IPv6 Deployment Experience Sharing and Current Strategy in Korea

Submitted by: Korea

Workshop for IPv6: Transforming the Internet
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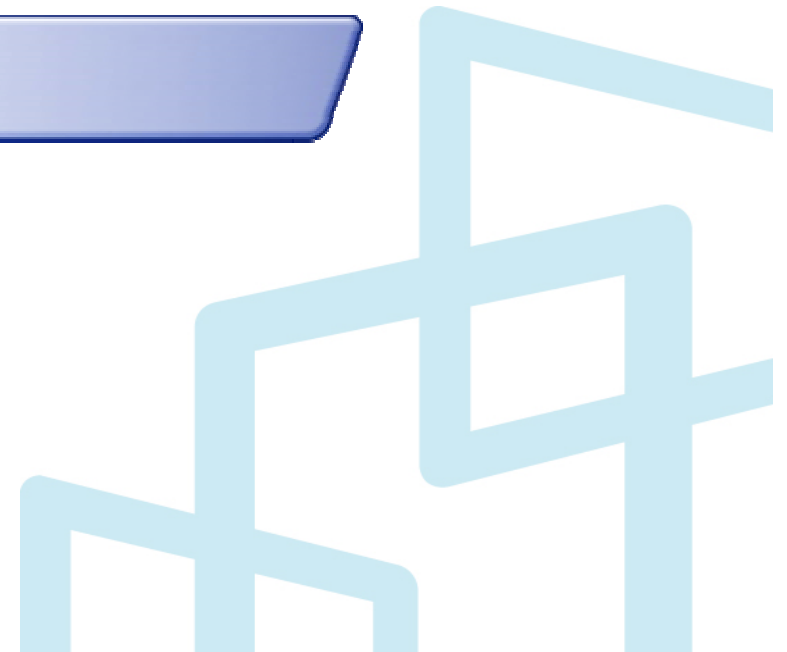APEC TEL41 IPv6 Workshop

Inhye Kim

IP policy & management team

Internet Protocol version 6

KISA
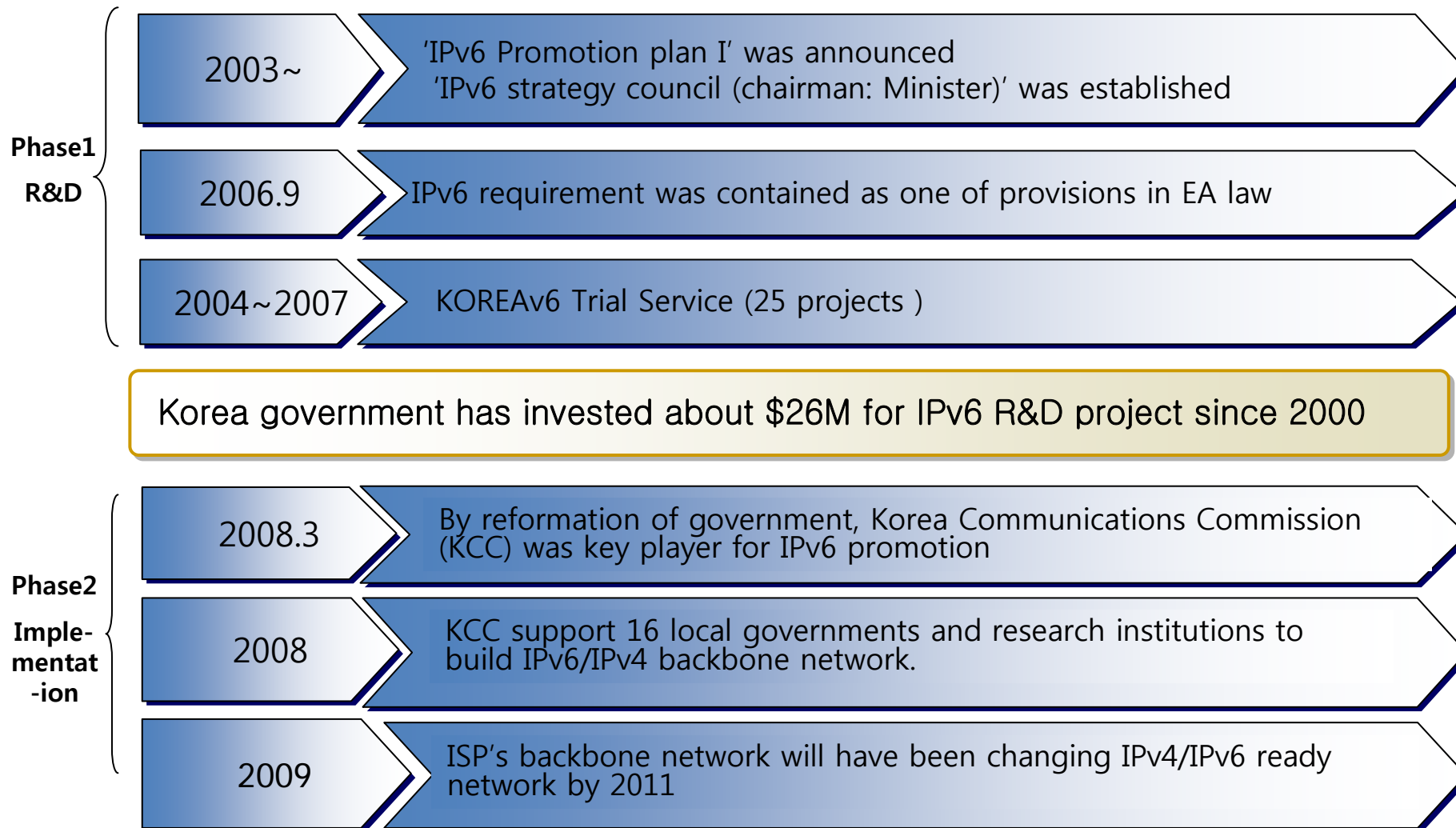한국인터넷진흥원

Contents

Internet Protocol version 6

1. Current IPv6 Status in Korea

KISA
한국인터넷진흥원

[Info.]A brief history of IPv6 in Korea

Phase1 R&D

2003~	'IPv6 Promotion plan I' was announced 'IPv6 strategy council (chairman: Minister)' was established
2006.9	IPv6 requirement was contained as one of provisions in EA law
2004~2007	KOREAv6 Trial Service (25 projects)

Korea government has invested about $26M for IPv6 R&D project since 2000

Phase2 Imple-mentat-ion

2008.3	By reformation of government, Korea Communications Commission (KCC) was key player for IPv6 promotion
2008	KCC support 16 local governments and research institutions to build IPv6/IPv4 backbone network.
2009	ISP's backbone network will have been changing IPv4/IPv6 ready network by 2011

Now, Korea have 5,202 blocks of /32 IPv6 address.
Ranked 3th in Asian-Pacific area

Current IPv6 status in Korea

- Collaboration system
  - In 2009, to collaborate among stakeholders, 'IPv6 Promotion council' was established with ISPs, KCC(Korea Communication Commission), and several government departments.
    - Mainly focused on increasing a IPv6 readiness of network infrastructure.

- Private & Public sector
  - Major ISPs now concerned IPv4/IPv6 dual stack product requirement mandatory.
  - In 2006, government conducted procurement policy regarding to IPv6-aware product.
  - Over 23 local government and research organizations have added IPv6 on their network since 2008

- .kr DNS server
  - 5 out of 11 .kr DNS servers are now fully serviced with IPv6

- IPv6 internet exchange
  - 6NGIX provides traffic exchange among ISPs and also provides IPv6 connectivity for public/private organization.
  - More information in http://vsix.kisa.or.kr or www.vsix.net (English version site is under reconstruction, it will open at 30th May.)

- If you interested in to make a peer, please contact us by email 'v6webmaster@kisa.or.kr'

- Procurement policy

  – 'In 2006, according to 'The Law about acquisition and operation of Information system', official notification was announced that every public agency must require IPv6 capable device when it purchase a communication H/W.

  – '2008 Guideline for execution of the budget' from Ministry of strategy and finance, also includes a following direction.
    - Hardware that used for developing a information system must support IPv4/IPv6 capability.

- IPv6 training course

  – National-wide IPv6 training courses was hold 18 times in 2009, and is still going on.
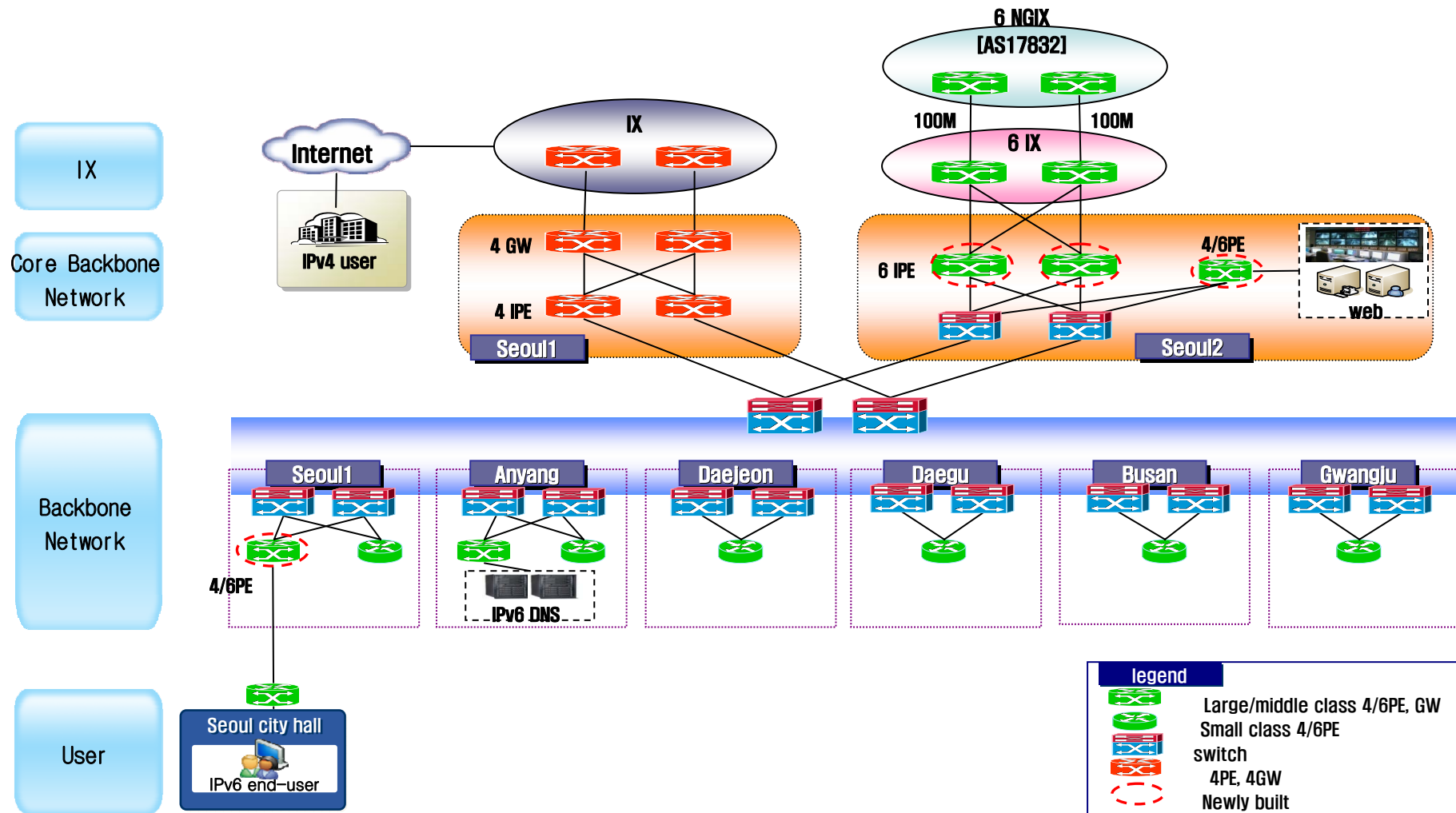 – 3 courses for beginner & intermediate & expert are organized in 2010

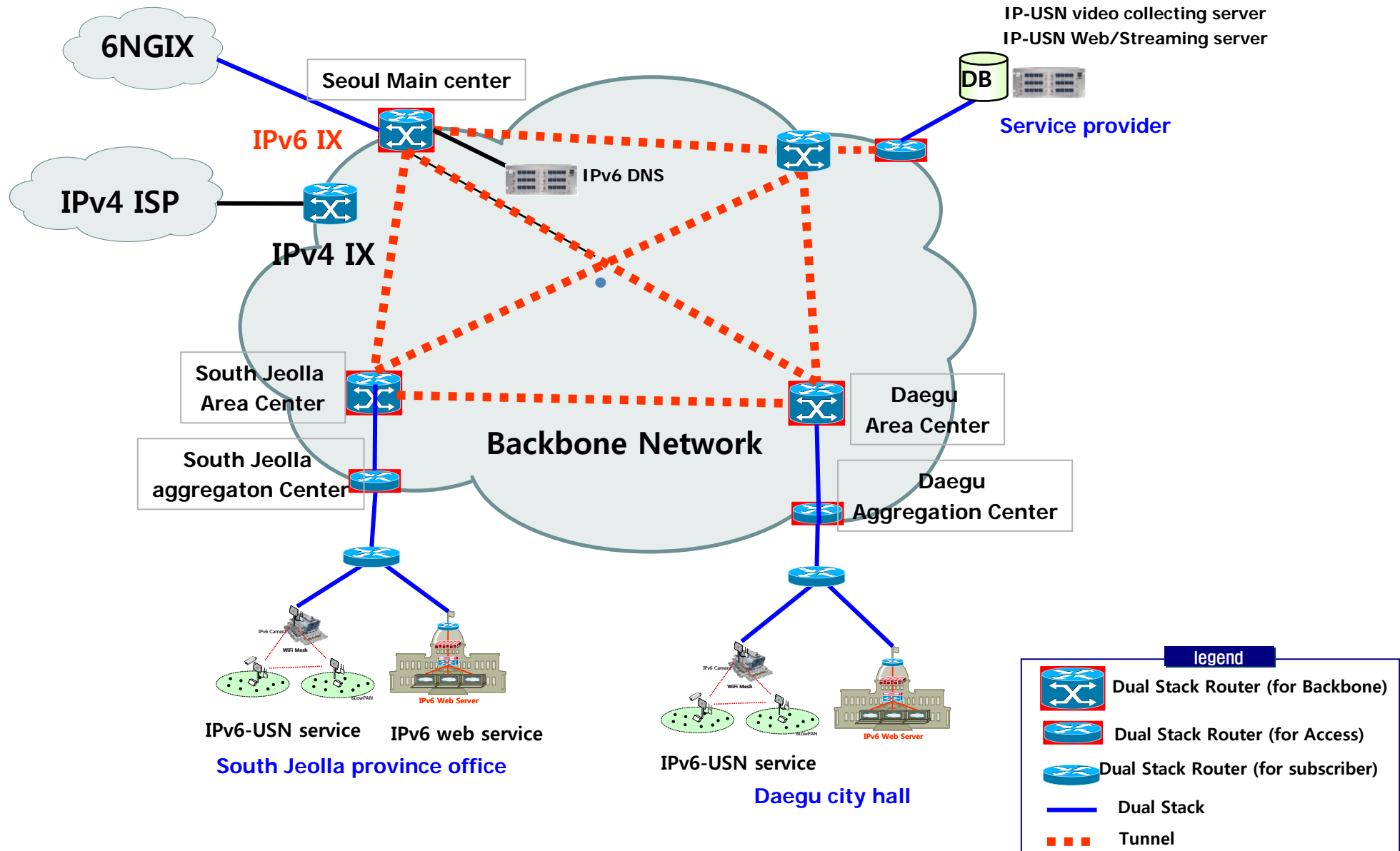# 2. IPv6 Deployment Experience sharing

- In 2009, 3 Major ISPs, 8 local government and commercial service providers participate in 'IPv6 Core Network building project':

  – To build IPv6 Core Network as a ISP's production network.
  – To increase IPv6 Readiness on ISP's backbone network
  – To verify stability for building large-scale IPv6 production network

	Group A	Group B	Group C
Participants	.1 Major ISP .1 Service Provider . 1 Business user (Seoul City hall)	.1 Major ISP .1 Service Provider . 2 Business user (Jeonam, Daegu)	.1 Major ISP .2 Service Provider . 1 Business user (Daejeon)
Adoption method & Coverage	.IPv6 over MPLS (6PE) . 7 service area covered - Seoul, Daejeon, Daegu, Busan, Gwangju, etc.	.IPv4/IPv6 DualStack on existing IPv4 network . 3 service area covered - Soeul, South Jeolla Province, Daegu	.IPv4/IPv6 DualStack on existing & newly building network . 3 service area covered - Seoul, Daejeon, Busan
Trial service for end-to-end verification	.IPv6 based web portal service - File archive, weather forecast	.Real-time atmosphere & weather condition monitoring service .Real-time video monitoring service .IPv6 based wireless internet connection service	.IPv6 based mobile contents portal service .IPv6 based on-line comic book service

Group A – IPv6 over MPLS (6PE)

IX

Core Backbone Network

Backbone Network

User

6 NGIX
[AS17832]

IX

Internet

IPv4 user

100M   100M

6 IX

4 GW

4 IPE

Seoul1

6 IPE

4/6PE

web

Seoul2

Seoul1   Anyang   Daejeon   Daegu   Busan   Gwangju

4/6PE

IPv6 DNS

Seoul city hall

IPv6 end-user

legend

Large/middle class 4/6PE, GW
Small class 4/6PE
switch
4PE, 4GW
Newly built

Group B, C – Dual Stack on existing IPv4 network

Result

- ## Group A (6PE)
  - 7 IPv4/IPv6 enabled core nodes established as a production level.
  - Metropolitan Seoul deployed IPv6 network at main office, and 4 affiliated organization.
  - 3 IPv6-based Applications were developed for verification end-to-end communication
  - ISP is able to accept if there is customer's request for IPv6
  - Group of technician learned how they deploy IPv6 on production network.

- ## Group B,C (DualStack)
  - 2 IPv4/IPv6 capable core nodes established as a production level.
  - South Jeolla local government and Metropolitan Daegu deployed IPv6 network at main office.
  - ISP is able to accept a customer's request for IPv6
  - Group of technician learned how they deploy IPv6 on production network.

- ## Each group secured more than one physical path for IPv6 on their commercial backbone network.

Key outcomes

Group A

6NGIX
(AS: 17832)
Domestic : 30
Foreign : 5

Group B

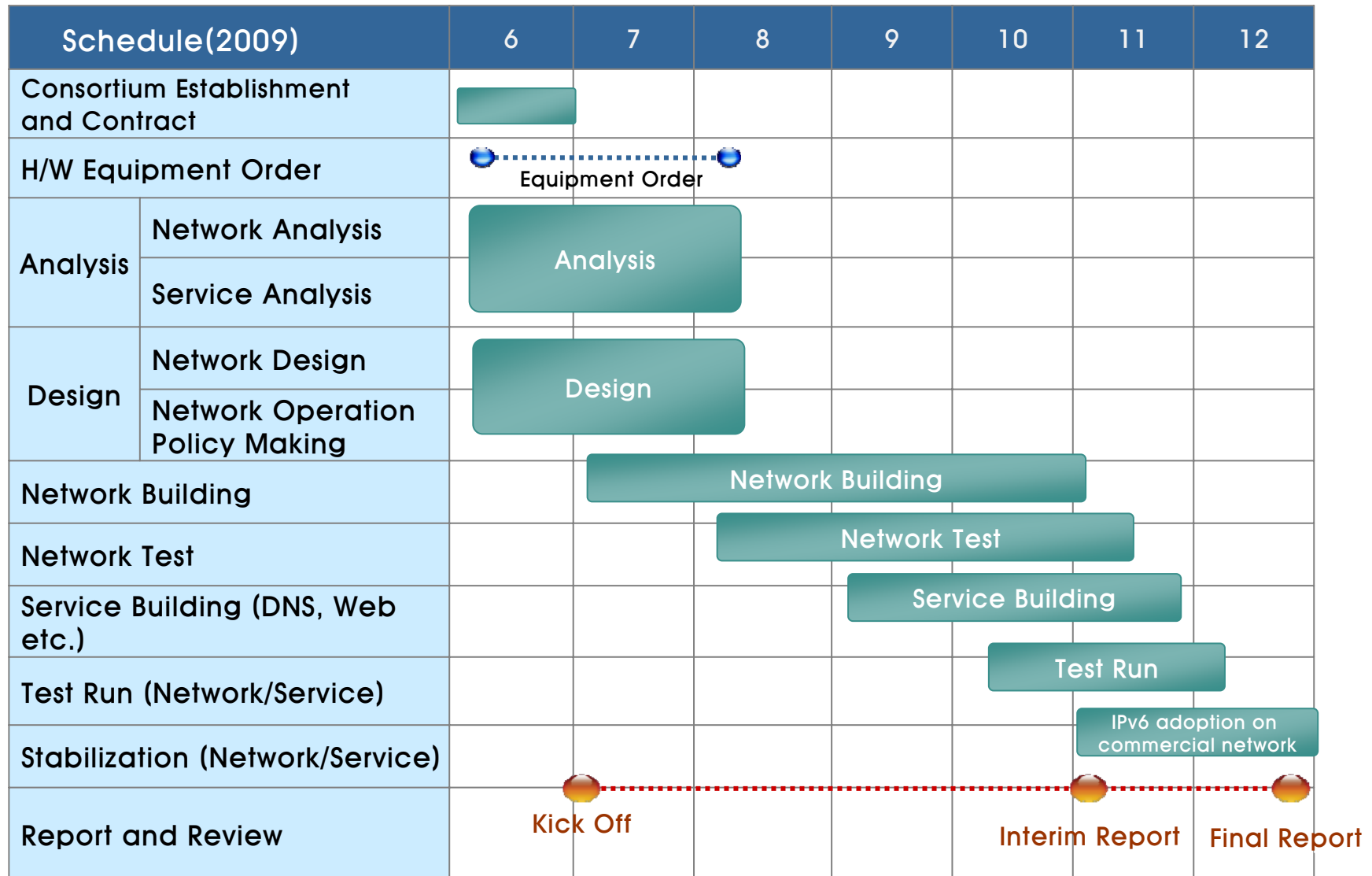**Group C**
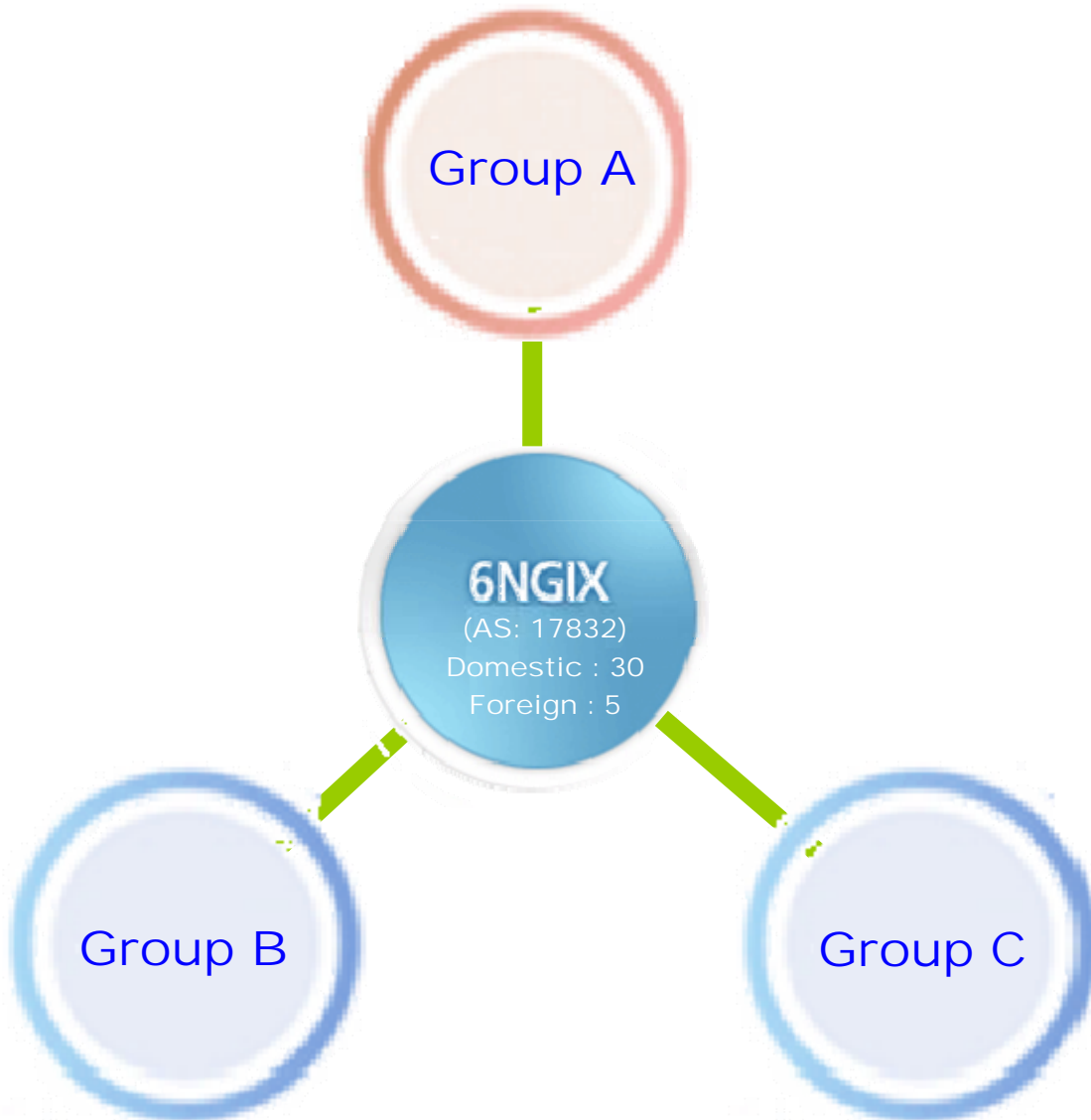
- National IPv6 readiness increased

- Player's confidence regarding the use of IPv6 increased

- By adding IPv6 on commercial ISPs, Other player's awareness increased

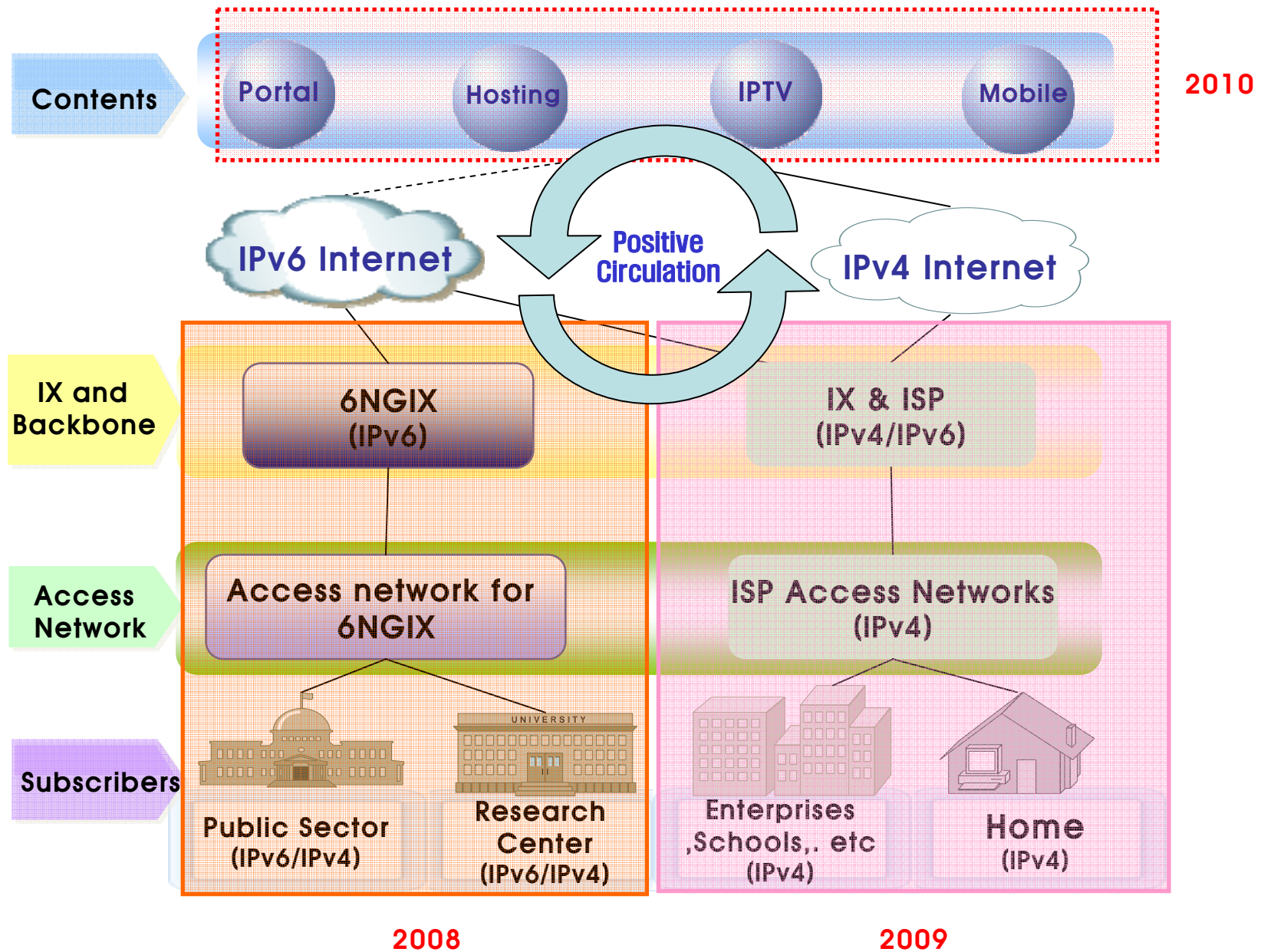- Customer's IPv6 accessibility increased

Timeline

- It took 6 months for deploying IPv6 on each group

Schedule(2009)		6	7	8	9	10	11	12
Consortium Establishment and Contract		▭						
H/W Equipment Order		●┄┄┄┄┄● Equipment Order						
Analysis	Network Analysis	Analysis						
	Service Analysis							
Design	Network Design	Design						
	Network Operation Policy Making							
Network Building			Network Building					
Network Test				Network Test				
Service Building (DNS, Web etc.)					Service Building			
Test Run (Network/Service)						Test Run		
Stabilization (Network/Service)							IPv6 adoption on commercial network	
Report and Review		● Kick Off ┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄● Interim Report ┄┄┄● Final Report						

3. Current Strategy in 2010

So, what we have been doing is…

Contents

Portal   Hosting   IPTV   Mobile   **2010**

IPv6 Internet   **Positive Circulation**   IPv4 Internet

IX and Backbone

6NGIX
(IPv6)

IX & ISP
(IPv4/IPv6)

Access Network

Access network for
6NGIX

ISP Access Networks
(IPv4)

Subscribers

UNIVERSITY

Public Sector
(IPv6/IPv4)

Research
Center
(IPv6/IPv4)

Enterprises
,Schools,. etc
(IPv4)

Home
(IPv4)

2008

2009

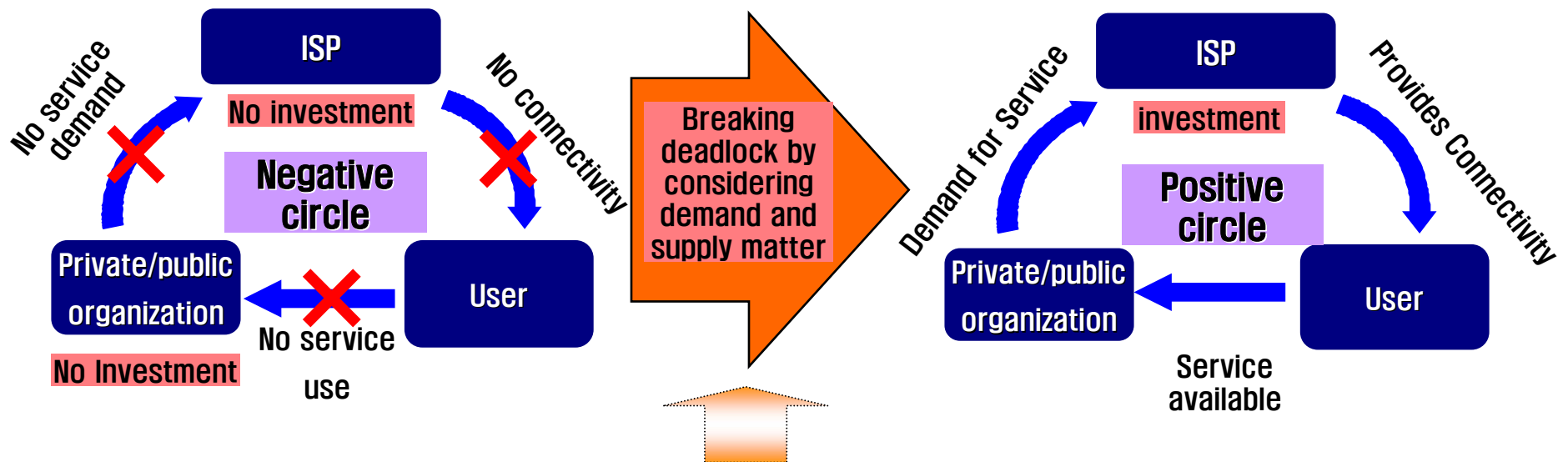| < The Example of Negative Circulation> |
| --- |
| ① No ISPs can support IPv6 Users
② No IPv6 Users request IPv6 Application Service
③ No org. request IPv6 connection service to ISP |

< The Example of Positive Circulation>
① ISP can support IPv6 Users ② IPv6 Users request IPv6 Application Service ③ Org. requests IPv6 connection service to ISP

No Service demand **No connectivity**

ISP
No investment
Negative circle

Private/public organization
No Investment

No service use

User

Breaking deadlock by considering demand and supply matter

Demand for Service **Provides Connectivity**

ISP
investment
Positive circle

Private/public organization

User
Service available

By Increasing awareness to various stakeholder with 'The guideline of case by case IPv6 test & scenario for each stakeholder' which is emphasizing upcoming event of newcomers having only IPv6 address.

- Since IPv6 is not transitable immediately like that of digital TV,
- Stakeholders need put more efforts to understand across the country.
- In short, the following aspects need to be considered during transition of IPv4 to IPv6.

    1. Maintain business continuity

    2. Protection of usersPlayer's confidence regarding the use of IPv6 increased

In details of Korea strategy

- Secure local internet **service's continuity**.

  => Provide internet service <u>without any disconnection</u> while on use

  => Provide <u>customized service</u>

- **Specific plans**
  1. Developing IPv6 activities based on standardization
     => Focus on promotion
  2. Preparing stakeholders' scenarios,
     => perform customized & preemptive promotion.
  3. Preparing the IPv4 address alloation shortage by end in 2011 as expected
     =>Establishing new address management system. (KISA is KRNIC)

     * KRNIC : KoRea Network Information Center

- **Korea has this Future plans as belows,**
 - Extend and reorganize IPv6 Promotion Council and check the spread level of IPv6 transition.
 - Produce and distribute the guidelines per scenarios about stakeholders.- Establish a new adress management system for IPv4 depletion.
 - Improve stakeholders' understanding by media, online campaign, education and etc, and promote continuously.

	2009	2010	2011
<u>Raising awareness of IPv4 address depletion</u>	Training, promotion		
Cooperating with ISPs & government for developing a IPv6 backbone network in ISP	IPv6 adoption in each area		
IPv6 adoption plan for public sector			
Supporting contents service provider's network(IPv4→IPv6)			
Various IPv6 Trial in several area	Trial		

Thank you!

If you have any question after this session....

Email : v6webmaster@kisa.or.kr