek, we used the advanced IT technologies such as DVTS and automatic language translation CHAT system over Internet/APII and accomplished many case studies about international culture exchange between Japan and Korea. We have published the result about this ITWeek on <http://itweek.info>. From the autumn on 2003, we have started the new e! project again and this new one would be more attractive. For example, the remote

lectures for university's flesh men, daily medical e-Learning and more practical international exchange class for Junior High School students.

This ITWeek event has carried not only the International Culture Exchange Experience by the advanced technologies to Japanese and Korean but also deeply technical relationship with Japanese and Korean technical staffs who worked for this event very hardly. And this relationship would carry the new opportunities for the future project between Japan and Korean.

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