Information management report: an international newsletter for information professionals and librarians, 3 (5), May 1993, pp. 1-4.
Originally written in Japanese in March 1992. Translated in English by Hideo Naito, Kanazawa University.

EDITORIAL

WIDE AREA NETWORKS IN JAPAN

Takao Suzuki
Ochanomizu University Library

Introduction

Wide area networks for scientific research in Japan were constructed and are operated by various bodies. Networks which have the same protocol offer transparent service by which users can interconnect within the networks. Some networks which do not have the same protocol offer e-mail services by using gateway systems.

Major networks which are comparatively old

N1net

N1net is the oldest, having started service in 1980 after 7 years preparation. It interconnects large general purpose systems in 170 universities and research institutes all over the country by applying the N1 protocol.

It has a remote login function called Network Virtual Terminal (NVT) and a Remote Job Entry (RJE) function. User numbers peaked during 1984-1986, after which numbers have dropped off because certain network limitations have prevented it from meeting rapidly changing user demands: it cannot interconnect to systems outside the country because of its unique protocol; it is limited to using large systems, and it cannot carry e-mail.

The National Centre for Science Information Systems (NACSIS) tried to make up for these weak points and started a BBS service by using a NACSIS host computer which can be connected by N1 protocol, and an e-mail service called SIMAIL which uses OSI standard MHS protocol and can transfer mail to large systems located on N1net. SIMAIL enables users to send e-mail to BITNET and the lnternet by using NACSIS's gateway facility.

JUNET

In 1984 some volunteers started the experimental operation of a research network called JUNET. Currently over 800 sites (200 universities, 500 private research institutes, 100 others) connect to JUNET. Many of them connect through point-to-point linking by Unix to Unix Copy (UUCP) protocol. These are known as pure JUNET sites. The e-mail service JUNET offers is identical to that offered by UUCPnet, and the electronic news is identical to that of the USENET. Therefore the service items are nearly equal to those offered by EUnet in Europe.

In 1987 the link to CSNET enabled the connection of JUNET to overseas countries, and afterwards the link between WIDE, a part of JUNET, and the lnternet in US took the place of it. TCP/IP connection sites are increasing among new members.

BITNETJP

BITNETJP is the Japanese segment of BITNET (EARN in Europe) and from its start-up in 1985 it enabled Japan, for the first time, to connect to overseas countries. It has some 80 members (mainly universities). The Science University of Tokyo is the root of nodes in Japan, which connects to Princeton University in the US and is therefore the Japanese front door to the world of BITNET. Amongst the services it offers are: e-mail, file transfer, LISTSERV, and NETSERV. The protocol used is RSCS, although recently some nodes have changed over to BITNET-II which uses TCP/IP.

Major IP Internetworks in Japan

Recently some networks tried to construct a common network environment and infrastructure in Japan, by interconnecting LANs and computer systems in research institutes through the TCP/IP protocol. Such trials are on the increase. Many of the IP protocol backbone networks run parallel to each other north and south through the Japanese Islands and interconnect to each other at specific points. The principle IP networks are outlined below.

WIDE

A research group which had been involved in the construction of JUNET, developed a volunteer-based network for research in 1988 known as WIDE. Currently some 80 institutes participate in WIDE. Member institutes connect directly to one of the backbone nodes – Network Operation Centres (NOC) – which are interconnected by 64 Kbps or 192 Kbps high-speed digital dedicated cables. The network offers electronic news and e-mail services, and TELNET and FTP services on TCP/IP. It connects to the Internet in the US through the University of Hawaii by 192 Kbps cable.

TISN

Todai (University of Tokyo) International Science Network (TISN), was set up in 1989 as a volunteer-based research WAN, which interconnects research institutes for science and technology. It is a star network whose hub is the University of Tokyo, Faculty of Science and has some 20 members. It links to WIDE and JAIN, with communication speeds of 48 Kbps or 64 Kbps. It connects to the Internet in the US through the University of Hawaii by 128 Kbps cable.

JAIN

JAIN was developed and operated experimentally in 1989 by a research group for the interconnection of campus LANs in Japan, supported by a grant-in-aid from the Ministry of Education, Science and Culture of Japan. This experiment was to try to interconnect campus LANs by IP on the X.25 cable of NACSIS. Member universities are connected to one of seven backbone nodes located at seven national universities with large computer centres by X.25 or IP. They can be connected to more than one backbone node for the purpose of backup in case of the system failure

of one backbone node. Some backbone nodes connect to TISN and/or WIDE. Communication speed is 9.6 Kbps, 48 Kbps or 64 Kbps.

SINET

SINET is a 100% government-supported Internet backbone network which NACSIS started operating in 1992. As the X.25 packet-switching network that NACSIS operated was not necessarily adequate for a TCP/IP backbone network, SINET had to be a star network whose hub is at NACSIS to which eight nodes at national universities are connected by 128 Kbps or 256 Kbps high speed digital cables. Members can be connected directly to one of these node universities by 9.6 Kbps or 64 Kbps cables, or to one of 28 nodes which are interconnected by the X.25 packet switching network and link to SINET. NACSIS provides 192 Kbps cable linking to NASA for the connection to the Internet in the US. As seven of the eight node universities have large computer centres as inter-university facilities, it may be argued that it was government policy for SINET to take the place of N1net.

Conclusion

Some of the networks described are gradually becoming out-of-date with regard to communication speed, service items, etc. However, it is expected that JUNET will improve communication speeds if it utilizes the Internet backbone routes such as JAIN. And it has new members who will link by the old cheap UUCP. BITNETJP can also improve communications speed if it changes over to BITNET-II.

As for the connection to large computer centres, the usual utilization of N1net will be shifted to that of IP Internet. Yet, IP backbones in Japan do have some problems. Their communication speed is one to three figures slower than T1 or T3 of the Internet; this will be a serious bottleneck in the future. I look forward to a national project such as the NREN in the US.

There are other networks such as HEPNET-J, SPAN and so on, whose members are limited to special subject research institutes. Also to be found are regional networks such as TRAIN, KARRN and so which interconnect neighbouring universities' LANs by TCP/IP.

Appendix

Examples of public services available on networks in Japan:

1. Part of the list of BITNET LISTSERV:

BUDDHIST@JPNTOHOK (Forum on Indian and Buddhist studies)

CRYPTO-L@JPNTOHOK (Forum on cryptology and related mathematics)

J-FOOD-L@JPNKNU10 (Japanese food & culture discussion list)

KERMIT-L@JPNSUT30 (Kermit discussion list)

2. Whois server on Internet in Japan

nic.ad.jp (192.41.197.14)
login: whois

3. Archie server on Internet in Japan

archie.kuis.kyoto-u.ac.jp (130.54.20.1)
login: archie

4. OPAC of university libraries on the Internet in Japan

University of Tokyo Library LILIPUT system
library.lib.u-tokyo.ac.jp (130.69.96.3)
login: guest

References in English

1. John S. Quarterman, The Matrix: computer networks and conferencing systems worldwide, Digital Press, 1990.

2. D. Frey and R. Adams, !%@:: a directory of electronic mail addressing and networks, O'Reilly & Associates, 1989.

3. Tracy L. Laquey, The user's directory of computer networks, Digital Press, 1990.

References in Japanese

1. University of Tokyo Large Computer Centre, Gakunai LAN to Intanettowakingu no tenkai = Development of Campus LAN and Internet, 1991.

2. Shoichi Noguchi, Nihon ni okeru akademikku nettowaku no sougo setsuzoku no shomondai = Problems about interconnection of academic networks in Japan, 1992.

3. University of Tokyo Large Computer Centre, Chiiki nettowaku no kadai = Problems about regional network, 1992.