

Activity Report of Asia-Pacific Medical Network Project in Kyushu University Hospital : Vol.2

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権利関係 :

3. Network news

This chapter discusses the network route from QGPOP to each organization via Research and Development (R & D) High-Speed Internet.

Fig-1 shows the network topology, with QGPOP as the center as of December 2005. At this time, we had already connected with Korea, China, Taiwan, Singapore, Thailand and Australia by R& D High-Speed Internet and performed several experiments.

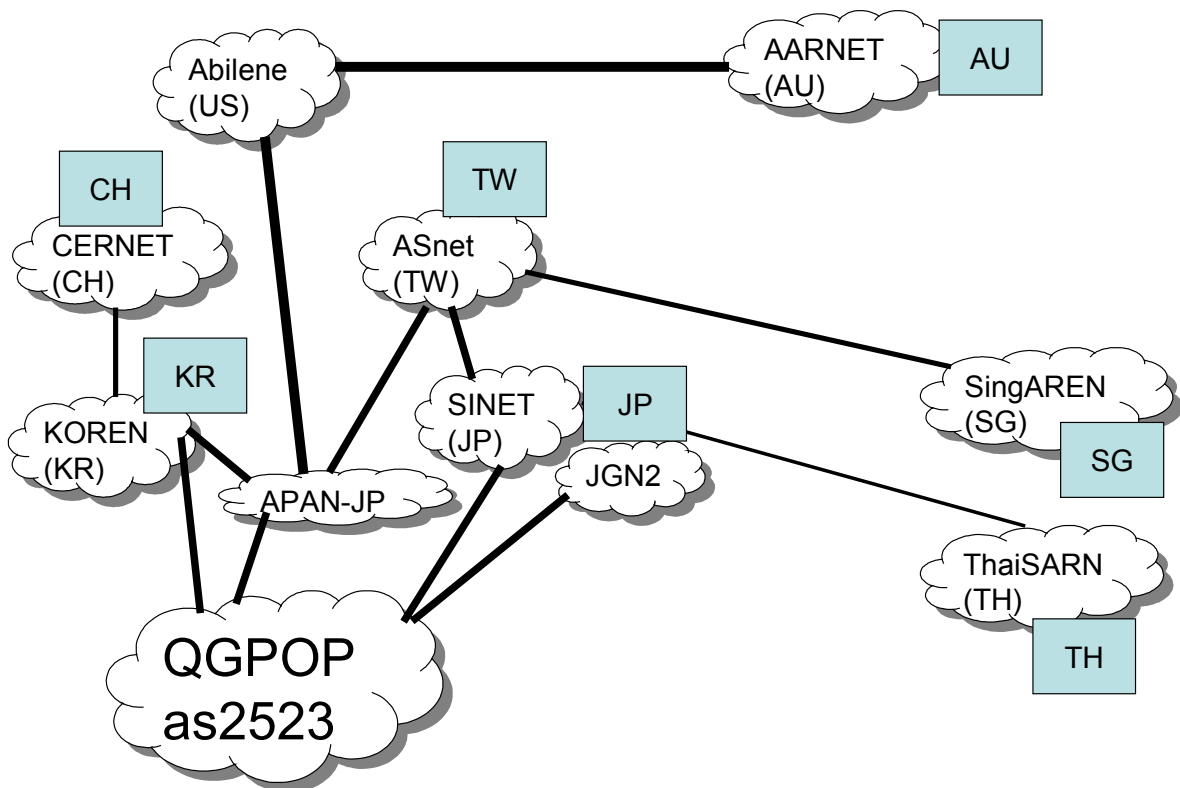


Fig-1: Network Topology around December 2005.

Japan:

Major Japanese Universities can be connected for DVTS using SINET. If the university, institute or organization is not connected by SINET, JGN2 can be used. But generally, the access line from JGN2 to the organization is necessary, plus expenses to establish the link.

Korea:

If the Universities or Institutes are member of KOREN, they can be connected using APII which connects to Japan at 1Gbps directly. Many universities such as SNU and HYU or institutes, such as NCC, have been already connected using DVTS.

China:

Tsinghua University and Jiaotong University have been already connected. If the universities or institutes are members of CERNET, then, they can be connected at sufficient speed. There are many routing paths to CERNET from QGPOP. QGPOP selects the route, which is transited by KOREN. CERNET is the R & D network center, located in Beijing. The network quality with Beijing is good, but since CERNET is usually congested, other areas outside of Beijing, cannot guarantee comparable quality. For example, DVTS communication with Jiotong University at Shanghai typically encountered difficulties .

Taiwan:

The direct 1Gbps R & D link supported by Taiwan can be used for communicating with Taiwanese universities or institutes. The Taiwan link is managed by ASNET and connected to APAN JP and SINET. QGPOP can connect to universities or institutes in Taiwan via SINET or APAN. This 1Gbps has enough capacity to communicate between Japan and Taiwan, but the network quality then depends on Taiwan's domestic network or the campus network capabilities.

Singapore:

There was no direct R & D network between Japan and Singapore. However, Taiwan is directly linked to Singapore, so Taiwan (ASNET) kindly transmits the packets between Singapore and Japan. In Singapore, SingAREN played a roll as an R & D Internet management, allowing universities and institutes in Singapore to connect to SingAREN for R & D communications. The universities and institutes in Singapore must cover the expense for the link to SingAREN , which has resulted in compromised link speeds. For example, even NUS, the biggest University in Singapore, can use several Mbps as R & D Network.

Thailand:

There was a direct link from Japan to Thailand. Its capacity was 45Mbps and supported by SINET. But this link was not stable. It was not used, except by NECTEC; however, if the link was used by other institutes, heavy routing coordination was necessary and several problems occurred. For example, on June 2005, the link was used for communication between Kyushu University Hospital and Mahidol Siriraj Hospital, but it seems that was the first usage for Mahidol University. The network equipment connecting NECTEC and Mahidol University had been broken. The link can not be used for R & D applications at the time.

Australia:

There is no direct R & D network between Japan and Australia but very high speed R & D networks can be used via United States. Using this link, very stable network quality was available but there is long delays. DVTS uses UDP, which is not affected by delays but interactive applications can be frequently interrupted.

Fig-2 shows the QGPOP network topology after January 2006.

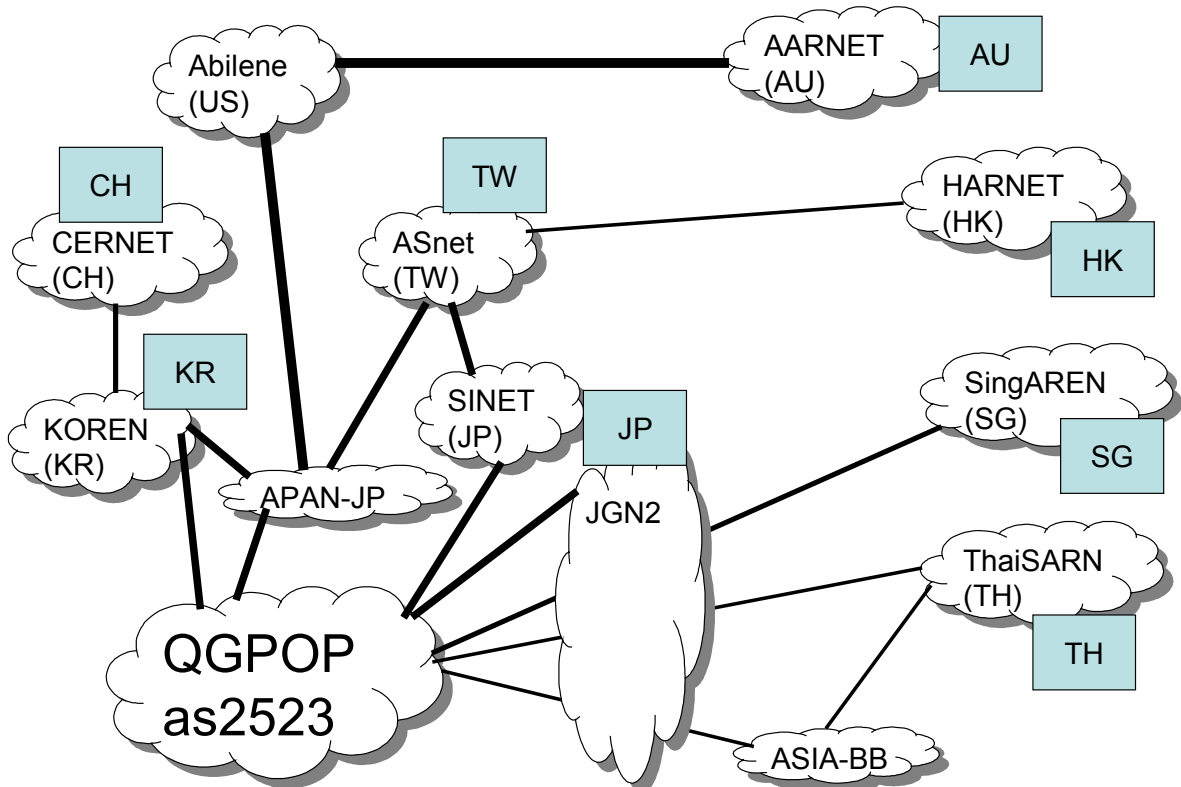


Fig-2: Network Topology after January 2006.

The new international R &D link from Japan to Singapore and Thailand has been started under JGN2 support. QGPOP has started to use the R & D link for the communication to Singapore and Thailand and has started to consider how to connect to Hong Kong using the R & D network.

Singapore/Thailand

Since the JGN2 Asian R&D Link has been started, the high speed link between QGPOP and SingAREN became available. The Taiwan link is no longer necessary for communication to Singapore. The JGN2 Asian R&D link for Thailand has also been available, but the speed is currently insufficient--just 45Mbps. If the link is used for DVTS, then, advanced application to the JGN2 center is necessary. If this application is accepted, then, the requested bandwidth is guaranteed. The Asia Broadband Project provides another internet route, from Thailand to Kyushu University, using JGN2. Talks are currently underway, between QGPOP and ASIABB, concerning routing policies to Thailand.

Hong Kong:

There is no direct link between Japan and Hong Kong but there are many candidate routing paths for high-speed communications. Because it includes several institutes or countries, coordination is necessary. One possibility is transit via Taiwan.

Fig-3 shows the network topology after TEIN2 becomes available.

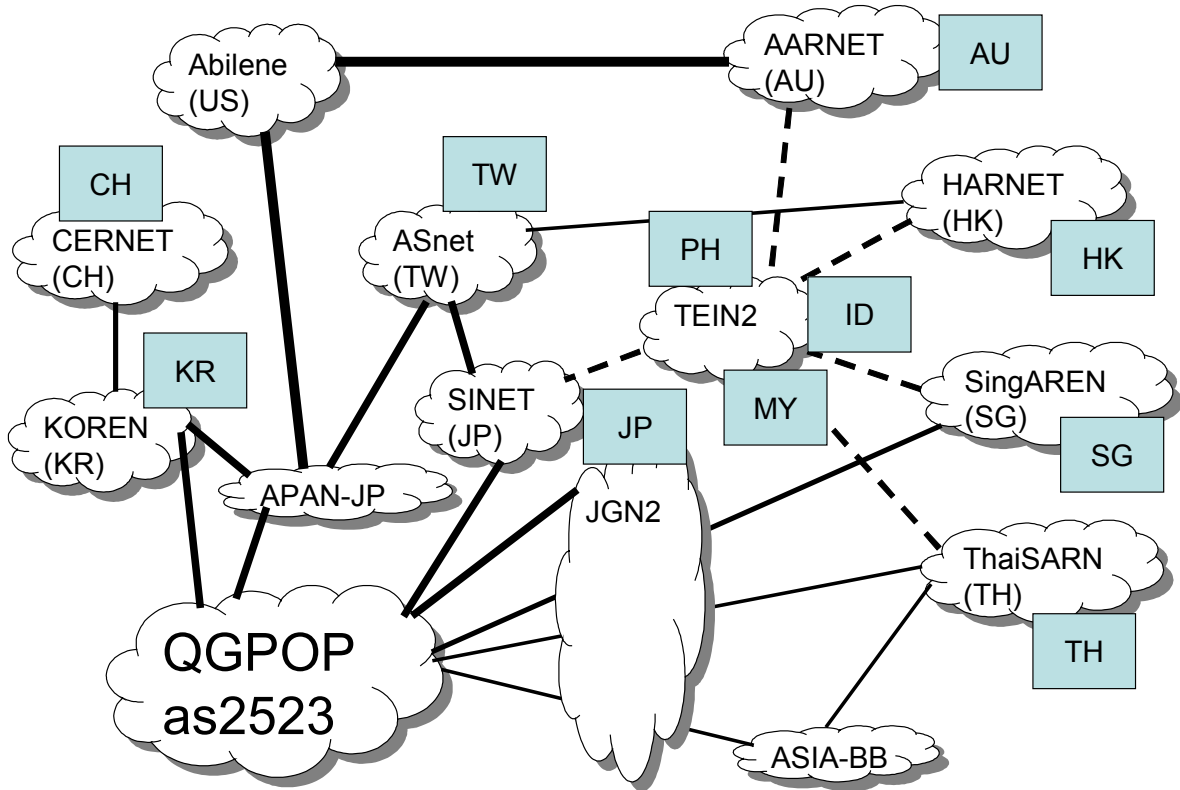


Fig-3: Network Topology with TEIN2

After TEIN2 is available, QGPOP can use TEIN2-based, high speed communication with Indonesia, Philippines and Malaysia will be possible, and the long delay to Australia will be decreased. More high speed communication to Singapore and Thailand is expected.

TEIN2 covers major Eastern and Southern Countries, but TEIN2 operates independently from each country's R&D institutes such as SingAREN or ThaiSARN. Namely, via TEIN2, packets from Japan will be delivered to TEIN2's Singapore NOC at high speed but not to SingAREN.

As the R&D Internet continues to evolve, we must optimize our current resources, constantly monitoring our applications results and efficiency. Given the rapid rate at which R&D communication technology matures, communication with Russia and India will be available in the near future, surpassing our expectations.