

JGN2 Utilization Guidance

(4th Edition)



September, 2007

National Institute of Information and
Communications Technology
(NICT)

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Preface

An open testbed network for research and development allows you to perform pioneering works for research and development of various technologies. As a result, you can implement an IT society 5 or 10 years in advance, giving society and people an early glimpse of IT society. In addition, the feedback from society and people on your research and development can accelerate the progress of your research and development, leading to an early application of the results in society, which will significantly contribute to the early realization of an IT society. The testbed network is clearly an important part of the IT strategy in Japan as it is clear from “e-Japan IT strategy II (developed by the IT strategy headquarters in July 2004),” which states the importance of enhancing the testbed network for research and development.

The Telecommunications Advancement Organization of Japan (TAO) established the Japan Gigabit Network (JGN), a network for researching and developing advanced technologies, including super-high-speed networks and advanced application technologies, in order to implement a next generation super-high-speed network in the 21st century. The JGN was in service for five years from 1999 to 2003, and left significant results in the promotion of broadband utilization, the promotion of IPv6 shifted from IPv4 in the Internet, the regional activation and the cultivation of human resources.

Under this background, the National Institute of Information and Communications Technology (“NICT”), an incorporated administrative agency, has been managing a new R&D testbed network “JGN2” since 2004 as the successor of JGN. The JGN2 is a nationwide network and has access points in all the prefectures (47 in total). Besides, the Japan-U.S.A. circuit and the Japan-Asia circuits (Thailand and Singapore) have been operated since August, 2004 and November, 2005 respectively as the JGN2 network. As well as the JGN, the JGN2 network is not only to provide a means to implement high-speed communication but also to become a global core for technical research and development of advanced networks towards the next-generation. The JGN2 network which aims to further develop the JGN, will play an important role on social field experiments and international collaboration. Though the JGN2 network is mainly operated by researchers in the fields of networks and advanced applications, participation of ordinary people is taking place as well as collaboration and connection with overseas organizations. In anticipation of the network technology of the future, the JGN2 network aims to promote that the ubiquitous society will be realized.

With this goal in mind, the JGN2 network which is opened for everyone like the JGN will promote the establishment of a research system for utilizing advanced networks through cooperation among the industry, the academia, the government and regional organizations to be both domestic and overseas, as well as it will improve networks as a social infrastructure. This guidance explains procedures for the JGN2 network utilization.

Chapter 1: Basic Operating Policy

Based on JGN2 Utilization Regulations, the basic operating policy is as follows:

(1) Users

In principle, anyone can utilize the JGN2 network for research and development. However, the user must be the person who is specified in a joint research contract with the National Institute of Information and Communications Technology (hereinafter referred to as NICT) or the person who is appointed by NICT for the research and development performed by NICT itself.

(2) Utilization Method

The JGN2 network can be utilized not only through connection to a JGN2 Access Point (hereinafter referred to as AP) established by NICT but also through connection to JGN2 Partnership Access Point (hereinafter referred to as PAP [*1]) and should be utilized by the user who is specified in the Item (1) above. As for each AP or PAP, please refer to Appendix-4. The JGN2 network can only be utilized to the extent specified by the joint research contract.

*1: PAP (Partnership Access Point)

PAP means some organizations not only connecting with JGN2 network but also providing in collaboration with NICT certain environment respectively to connect the other organizations with the JGN2 network as JGN2 users.

PAP can be connected with the JGN2 network as well as the existing AP, but as the operation policy of respective PAPs is to be established independently, their respective services and utilization procedures are different from each other among them as for the following items.

For further information, please refer to Appendix-9.

(3) Costs

The JGN2 network can be utilized free of charge. However, the user's equipment must be connected to the equipment at AP or PAP. The cost of a line required for the connection (hereinafter referred to as the "access line") must be borne by the user.

Chapter 2: Available Services

JGN2 provides not only Ethernet Connection Service (L2 Service) and IP Connection Service (L3 Service) that are available at all the access points but also OXC (Optical Cross Connect) Service, 10Gbps Connection Service and Optical Testbed Service which are available between specific access points [*2].

The user can be connected to the JGN2 network physically through the line to a JGN2 access point, which is prepared by the user as an access line. Besides, a regional data highway provided by a municipality may be used as an access line.

Though 10/100/1000BASE-TX ports are provided at all the access points, the maximum transmission capacity available is specified for each access point as shown in Appendix-4. In addition, the JGN2 network does not guarantee the band, or the expected line speed may depend on the line configuration and the utilization status.

There may be cases where the JGN2 network collects communication data for research activities. In addition, there may be cases where the JGN2 network operation is suspended because of the influence of experimental traffic. In these cases, NICT will notify users of that effect via the NICT homepage, except for cases of emergency.

The configuration of the communication line is shown in Appendix-5 as “Outline of JGN2 Network”, while the interface conditions are shown in Appendix-6 as “Main Specifications of JGN2 Connecting Equipment” [*2].

*2: Available Services, etc. to Be Provided through PAP

In case of connecting with PAP, usable services, maximum transmitting capacity and interface conditions are different from each other among PAPs.

For further information, please refer to Appendix-9 or ask respective PAPs.

The services available in the JGN2 network are explained in the following.

2.1 Services Available in All the Access Points

In the JGN2 network, connection ports for 10/100/1000BASE-TX (RJ45) are provided at all the access points. In addition, an optical connection such as 1000BASE-SX/LX is also available though there are limits to the number of ports. In case the optical connection is utilized, it is required for users to contact the JGN2 contact point for each experiment.

(1) Ethernet Connection Service (L2 Service)

a. Point to Point Connection Service

This service provides L2 point to point connection based on a VLAN.

b. Multi-points Connection Service

This service provides L2 multiple point connection based on the same VLAN.

If multiple paths are needed for the same access point in these services, VLAN-ID can be given for each path to use the same port.

(The VLAN-ID will be designated by NICT.)

(2) IP Connection Service (L3 Service)

This service provides connections for JGN2 users with each other, or with other research networks and other users, at the IP level as a service with an IPv6/IPv4 dual stack. The information on available interconnected research networks will be released on the homepage as some new information is obtained. An IPv6 address can be assigned from this network, and an application can be submitted for the address to NICT as required. In this service, some networks cannot be utilized for communication and in addition, transit is not provided.

2.2 Services Available in Specific Access Points

For utilizing the following services, NICT can accept consultation on each experiment. As for the serviceable access points, see Appendix-4.

(1) OXC (Optical Cross Connect) Connection Service

This service provides connections for places where the OXC system is installed at the optical wavelength level. 1Gbps and 10Gbps will be used as connection interface.

(2) 10Gbps Connection Service

This service provides connections for certain access points by a 10Gbps-Ethernet. It is also possible to connect access points which do not provide this service.

(3) Optical Testbed Service

This service provides optical transmission with dark fiber to conduct experiments between certain access points.

2.3 Other Research Support

To support research utilizing the JGN2 network, NICT is planning to provide the following information on its homepage and its mailing list.

- Maintenance and trouble information
- Traffic information
- Introduction of research in progress
- Information on symposiums, events, research result presentations
- Mailing list for promoting communications among participants
- Introduction of regional activities such as regional conferences

Chapter 3: Procedures Required for Utilization of the JGN2 Network

3.1 Basic Concept on Utilization

The following procedures are required for utilizing the JGN2 network.

(1) Joint research contract

Before utilizing the JGN2 network, the user must conclude a joint research contract with NICT. A separate joint research contract is necessary for each research organization. In addition, overseas researchers can utilize the JGN2 network by concluding MOU (Memorandum of Understanding) based on the comprehensive joint research contract (See Appendix-8).

Once a joint research contract is concluded, each research organization does not have to conclude a new joint research contract each time when a new research project is organized. Otherwise, it is also possible for each new project to enter into a research contract. (In detail, see Section 3.4 “Concluding Joint Research Contracts”.)

(2) Submitting required documents

It is required to submit research plans to NICT, describing the contents of the research to be performed on the JGN2 network. Research plans must be submitted for each research project when a new research project is established or each time when the research project is modified.

A joint research contract must be concluded for each research organization, and required documents must be submitted for each research project. (In detail, see Section 3.3 “Documents (Research Plans) to Be Submitted When Using the JGN2 network”.)

When the user stipulated in Article 3 of JGN2 Utilization Regulations wants to utilize the JGN2 network for a short term (in principle, about one month at the longest) due to an event and the like, it is required to submit an event utilization application to NICT (In detail, see Section 3.6 “Temporary Utilization”).

(3) Submitting application

TO:

JGN2 Center

National Institute of Information and Communications Technology

4-2-1, Nukui-Kitamachi, Koganei,

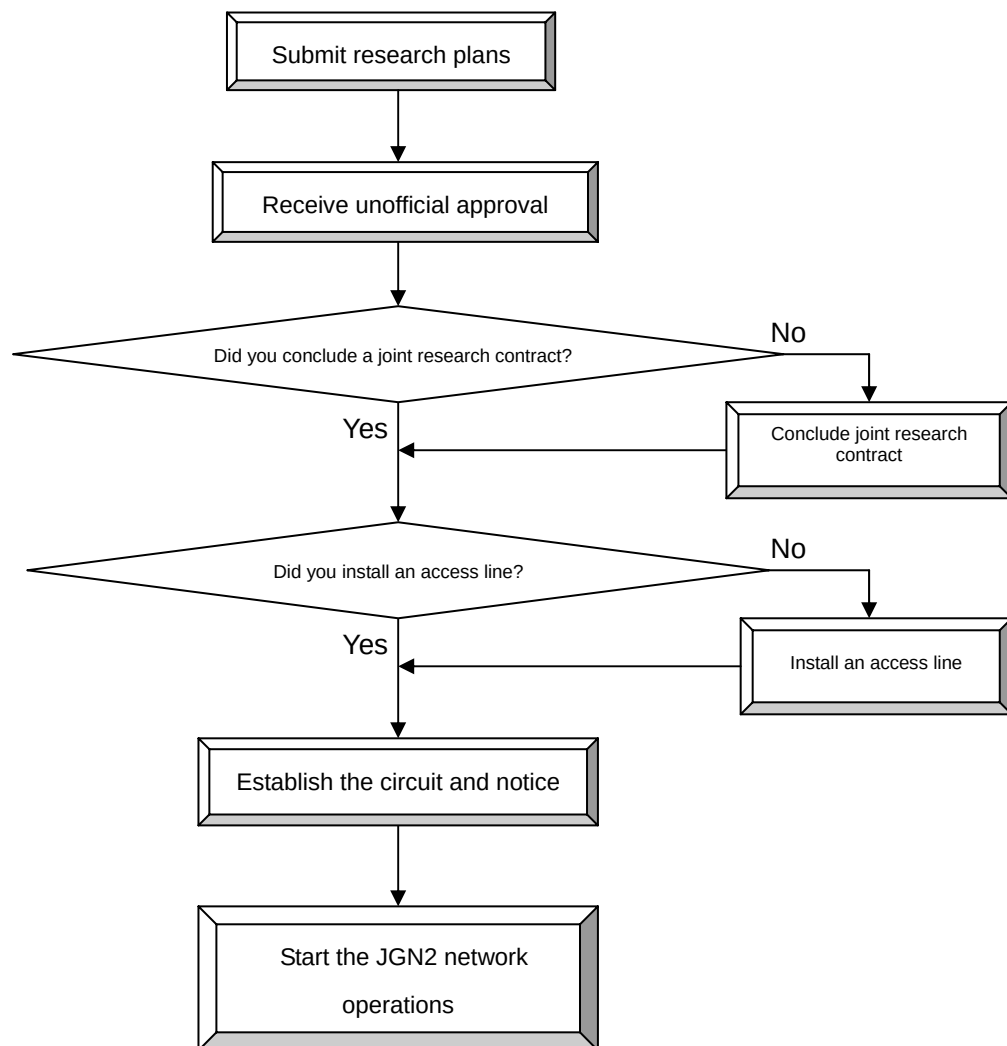
Tokyo 184-8795, Japan

TEL: 042-327-6024 FAX: 042-327-5689

E-Mail: jgn2center@jgn2.jp

3.2 Flowchart of Use

The basic procedures required to utilize the JGN2 network are shown below.



At first, it is required to submit research plans for the research to be implemented on the JGN2 network to NICT (See Section 3.3 “Documents (Research Plans) to Be Submitted When Using the JGN2 Network” and Appendix-2).

NICT examines the contents of the research plans. If NICT deems the plan appropriate, NICT will give unofficial approval to the applicant after confirming that there is no problem in the connection to the JGN2 network.

If the research organization has not concluded a joint research contract, NICT asks the organization to conclude a joint research contract in accordance with the research plans (In detail, see Section 3.4 “Concluding Joint Research Contracts”).

If the research organization does not have an access line, the organization should begin to prepare the access

line required to connect to the access point, as well as the equipment and facilities prepared at the user side. The user should prepare them in close coordination with the person in charge of the access point [*3]. When the date is fixed for actually connecting the equipment to the access point, it is required for the user to notify NICT of its connection date.

After being notified of the connection date, NICT establishes the JGN2 circuit concerned. NICT will notify the user of the opening date when the circuit will come into service and the necessary information for its establishment.

The user can utilize the JGN2 network after all the procedures are completed.

***3: Procedures for Utilizing PAP**

In case of utilizing the JGN2 network through PAP, at first, the application for utilizing the JGN2 network through PAP should be submitted to NICT. After that, NICT is to confirm if it is acceptable or non-acceptable. In the meantime, the PAP contact person may occasionally get in touch with the user.

With regard to preparation of the access line necessary for connecting with PAP and the equipment at the user, please sufficiently consult with the PAP contact person.

3.3 Documents (Research Plans) to Be Submitted When Using the JGN2 Network

(1) Submitting research plans

It is required to appoint a project leader who controls the entire research project and a chief researcher for each research organization. In principle, the project leader is responsible to compile research plans, including [Research Project Overview] and [Research Organization Information], and submit them to NICT.

Table 3-1 Work Assignment as for the Preparation of Research Plans

	Preparation	Submission
Research Project Overview	Project leader	Project leader
Research Organization Information	Chief of each research organization	Project leader

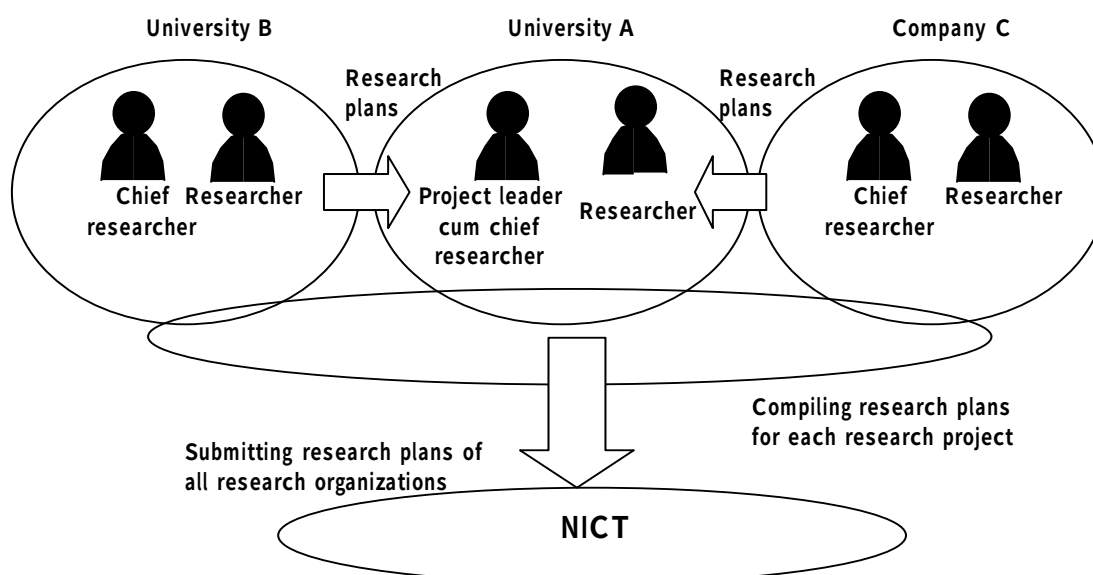


Figure 3-1 Image of Research Plan Submission

As for the research plan [Research Project Overview], the project leader should describe the entire research project information and submit it to NICT.

As for the research plan [Research Organization Information], the chief researcher in each joint research organization should describe each research organization information and submit the it to the project leader. The project leader should collect the information and submit it to NICT.

(2) Configuration of research plans

The configuration of the research plans is summarized in Table 3-2. The details of these research plans are explained below the table. In addition, the submission of other documents may be required.

Table 3-2 Configuration of Research Plans

Name	Purpose
Research Project Overview	Clarify the purpose of the research and the contents of the research. Clarify the network configuration of the entire research project.
Research Organization Information	Clarify the contents of each research organization. Set up and change the network and equipment in each research organization. Clarify the contact persons for each research organization.

- Research Project Overview (Description related to the entire research project)

In the research project overview, it is required to describe the topics related to the entire research project as shown below.

1. Research Project Information (1) Research project theme (2) Project leader (3) Joint research organizations (4) Contact points for the research project (5) Research purpose (6) Contents of the research
2. Utilization Service Information (1) Topology (Network overview of the entire research project) (2) Information on connected sections (3) Schedule of the entire research project

- Research Organization Information (Information related to each research organization)

In the research organization information, it is required to describe the details of each research organization that participates in the research project as shown below. This information must be prepared for each research organization.

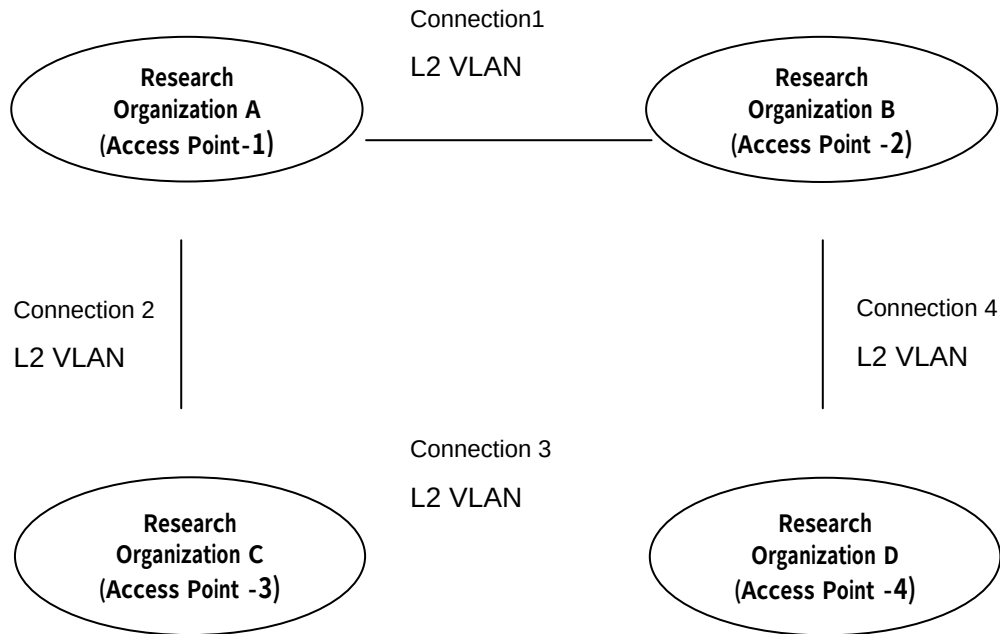
1. Researcher Information (1) Research project theme (2) Chief researcher (3) Researchers (4) Utilized Access point
2. Utilization Service Information (1) Topology (Details of network and equipment configuration in the research organization) (2) Connection information (3) Utilization schedule
3. Paperwork Procedure Information (1) Contact points for the research organization (2) Contact points of the person in charge of the contract paperwork (3) Information on the existing joint research contracts

Examples of topology diagram of the research project overview and the research organization information are shown below.

[Synopsis of Research Project]

2. Information of Service Utilization

(1) Topology (Synoptic Network of the Entire Research Project)



(It is required to write the configuration schematic diagram of the entire research project.)

(2) Detailed information on connected sections

Connection 1 (new/continue/abolish)

Date of Work (d/m/y)

	AP Name	Port Number	Physical IF	VLAN-ID	Nego	Service Type	Access Line
1A	AP-1		1000BASE-T			SA	LA
1B	AP-2		1000BASE-T			SA	LA

Connection 2 (new/continue/abolish)

Date of Work (d/m/y)

	AP Name	Port Number	Physical IF	VLAN-ID	Nego	Service type	Access line
2A	AP-1		1000BASE-T			SA	LA
2B	AP-3		1000BASE-T			SA	LA

Connection 3 (new/continue/abolish)

Date of Work (d/m/y)

	AP Name	Port Number	Physical IF	VLAN-ID	Nego	Service type	Access line
3A	AP-2		1000BASE-T			SA	LB
3B	AP-3		1000BASE-T			SA	LA

Connection 4 (new/continue/abolish)

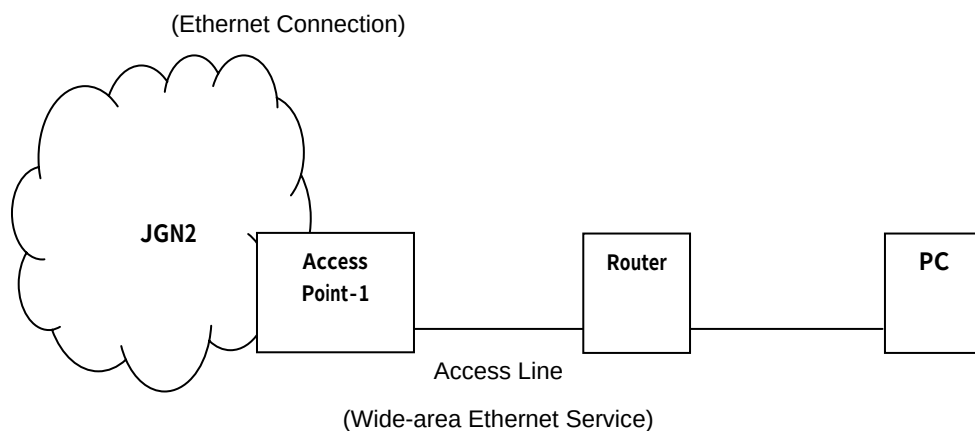
Date of Work (d/m/y)

	AP Name	Port Number	Physical IF	VLAN-ID	Nego	Service type	Access line
4A	AP-2		1000BASE-T			SA	LB
4B	AP-4		1000BASE-T			SA	LA

[Research Organization Information]

2. Information of Service Utilization

(1) Topology (Details of Network and Equipment Configuration in the Research Organization)



(It is required to write the equipment configuration diagram to each research organization from its access point connected.)

	AP Name	Port Number	Physical IF	VLAN-ID	Nego	Service Type	Access Line
1	AP-1		1000BASE-T			SA	LA

Figure 3-2 Image of Topology Diagram and an Example for Description

For the form required for applications, see “Appendix-2”. The form can also be downloaded from the following URL.

<http://www.jgn.nict.go.jp/>

3.4 Concluding Joint Research Contracts

To utilize the JGN2 network, a joint research contract must be concluded with NICT. The basic flow of procedures for concluding a joint research contract is shown below. (See Appendix-3 “Joint Research Contract (Example)”.)

- Submit research plans for each project.
- Conclude a joint research contract for each research organization.
- “The Research Plan [Research Organization Information] (1. Researcher Information)” should be a part of the joint research contract.
- “The Research Plan [Research Organization Information] (1. Researcher Information)” should be attached as numerous as belonging research projects to the joint research contract of each research organization.

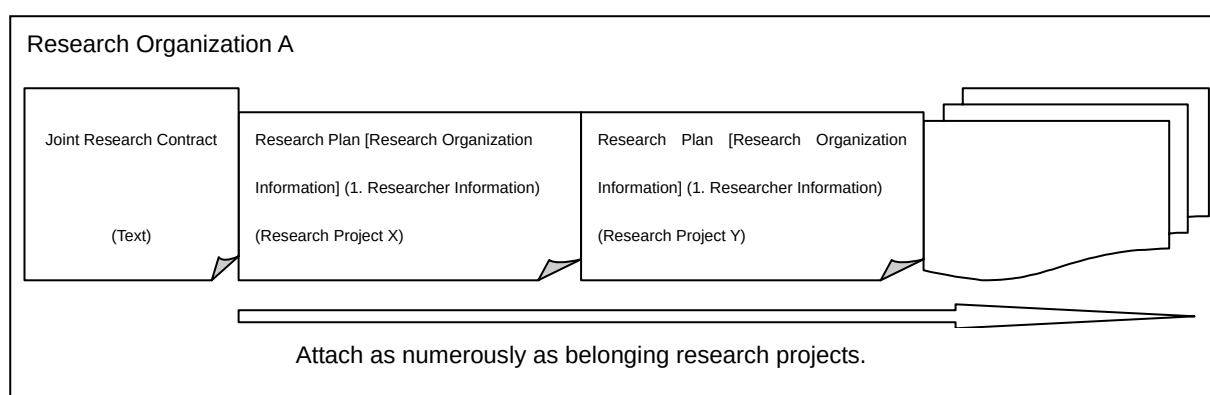


Figure 3-3 Formation of the Joint Research Contract

A research organization utilizing the JGN2 network for the first time should conclude a joint research contract. In principle, Joint research contracts terminate at the end of the fiscal year.

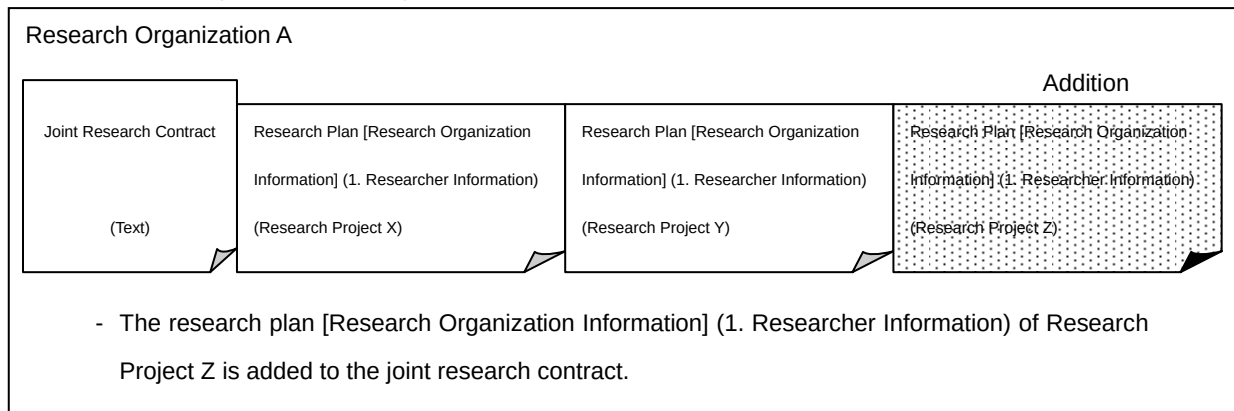
If a new research project is added or there is a modification to the contents of the research plan, the research organization ordinarily does not have to conclude a joint research contract again. After notifying NICT of the addition or modification, replace “the Research Plan [Research Organization Information] (1. Researcher Information)” in the joint research contract with a new one in accordance with the reply from NICT. (But it is also possible to conclude a contract again, if necessary.)

If a research organization that has already concluded a joint research contract wants to add a new research project, it is required to add the information on “the Research Plan [Research Organization Information] (1. Researcher Information)” to the contract.

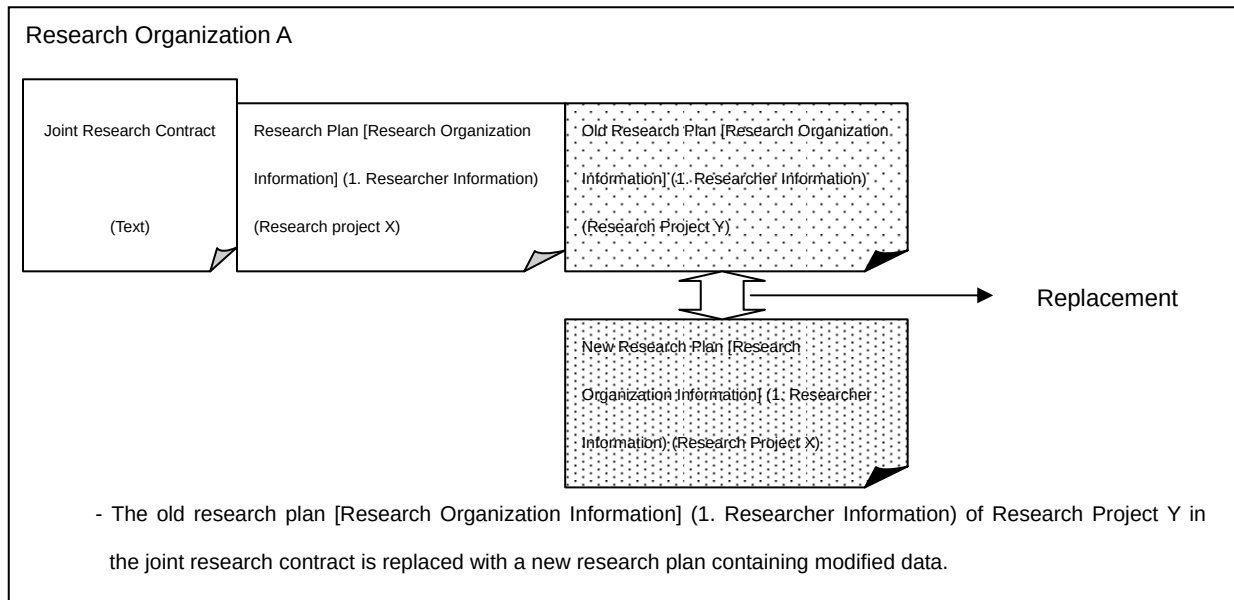
If the research organization wants to modify the contents of the research project, it is required to replace the research plan with a new one (For details, see Section 3.5 “Specific Application Method”.

Diagrams on adding a research plan to the joint research contract, replacing the research plan and deleting the research plan are shown below.

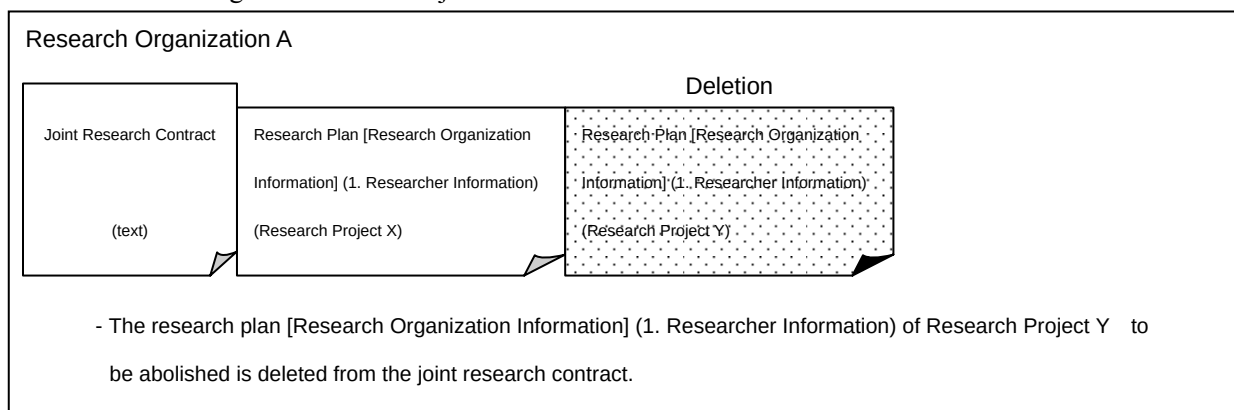
- In Case of Adding a Research Project



- In Case of Modifying the Contents of the Research Project



- In Case of Deleting the Research Project



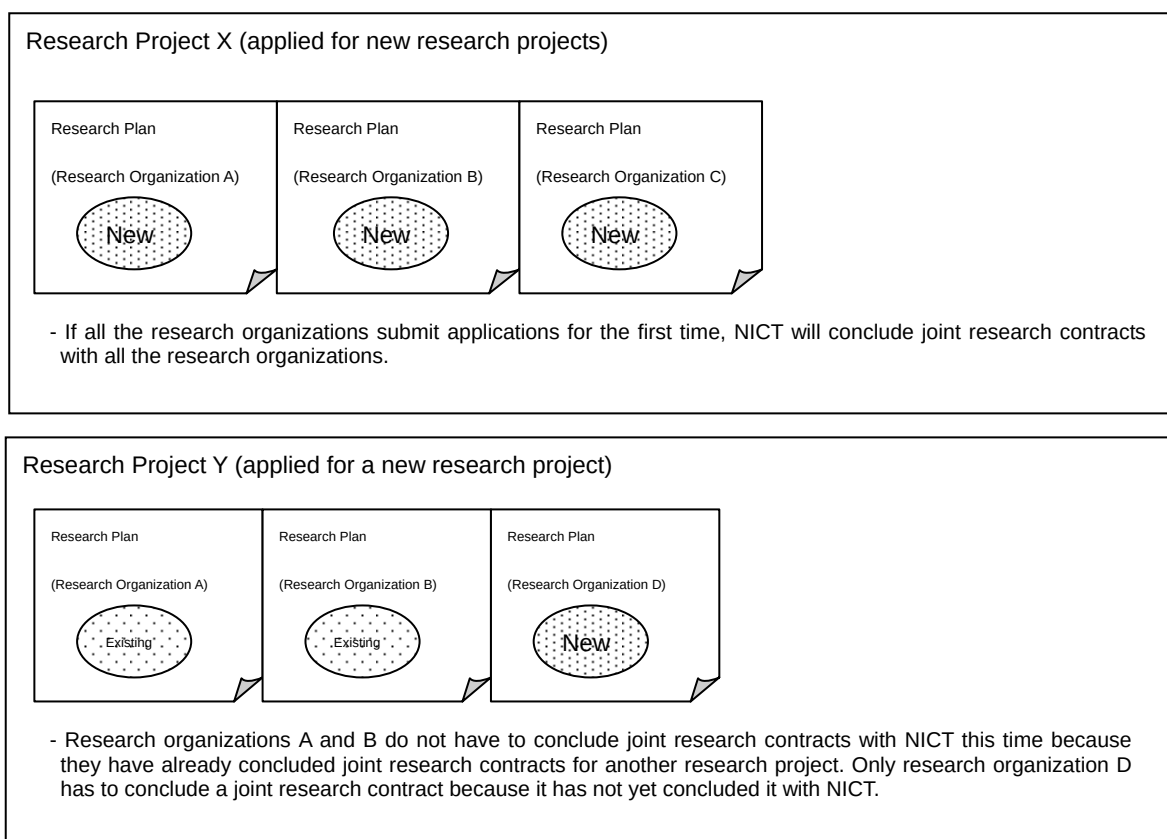
3.5 Specific Application Method

There are various cases in utilizing the JGN2 network: a case which new research projects may be launched, a case which a research organization may participate in the existing research project or leave the existing research project and a case which the contents of the utilization service may be changed. The specific application method is explained for each case in this section. (For cases which are not explained in this document, it is required to consult with NICT individually.)

(1) In Case of launching a new research project

In case of launching a new research project, it is required to compile research plans one by one for each research project and submit them to NICT.

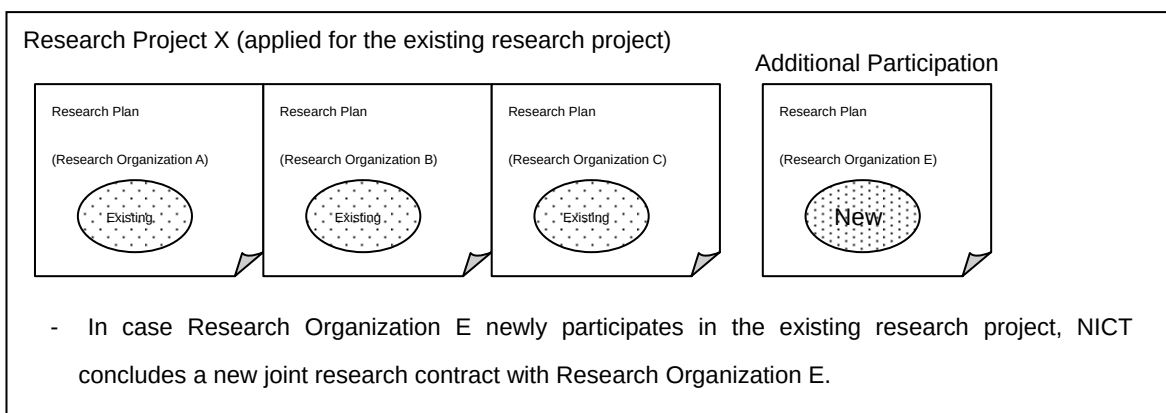
For utilizing the JGN2 network, a research organization which has not yet concluded a joint research contract with NICT should conclude a joint research contract with NICT.



(2) In Case of participating in the existing research project or leaving the existing research project

In case a research organization newly participates in the existing research project, it should submit a “Research Plan [Research Organization Information]” to NICT. If the research organization has not yet concluded a joint research contract with NICT, it should conclude a joint research contract with NICT. It

is also required to modify the “Research Plan [Research Project Overview]” and submit it to NICT. The project leader should compile research plans of the entire research project and submit them to NICT. The modification procedure is completed when a notice from NICT is received.



The leaving procedure is also in accordance with the additional participation procedure mentioned above. In case the research project is discontinued due to leaving research organizations, it is required to notify NICT of it in writing one month prior to its leaving in accordance with the joint research contract.

(3) In Case of modifying (adding or deleting) the chief researcher or the researcher

In case of modifying (adding or deleting) the chief researcher or the researcher, it is required to submit a “Research Plan [Research Organization Information]” in which the information of the modified research organization is described. The information on research organizations for which no modification are made does not have to be submitted. A “Research Plan [Research Project Overview]” should be submitted only when there is a certain modification. The modification procedure is completed when a notice from NICT is received.

(4) Other modifications

In case there is a certain modification to, for example, the utilization service, the research contents or others, it is required to submit the modified “Research Plan [Research Project Overview] and [Research Organization Information].” The modification procedure is completed when a notice from NICT is received.

3.6 Temporary Utilization

(1) Temporary utilization

Temporary utilization, in principle, refers to the JGN2 network utilization in an event and the like by a

research organization which has already concluded a joint research contract. The event and the like refers to the JGN2 network utilization for a short period (in principle, no longer than one month) when the research organization meets the following conditions:

- Perform a demonstration by using the JGN2 network.
- Comply with the research contents described in the research plan.

In this case, the research organization is permitted to change the network setting defined in the research plan in order to perform the demonstration.

In case of performing a demonstration by using the JGN2 network, it is required to submit an event utilization application regardless of whether or not the network setting is changed.

See “Appendix-7” for the format required for submitting an application. The form can also be downloaded from the following URL:

<http://www.jgn.nict.go.jp/>

(2) Utilization conditions

Before utilizing the JGN2 network, it is required to understand the following conditions:

- Take responsibility for any problems to the JGN2 network utilization through the person responsible for the event.
- Take care not to cause any physical damage to the JGN2 network during the event and before and after it.
- Accept no guaranteeing for the communication quality with the JGN2 network.
- Submit a research report related to the event (with any quantity and form) to NICT.
- Publicize the JGN2 network actively.
- Use the following logo during the event.



(3) Caution

In case of submitting an application, it is required to take note of the following points:

- In principle, submitting an application one month or more in advance. (in case of establishing a line and the like, taking into account how many days required for its work.)
- There are cases where a request is not accepted because of the network setting.
- In principle, the period of the JGN2 network utilization is one month at the longest.

Chapter 4: Before Utilizing the JGN2 Network

4.1 Conditions for Network Provision

- (1) NICT does not guarantee the quality of communication on the JGN2 network.
- (2) NICT is not liable for any damage resulting from users' utilization of the JGN2 network or inability to utilize the JGN2 network.
- (3) NICT may collect communication data for the purpose of research and management.

4.2 Rules to Be Observed

In utilizing the JGN2 network, the user should observe the following rules:

If the user violates any of the following rules, NICT may revoke permission to utilize the network.

- (1) In utilizing the JGN2 network, NICT prohibits the following acts:

The user should take appropriate measures to prevent the following acts.

- Utilize the JGN2 network without concluding a joint research contract.
- Utilize the JGN2 network for a purpose unrelated to the research performed by the user, which is specified in Article 3 of Utilization Regulations.
- Utilize the JGN2 network directly for profit
- Let a person other than the user specified in Article 3 of Utilization Regulations utilize the JGN2 network.
- Interfere with the network management.
- Violate the regulations or offend the public order and morals.
- Perform other acts which NICT (the JGN2 administrator) considers inappropriate.

- (2) In utilizing another network via the JGN2 network, it is also required to observe the utilization regulations of the network concerned.

4.3 Caution

In utilizing the JGN2 network, it is required to keep the following items in mind.

- (1) All matters regarding the user's facilities in the section to the user's site from the connection equipment installed by NICT and the access line are in the user's responsibility.
- (2) Depending on the access point, it may be required to have separate coordination with the organization which has installed the equipment before using the equipment.
- (3) The ownership of the intellectual property obtained by the user in the course of research utilizing the JGN2 network is stipulated in the joint research contract or other document.
- (4) NICT is not liable for any damage resulting from user's utilization of the JGN2 network.
- (5) If the user causes damage to NICT either intentionally or through gross negligence in utilizing the JGN2 network, the user is liable for NICT as for the damage.

4.4 Cooperation

- (1) To let people know about the usability of the JGN2 network and to urge onward a certain active research and development, it is required for users to cooperate with NICT by reporting the progress and results of the research through research presentation conferences and symposiums sponsored by NICT.
- (2) If users will contact the press or write a paper concerning the research utilizing the JGN2 network, it is required to state that the JGN2 network would have been utilized for the research and give the research project number that would have been assigned by NICT when the joint research contract is concluded. At the same time, it is required to submit a copy of the presented material or paper to NICT. When contacting the press, NICT will be informed in advance.

4.5 Others

- (1) Besides the JGN2 network, the user should establish an environment in which the Internet can be used because NICT notifies users of the JGN2 network troubles and the like.
- (2) Information on maintenance, troubles, traffic and events such as research presentation conferences and the like can be submitted on the JGN2 home page.

Reference 1: Operation System

The JGN2 network is operated by NICT. To operate the JGN2 network smoothly, NICT has established the following organizations.

(1) Next Generation Advanced Network Promotion Conference

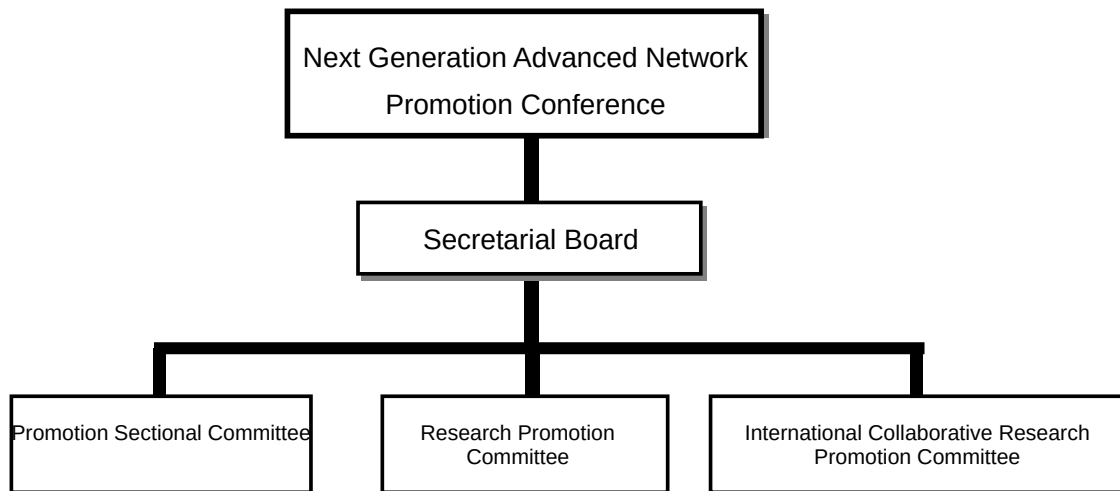


Figure Reference 1-1 JGN2 Operation System

The roles of the organization and each committee in Figure Reference 1-1 are as follows:

1. Next Generation Advanced Network Promotion Conference

Examine methods to promote the research and development utilizing the JGN2 network and the direction of the JGN2 project management.

2. Secretarial Board

Examine the issues regarding the smooth management for the next generation advanced network promotion conference and the management policy of the JGN2 project.

3. Promotion Sectional Committee

Examine the utilization promotion of the JGN2 network, communicating with regional conferences, and carrying out public relations.

4. Research Promotion Committee

Serve a forum to exchange opinions between researchers directly controlled by NICT and external researchers and examine the direction of research themes utilizing the JGN2 network.

5. International Collaborative Research Committee

Examine the research and development utilizing the JGN2 international circuits.

(2) JGN2 Center and JGN2 Network Operation Center (NOC)

To operate the JGN2 network smoothly, NICT has established the JGN2 center and the Network Operation Center (NOC).

JGN2 Center

The JGN2 center plays a role to deal with users' applications for connecting to the JGN2 network, accept and examine research plans, conclude joint research contracts, determine network settings, respond to inquiries regarding network settings and provide research and development support information such as network reservation status, trouble information and the like.

JGN2 Network Operation Center (NOC)

NOC implements network settings determined by the JGN2 center and operates and monitors networks.

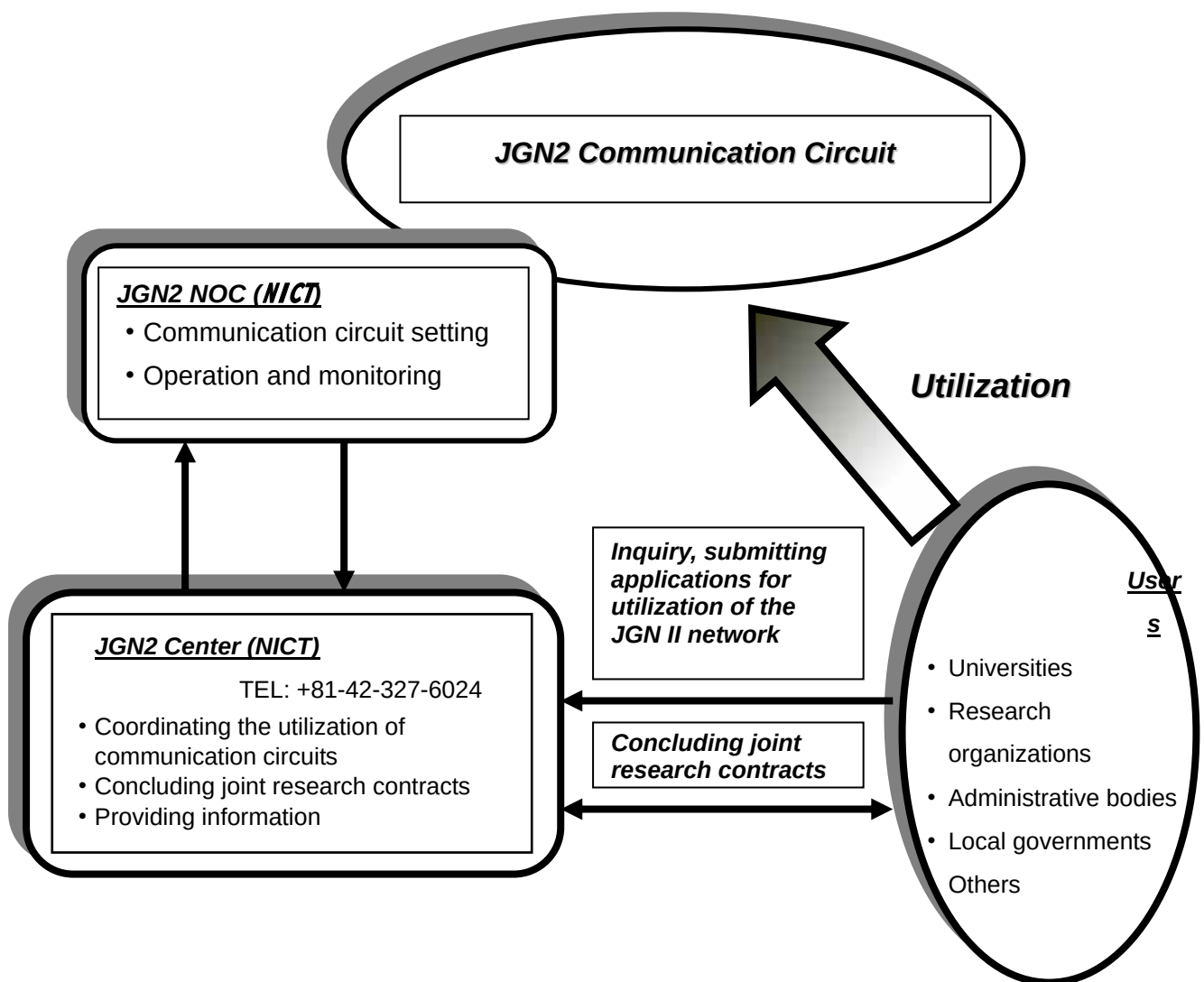


Figure Reference 1-2 Network Operation System

Reference 2: Glossary

- [Ubiquitous]** The term ubiquitous means being everywhere in Latin.
By way of example, Ubiquitous Network: A network that can be accessed from anywhere at any time not only by computers but also by various apparatuses including cellular phones.
- [ADSL]** Abbreviation of Asymmetrical Digital Subscriber Line. It is a type of high-speed communication technology using subscriber lines of telephones (metal cables). Transmission speeds are different between upstream and downstream directions.
- [Ethernet]** The most widely used LAN method. It has become a synonym for LAN. Transmission speeds of 10Mbps, 100Mbps, 1Gbps and 10Gbps are standard.
- [FTTH]** Abbreviation of Fiber To The Home. This is a plan to replace all cables such as telephone lines with optical fibers and to disseminate optical fibers into general households.
- [IP]** Abbreviation of Internet Protocol. A protocol which is widely used by LANs and the Internet.
- [IPv4]** Abbreviation of Internet Protocol version 4. The most widely used version of the Internet Protocol at present. IPv4 addresses will be exhausted soon.
- [IPv6]** Abbreviation of Internet Protocol version 6. An IP protocol for the next generation. To solve the IP address exhaustion problem, IP addresses have been extended to 128 bits, which are four times larger than IPv4 addresses.
- [L2]** Abbreviation of Layer 2. In this method, packets are forwarded to the destination determined by MAC (Media Access Control) addresses.
- [L3]** Abbreviation of Layer 3. In this method, packets are forwarded to the destination determined by IP addresses.
- [OXC]** Abbreviation of Optical Cross Connect. This is a device which relays signals without returning optical signals to electric signals. It assigns wavelength multiplexed optical signals based on the wavelength.
- [QoS]** Abbreviation of Quality of Service.
- [VLAN]** Abbreviation of Virtual LAN. This is a technique of constructing a logical LAN apart from a physical LAN by grouping computers connected to the LAN.
- [VLAN-ID]** Abbreviation of Virtual LAN-Identification. Additional information assigned to each group to distinguish groups when computers are grouped for a VLAN.

JGN2 Utilization Regulations

<Article 1> Purpose

The purpose of these regulations is to stipulate the rules to be observed by JGN2 users when utilizing the JGN2 network.

<Article 2> Definition

The JGN2 is an open testbed network for research and development that was installed by the National Institute of Information and Communications Technology (hereinafter referred to as “NICT”) and will be operated until the end of the fiscal year, 2007 to promote research and development which contributes to significantly improving communication and broadcasting techniques, such as super-high-speed network techniques and advanced application techniques.

<Article 3> User

The person who can utilize the JGN2 network (hereinafter referred to as “the user”) is the person who is specified in a joint research contract with NICT or who is appointed by NICT in the research and development performed by NICT itself.

<Article 4> Application for Utilization

1. The user should submit an application for the utilization of the JGN2 network to NICT in accordance with the procedures explained in the “JGN2 Utilization Guidance.”
2. Based on the application, NICT will make adjustments, if necessary.

<Article 5> Prohibitions

The user is prohibited from performing the following acts when utilizing the JGN2 network.

- (1) Utilizing the JGN2 network for the regulation which is not related to the research specified in Article 3 of JGN2 Utilization Regulations.
- (2) Utilizing the JGN2 network for direct profit
- (3) Interfering with the network operations
- (4) Violating the regulations or offending public order and morals
- (5) Other acts which NICT (the JGN2 administrator) considers inappropriate

<Article 6> Network Provision Conditions

1. NICT does not guarantee the quality of communication on the JGN2 network.
2. NICT may collect communication data for research or operational purposes.

<Article 7> Cooperation

The user should cooperate with NICT in the following ways when utilizing the JGN2 network.

- (1) Cooperate with NICT in the operation of the JGN2 network.
- (2) Observe the rules specified in detailed regulations (“JGN2 Utilization Guidance”).
- (3) Cooperate with NICT in collecting information stipulated in Item 2 in the previous article.
- (4) Observe the utilization regulations of other networks, too, when utilizing the network concerned through the JGN2 network.
- (5) Take appropriate measures to prevent JGN2 from being utilized for the communication unrelated to the research specified in Article 3.

<Article 8> Intellectual Property

The ownership of the intellectual property obtained in the course of research utilizing the JGN2 network is stipulated in the joint research contract in Article 3.

<Article 9> Revoking Permission

NICT may revoke permission to utilize the JGN2 network if the user violates these utilization regulations.

<Article 10> Additional Rule

These regulations are effective from April 1, 2004.

JGN2 Research Plan [Research Project Overview]

1. Research project information

Project No. (JGN2 -)

	Submitted on (d/m/y)
--	----------------------

(1) Research project theme

Theme (Japanese):

Theme (English):

(When two or more research organizations jointly propose a research project, use the same theme name.)

(2) Project leader

Research organization to which he/she belongs (Japanese):

Research organization to which he/she belongs (English):

Name:

Department, post (Japanese):

Department, post (English):

Address:

Phone number:

FAX number:

E-mail:

(3) Joint research organizations

(Enter information on the joint research organizations.)

1.

2.

3.

(If there are more organizations, add item numbers or attach a separate sheet.)

(4) Contact for the research project (The contact person to whom NICT should send notices concerning the research project.) Organization to which he/she belongs: Name: Department, post: Phone number: FAX number: E-mail:
(5) Research purpose
(6) Details of the research (Field of research) (Reason why JGN2 is required)

2. Use service information

(1)Topology

(NW overview of the entire research project)

(2) Detailed information on connecting sections

(Enter one path as one connection.)

Connection 1 (new/continue/abolish)

Date of work (d/m/y)

	AP name	Port number	Physical IF	VLAN-ID	Nego	Service type	Access line
1A							
1B							

Connection 2 (new/continue/abolish)

Date of work

	AP name	Port number	Physical IF	VLAN-ID	Nego	Service type	Access line
2A							
2B							

Connection 3 (new/continue/abolish)

Date of work

	AP name	Port number	Physical IF	VLAN-ID	Nego	Service type	Access line
3A							
3B							

Remarks:

(If there are more than three connections, add tables.)

JGN2 Research Plan [Research Organization Information]

Project No. (JGN2 -)

1. Researcher information

	Submitted on (d/m/y)																
(1) Research project theme Theme (Japanese): Theme (English): (When two or more research organizations jointly propose a research project, use the same theme name.)																	
(2) Chief researcher (Write the chief of each organization.) Organization to which he/she belongs (Japanese): Organization to which he/she belongs (English): Name: Department, post (Japanese): Department, post (English): Address: Phone number: FAX number: E-mail:																	
(3) Researcher <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Post</th> <th style="width: 30%;">Researcher name</th> <th style="width: 20%;">E-mail address</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> (Enter all the researchers concerned with this research project. If there is not enough space, extend the table.)		Department	Post	Researcher name	E-mail address												
Department	Post	Researcher name	E-mail address														

(4) Access point used

Place of installation:

Address:

2. Utilization service information

(1) Topology (Details of NW and equipment configuration of the research organization)

(2) Connection information (Enter information on the connections your organization uses.)

a. Access points utilized

	AP name	Port number	Physical IF	VLAN-ID	Nego	Service type	Access line
1							
2							
3							

Remarks:

(If you use more than three ports, extend the table.)

※ If “new” is set, leave the “Port number” and “VLAN-ID” columns (except when you want untag) blank.
When NICT sends a reply , NICT will return a table in which the above data is written.

※ If you want “untag” when “new” or “modification” is specified, enter “N/A” in the “VLAN-ID” column.

※ In the “Nego (negotiation) column,” enter “auto” when you want “autonego.” If you have no specification, leave the column blank.

※ For “Service type,” choose from the following items.

SA: L2 service

SB: L3 service

SC: OXC connection service

SD: 10G connection service

SE: Optical test bed service

※ For the line type of “Access line,” choose from the following items.

LA. Using a commercial service

LB. Using an information high way of a municipality

LC. Using LAN at a campus or other site

LD. Directly connecting with a cable

LE. Other (Write the details in Remarks)

If you want L3 connection, fill out the following table.

Address distribution (yes/no)	IPv4	IPv6	Link address	Routing

b. Used band on JGN2
Mbps

(3) Use schedule

Desired start date	End date
(d/m/y)	to (d/m/y)

3. Procedure information

(1) Contact for the research organization

(The contact person to whom NICT should send notices concerning the research project.)

Organization to which he/she belongs:

Name:

Department, post:

Phone number:

FAX number:

E-mail:

(2) Contact address of the person in charge of office work

Organization to which he/she belongs:

Name:

Department, post:

Address:

Phone number:

FAX number:

E-mail:

(3) Information on existing joint research contract

a. Have you already concluded a joint research contract with NICT?

b. Joint research theme name and project No.

※ Enter for each research organization.

Joint Research Contract (Example)

The National Institute of Information and Communications Technology (“A”) and (enter the name of the institution applying for the research) (“B”) have entered into this Joint Research Contract (hereinafter referred to as “Contract”) on the following terms and conditions:

<Article 1> Purpose and Subjects of Research

A and B shall conduct research on the subjects described in the attached Research Plan (hereinafter referred to as “Project Themes”) by using telecommunications circuits of the JGN2 network provided by A for the purpose of significantly improving communications and broadcasting technology.

<Article 2> Definitions

The following terms in this Contract shall be defined as follows:

- (1) “Invention or Idea” shall mean an invention as defined in Article 2 Section 1 of the Patent Law (1959 Law No.121), an idea as defined in Article 2 Section 1 of the New Utility Model Law (1959 Law No.123), design as defined in Article 2 Section 1 of the Design Law (1959 Law No. 125), or trademark as defined in Article 1 Section 2 of the Trade Mark Law (1959 Law No.127).
- (2) “Industrial Property Right” shall mean any patent right, utility model right, design right or trademark right granted in Japan and foreign countries.
- (3) “Right to Obtain Industrial Property Right” shall mean the right to obtain a patent in Japan or in any foreign country, the right to register a utility model, the right to register a design or the right that arises from the application for registration of a trademark.
- (4) “Industrial Property Right, etc.” shall mean Industrial Property Right as defined in paragraph (2) and the Right to Obtain Industrial Property Right as defined in the preceding paragraph.

<Article 3> Place of Research

The joint research under this Contract ("Joint Research") shall be carried out in the following place(s):

Location of B's premises and other places as necessary

<Article 4> Research Term

1. The term of the Joint Research shall commence on the conclusion date of this Contract and shall end on the last day (March 31) of the fiscal year in which this Contract was concluded.
2. This Contract shall be extended for a period of one (1) year each time unless either A or B notifies the other in writing of the intention to terminate at least one (1) month prior to the expiration of this Contract or any extension hereof; provided, however, that A may be exempted from notifying its intention to terminate in writing if A publicly announces for the purpose of making widely known the fact that A will discontinue its service of providing telecommunications circuits of the JGN2 network by an electromagnetic method at least six (6) months prior to the expiration of this Contract.

<Article 5> Electromagnetic Method

An electromagnetic method referred to in Article 4 shall mean any of the following methods:

- (1) A method of using an electronic information processing system which connects the computer used by A and B via telecommunications circuit, whereby information is transmitted via such telecommunications circuit and such information is recorded on the files stored in the computer used by B; or
- (2) A method of providing information recorded on the files stored in the computer used by A for public access via telecommunications circuits.

<Article 6> Researcher

B shall have those researchers whose names are listed on the attached Research Plan participate in the Joint Research on each of the Project Themes defined in Article 1

<Article 7> Equipment

1. A shall provide telecommunications circuits of the JGN2 network and a connecting device to be installed in the place specified in the attached Project Plan referred to in Article 1 for the Joint Research, and B shall bear all other expenses incurred in connection with the Joint Research and shall provide all other necessary research equipment.
2. The right to any property or material acquired for conducting the Joint Research shall belong to the party who bears the expenses thereof.

<Article 8> Addition to, Change in or Cancellation of Research Subjects

If B makes a request for addition to, change in, or partial cancellation of any Project Theme defined in Article 1 in the form designated by A, A shall examine the content of such request in a prompt manner and notify B of approval or disapproval thereof in writing.

<Article 9> Research Term in the Event of Addition to, Change in or Cancellation of Research Subjects

If A gives approval under the preceding article, this Contract shall be considered to have been renewed on the date of such approval. In this case, the term of the Joint Research shall commence on the date of such renewal and end on the last day (March 31) of the fiscal year in which such renewal occurred.

In this case, the provision of Article 4 Section 2 shall apply continuously.

<Article 10> Compensation for Damage

1. B shall be liable for compensation for any A's damage due to B's intentional act or material negligence in the course of conducting the Joint Research.
2. A shall not be liable for any damage incurred by B in connection with the utilization of the telecommunications circuits of the JGN2 network.

<Article 11> Compliance with Terms of Utilization

1. B shall comply with “Terms of Utilization of the JGN2 network” which are separately prescribed by A when utilizing the telecommunications circuits of the JPN II network for the conduct of the Joint Research.
2. A may terminate this Contract if B fails to comply with “Terms of Utilization of the JGN2 network” without compensating B for any damage incurred by B due to such termination.

<Article 12> Application for Industrial Property Right

Application for Industrial Property Right in any invention or idea developed as a result of the Joint Research shall be filed in the following manner.

1. If either A or B intends to apply for an Industrial Property Right in any invention or idea developed independently by the researchers belonging thereto, such party shall confirm, in advance, with the other party that such Invention or Idea has been developed independently.
2. A and B may jointly apply for an Industrial Property Right in any invention or idea jointly developed by the researchers belonging to A and the researchers belonging to B after entering into a separate Joint Application Contract setting out the shares of A, A’s researchers (including those who have left A after the date on which such invention or idea was developed) and B in the ownership of the Industrial Property Right, etc. in such invention or idea (hereinafter referred to as “Shared Industrial Property Right, etc.”).
3. In applying the provisions of Item-2 to a case where a researcher belonging to A on loan from a third party under an Industry-Academia-Government Joint Research and Development Contract between A and such party has assigned part of the Shared Industrial Property Right, etc. to such other party of such contract, the other party of such contract shall be a joint applicant for such Shared Property Right, etc. on behalf of such researcher.

<Article 13> Grant of Priority Right

1. A may grant B and the person designated by B a priority right to use any invention or idea in which the Industrial Property Right, etc. is exclusively owned by A and researchers belonging to A (or the institution that loaned such researcher in the case where such researcher has assigned his/her share in such Industrial Property Right, etc. to such institution) for a period not exceeding five (5) years from the date of completion of the Joint Research.
2. B may grant the person designated by A a priority right to use any invention or idea in which the Industrial Property Right, etc. is exclusively owned by B for a period not exceeding five (5) years from the date of completion of the Joint Research.
3. A and B may grant the person designated by A and the person designated by B a priority right to use any invention or idea subject to Shared Industrial Property Right, etc. for a period not exceeding five (5) years from the date of completion of the Joint Research.

<Article 14> Grant of Right to Third Parties

If A has granted a priority right to B or the person designated by B in accordance with the provisions of paragraphs (1) and (3) of the preceding article, and B or such person designated by B has not used such invention or idea in the second year and after during the term of such right without good reason, or if it is deemed extremely detrimental to the public interest to grant such person a priority right to use such invention or idea, A may allow a person other than B or such person designated by B (hereinafter referred to as “Third Party”) to use such invention or idea, provided, however, that A shall obtain consent from B prior to allowing any person to use any invention or idea described in paragraph (3) of the preceding article.

<Article 15> Royalties

Royalties for Industrial Property Right shall be paid as follows:

1. If A allows B or any person designated by B to use any invention or idea subject to any Industrial

2. If B allows any person designated by A to use any invention or idea subject to any Industrial Property Right, etc. (excluding Shared Industrial Property Right, etc.) succeeded by B, B shall collect a royalty in proportion to B's share in the ownership of such Industrial Property Right, etc.

1. The results of the Joint Research shall be made public in principle. The timing and the method of such publication shall be determined upon consultation between A and B.
2. B shall report to A on the progress and result of the Joint Research as requested by A.

In Witness Hereof, A and B have concluded this Contract in duplicate, with both parties retaining one copy respectively.

A: The National Institute of Information and Communication Technology
4-2-1, Nukuii-Kitamachi, Koganei, Tokyo

By: _____, President seal

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Refer to Appendix-4: “List of JGN2 of Access Points and Services Available” in the Required Documents Table as for Method of Utilization.

Refer to Appendix-5: “Outline of JGN2 Network” in the Required Documents Table as for Method of Utilization.

Main Specifications of JGN2 Connecting Equipment

(1) Details on Ethernet/IP connection services*

Table Appendix 6-1: Ethernet/IP Connection Service

Item	Description
Available interface	10BASE-T/100BASE-TX/1000BASE-T **
Physical interface	RJ-45 connector **
VLAN-ID	Determined by NICT within the range of 1 to 4,094.

* The band is not guaranteed.

** For optical connections other than the above such as 1000BASE-SX/LX, consult NICT for each experiment.

(2) Main specifications of the connection equipment

Table Appendix 6-2: Connection Equipment Type A (CentreCOM 9812T)

Physical Interface Speed (bps)	Standard	Connection Condition
10Mbps max.	IEEE802.3 10BASE-T	RJ-45 connector
100Mbps max.	IEEE802.3u 100BASE-TX	RJ-45 connector
1000Mbps max.	IEEE802.3ab 1000BASE-T	RJ-45 connector
1000Mbps max.	IEEE802.3z 1000BASE-SX/LX	SC connector/GBIC

Table Appendix 6-3: Connection Equipment Type B (GS4000-○○E)*

Physical Interface Speed (bps)	Standard	Connection Condition
10Mbps max.	IEEE802.3 10BASE-T	RJ-45 connector
100Mbps max.	IEEE802.3u 100BASE-TX	RJ-45 connector
1000Mbps max.	IEEE802.3ab 1000BASE-T	RJ-45 connector
1000Mbps max.	IEEE802.3z 1000BASE-SX/LX	SC connector/GBIC

(Note)*: ○○ is 80E or 160E depending on the access point.

Table Appendix 6-4: Connection Equipment Type C (Catalyst6509)

Physical Interface Speed (bps)	Standard	Connection Condition
10Mbps max.	IEEE802.3 10BASE-T	RJ-45 connector
100Mbps max.	IEEE802.3u 100BASE-TX	RJ-45 connector
1000Mbps max.	IEEE802.3ab 1000BASE-T	RJ-45 connector
1000Mbps max.	IEEE802.3z 1000BASE-SX/LX	SC connector/GBIC

(3) OXC service

- a. Input signal (optical condition): IEEE GbE LX compliant
- b. Frame configuration and mapping method: IEEE802.3z compliant
- c. Applicable connector: IEC 61754-4, IEC 61754-6 or IEC 61754-20 optical fiber connector
- d. Applicable optical fiber: ITU-T recommendation G652 compliant single mode optical fiber cable (hereinafter referred to as “SM type optical fiber cable”)

Or

ITU-T recommendation G653 compliant dispersion shift fiber type single mode optical fiber cable (hereinafter referred to as “Dispersion shift SM type optical fiber cable”)

Or

ITU-T recommendation G651 compliant multi-mode optical fiber cable (hereinafter referred to as “MM type optical fiber cable”)

(4) 10Gbps connection service

- a. 10 Gigabit Ethernet (LAN PHY)
- b. 10 Gigabit Ethernet (WAN PHY)
- c. Applicable connector: JIS C 5973 (F04 type single core optical fiber connector)

(5) Optical test bed service

[Optical network system A]

- a. Connector: JIS C 5973 (F04 type single core optical fiber connector) (Patch panel connection connector)
- b. Fiber core type: ITU-T recommendation G652 SM type optical fiber cable

And

ITU-T recommendation G655 compliant NZ-DS type optical fiber cable

[Optical network system B]

- a. Connector: JIS C 5973 (F04 type single core optical fiber connector) (Patch panel connection connector)
- b. Fiber core type: ITU-T recommendation G652 SM type optical fiber cable (2 cores)

JGN2 Event Utilization Application

Event number (Event-)

Submitted on (d/m/y)

(1) Event name

(2) Outline of the event

(Briefly describe the purpose, contents, attendees, utilization method and other information regarding the event.)

(3) Event schedule

(Particularly, describe the test period and actual utilization period of the line.)

(4) Applicant (Person responsible for the event)

Organization to which he/she belongs:

Name:

Department, post:

Phone number:

FAX number:

E-mail:

(5) Contact regarding the event

(The contact person to whom NICT should send notices regarding the event.)

Organization to which he/she belongs:

Name:

Department, post:

Phone number:

FAX number:

E-mail:

(6) Topology (Details of NW and equipment configuration)

a. Connection schematic diagram

b. Detailed information on connecting sections

(Enter one connection as one path.)

Connection 1 (new/existing)

Date of work (d/m/y)

	AP name	Port number	Physical IF	VLAN-ID	Nego	Service type	Access line
1A							
1B							

Connection 2 (new/existing)

Date of work (d/m/y)

	AP name	Port number	Physical IF	VLAN-ID	Nego	Service type	Access line
2A							
2B							

Connection 3 (new/existing)

Date of work (d/m/y)

	AP name	Port number	Physical IF	VLAN-ID	Nego	Service type	Access line
3A							
3B							

Remarks:

(If there are more than three connections, add tables.)

※ Leave the “Date of work” field blank. NICT will enter the (planned) date for performing setting work. ※ If two or more paths are required in the same section, fill out the above tables for the required number of connections. ※ If “new” is set, leave the “Port number” and “VLAN-ID” columns (except when you want untag) blank. When NICT sends a reply, NICT will return a table in which the above data is written. ※ If you use an existing setting, refer to the research plan and fill in the form using the information at hand. ※ If you want “untag” when “new” is specified, enter “N/A” in the “VLAN-ID” column. ※ In the “Nego (negotiation) column,” enter “auto” when you want “autonego.” If you have no specification, leave the column blank. ※ For “Service type,” choose from the following items. SA: L2 service SB: L3 service SC: OXC connection service SD: 10G connection service SE: Optical test bed service ※ For the line type of “Access LINE,” choose from the following items. LA: Using a commercial service LB: Using an information highway of a municipality LC: Using LAN at a campus or another site LD: Directly connecting with a cable LE: Others c. Specification of the period Desired connection start date: (d/m/y) Desired connection end date: (d/m/y) (The period is about one month at the longest, including the test period.)
(7) Identifying the joint research contract a. Research project theme name b. Project number JGN-

Operation Policy of the JGN2 International Circuits

1. Purpose

In the JGN2 project, NICT provides and operates the JGN2 international networks as a foundation for joint research between Japan and USA, Thailand, Singapore and promotes research and development of next generation information and communication technologies, applied network technologies and their standardizations in order to foster international research collaboration among network research organizations including NICT.

2. Main Specifications of JGN2 International Circuits

<Japan-USA>

The specifications of JGN2 Japan-US Circuit are as follows:

- | | |
|--------------------------------------|---------------------------------------|
| [1] International leased Circuit | 10Gbps (OC-192 SONET) × 1 |
| [2] Zone | Otemachi/Tokyo – Abbotto Hall/Chicago |
| [3] Inauguration date of the service | August 1, 2004 |

<Japan-Thailand>

The specifications of JGN2 Japan-Thailand Circuit are as follows:

- | | |
|--------------------------------------|------------------------------------|
| [1] International leased Circuit | 45Mbps (ATM) × 1 |
| [2] Zone | Otemachi/Tokyo – ThaiTower/Bangkok |
| [3] Inauguration date of the service | November 7, 2005 |

<Japan-Singapore>

The specifications of JGN2 Japan-Singapore Circuit are as follows:

- | | |
|--------------------------------------|-------------------------------------|
| [1] International leased Circuit | 155Mbps (OC-3 SONET) × 1 |
| [2] Zone | Otemachi/Tokyo – SingAREN/Singapore |
| [3] Inauguration date of the service | November 7, 2005 |

3. Operation Policy

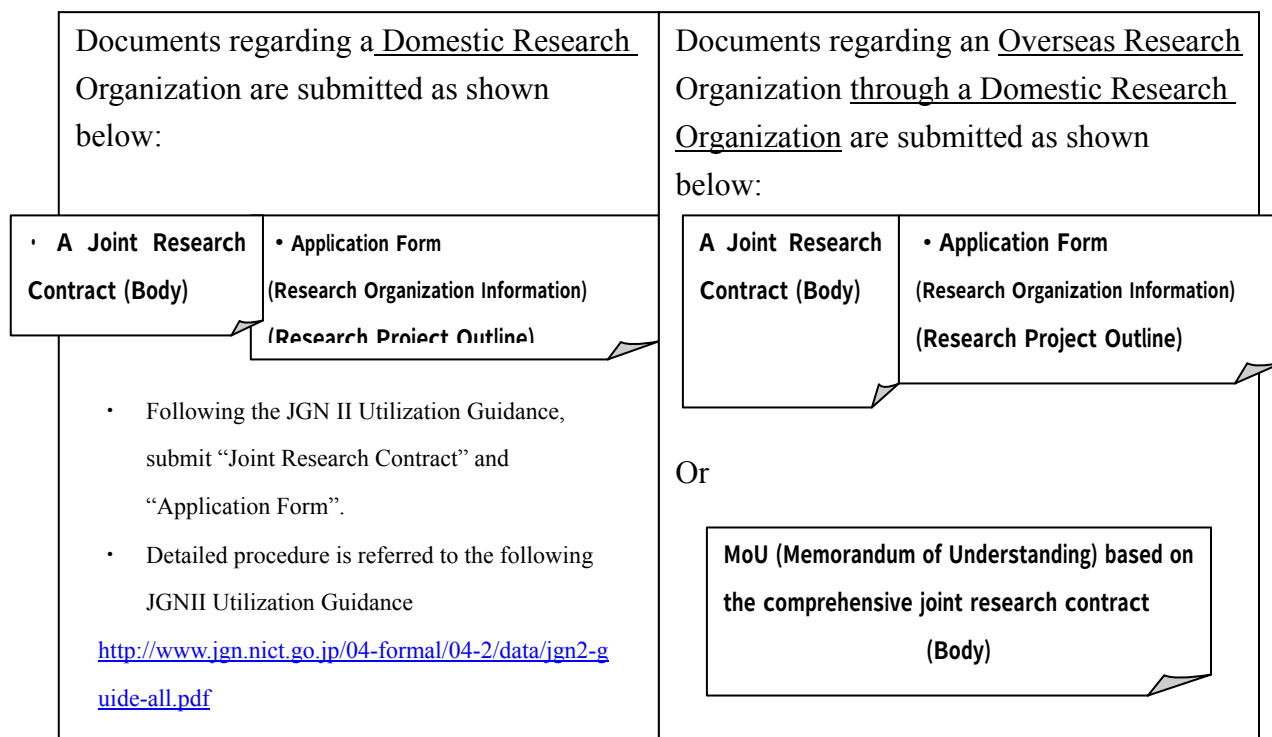
The basic policy is to offer the JGN2 research environment to wide ranging overseas researchers. Not only maintenance of a good research environment but also appropriate management of the achievements of research and development are required. Based on this basic policy, the operation policy of the JGN2 international circuits will be set as follows:

- In the case of conducting a joint research project between a domestic research organization and overseas research organization via the JGN2 international circuits, the Japanese domestic research organization is required to follow the procedures of 'JGN2 Utilization Guidance' and the overseas research organization is also required to follow 'JGN2 Utilization Guidance' or MoU (Memorandum of Understanding) based on the comprehensive joint research contract. (Refer to CASE 1 shown in the next page.)
- In principle, the communications between overseas research organizations (transit) via the JGN2 international circuits are not accepted except a joint research project participated by NICT. (Refer to CASE 2 shown in the next page.)

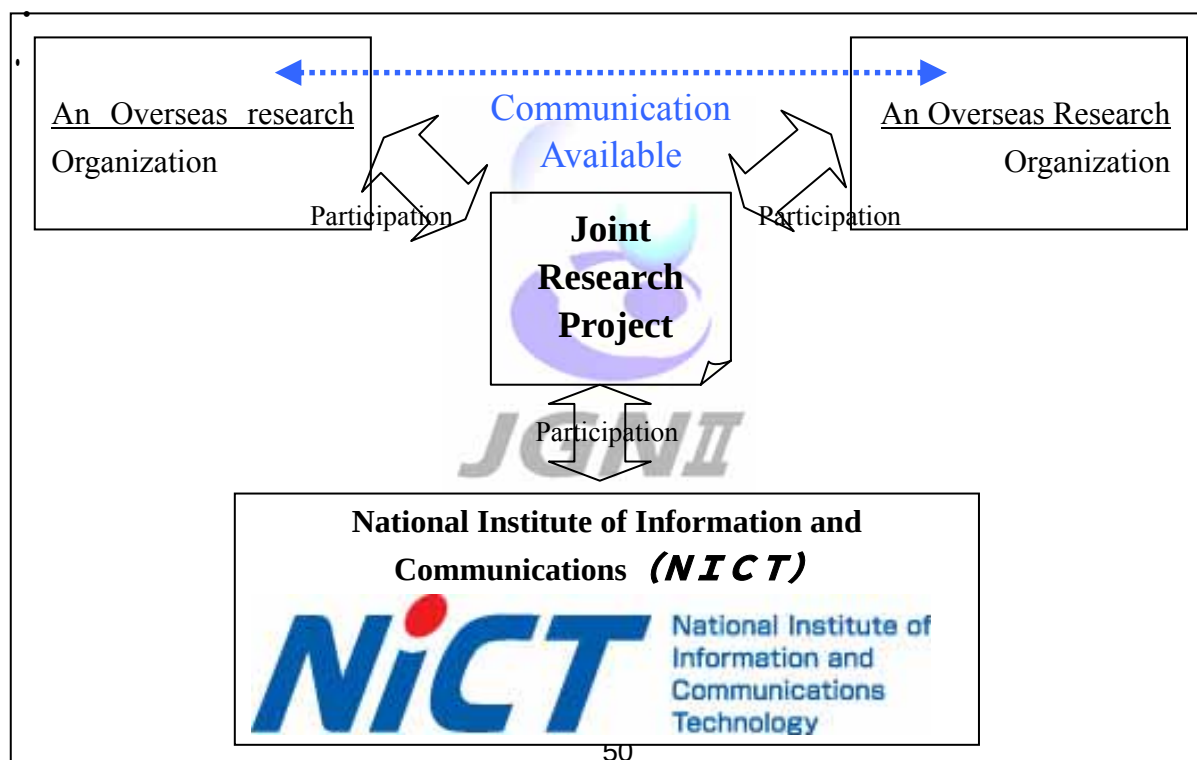
- This operation policy will be reviewed and revised if necessary based on the actual condition of utilizing the JGN2 international circuits within the limit of March, 2008.

Utilization Policy of JGN International Circuits

- CASE 1: A case of the joint research project undertaken by a domestic research organization and an overseas research organization



- CASE 2: A case of the joint research project undertaken by an overseas research organization and another overseas research organization



Instructions for Utilizing PAP

1. Regarding PAP (Partnership Access Point)

PAP means some organizations not only connecting with JGN2 network but also providing in collaboration with NICT certain environment respectively to connect the other organizations with the JGN2 network as JGN2 users.

PAP can be connected with the JGN2 network as well as the existing AP, but as the operation policy of respective PAPs is to be established independently, their respective services and utilization procedures are different from each other among them as for the following items.

2. Procedures for Utilizing PAP

In case of utilizing the JGN2 network through PAP, at first, the application for utilizing the JGN2 network through PAP should be submitted to NICT. After that, NICT is to confirm if it is acceptable or non-acceptable. In the meantime, the PAP contact person may occasionally get in touch with the user.

With regard to preparation of the access line necessary for connecting with PAP and the equipment at the user, please sufficiently consult with the PAP contact person.

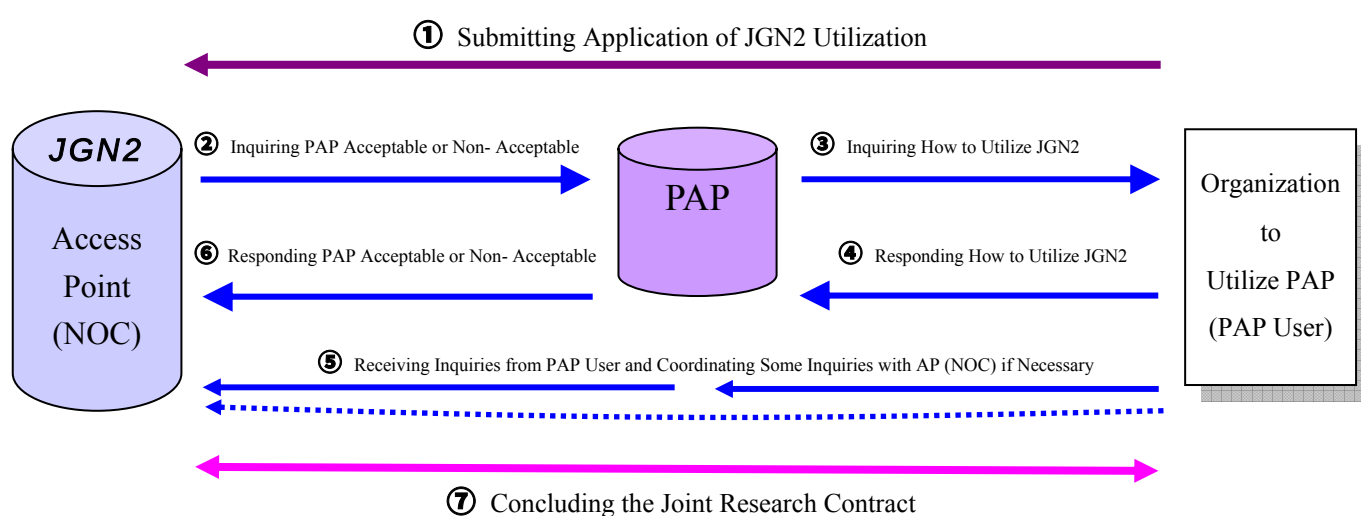


Figure 1. Procedures for Utilizing PAP

In case of utilizing PAP, the joint research contract should be concluded with NICT independently. The procedures regarding its contract conclusion is the same as those in case of utilizing AP.

Please refer to “3.4 Concluding Joint Research Contracts” on the Page-16 of “JGN2 Utilization Guidance”.

3. Available Services Provided and Maximum Capacity Transmitted, Contact Point, etc. as of Each PAP

In case of connecting with PAP, utilizable services, maximum transmitting capacity and interface conditions are different from each other among PAPs.

For further information, please give inquiries to each PAP shown in the following table.

Table of JGN2 PAP
(As of August, 2007)

Block	Prefecture	Name of PAP	Place of PAP	Address of PAP	TEL (For Distance Calculation)	Usable Service		Usable Service for Specific Access Point				Transmission Capacity (bps)
						L2 ※1	L3 ※2	OXC-1G Connection	OXC-10G Connection	10G Connection	Optical Testbed	
						Usable	Usable for IPv6 only	-	-	-	-	1G
Chugoku	Hiroshima	Chugoku-PAP-1	Information Media Center, Hiroshima University	1-4-2, Kagamiyama, Higashi-Hiroshima-shi, Hiroshima	082-424-6XXX	Usable	Usable for IPv6 only	-	-	-	-	1G
			Contact Point	Contact Person	Contact TEL	Contact FAX	Available Time (For Inquiry)	Operated Time of Equipment	Condition/Interface of Equipment			User's Equipment Usable/Unusable
			Information Media Center, Hiroshima University	Associate Prof. Koji NISHIMURA	082-424-6262	082-422-7043	Weekday 9:00~17:00	24h a Day for 356 Days	UTP	Lambda	Others	Usable
Shinetsu	Nagano	Shinetsu-PAP-1	Densan Co., Ltd.	451 Agatacho, Nagano-shi, Nagano	026-234-0XXX	Usable	Usable	-	-	-	-	100M
			Contact Point	Contact Person	Contact TEL	Contact FAX	Available Time (For Inquiry)	Operated Time of Equipment	Condition/Interface of Equipment			User's Equipment Usable/Unusable
			Internet Service Division, Densan Co., Ltd.	Makoto SUGANUMA	026-234-0151	026-234-2449	Weekday 8:30~17:00	24h a Day for 356 Days	UTP	Lambda	Others	Usable