Activity Report of Asia-Pacific Medical Network Project in Kyushu University Hospital : Vol.3

Shimizu, Shuji
Kyushu University Hospital

Nakashima, Naoki
Kyushu University Hospital

https://doi.org/10.15017/8304

出版情報：「超高速ネットワークを利用したアジア遠隔医療プロジェクト」 TEMDEC活動報告. 3, pp.1-144, 2007-04. AQUA事務局
バージョン：
権利関係：

3. Network news

This chapter introduces the network schematics utilized by the AQUA Project. Figure 1 illustrates the regional Internet components used as of 2007.

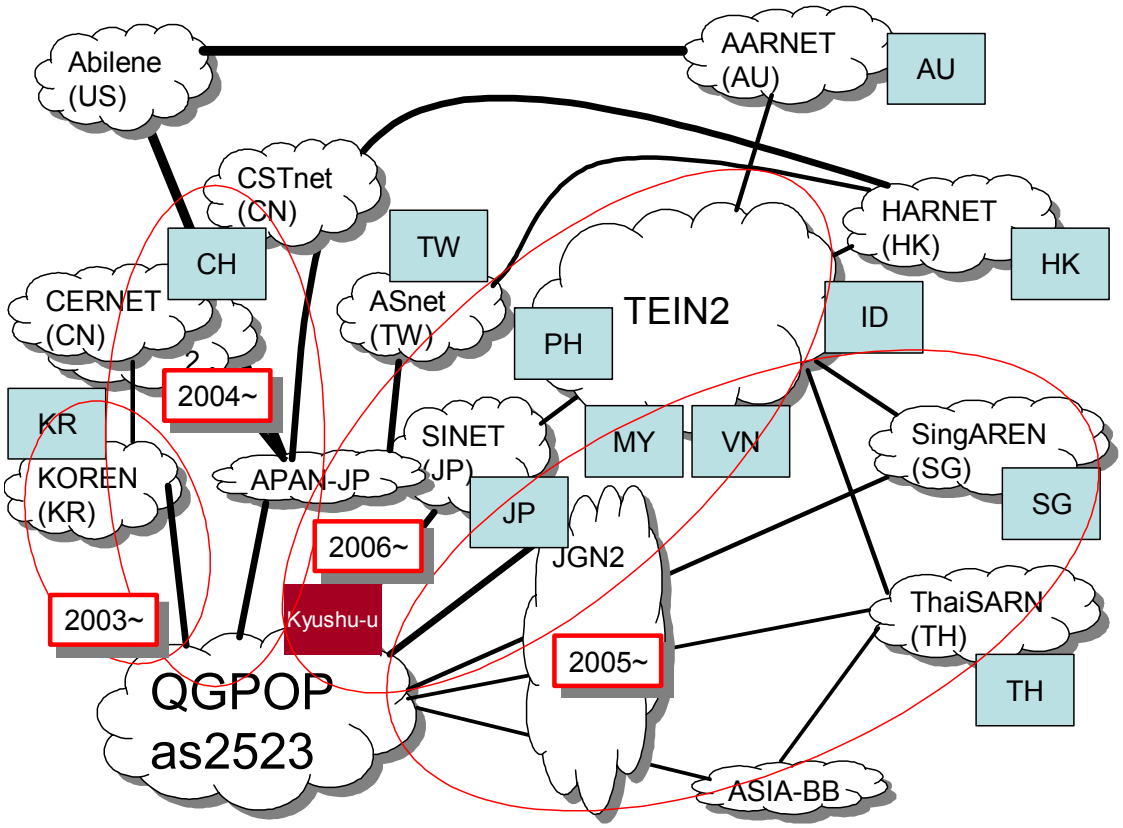

Fig. 1: The 2007 AQUA Project Internet Environment

Briefly introducing the Internet environment, Kyushu University is via SINET and QGPOP. The Hospital of Kyushu University is a subsidiary of Kyushu University and has access to these connections. QGPOP has connected to many countries in Asia as well as to the worldwide advanced Research and Education (R&E) network at very high speed and provides the primary connectivity to Kyushu University. Since the stability of R&E does not exceed commodity networks, QGPOP is used instead and avoids the instability and potential disruptions of the Kyushu University network. The areas not connected by QGPOP can be reached via SINET from Kyushu University. SINET also focuses on Research and Education and thus requires additional policy considerations; therefore QGPOP remains the primary connection.

The following summary describes the Internet development that had been used by AQUA Project until 2006. Prior to 2003, high-speed Internet access for research and education from Japan to the United States and Taiwan had been available through APAN. In 2003, 1G Internet service between Japan and Korea was started by APII; additionally, this project was started. Rapid Internet access from Japan to China became possible in 2004 through NICT and to Korea and China through APII, enabling experiments with China. In 2005, JGN2 of NICT initiated high-speed Internet access to Thailand and Singapore and new activities with Singapore and Thailand began, using these high-speed links.

Beginning in 2006, the TEIN2 connection provides 620 Mbps links to NOCs in Singapore and Hong Kong, 150Mbps links to Malaysia and Thailand through the NOCs and 45 Mbps links to Vietnam and Indonesia. The Philippines has also been connected at 150Mbps via TEIN2. Australia successfully connected at 1Gbps via the United States, and an additional 620Mbps link with short latency became available through TEIN2.

Since the high-bandwidth links of 620Mbps, 150Mbps and 45Mbps are available only to NOCs, then the final obstacle for AQUA is to improve local NOC connectivity to domestic Internet services. The Hong Kong NOC, for example, has many high-speed links, but because HARNET, a Hong Kong domestic Internet group does not connect to TEIN2 with sufficient speed, there was a problem connecting to HKCU (Hong Kong Chinese University), despite the presence of a high-speed link to Japan. HKCU has a 1G link to CSTnet, so the AQUA project used this high-speed link for the experimentations with HKCU instead of the TEIN2 link. Also, in Singapore, SingAREN does not link with adequate speed to the TEIN2 NOC, so the JGN2 link is used for experimentations with NUS (National University of Singapore). On the other hand, the link speed of JGN2 to Thailand is just 45Mbps, so even though there is no direct TEIN2 connection to Thailand from Japan, the TEIN2 link is sometimes utilized to provide higher bandwidth.

The following network supported the Manila APAN Medical demonstrations.

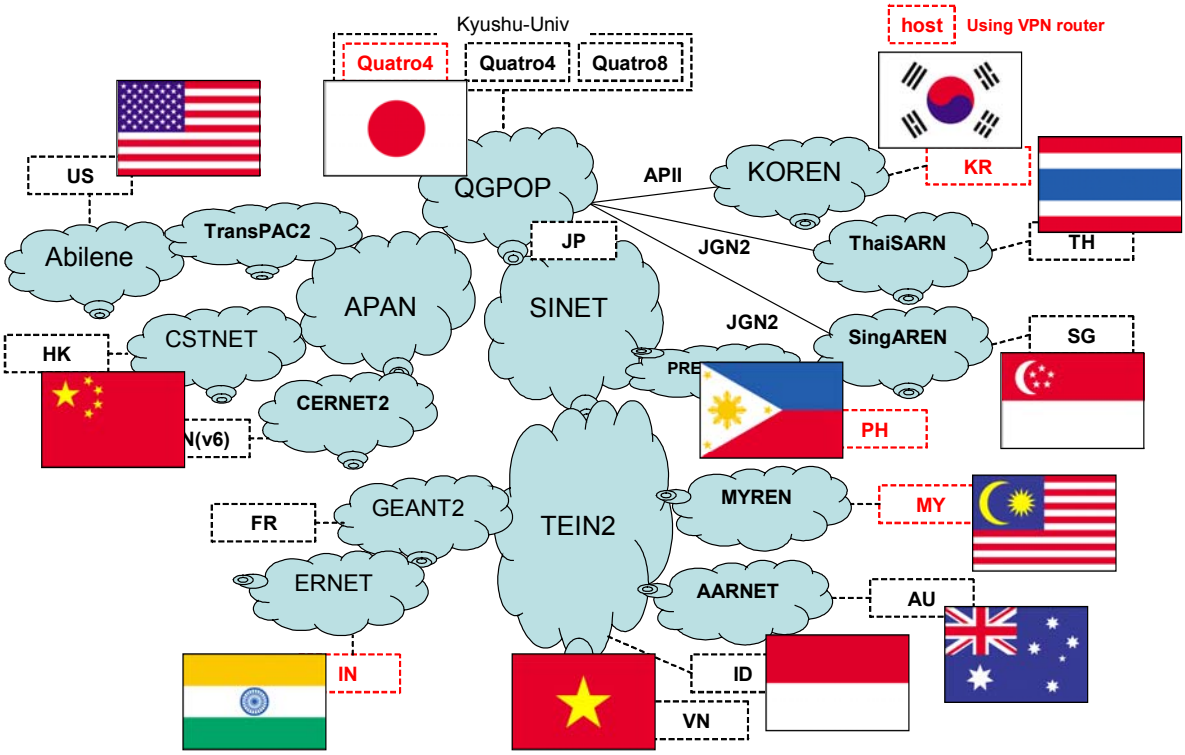

Fig-2: Intended network design for the APAN Manila Meeting.

The high point of the APAN Manila meeting was the attendance of the group from India. India connected by ERNET via GEANT2 (see Fig-2). ERNET is connected to GIANT2 in Italy.

Due to the large earthquake that had recently occurred in southern Taiwan, some optical fibers had been damaged, resulting in the actual used network depicted in Fig-3. Most connectivity from Southeast Asia utilized a link via Korea.

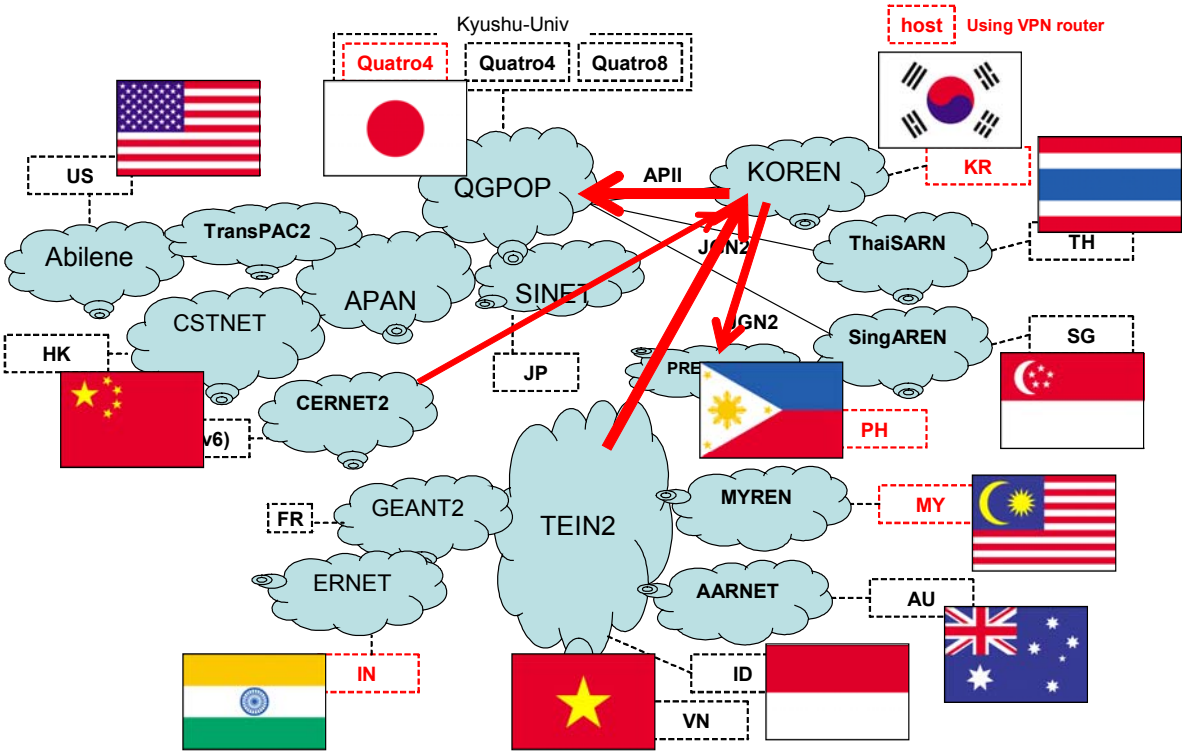

Fig-3: Actual Network of APAN Manila Meeting

In January, it was difficult, if not nearly impossible, to connect to many Southeast Asian countries. Singapore, Vietnam, Malaysia and Thailand, which connected via Hong Kong and China, seemed to have difficulty executing successful demonstrations at the APAN Meeting. Thanks to great effort and backup links from the Tele Communication Company, the networks in Fig-3 were available at the APAN Manila Meetings and the medical demonstrations could employ suitable access speeds.

The final report in this section describes the 10G upgrade of the Japan-Korea link. This tremendous technological advance will enable applications that require more than 1G, including un-compressed HD transmissions. Figure 4 illustrates the detailed network schematics of both the Japan-Korea 10G link and the NOC configuration.

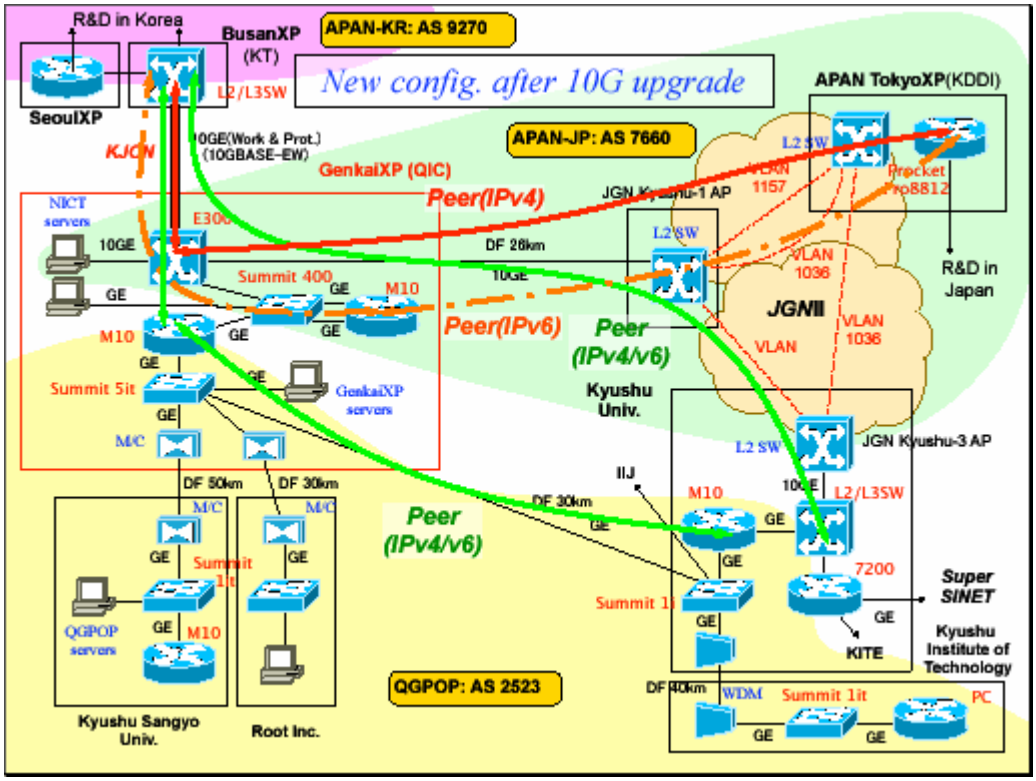

Fig-4: 10G links between Japan and Korea

By 2006, most countries had connected to Japan with sufficient speed for the AQUA project. Still, there are many demands and expectations for 2007, including more convenient access to India (bandwidth and latency), speed upgrades for Vietnam and Indonesia and implementation of high speed links to countries that are not currently connected with enough speed, for instance, Laos and Cambodia.