◉ Regarding Utilization of JGN2plus

In principle, anyone can use JGN2plus, if their purpose is research and development, and if there is a research partner located in Japan. Please refer to the JGN2plus web page for details on services of JGN2plus, and how to utilize the JGN2plus services.
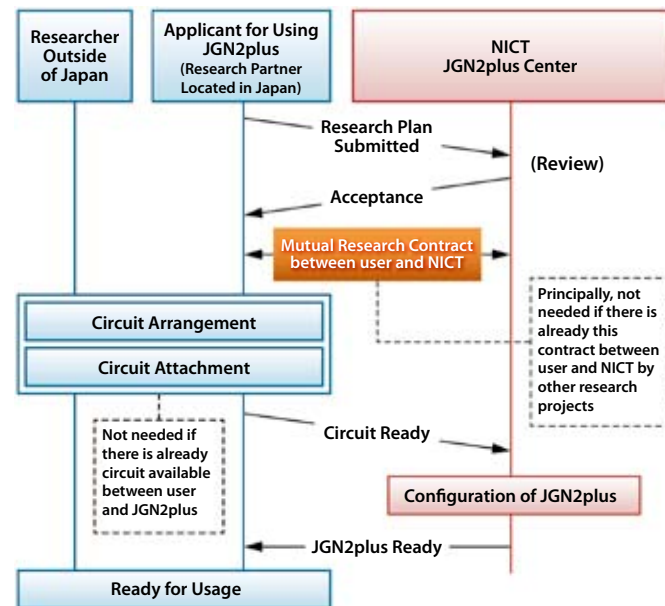
<http://www.jgn.nict.go.jp/english/>

■ Notes on JGN2plus usage

- The term of usage is from April, 2008 to March, 2011 (planned).
- Through your research partner in Japan, please send your "JGN2plus Research Plan*10 (research project summary, research organization information)" in advance to JGN2plus center.
- JGN2plus center will confirm that your research plan is indeed research and development, and that it is possible to use the JGN2plus service from a technical standpoint.
- It is necessary to conclude a "Mutual Research Contract Regarding Usage of JGN2plus Service" between user and NICT on usage.
- It is needed to install an access circuit to an access point, PAP, or PNW after concluding the contract to use JGN2plus.
- Please refer to the usage guidelines for using JGN2plus.

*10: Please download the format for "JGN2plus Research Plan" from the following URL.
http://www.jgn.nict.go.jp/japanese/procedure/document.html

《 JGN2plus Utilization Procedure 》

Researcher Outside of Japan	Applicant for Using JGN2plus (Research Partner Located in Japan)	NICT JGN2plus Center

Research Plan Submitted → (Review)

Acceptance ←

Mutual Research Contract between user and NICT

Circuit Arrangement

Circuit Attachment

Principally, not needed if there is already this contract between user and NICT by other research projects

Not needed if there is already circuit available between user and JGN2plus

Circuit Ready

Configuration of JGN2plus

JGN2plus Ready

Ready for Usage

● Local Contacts

Ministry of Internal Affairs and Communications
Technology Policy Division, Global ICT Strategy Bureau

Bureau of Telecommunications

Hokkaido Bureau of Telecommunications
Telecommunications Business Division, Information and Communications Department

Tohoku Bureau of Telecommunications
Information and Communications Collaboration Promotion Division, Information and Communication Department

Kanto Bureau of Telecommunications
Information and Communications Collaboration Promotion Division, Information and Communication Department

Shinetsu Bureau of Telecommunications
Information and Communications Development Office, Information and Communications Department

Hokuriku Bureau of Telecommunications
Telecommunications Business Division, Information and Communications Department

Tokai Bureau of Telecommunications
Information and Communications Collaboration Promotion Division, Information and Communication Department

Kinki Bureau of Telecommunications
Information and Communications Collaboration Promotion Division, Information and Communication Department

Chugoku Bureau of Telecommunications
Information and Communications Collaboration Promotion Division, Information and Communication Department

Shikoku Bureau of Telecommunications
Telecommunications Business Division, Information and Communications Department

Kyushu Bureau of Telecommunications
Information and Communications Collaboration Promotion Division, Information and Communication Department

Okinawa Office of Telecommunications
Administration Division, Information and Communications Department

National Institute of Information and Communications Technology

---

Advanced Testbed Network for R&D

JGN2plus

Start for The New Generation Network

Head for the future of ICT Society with JGN2plus!

HOKKAIDO
TOHOKU
CHICAGO
HOKURIKU
SHINETSU
KANTO
BUSAN
CHUGOKU
TOKAI
LOS ANGELES
KINKI
KYUSHU
TOKYO
SHIKOKU
HONGKONG
OKINAWA
SINGAPORE
BANGKOK

NICT TOKYO

National Institute of Information and Communications Technology

JGN2plus looks for the visions of the future ICT society
through activities in R&D and the future of New Generation Network

The National Institute of Information and Communications Technology (NICT) has launched the operation of research and development testbed network, JGN2plus, which further extends the capabilities of JGN2. The newly established research center, SPARC, will be the center of R&D activities which will drive the wide research collaboration activities with the industry, the academia, the government and regional organizations.

◉ JGN2plus Network

JGN2plus is a three-year project starting from April, 2008 which consists of activities and operations of an open testbed network for R&D. JGN2plus extends the activities which started in as JGN from 1999, and continued as JGN2 from 2004.
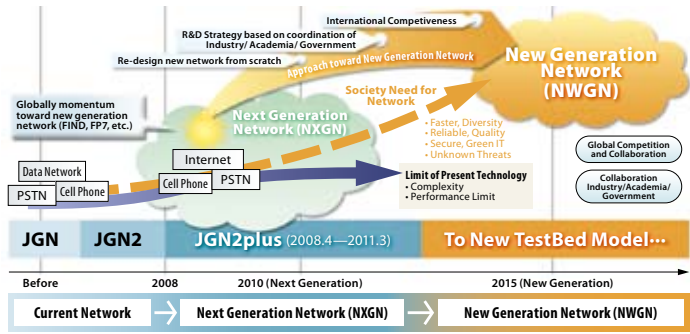
JGN2plus will support NICT's driving activities for the development of the New Generation Network, and is the core of the new research center (SPARC). It is also an open testbed network to researchers for advanced R&D activities in networking, field tests, and experiments for various applications.

《 Activities toward New Generation Network 》

```
International Competitiveness
R&D Strategy based on coordination of
Industry/ Academia/ Government
Re-design new network from scratch      New Generation
                                          Network
                                          (NWGN)
Globally momentum
toward new generation          Society Need for
network (FIND, FP7, etc.)      Network
                               - Faster, Diversity
        Next Generation        - Reliable, Quality      Global Competition
        Network (NXGN)         - Secure, Green IT       and Collaboration
Data Network                   - Unknown Threats
         Internet
PSTN  Cell Phone  Cell Phone  PSTN   Limit of Present Technology   Collaboration
                                     - Complexity                  Industry/Academia/
                                     - Performance Limit           Government

JGN   JGN2   JGN2plus (2008.4—2011.3)     To New TestBed Model…

Before      2008    2010 (Next Generation)    2015 (New Generation)

Current Network → Next Generation Network (NXGN) → New Generation Network (NWGN)
```

◉ Activities on JGN2plus and SPARC*¹, the New Research Center

■ Driving the R&D for New Generation Network

1. Collaboration with industry, academia, government, regional organizations to drive the activities toward New Generation Network, R&D on network and applications.
2. Through field research activities, fostering of IT researchers.
3. Activities with regional organizations through R&D activities and network interconnections through PAP*²/PNW*³.
4. Promotion of application R&D activities using JGN2plus with public awarded research funds.
5. Promote R&D activities not only inside Japan but also researchers worldwide with implementation of international circuits.

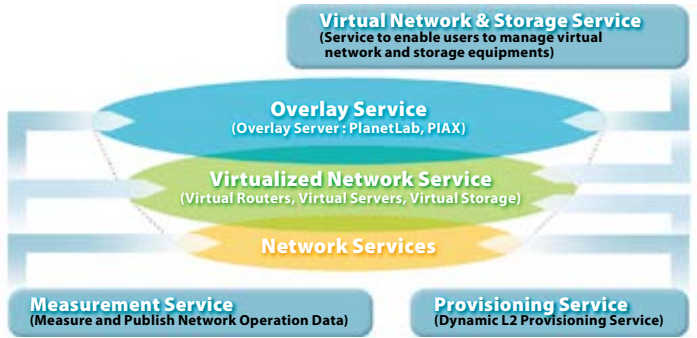### ■ Establishment of SPARC, Center of R&D

1. To efficiently promote of R&D activities using JGN2plus, SPARC has been established.
2. Main research theme is "Research on Operations and Management Technologies for New Generation Network."
3. We will further promote R&D activities inside SPARC by setting 6 research topics*⁴ to be focused on.

*1: SPARC/ Service Platform Architecture Research Center
*2: PAP/ Partnership Access Point
*3: PNW/ Partnership Network
*4: 6 research topics/ Refer to "Research Projects Supported by SPARC" for details.

◉ 2 Types of JGN2plus Services

In addition to the existing "Network Service," which allows flexible usage for R&D and field tests by interconnecting with various networks, JGN2plus will offer after April, 2009 "Platform Service (Trial)*⁵" which will further collaborate operation and R&D activities for realizing New Generation Network.

《 Platform Service (Trial) Offered After April, 2009 (planned) 》

```
Virtual Network & Storage Service
(Service to enable users to manage virtual
network and storage equipments)

Overlay Service
(Overlay Server: PlanetLab, PIAX)

Virtualized Network Service
(Virtual Routers, Virtual Servers, Virtual Storage)

Network Services

Measurement Service              Provisioning Service
(Measure and Publish Network     (Dynamic L2 Provisioning Service)
Operation Data)
```

■ Network Service

1. L3 Service (IP Connectivity) and L2 Service (Ethernet Connectivity)
   - Bandwidth: 100 Mbps – 10 Gbps
2. Optical Testbed Service
   - Dark fiber optical transmission <Length: 592 km>
3. Access Points and Network for R&D [as of October, 2009]
   - Access Points Nationwide <58 Access Points>
   - PAP for increasing network connectivity <5 PAPs>
   - PNW to collaborate with regional information highway networks <4 NW>

■ Platform Service (Trial) [From after April, 2009 planned]

1. Measurement Service
   - Service to collect and publish various measurement figures regarding JGN2plus and partner networks
2. Provisioning Service
   - Service to dynamically provision L2 network services
3. Overlay Service
   - Service to enable usage of overlay servers such as PlanetLab*⁶, PIAX*⁷ etc.
4. Virtual Network & Storage Service
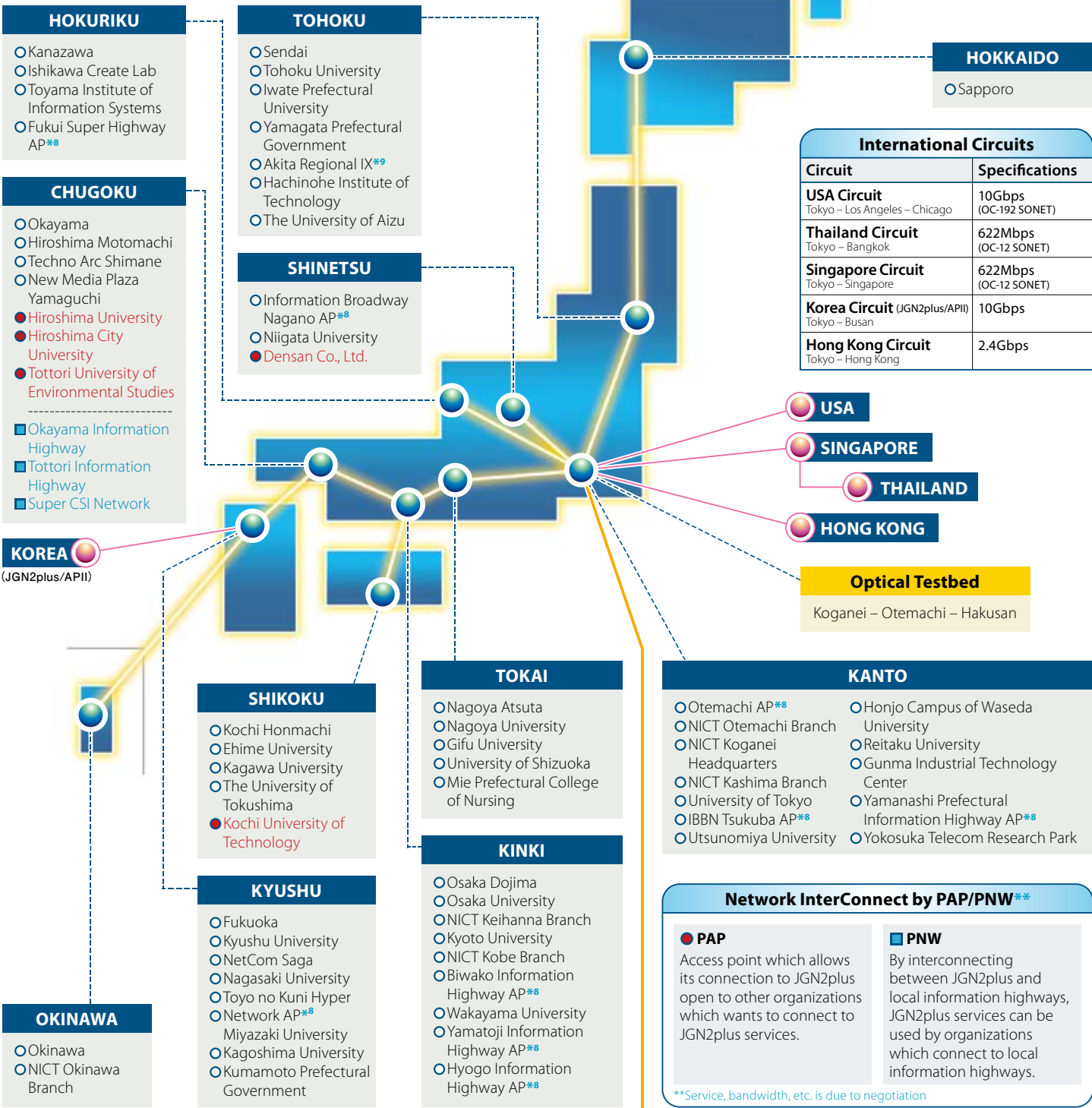   - Service to enable users to manage virtual network and storage equipments

*5: Platform Service (Trial)/ This menu is still under planning, so service, date, may change without notice.
*6: PlanetLab/ A distributed testbed platform for networking and system research, which in Japan is known as PlanetLab Japan, where NICT and University of Tokyo serves as core members. JGN2plus plans to promote this research activities in cooperation with NICT Hakusan Research Laboratory and University of Tokyo.
*7: PIAX/ A P2P agent platform developed by University of Osaka et al. for Research and Development Program of "Ubiquitous Network Authentication and Agent" and "Ubiquitous Service Platform" funded by Ministry of Internal Affairs and Communications.

◉ JGN2plus Network [As of October, 2009]

○ Access Point ···· 58 Access Points
● PAP (Partnership Access Point) ···· 5 PAPs
■ PNW (Partnership Network) ···· 4 NW

*8: AP/ Access Point
*9: IX/ Internet Exchange

HOKURIKU
- ○ Kanazawa
- ○ Ishikawa Create Lab
- ○ Toyama Institute of Information Systems
- ○ Fukui Super Highway AP*⁸

TOHOKU
- ○ Sendai
- ○ Tohoku University
- ○ Iwate Prefectural University
- ○ Yamagata Prefectural Government
- ○ Akita Regional IX*⁹
- ○ Hachinohe Institute of Technology
- ○ The University of Aizu

HOKKAIDO
- ○ Sapporo

CHUGOKU
- ○ Okayama
- ○ Hiroshima Motomachi
- ○ Techno Arc Shimane
- ○ New Media Plaza Yamaguchi
- ● Hiroshima University
- ● Hiroshima City University
- ● Tottori University of Environmental Studies

- ■ Okayama Information Highway
- ■ Tottori Information Highway
- ■ Super CSI Network

SHINETSU
- ○ Information Broadway Nagano AP*⁸
- ○ Niigata University
- ● Densan Co., Ltd.

International Circuits

Circuit	Specifications
USA Circuit Tokyo – Los Angeles – Chicago	10Gbps (OC-192 SONET)
Thailand Circuit Tokyo – Bangkok	622Mbps (OC-12 SONET)
Singapore Circuit Tokyo – Singapore	622Mbps (OC-12 SONET)
Korea Circuit (JGN2plus/APII) Tokyo – Busan	10Gbps
Hong Kong Circuit Tokyo – Hong Kong	2.4Gbps

- ● USA
- ● SINGAPORE
- ● THAILAND
- ● HONG KONG
- ● KOREA (JGN2plus/APII)

Optical Testbed
Koganei – Otemachi – Hakusan

SHIKOKU
- ○ Kochi Honmachi
- ○ Ehime University
- ○ Kagawa University
- ○ The University of Tokushima
- ● Kochi University of Technology

TOKAI
- ○ Nagoya Atsuta
- ○ Nagoya University
- ○ Gifu University
- ○ University of Shizuoka
- ○ Mie Prefectural College of Nursing

KANTO
- ○ Otemachi AP*⁸
- ○ NICT Otemachi Branch
- ○ NICT Koganei Headquarters
- ○ NICT Kashima Branch
- ○ University of Tokyo
- ○ IBBN Tsukuba AP*⁸
- ○ Utsunomiya University
- ○ Honjo Campus of Waseda University
- ○ Reitaku University
- ○ Gunma Industrial Technology Center
- ○ Yamanashi Prefectural Information Highway AP*⁸
- ○ Yokosuka Telecom Research Park

KYUSHU
- ○ Fukuoka
- ○ Kyushu University
- ○ NetCom Saga
- ○ Nagasaki University
- ○ Toyo no Kuni Hyper Network AP*⁸
- ○ Miyazaki University
- ○ Kagoshima University
- ○ Kumamoto Prefectural Government

KINKI
- ○ Osaka Dojima
- ○ Osaka University
- ○ NICT Keihanna Branch
- ○ Kyoto University
- ○ NICT Kobe Branch
- ○ Biwako Information Highway AP*⁸
- ○ Wakayama University
- ○ Yamatoji Information Highway AP*⁸
- ○ Hyogo Information Highway AP*⁸

OKINAWA
- ○ Okinawa
- ○ NICT Okinawa Branch

Network InterConnect by PAP/PNW**

● PAP
Access point which allows its connection to JGN2plus open to other organizations which wants to connect to JGN2plus services.

■ PNW
By interconnecting between JGN2plus and local information highways, JGN2plus services can be used by organizations which connect to local information highways.

**Service, bandwidth, etc. is due to negotiation

Research Projects Supported by SPARC

JGN2plus project has its own research project under SPARC with the theme "Research and Development on Operations and Management for New Generation Network (NWGN)." It has 6 research topics under the theme, as described on the right figure.

SPARC will promote research aiming for NWGN by collaborating with: various NWGN forums, oversea development projects, public funded research projects, JGN2plus research projects.

```
Service Platform Architecture Research Center
Research Theme  "R&D on Operations & Management Technology
                 for New Generation Network"

Topic 1          Topic 2          Topic 3          Topic 4          Topic 5          Topic 6
R&D on NWGN      R&D on NWGN      R&D on           Establishment    International     Research
Service          Service          Middleware and   of               Federation       and
Platform         Testbed          Application      Translational    of               development
Fundamental      Federation       of Optical Path  Technologies     Testbed          on the
Technology       Technology                        for NWGN                          integrated wired
                                                   Operation                         and wireless
                                                                                     network platform

Collaboration → Research Activities on Internet/NGN
Collaboration → Worldwide R&D Network/ Projects

Testbed Network Operation & Management

JGN2plus Utilize Research Projects    Funded Research Projects
```