

JGN2 Activities

September 7th, 2006

National Institute of Information and Communications Technology
(NICT)

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Outline of JGN2

- **Open testbed network for research and development;**
- **Network based on Ethernets (L2) and IP(L3)**
- **Super-high-speed backbone network up to 20Gbps**
(10Gbps x 2);
- **Nationwide access point (s) in each prefecture**
(Total: 64)
- **International circuits for USA, Singapore and Thailand**
- **Implementation of Optical Cross Connect (OXC)**
- **Optical testbed with dark fiber**



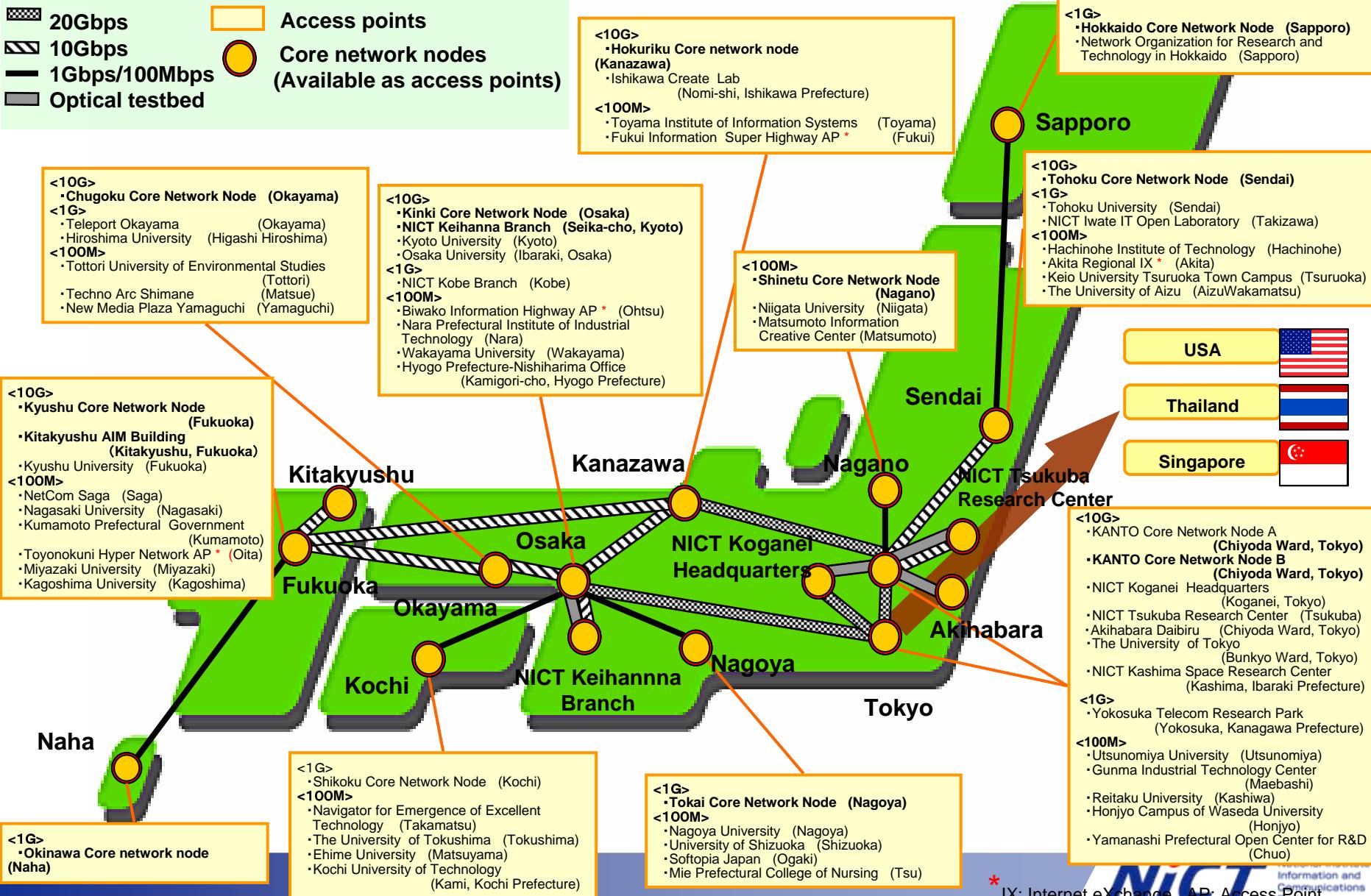
Outline of JGN2 Network

May, 2006

[Legends]

- 20Gbps
- 10Gbps
- 1Gbps/100Mbps
- Optical testbed

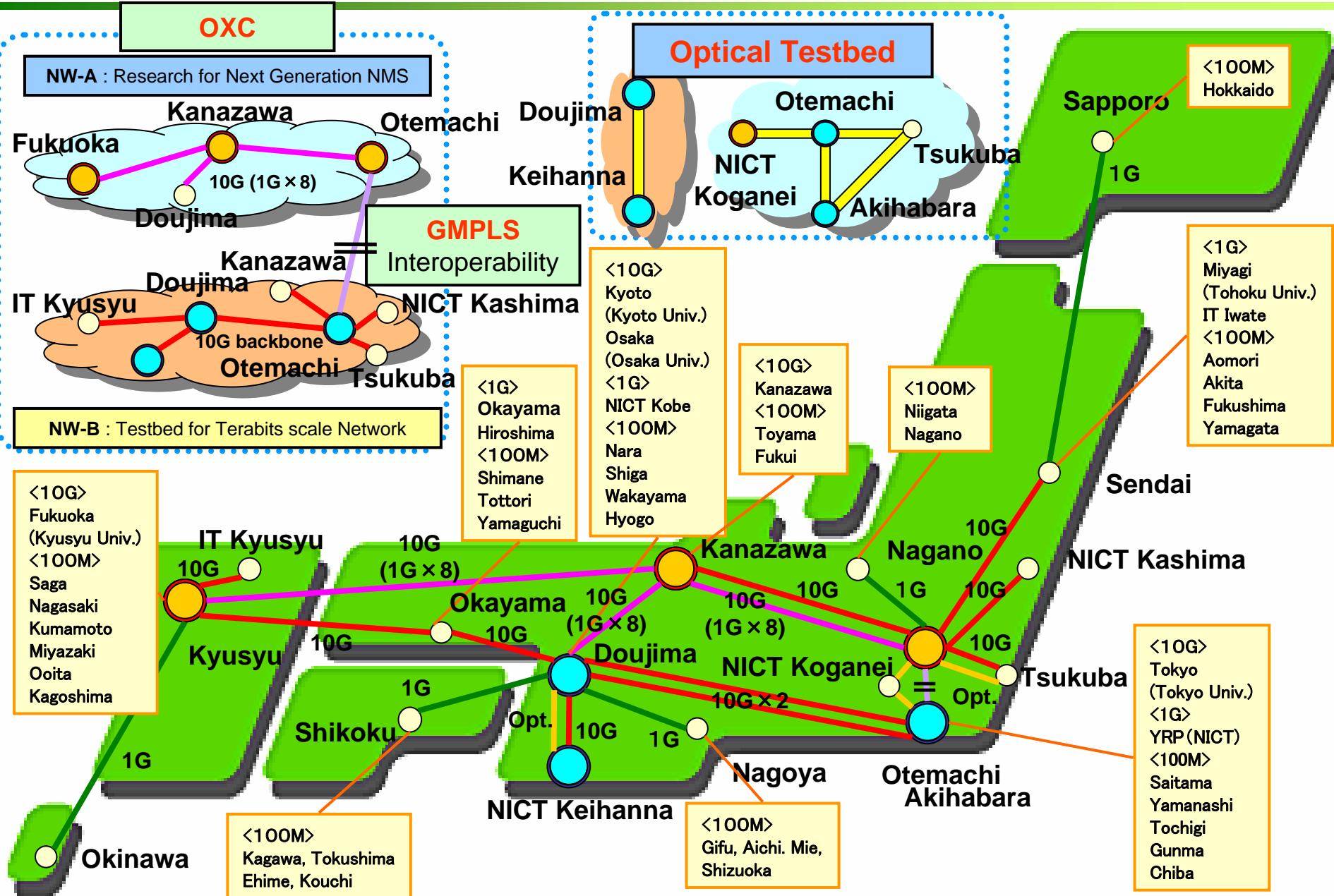
Access points
Core network nodes
(Available as access points)



* IX: Internet eXchange AP: Access Point

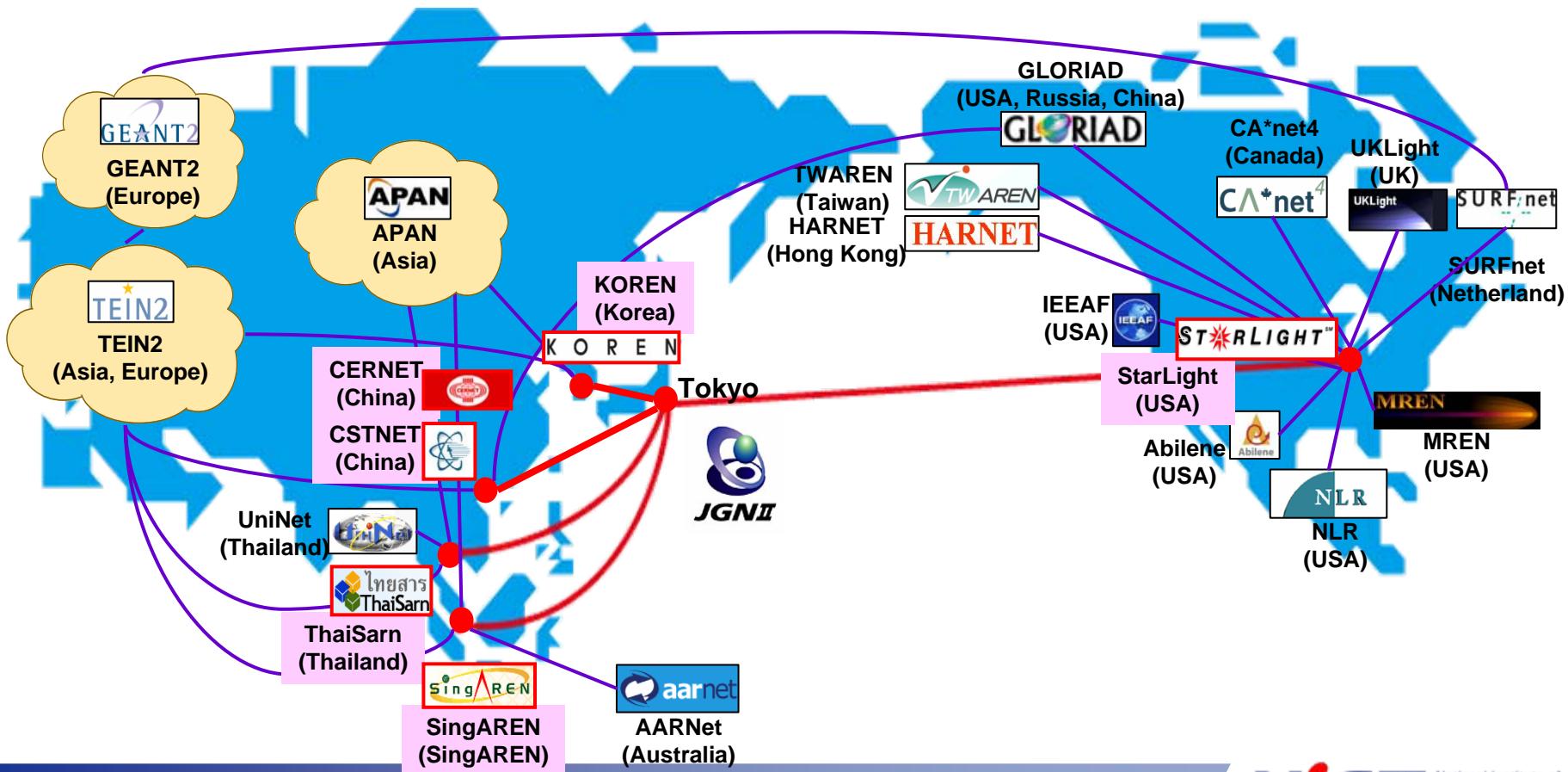


JGN2 Core Network Topology



JGN2/NICT International Network Structure

US-JP line	: Tokyo-Chicago, 10Gbps x 1
TH-JP line	: Tokyo-Bangkok, 45Mbps x 1
SG-JP line	: Tokyo-Singapore, 155Mbps x 1
KR-JP line	: Fukuoka-Hyeonhae, 2.4Gbps x 1
HK-JP line	: Tokyo-Hong Kong, 2.4Gbps x 1

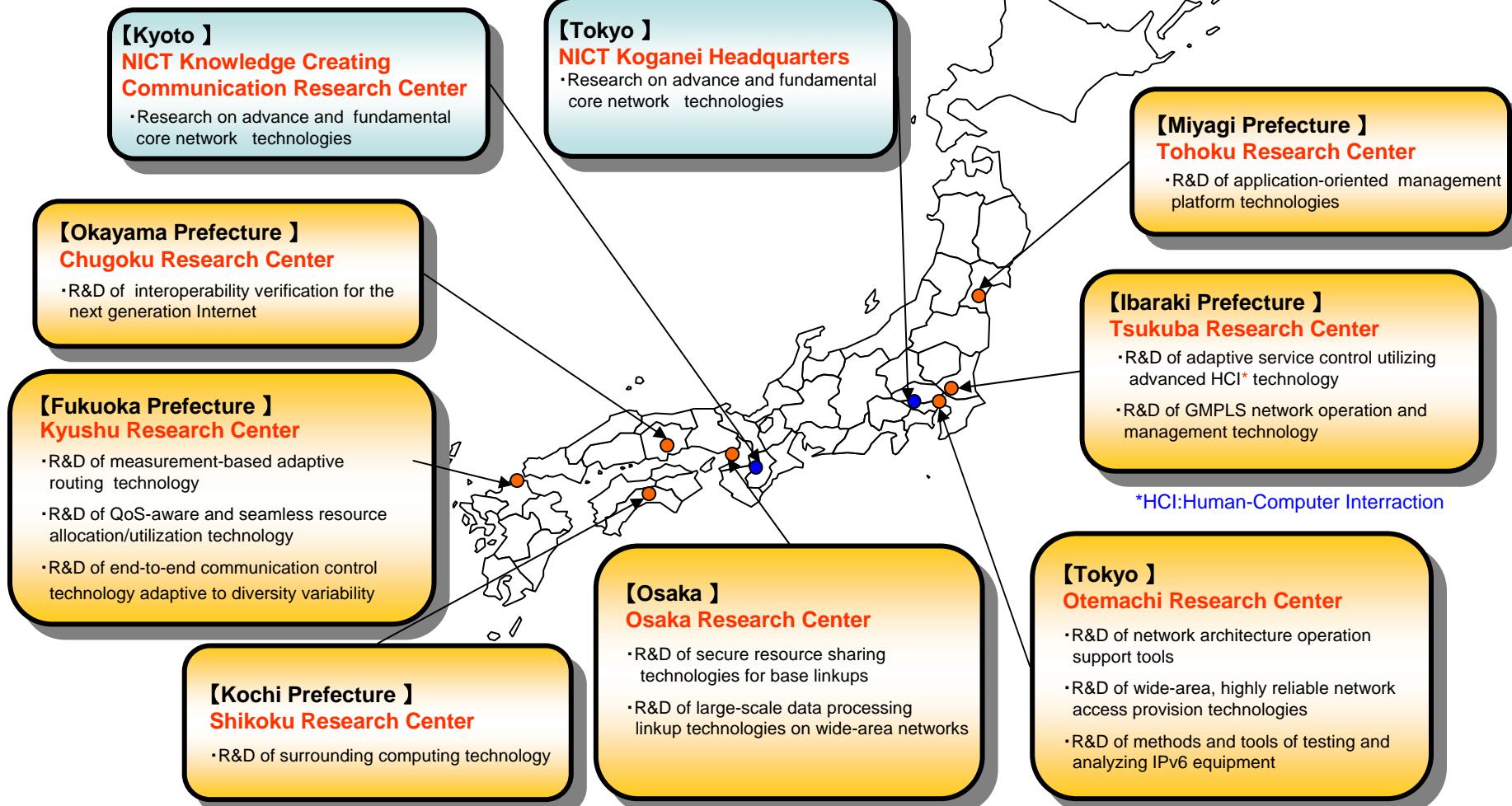


NICT Research Centers

— Research and development being undertaken by NICT (Research Centers, etc.) —

■ Research Centers in charge of JGN2 research activities (7 sites nationwide)

■ NICT Information and Communications Department (Koganei, Keihanna)



*HCI:Human-Computer Interaction

JGN 2 Key Research Activities

1. Research activities in JGN2 Research Center

- Nationwide IPv6 Multicast experiment
- GMPLS network operation and management technology
- Sensor network experiment etc.

2. Research activities on Optical Testbed on JGN2

- 1000 Wavelengths WDM experiment for 126Km Transmission
- 100Tera Optical Router Technology
- 160Gbps Optical Packet Switching System Prototype
- Quantum Cryptography Telecommunications Technology etc.

3. International Research activities on JGN2

- 4K Digital Cinema (4096 x 2160 pixel resolution)
- Data Reservoir LSR demonstrative experiment on IPv4 and IPv6
- Globe-scale radio astronomy (e-VLBI)
- 3D-HD Experiment of Telemedicine etc.

JGN2 Primary Activity

- Activity Situation for General R&D Project – (Apr./2004 - Jun./2006)

Results of JGN2 R&D Project

Total Number of R&D Domestic Projects through JGN2: **125**

- Network

· Network Basic Technology	14
· Optical Technology	20
· IPv6 Technology	16
· Security Technology	12

- Middleware

· Quantum Cryptography Technology	2
· Grid Research	7
· Human Interface	6

- Application

· Educational Field	15
· Medical Field	7
· Regional Field	12
· Contents Field	12
· Environmental and Scientific Field	5

(Project Category: counted plural times)

International Project

Number of International Project: **16**

The projects via JGN2 were performed with the research organizations in USA, Thailand, Singapore and also Europe and the areas in East Asia via the other networks with interconnection.

JGN2 Human Resource Development

(Category)	(Number)
Research Organization	443
Participated Researcher	1358
Participated Researcher from 7Research Centers	94
Thesis	61
Presentation	89
Patent Application	2

iGrid2005 / SC|05

iGrid2005 and SC|05 were the remarkable events where many experiments / demonstrations were enabled by utilizing high-bandwidth international link provided by JGN II.

Examples of experiments / demonstration in iGrid2005 and SC|05



2005/09/26-29
San Diego, CA



2005/11/12-18
Seattle, WA

members	Outline of Experiments / demonstration
NECT, MIT, Manchester Univ. etc.	Demonstration of globe-scale radio astronomy (eVLBI) with real-time data transfer from radio telescopes of US, Europe and Japan
NECT, UIC, Johns Hopkins Univ., KIST, Univ. of Tokyo, etc.	Transporting Sloan Digital Sky Survey (SDSS) data using UDT
NECT, AIST, KDDI Lab, NTT Lab,	Demonstration of coordination of Grid and NW resource scheduler over GMPLS
Keio Univ., NTT, UIC, etc.	Trans-pacific real-time transmission of 4K Digital Cinema
Univ. of Tokyo	Data Reservoir: Massive data transfer over globe-size long distance link using IPv6
NECT, Osaka Univ. NAIST, etc.	-QoS over high-speed network -Grid architecture and access control to connect sensing devices
JAXA, Fujitsu	High-speed data transfer over SFRS on Ether
NECT, Ehime Univ.	3D simulation of space weather and real-time visualization of satellite observation data



Road to “Post JGN2” Project

- Deployment of Broadband Network
 - 2.4 Gbps High Speed
 - 66 Access Points
- Promotion of IPv6 Technology



JGN

1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

- Promotion of Optical Network Technology
 - Optical Testbed
 - OXC
- International Strategy ((USA, Singapore, Thailand))



JGN II

- NGN ?
- Ubiquitous ?

Coming soon!

Post JGN2

Beyond JGN II

The Viewpoint of “Post JGN2”

Key Concept

What is the key concept of testbed network to promote R&D of advanced ICT technologies ?

Network Topology

How should we develop new network with key concept ?

Promotion of R&D Activities

How can we promote R&D activities using “Post JGN2” ?

International strategy

How can we promote international collaboration using “Post JGN2” ?

Contact Address

Thank you!

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