

# JUNET Users' Guide, 1st ed. (excerpt)

## By JUNET Users' Guide Preparation Committee

### Introduction

More than three years have passed since the JUNET experiment began in October 1984. At the beginning of the experiment, we operated in a "grass-roots" manner and made efforts to accumulate achievements so that this type of academic network, which was unprecedented in Japan, would be accepted without difficulty. As the number of participating organizations increased, so did the number of opportunities to present reports at conferences, etc. As a result, the demand for a kind of guidebook on JUNET has increased considerably.

The development of such a document had been a priority since the start of the experiment, but the group of volunteers involved in the technical development of the network in the early years of the experiment were unable to write such a guide because of the high priority of their development work. Eventually, these were edited and re-posted by NTT's Mr. Nojima, who recognized the important source of information in the JUNET Q&A that had been exchanged as JUNET news. This activity gradually became more and more active, with many volunteers editing and adding to the JUNET Q&A. As JUNET has developed through democratic management by the experimental participants, it was appropriate to compile it into this "JUNET User's Guide".

It is the sincere hope of the "JUNET Users' Guide" and the "JUNET Users' Committee" that this guide will contribute to the understanding and development of JUNET, as well as to the fields related to computer communication, which is the goal of JUNET.

### Prologue to the Publication of the JUNET User's Guide (1st Edition)

The creation of the JUNET User's Guide began in February 1987, when Nojima@NTT, one of the current members of the JUNET Users' Committee, contributed a collection of news articles on JUNET that had been posted up to that time. Then, from March to September 1987, Saito@Osaka University, Ichikawa@Fujitsu, and Kusumoto@Densoken, in that order, served as editors, called hand-guide sponsors, and collected and wrote useful information and

submitted it as JUNET news.

On the other hand, the JUNET Administration Group (junet-admin@junet) has had to deal with an increasing number of inquiries as the number of organizations participating in JUNET has continued to grow. The JUNET Administration Group (junet-admin@junet) began distributing hard copies of this manual, which had been posted as a JUNET News item.

At the end of September 1987, Nojima, Saito, and Kusumoto decided to create a systematic and easy-to-use handbook, unlike the conventional collection of handbooks, and continued to work on it with the cooperation of many people through JUNET. The result is the "JUNET User's Guide (1st Edition)" which has now been published. We would like to thank all those who have helped us in various ways to make this guide possible. We are sure that some parts are still insufficient, but we would be happy to hear your comments on the second edition.

#### <1> Background of JUNET

For researchers involved in many fields of science and technology, especially in the field of computer science, computer systems have come to play an important role as a research environment. Information exchange among researchers can now be realized using networks that combine computers as a research environment. Numerous such networks have been realized, including the U.S. Department of Defense's ARPA network, the UNIX-based USENET, the U.S. NSF's CSNet, and Australia's ACSNET. These networks, called "academic networks" and others, serve to exchange research information, mainly through message exchange functions such as e-mail and electronic news. These networks are unique in that they are used by computer network researchers as testbeds for their research, and many network technologies, including network management, network application functions, and protocols, have emerged from their practical operation. In addition, since academic networks around the world should be interconnected by nature, there are active efforts to connect networks to each other.

On the other hand, in our country's research environment, the N-1 network, which connects the mainframes of university computer centers, is in operation. The N-1 provides virtual terminals and file transfer functions to share large computing power using efficiency-oriented communication functions based on a proprietary protocol, and the same The network does not currently provide a message exchange function. Therefore, the construction of JUNET was started with the aim of contributing to the development of computer network technology

and culture through actual operation and international connectivity.

## <2> History of JUNET

In Japan, the development of academic networks based on message exchange has been hindered for two main reasons: first, computer systems that facilitate the construction of flexible, open networks are insufficient as research infrastructures, and second, the development of academic networks has been hindered by the lack of a sufficient number of computer systems that can be used for research. The second was the lack of generalization of the use of public telephone lines. Second, there were strong restrictions on the use of public telephone lines. However, since 1983, the UNIX operating system has become popular among researchers, and as high-performance personal computers have developed and the environment for communication using public telephone lines has improved, the situation for building a network using the UUCP protocol over a public line has become more favorable. - In this context, the JUNET network has been developed.

Under these circumstances, the JUNET experiment was started in October 1984, combining three local area network gateways (Tokyo Institute of Technology, Keio University, and the University of Tokyo), all of which were running the UNIX operating system. The network was launched in October 1984.

With the start of the network experiment between the three universities, e-mail and electronic news services were launched, and studies on network management, handling of Japanese-language messages, and inter-network connectivity began while the network was in actual operation. As a result of our research on name management and routing control, a system to realize name management based on hierarchical domains was introduced in May 1985.

In January 1986, the University of Tokyo began operating CSNET as a gateway to JUNET and USENET. Since CSNET and USENET have already achieved inter-network connectivity with several academic networks, information exchange with these networks was also achieved indirectly.

## <3> Current Status of JUNET

As of November 1987, JUNET has about 110 participating organizations and about 1000 systems and e-mail exchanges. These organizations include universities, national research institutes, computer manufacturer laboratories, telephone company laboratories, and

software company R&D departments, all of which participate as volunteers. Currently, UUCP protocols using telephone lines or public packet switching networks are mainly used for inter-organizational coupling, and 2400 bps or 9600 bps modems are used for communication, which is based on the CCITT V22bis, Telebit's TrailBlazer, and Microcom MNP Class 6 standards.

JUNET is essentially a network that combines the local area networks of participating organizations. It provides address management for message exchange, routing control, and various application functions related to message exchange, as well as gateway functions based on inter-network coupling with other networks. Actual communication is performed using the UUCP protocol on UNIX, mainly over public telephone lines and public packet switching networks, but experiments with the TCP/IP protocol system have also begun.

Since the local networks of each organization are combined, the systems that make up the network can be classified into two types: gateways and other systems. Gateways are systems that are coupled to systems outside the university or institute. The non-gateway systems have a local coupling to the gateway and can communicate with all systems in JUNET.

As mentioned earlier, the gateways are mainly connected by UUCP links over public telephone lines or public packet switching networks. In contrast, the interconnection of systems within an organization is done over a variety of media, including internal telephone lines, direct coupling, and Ethernet. Differences in protocols and addressing schemes used in these local networks are absorbed by gateways.

#### <4> Functions of JUNET

The main functions of JUNET are the applied functions of message exchange, i.e., e-mail and electronic news. These are based on RFC822, the DARPA Internet message format standard. Because of the strong demand for the use of Japanese characters in these message exchange functions, not only ASCII codes but also JIS Kanji codes can be used. However, if there are Kanji codes in the message, systems that cannot handle Kanji codes may be confused. JUNET tentatively solves this problem by indicating the code to be used in the Subject section of the message header. For example, Subject: next meeting (In Kanji).

Name management technology to manage the address and name of each user for message exchange is an important technology not only for the quality of user interface, but also for

routing control and communication reliability. For this reason, the name management system provided by JUNET takes the following points into consideration and implements them.

Name management based on a hierarchical domain structure.

A system for generating sendmail rules has been developed for this purpose.

## <5> Management and Operation of JUNET

JUNET is operated by both an overall administrator (`junet-admin@junet`) and a collection of administrators for each domain (`postmasters@junet`), the top-level domain administrators within each organization. Some documents say that JUS is running the site or some university is running the site, but that is not true. The former is a falsehood, and the latter may be true that some universities are major participants in JUNET and are involved in its operation, but they are not the only ones running it. This is incorrect. INETClub is, as stated in this guide (see [inetclub]), a peer-to-peer organization for exchanging e-mail with foreign countries. JUNET is a domestic network.

Therefore, any system that is not properly recognized by these governing bodies is not a JUNET node. Also, a node that cannot exchange messages correctly in JUNET address expressions is not a JUNET node. JUNET or the University of Tokyo's host `ccut.cc.u-tokyo.junet`, which is located at the top level of JUNET, and whether or not mail can be exchanged using JUNET's address expressions between those nodes. JUNET is determined by the ability to exchange mail using JUNET's address expressions between JUNET and its nodes.

JUNET participating organizations may not use JUNET for commercial purposes. Furthermore, no unspecified number of people are allowed to participate as users of JUNET. This means that users are limited to those who have an official login account with the host of the organization participating in JUNET. No matter how large the number, this is interpreted as a specific number. By the way, leaving a terminal on the side of the road and allowing people to use it on the street does not constitute a large number of people, and is not allowed.

JUNET is a volunteer network. As long as you are participating, you have obligations accordingly. For example, sending e-mails and news to the neighboring sites correctly. The administrators of each domain are required to read this manual carefully and operate according to it. In principle, they are also expected to solve system problems by themselves.

Of course, there is support from the main organization, the general administrator, and volunteers through the news system. However, it is not a good idea to take it for granted that the main organization will support you. The administrators of each organization should be aware that they themselves are part of JUNET. Of course, the technical capabilities and computing resources of each host vary greatly. However, it is possible to make a variety of efforts. As long as you participate in JUNET, it is important that you make an effort to contribute in some way. JUNET is not a commercial network.

JUNET is not a commercial network. Let's participate in JUNET constructively and make it better.