

# NTT Communications and IPv6

Kenji Nomura

General Manager, IP Task Force,  
NTT Europe Ltd.

# Background

## IPv6 people

- IPv6 almost completely established
- Official Address (sTLA) allocation already started
- IPv6 has advanced and useful functions (PnP, Security, QoS ...)

## Provider

- How should we do BUSINESS using IPv6 ?
- What's the BUSINESS model ?

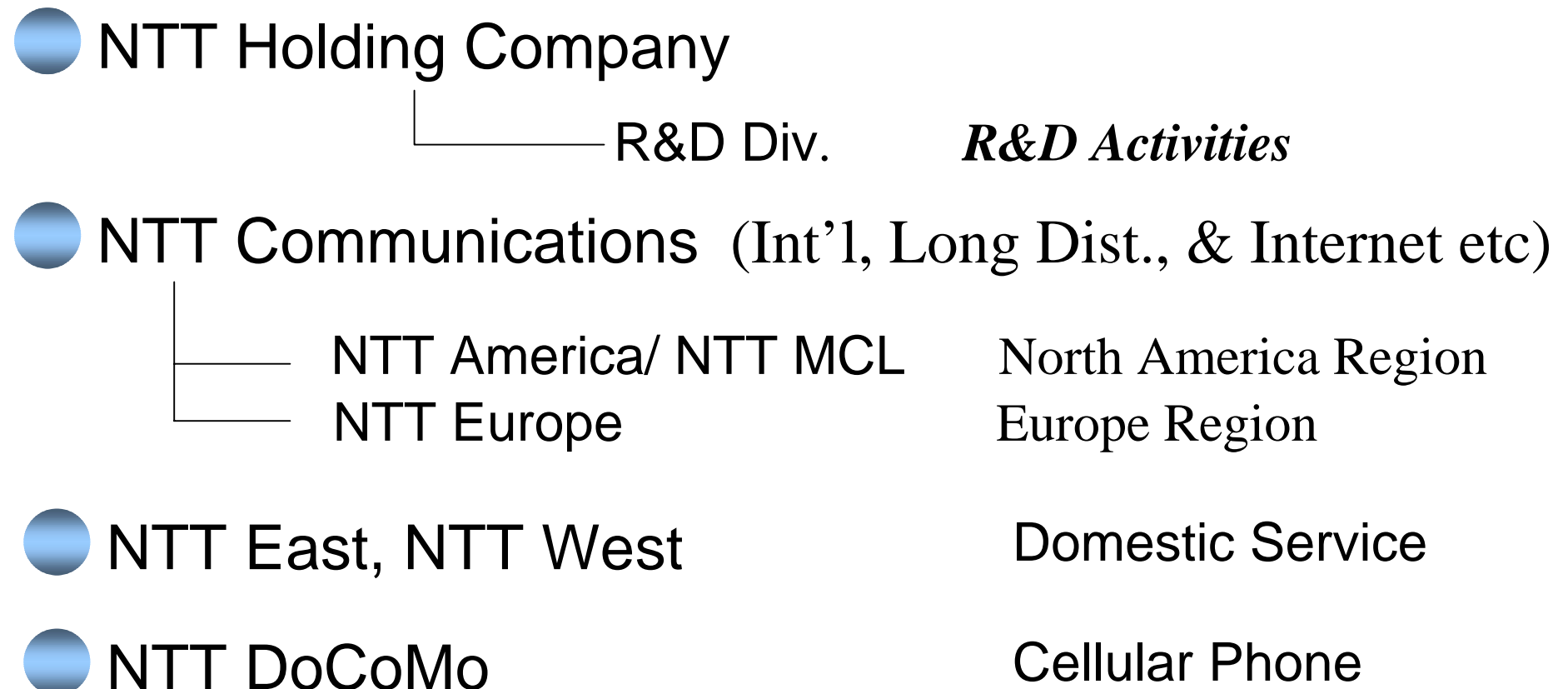
## User

- How should I use IPv6 ?
- Who can I communicate to ?

NTT Com thinks...

First of all, ISPs should support IPv6 !

# The Structure of NTT Group



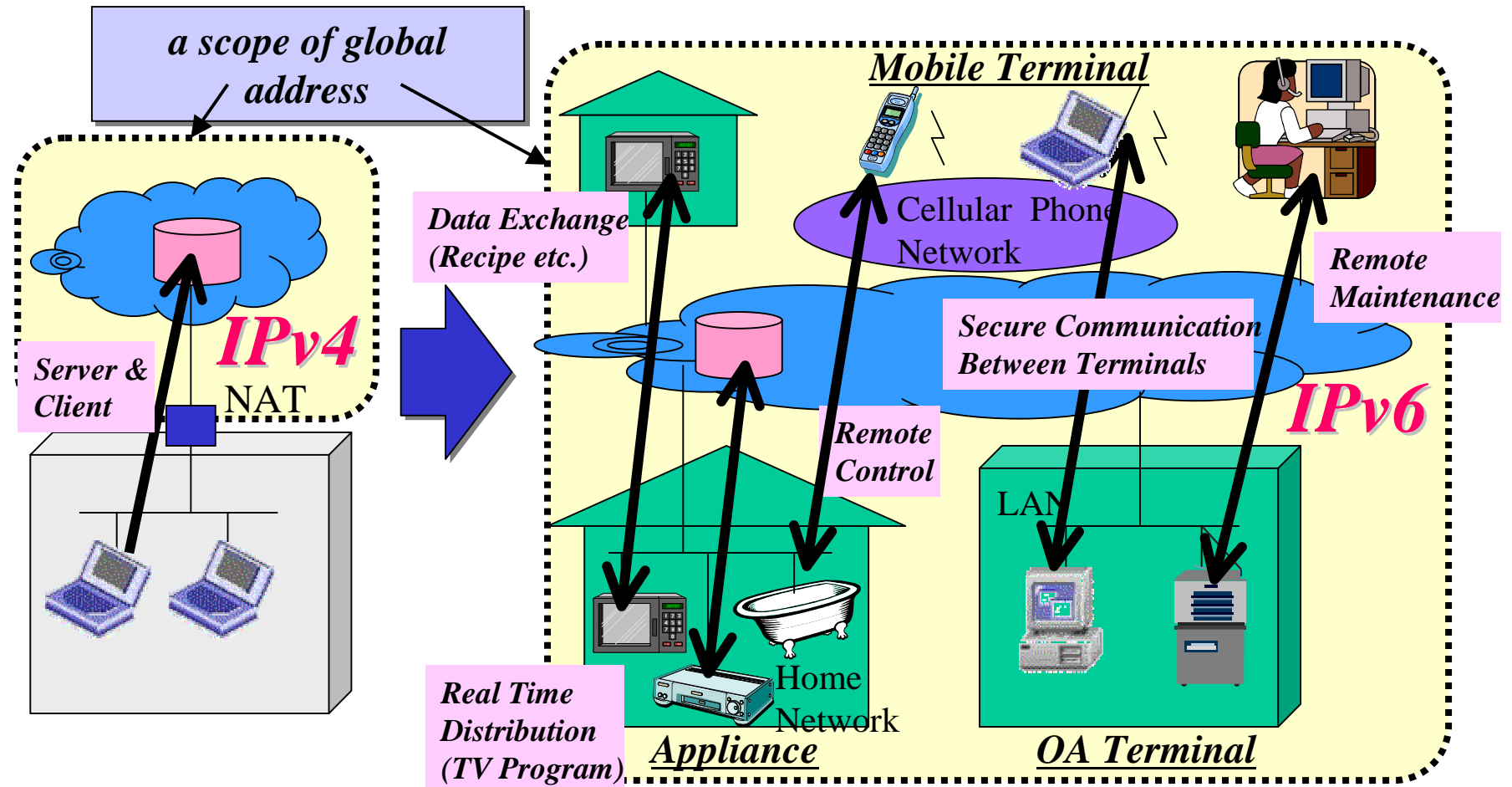
# History

- **Since 1996, NTT has been researching IPv6 network operation on a global scale.**
  - NTT Com Obtained sTLA registry from APNIC (Sep. 1999)
- **Some customers longed to connect to IPv6 network.**
  - First of all ISPs should support IPv6, we thought.
  - NTT Com has started IPv6 trials on a global scale. (Dec. 1999)
- **Companies started considering businesses with IPv6.**
  - Our trials have supported developers of IPv6 business.
  - Now we're preparing for commercializing IPv6 services.

# IPv6 expands Internet Business

IPv4 Business : *One way*  
(*Client & Server*)

IPv6 Business : *Two way*  
(*Device-to-Device*)



What is an IPv6 service?

What is an application suitable for IPv6?

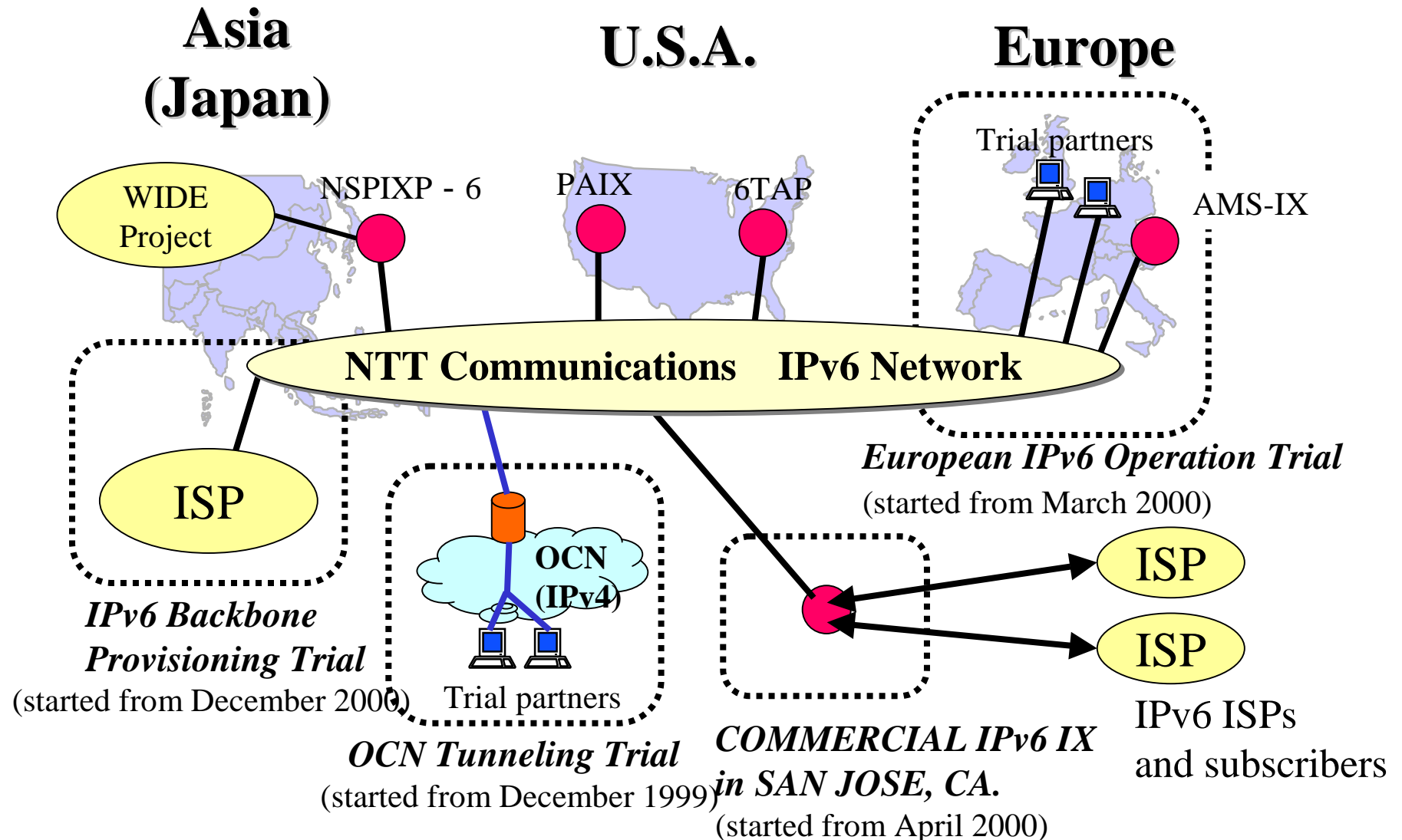
# NTT Communications' IPv6 Trials

- **Network Operation Trials** (<http://www.v6.ntt.net>)
  - IPv6 OCN Tunneling Trial (NTT Communications)
    - No charge for accessing IPv6 network during the trials.
    - The trials will end on March 31, 2001.
  - IPv6 Operation Trials in Europe (NTT Europe)
  - IPv6 Commercial IX in San Jose, U.S.A. (NTT MCL)
- **IPv6 Application Trial**
  - Application Trial
    - Tests & developments for system integration and migration
  - Individual Trial
    - Joint trials with several companies.

# Network Operation Trials

- **IPv6 OCN Tunneling Trial (NTT Communications)**
  - IPv6 over IPv4 tunneling technology
    - For customers of OCN leased-line connection service
    - For customers of OCN dial-up access service (planning)
- **IPv6 Operation Trials in Europe (NTT Europe)**
  - Native connection, Tunneling connection
  - Connecting to the many IPv6 networks that exist in Europe
- **IPv6 Commercial IX in San Jose, U.S.A. (NTT MCL)**
  - Operating a commercially usable IPv6 IX service
  - NTT America's San Jose data center

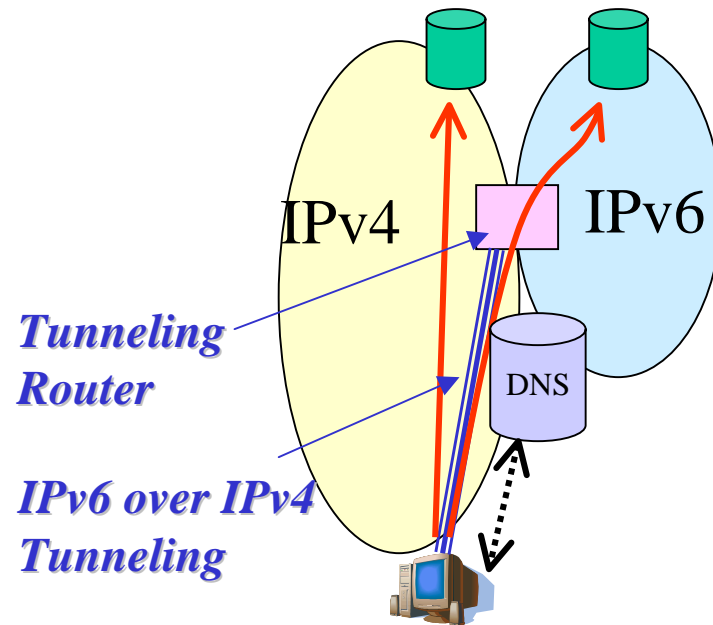
# NTT Com Global IPv6 Network



# IPv6 OCN Tunneling Trial

# Transition Support

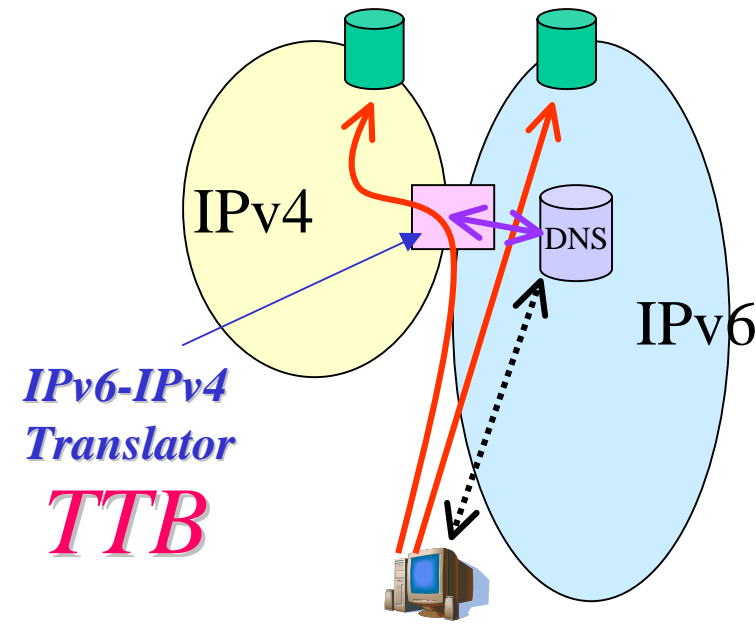
Providing IPv6-IPv4 translator function “TTB” (Joint Trial with YDC Corporation)



IPv4 / IPv6 dual stack terminal

## IPv6 over IPv4 tunneling

A dual stack terminal can access to the servers on IPv6 networks using IPv4 network services.



IPv6 terminal

## IPv6-IPv4 Translation

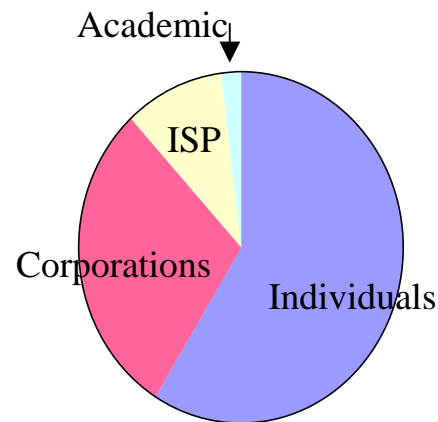
The terminal in the native IPv6 environment can access to the servers on IPv4 networks via IPv6-IPv4 Translator “TTB”.

# Status of OCN IPv6 Trial

Number of trial partners: about 150 (As of mid-Dec..2000)

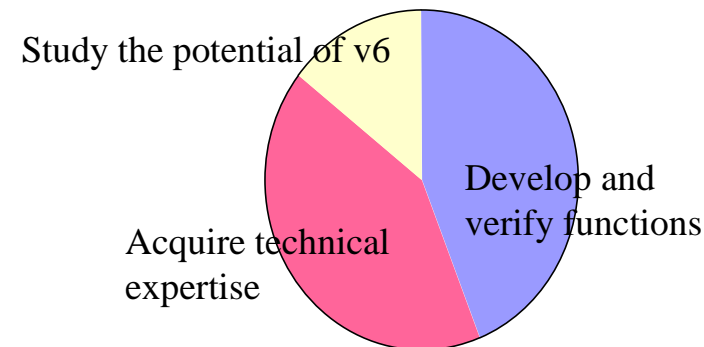
## Breakdown of Participants

Shifting from research phase to business phase



## Purpose of Participation

53% of participants are preparing to commercialize the service



Participants with IPv6 experience 28 %

IPv6 researchers and developers 20 %

What do you expect for IPv6?

- 1) Addresses
- 2) Security

# Application Trials

# IPv6 Application Trials

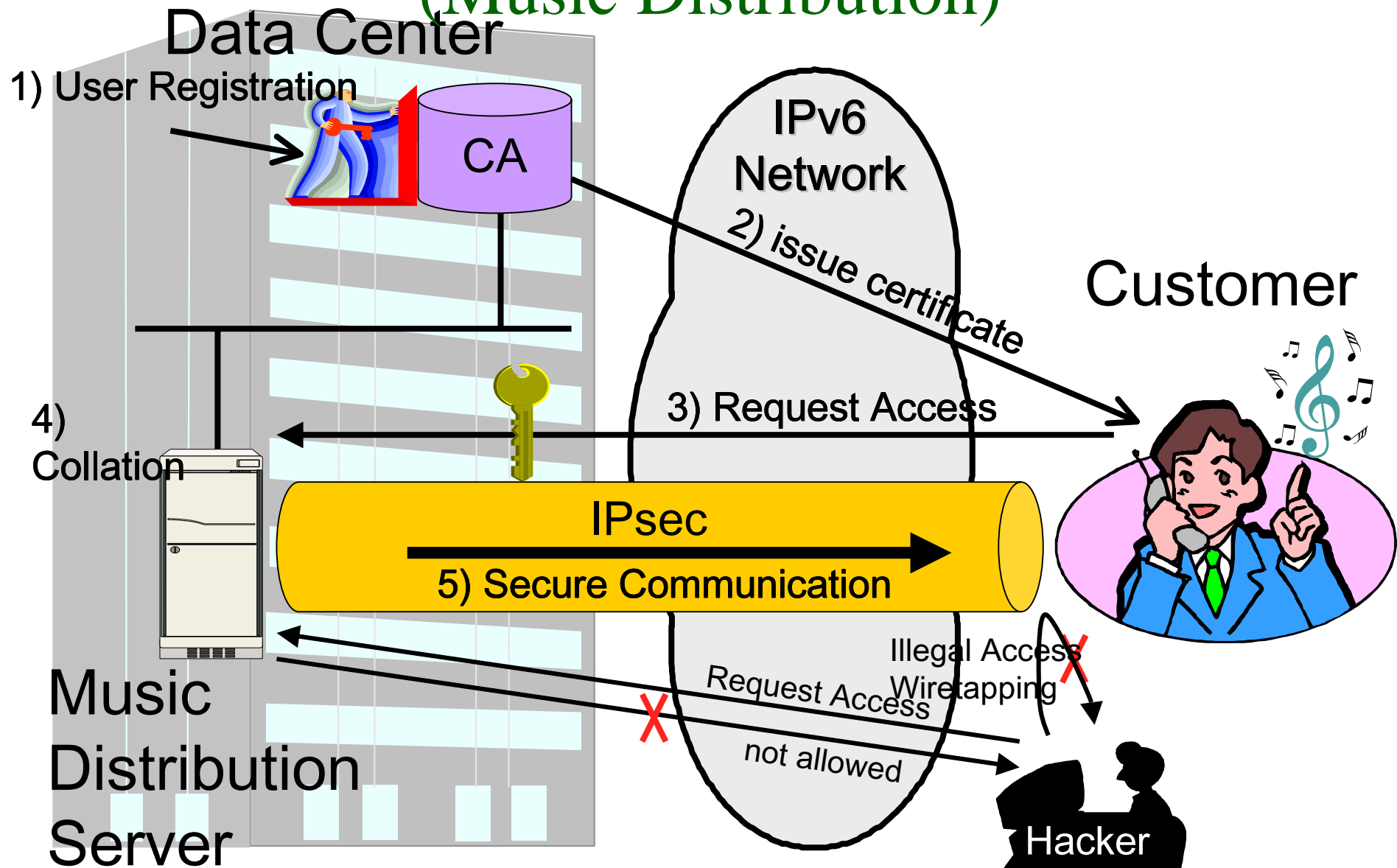
## ● Application Trials

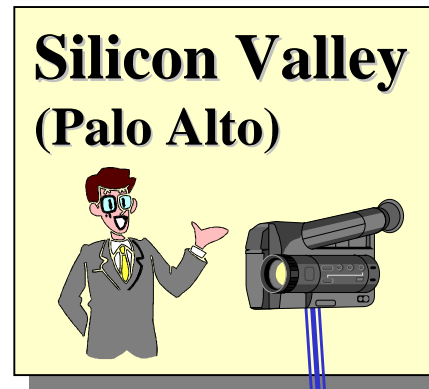
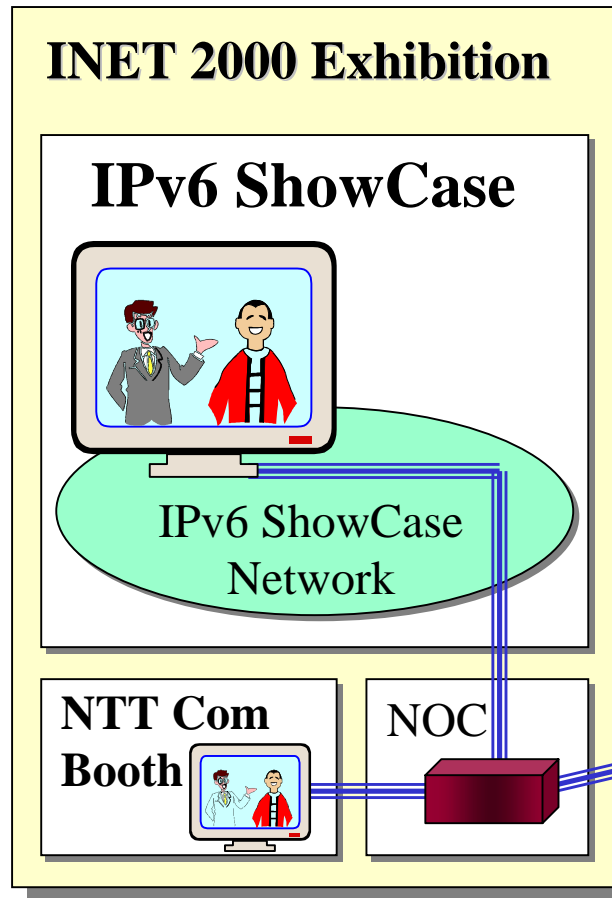
- develop and test IPv6 applications
- system integration and migration of enterprise network
- demonstration:
  - N+I 2000 : Music Distribution with IPv6 security.
  - INET 2000 : TV Conference between Yokohama and San Jose.

## ● Individual Trials

- develop and test IPv6 solutions with several companies
- support developing new Internet business markets

# N+I 2000 Demonstration (Music Distribution)



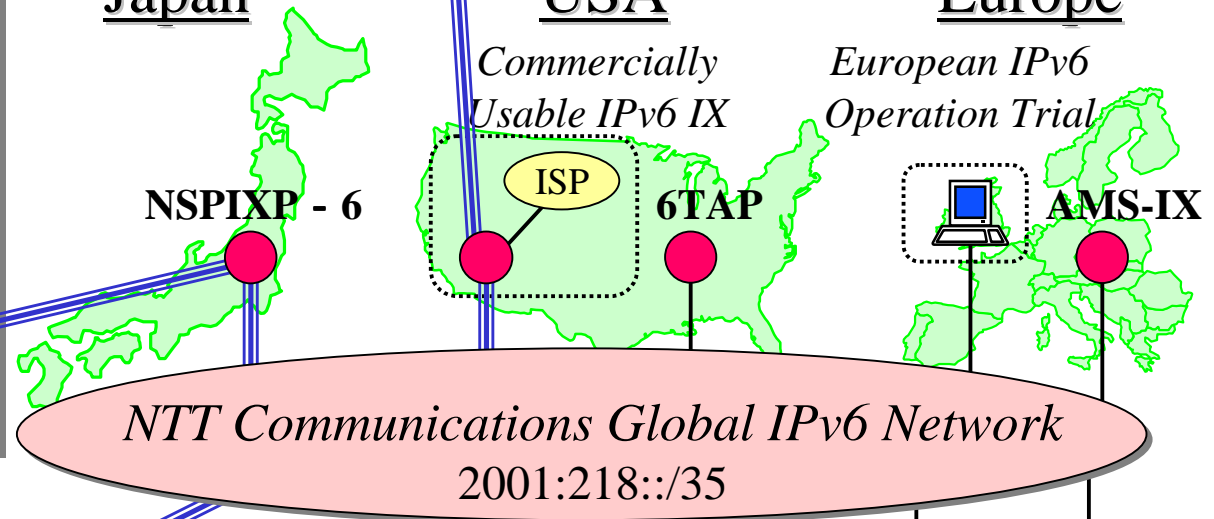


# [ INET 2000] Trial System : Video Conference

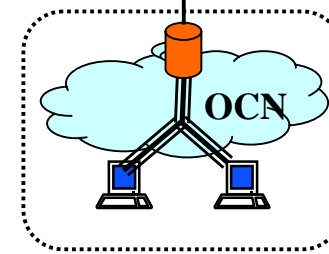
Japan

USA

Europe



Secure transport  
by IPsec



IPv6 backbone provisioning

IPv6 OCN Tunneling Trial

# The Renewal of our Web Site

<http://www.v6.ntt.net>



● Let's try to run IPv6 application on your IPv6 network !  
(Music Distribution)

● Joint trial with

- NTT Business Information Service, Inc.
- NTT Software Corporation

# Web site for testing IPv6 application

This site is opened for every IPv6 users of the world.

## ● **NTT Business Information Service, Inc.**

- constructs a music distribution site
- application: mpeg123 (Linux and FreeBSD)

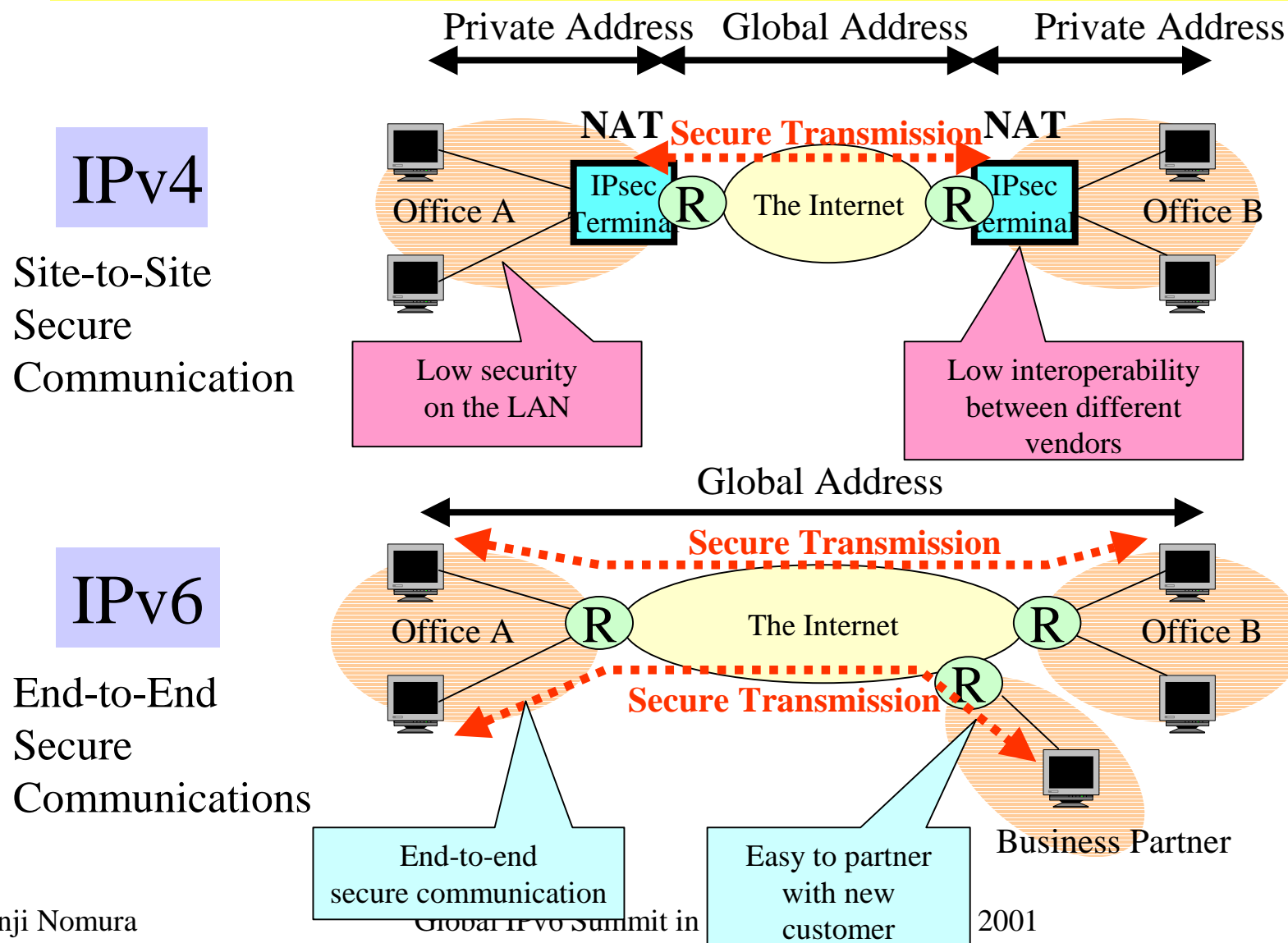
## ● **NTT Software Corporation**

- develops TWIN-VQ IPv6 for Windows2000 + MSDN  
(joint research with NTT Cyber Space Laboratories)  
provides music songs for audition

# Individual Trials

# End-to-End Secure Communication

Easy to setup IP-VPN between end-to-end terminals with IPv6



# IPv6 End-to-End Security Trial



Takenaka Corporation is the Japan's oldest architectural, engineering and construction firm with a long history rich in tradition that spans nearly 400 years.  
( <http://www.takenaka.co.jp> )



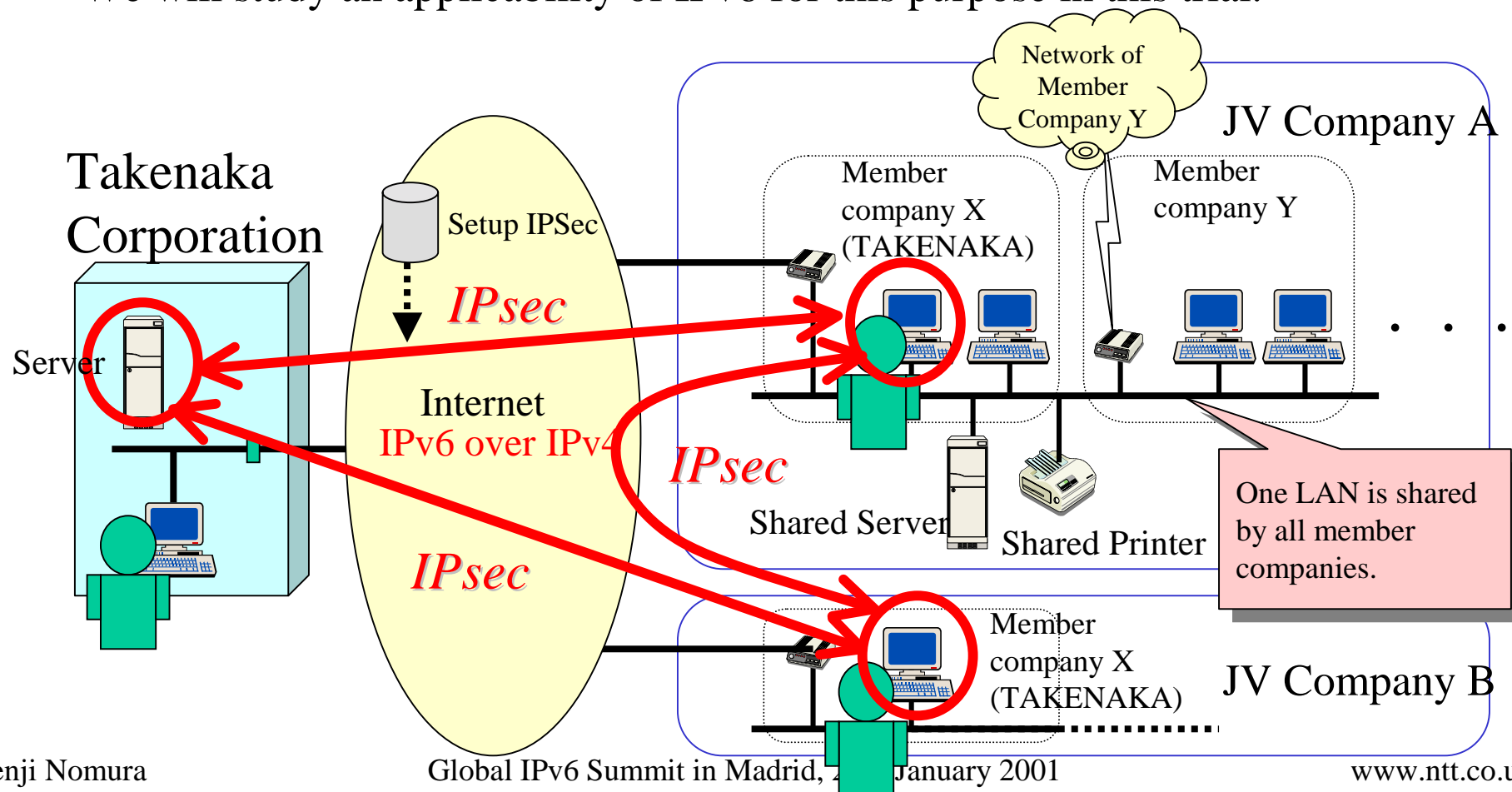
**Osaka International Convention Center  
(Grand Cube Osaka)**

Constructed by Takenaka Corporation  
and nine other companies (JV)

**Many landmarks are constructed by JV (Joint Venture).**

# IPv6 Trial with Takenaka Corporation

- In a JV office, member companies are sharing a LAN to have common information. On the other hand, Takenaka corporation's staffs, who belong to respective JV companies, have to communicate each other.
- Therefore end-to-end secure communication method is necessary.
- We will study an applicability of IPv6 for this purpose in this trial.

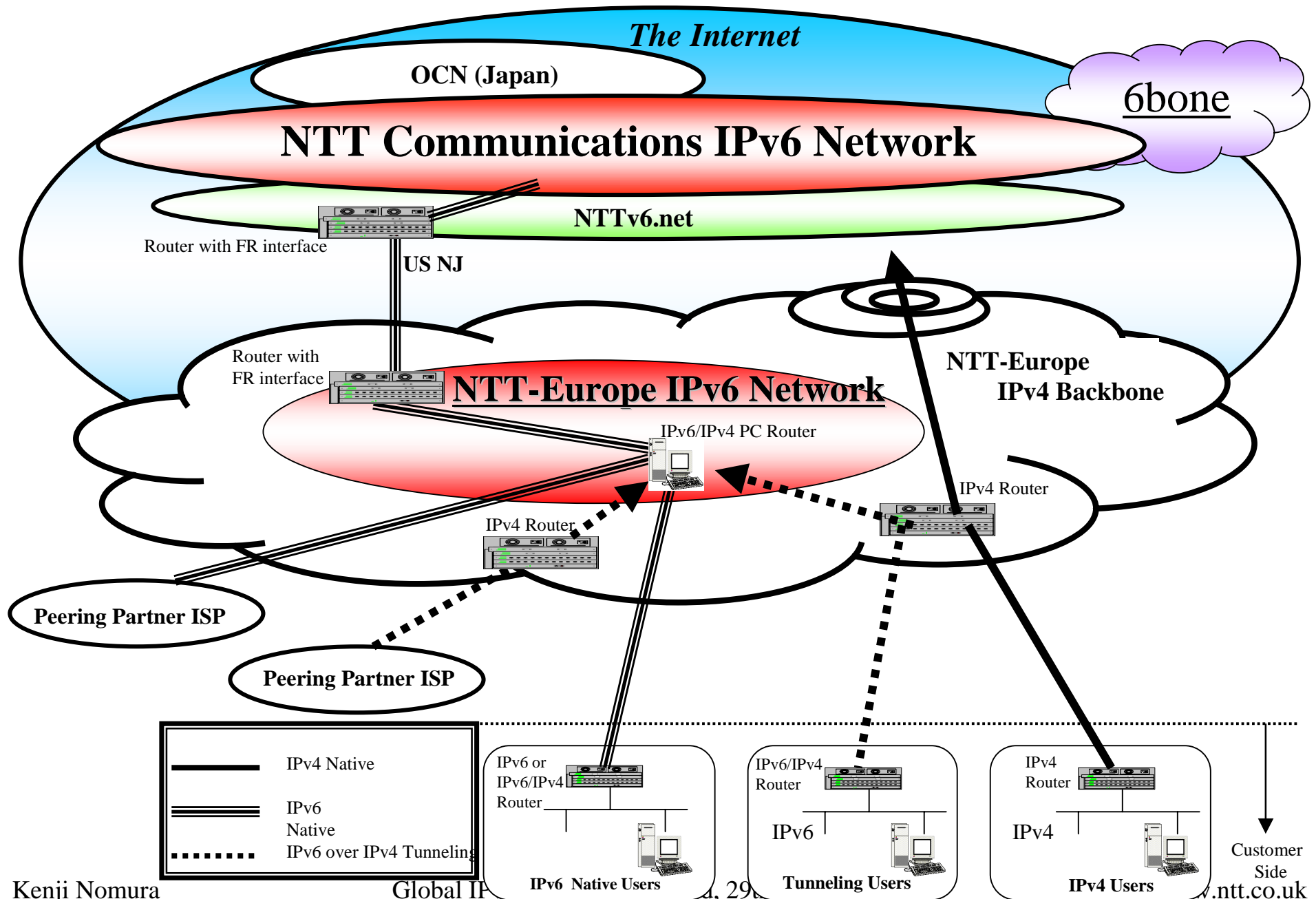


# Activities in Europe

# IPv6 Trial in Europe

- **Providing a Native connection and a Tunneling connection**
- **Connecting to many IPv6 networks that exist in Europe**
- **How will this access be provided ?**
  - By direct connection to NTT Groups PoP in [London](#) and [Dusseldorf](#)
  - By tunneling connection using the existing IPv4 internet connectivity
- **Conditions for Access ?**
  - There will be [no charge](#) for access to the IPv6 network during the trials

# Network of NTT Europe IPv6 Trial

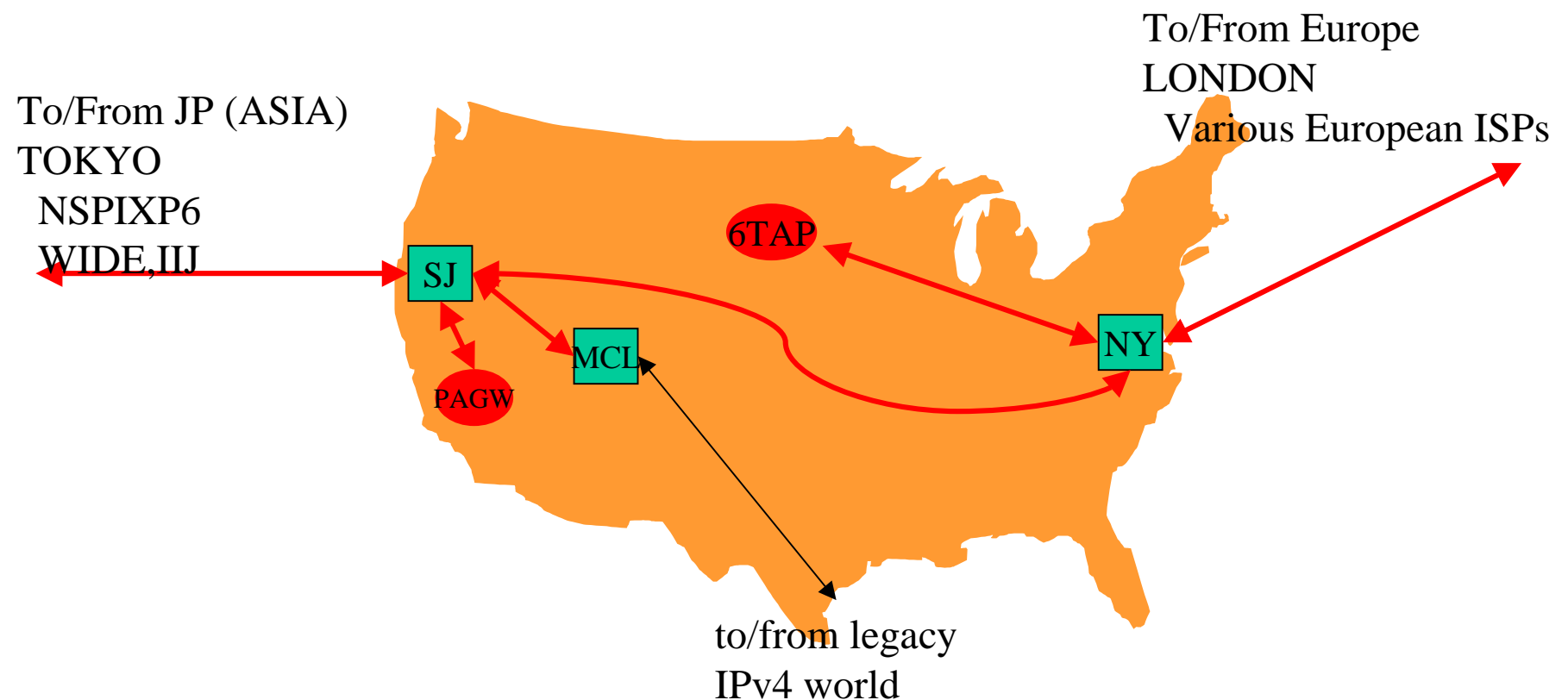


# Activities in US

## IPv6 Activity in U.S.

- NTT MCL, Inc. which is an affiliate company of NTT Communications, provides public with an **IPv6 IX** facility in **San Jose**, California, USA
  - not free but CONTRACT
  - which means that we will be RESPONSIBLE for it

# Network in the United States



# Future Plan

## ● Expand IPv6 Trial

- IPv6 backbone provisioning trial (for ISP, ICP, ASP....)
- IPv6 trial for OCN dial-up access service (Planning)
- Expand region of the IPv6 backbone (Asia ....)

## ● IPv6 Commercial Service

- Spring of 2001
- Native IPv6 service, IPv6 over IPv4 tunneling service

# Contact

- **NTT Com IPv6 Trial** : **ipv6@ntt.com**  
(Hiroaki SADATA)
- **JAPAN (OCN)** : **ipv6@ntt.com**  
(Takashi ARANO)
- **Europe** : **ipv6@uk.ntt.net**  
(Kenji NOMURA)
- **US** : **ipv6@nttmcl.com**  
(Shin MIYAKAWA)

Thank You !!