

Capacity Building for IPv6 by IPv6 Promotion Council Japan



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IPv6 Promotion Council / TF on IPv4 address Exhaustion

NTT East, Japan

Organizations in Japan

- **IPv6 Promotion Council**

- Established in October 2000. Currently have 103 organizations and 106 individuals as members
- Purpose
 - Pursue an international leadership role for Japan in the Internet field
 - Develop rich human resources for continuous development of a new infrastructure for a high information society
 - Promote new business and vitalize existing business in hardware, software and service of networks and devices

- **The Task Force on IPv4 Address Exhaustion**

- Established in September 5, 2008. Currently have 23 Internet related organizations including MIC as members
- Purpose
 - Smooth transition from IPv4 to IPv6 when the IPv4 exhaustion comes
 - Solutions for the issues(technology, operation, management)
 - Enlightenment and Publicities
 - Human resource development
 - Progress management

IPv6 Promotion Activities

- 1) Status Check
- 2) Enlightenments & Publications
- 3) Building guidelines and Authenticating IPv6 Ready Activities
- 4) Technology Verification
- 5) Human resource Developments


IPv6 Transition Status in Japan

1. Hearings from **10** ISP, CATV, and iDC hosting companies (Feb, 2010)
2. Questionnaire to **315** organizations in the TF for IPv4 Exhaustion (Dec 2009-Feb2010)
3. Questionnaire to **21** vendors belonging to JATE (Japan Approvals Institute for Telecommunications Equipment)

Item	Hearing	TF	JATE
Number	10	315	21
Acknowledgement for IPv4 Depletion	100%	87.7%	90%
Introduction of IPv6	30%	23.5%	24%

- Issues when integrating / supporting IPv6 in organizations (from TF questionnaire)

Issue	Count	Percentage
1) Cost calculation and preparation are difficult	114	63.7%
2) Lack of knowledge and information about IPv6	87	48.6%
3) Lack of products and services for IPv6 integration	87	48.6%
4) Lack of human resources	85	47.5%
5) Lack of general knowledge for IPv4 depletion from the users	58	32.4%
6) Lack of knowledge at the management level	27	15.1%

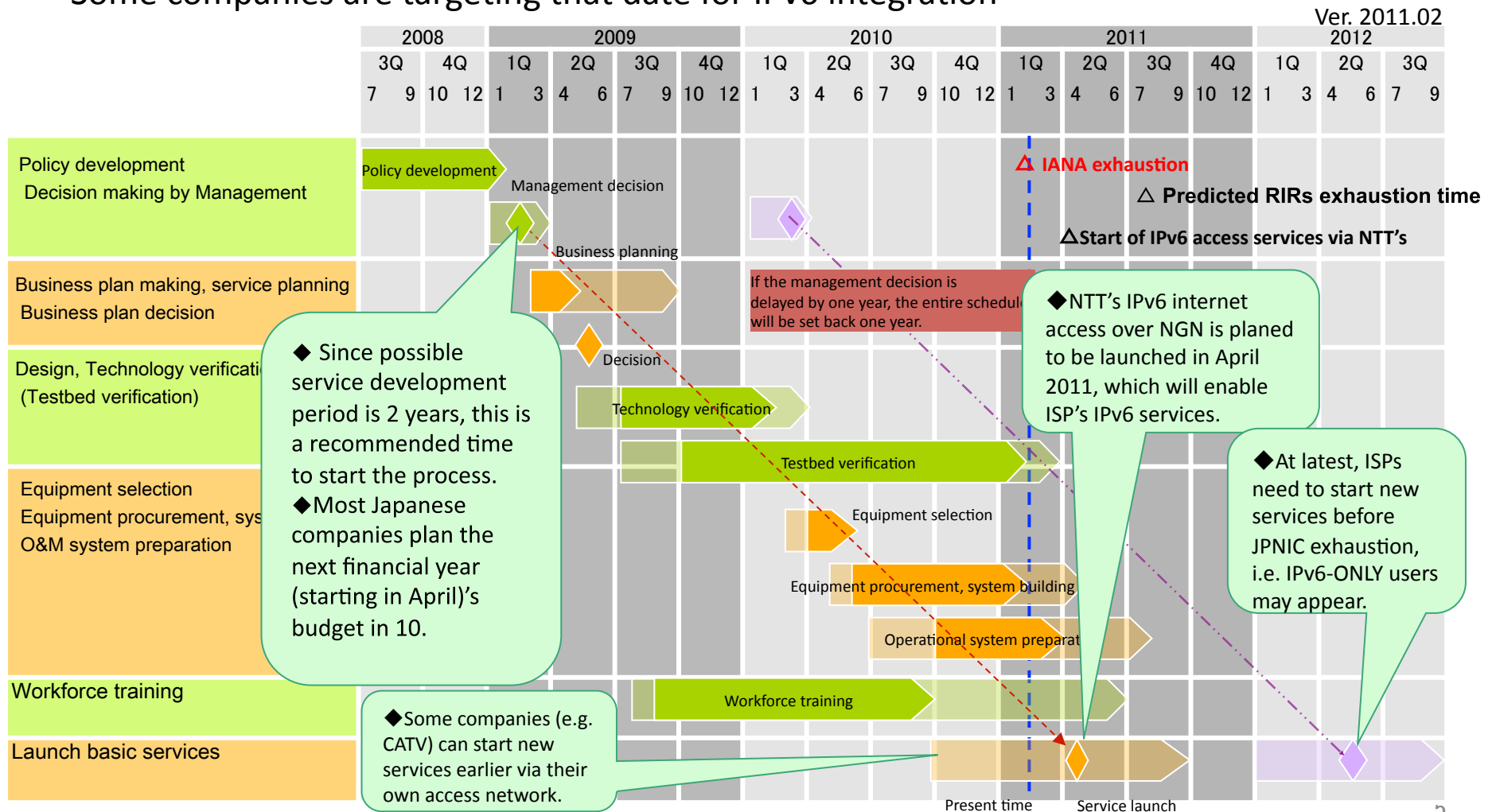
 There are various obstacles for introducing the IPv6 technology

Action Plans

Japan's NGN network by NTT East / West is starting its IPv6 service in April 2011

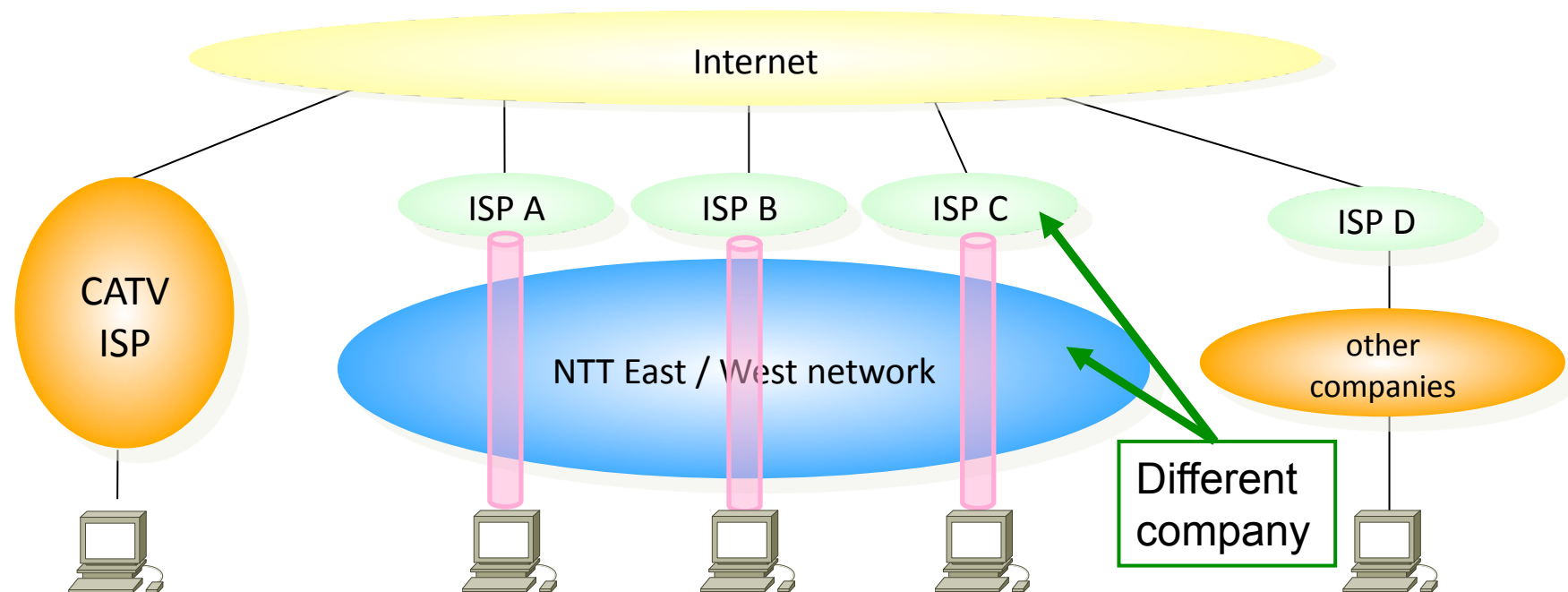
→ Some companies are targeting that date for IPv6 integration

-----▶ Recommended Schedule
 - - - - -▶ Latest start Schedule



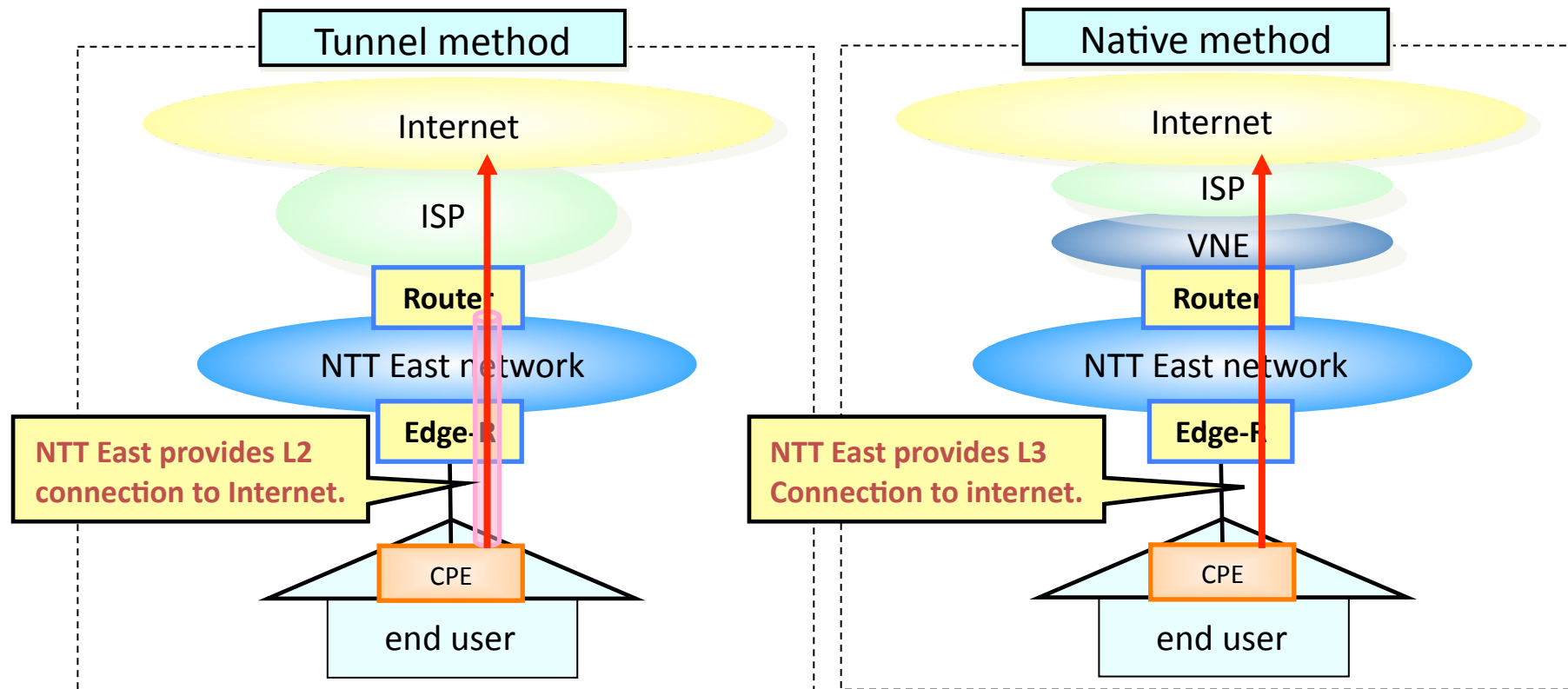
Network Structure in Japan

- ISP companies and access line carrier companies are different
- NTT only work access line carriers



NTT East/West Start IPv6 Service

- NTT East/West start IPv6 access service from this April
- NTT East/West prepare two different methods



Enlightenment Activities

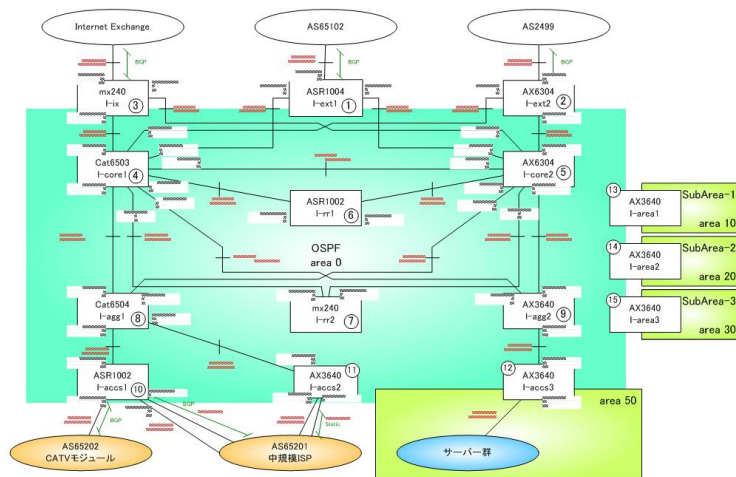
- Events for promoting IPv6
 - Global IP Business Exchange, IPv6 Summit, Booth at INTEROP
- Seminar on IPv6 Internet access network overview in Japan
- List of current IPv6 services
 - Self-list the IPv6 services to TF
<http://www.kokatsu.jp/blog/ipv4/data/ipv6service-list.html>
- List of IPv6 technology specification authorization programs
 - List of IPv6 authorization programs gathered by TF
<http://www.kokatsu.jp/blog/ipv4/data/ipv6-service-logo.html>

Guidelines and Authorization Activities

- IPv6 transition reference model
 - Sample network and multi-vendor configuration examples for ISP/CATV dual stack network
 - <http://www.v6pc.jp/jp/entry/wg/2010/06/referencemodel.phtml>
- Guideline for IPv6 home routers
 - As the way of Japan's IPv6 connection using NGN is confirmed, how to build the IPv6 home routers is now out
 - <http://www.v6pc.jp/en/entry/wg/2010/04/ipv610.phtml>
- IPv6 Ready Logo Service for ISP
- Self-Check Sheet for IPv6 ready curriculums & exams
 - Authenticating exams and curriculums if it is IPv6 ready (targeting .ComMaster and CCNA, CCNP as the early registers)
 - <http://www.v6pc.jp/jp/entry/wg/2009/11/v6qualification.phtml>
 - (Will interact with IPv6 Forum IPv6 Ready Education Program)

IPv6 Verification Testbed

- Providing a simulating environment for introducing IPv6.
Two places in Japan (Tokyo and Osaka)
- Target audience
xSP, Sler, device vendors, software vendors, academia, etc
- Environment
Pseudo IX environment(2 upstream routes), Global AS, private AS, IPv4 (/21), IPv6 (/32), multi-vendor routers, servers, LSN, load balancer, user PC, etc.

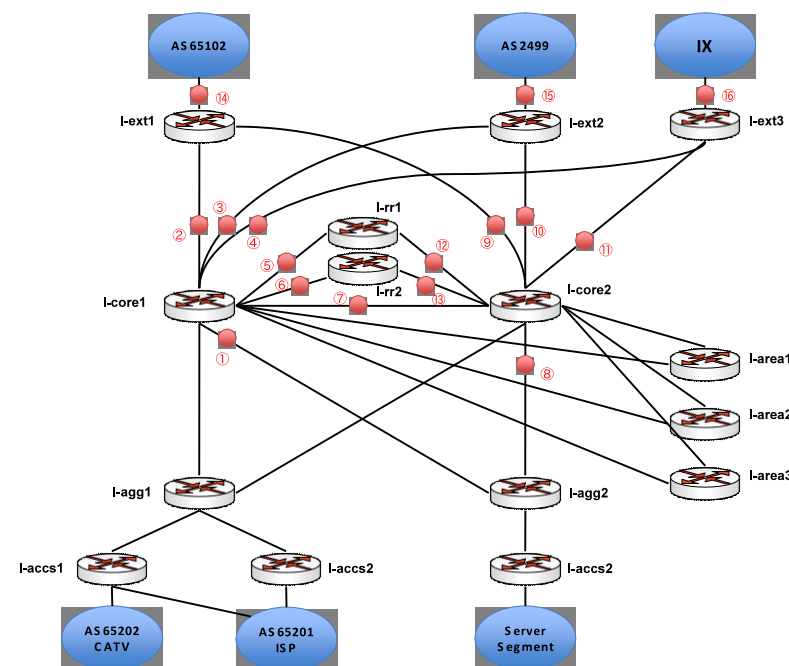
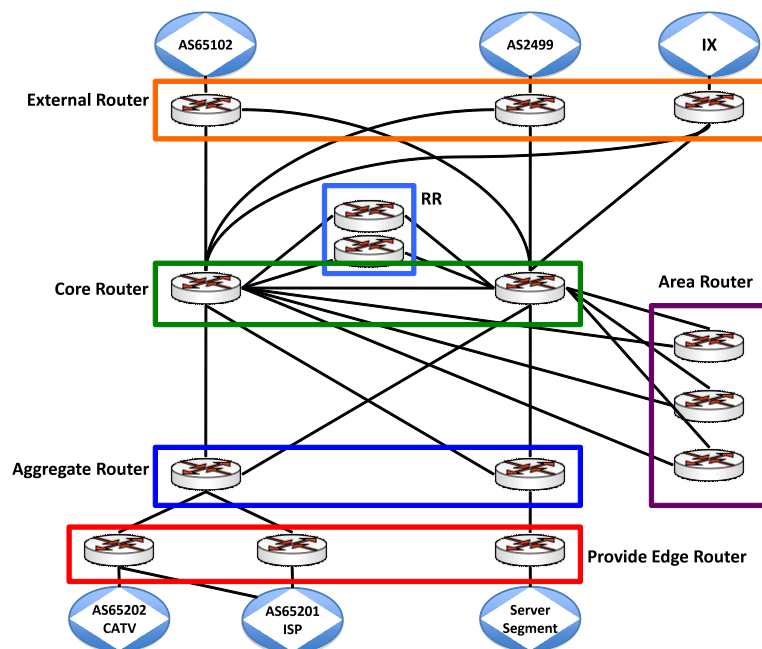


Example topology



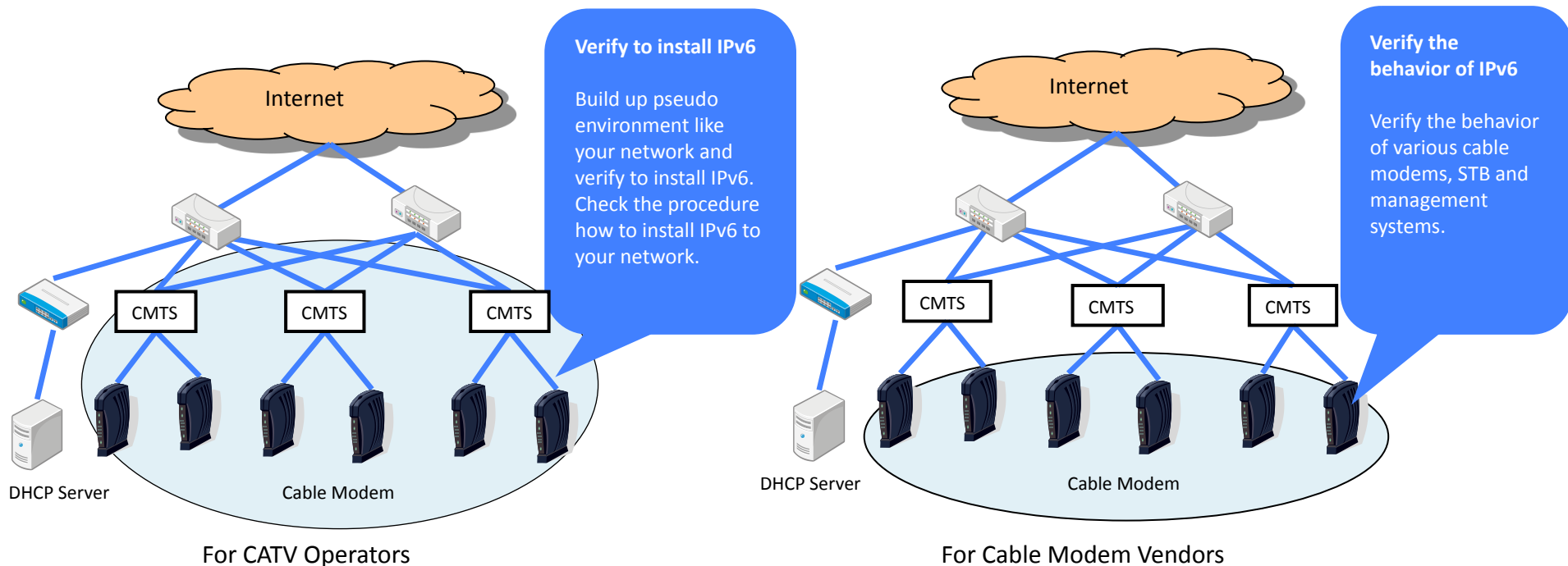
case1. ISP

- Construct redundancy network
- Config BGP, OSPF and other network parameters for IPv6
- Make pseudo IPv6 trouble, and confirm that there is no effect to ipv4
- You can change the topology according to your customer



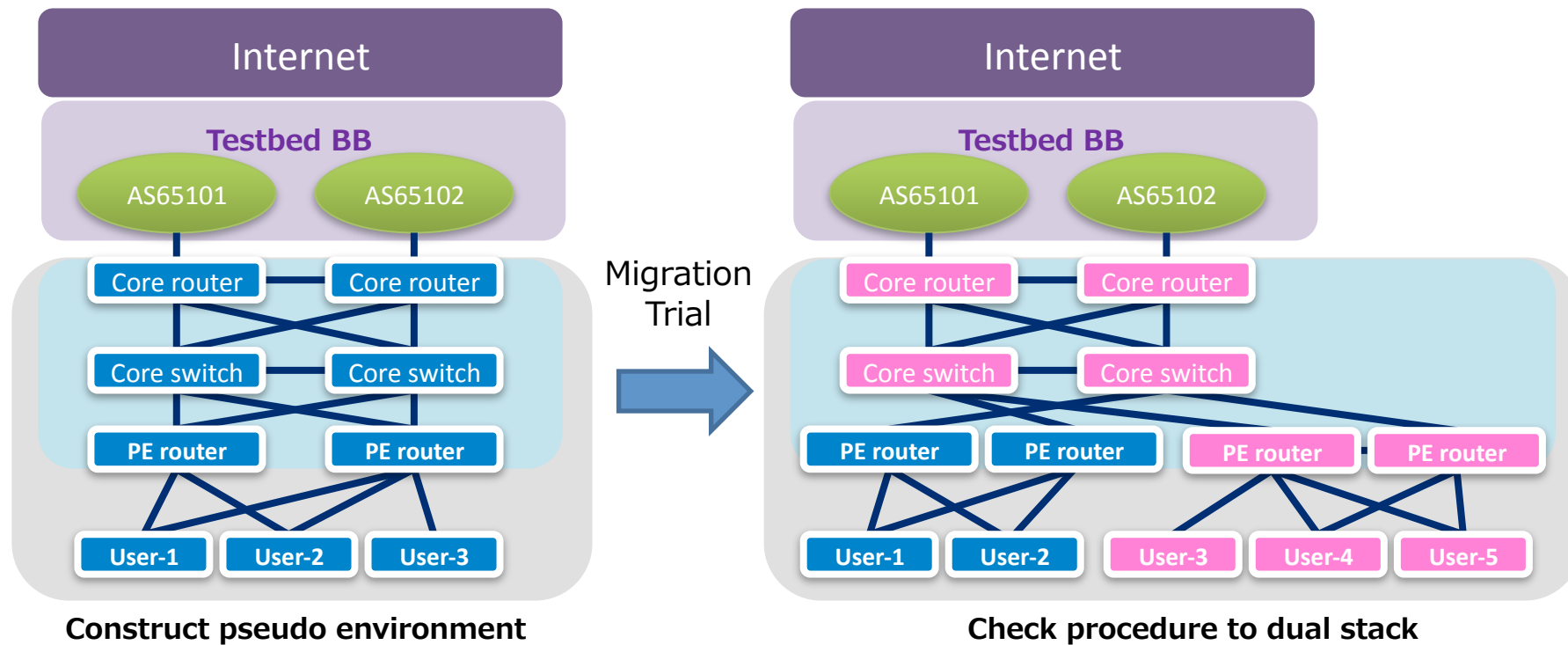
case2. CATV ISP

- Combine CMTS and cable modems as some pattern, create procedure to migrate to IPv6, and verify it over the dual stack network.
 - Prepared two vendors' CMTS
 - Prepared many popular modems
 - Equipment can be brought



case3. Data Center Provider

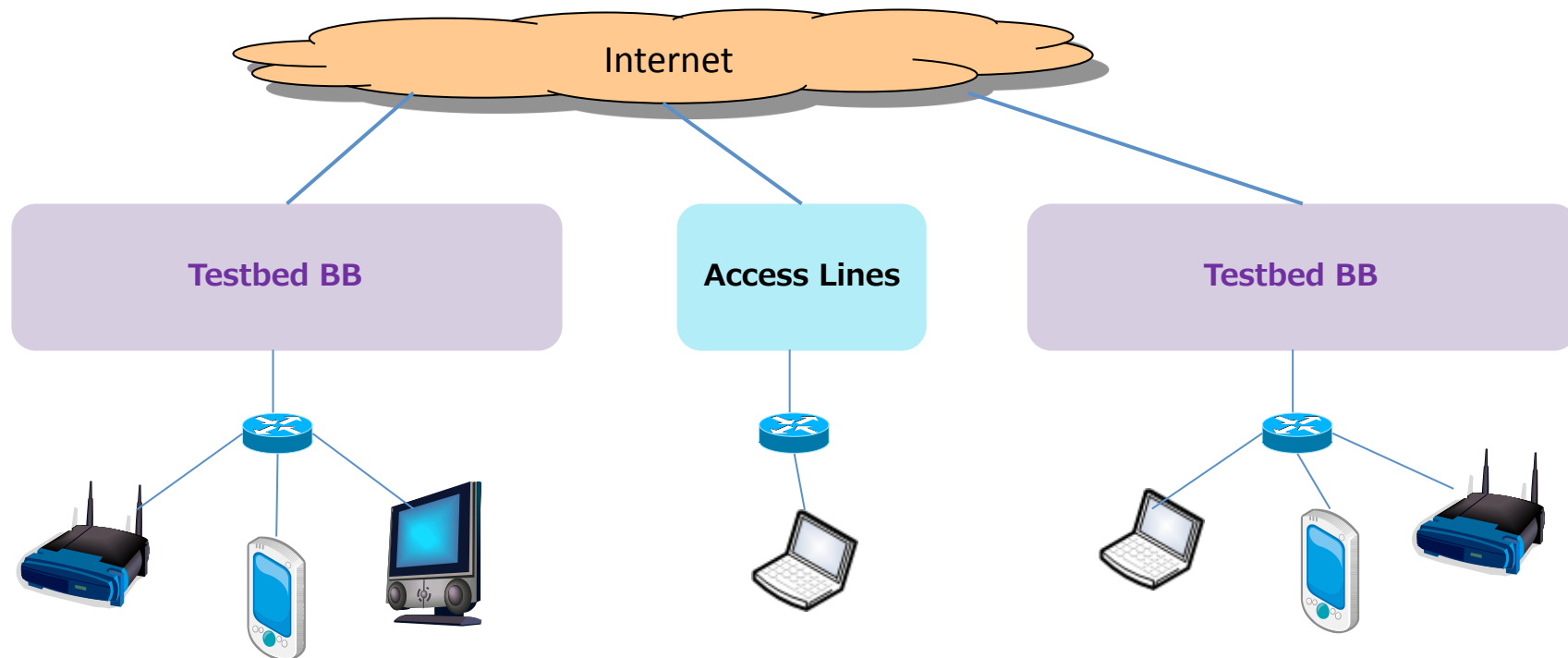
- Check implementation status and procedure to migrate to dual stack for Data Center Provider



Remarks:
 IPv4/IPv6 dual stack node
 IPv4 single stack node

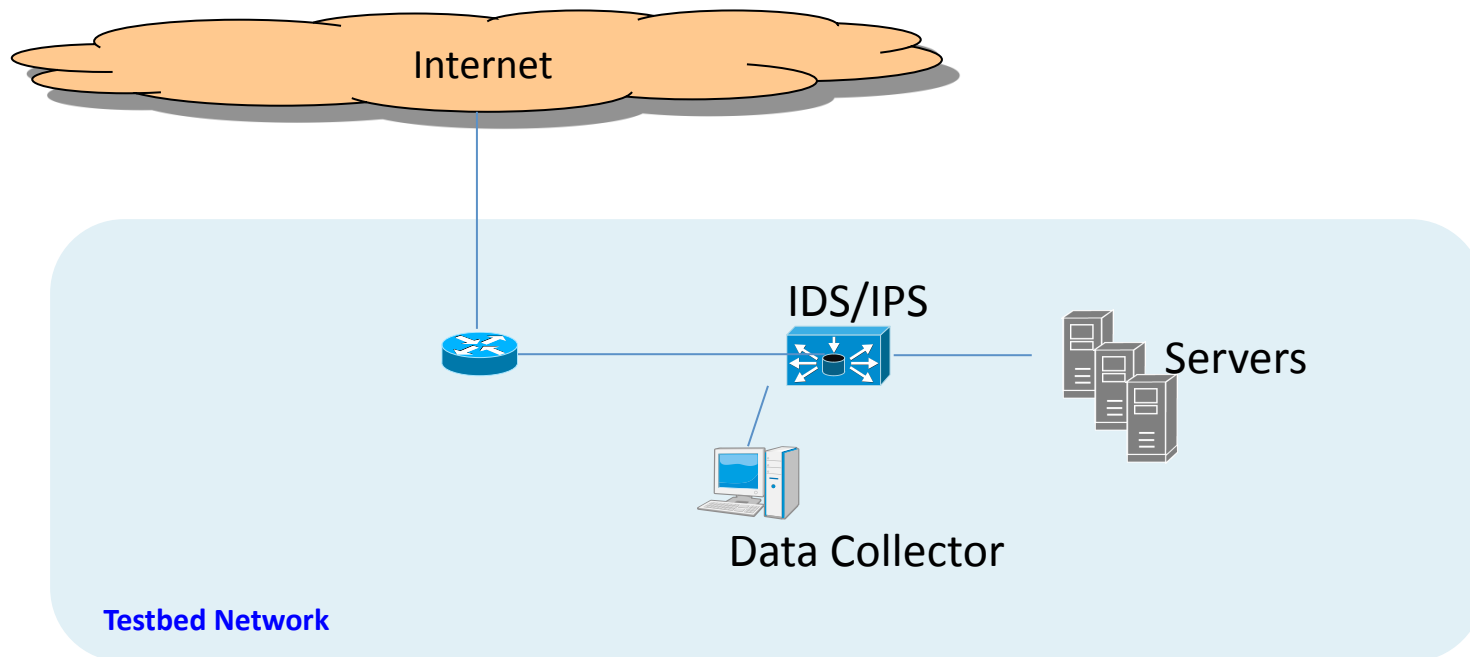
case4. Application Developer

- Determine whether the service is not affected
 - Devices and applications which are under development, are functioning on dual stack environment



case5. Security Appliance Developer

- Check the behavior of protocol and implement around security issue for IPv6
- Check the behavior of IDS/IPS for IPv6
- Collect malwares for IPv6
- Develop signatures for IPv6



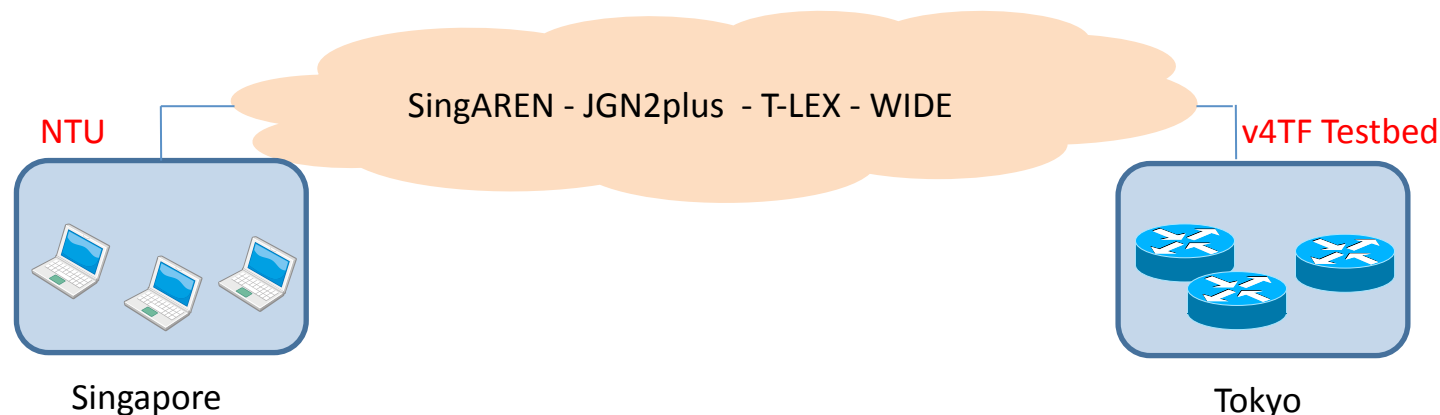
IPv6 Hands-on Seminars

- Human resource development to support the integration of IPv6 technologies
 - Conducting more than 50 IPv6 hands-on seminars all over Japan during 2010
- Topics
 - ISP Network (Alaxala)
 - iDC Network (Cisco)
 - ISP/iDC/CATV/SOHO Servers (NEC)
 - CATV Network (Cisco & ARRIS)
 - IPv6 Multicast (Alcatel-Lucent, Alaxala, Cisco)
- Outputs
 - Multi-vendor PDF Materials in Japanese / English
<http://www.kokatsu.jp/blog/ipv4/en/data/ipv6-hs-materials-en.html>



Seminar at Singapore

- 2010/6/28 @ Nanyang Technological University
cooperate with SingAREN
- 12 participants
(researcher, students)
- Use Alaxala AX3640
- Configure IPv6 address and OSPFv3
- Shooting virtual trouble



Seminar at Bangkok

- 2010/10/15 @ CAT Telecom
cooperated with ThaiSARN
- 16 participants
(ISP operators, students)
- Use Alaxala AX3640
- Setting IPv6 address
- Config OSPFv3
- Shooting virtual trouble



International Relationships

MoU to work together for IPv6 introduction

Counter Country	Counterpart	Japan Side	Signed On
Taiwan	Interoperability and Certification of Next Generation Internet Project, Taiwan	Task Force on IPv4 Address Exhaustion	October 28, 2009
Singapore	SingAREN	IPv6 Promotion Council	June 28, 2010
Thailand	IPv6 Forum Thailand, ThaiRen, Thailand ISP Association, Thailand Research Education Network Association	IPv6 Promotion Council	July 12, 2010
Malaysia	nav6 (National Advanced IPv6 Centre Of Excellence)	IPv6 Promotion Council	October 20, 2010
India	Telecommunication Engineering Centre	IPv6 Promotion Council	October 1, 2010
Indonesia	IPv6 Forum Indonesia	IPv6 Promotion Council	February 22, 2011 (Will be signed)

Signing Ceremony at SG



Our role in promoting IPv6

1. Declaring we are going to “Next Phase”
2. Sharing the knowledge and experiences for capacity building
3. Infrastructure development
 - a. DNS, including DNS-SEC
 - b. Interoperability, including smart objects
4. Traffic data collection, analysis and sharing
5. Explore new continents , e.g., Green IT by IPv6
6. Human Resource Exchanges