IPv6 Deployment Experience Sharing and Current Strategy in Korea

Submitted by: Korea
IPv6 Deployment Experience Sharing & Current Strategy in Korea

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Inhye Kim
IP policy & management team
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1. Current IPv6 Status in Korea
A brief history of IPv6 in Korea

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
Implementat-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
Current IPv6 status in Korea

- 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](http://vsix.kisa.or.kr) or [www.vsix.net](http://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

<table>
<thead>
<tr>
<th>Participants</th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
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<tbody>
<tr>
<td>.1 Major ISP</td>
<td>.1 Major ISP</td>
<td>.1 Major ISP</td>
<td>.1 Major ISP</td>
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<tr>
<td>.1 Service Provider</td>
<td>.1 Service Provider</td>
<td>.2 Service Provider</td>
<td>.2 Service Provider</td>
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<tr>
<td>.1 Business user (Seoul City hall)</td>
<td>.1 Business user (Jeonam, Daegu)</td>
<td>.1 Business user (Daejeon)</td>
<td>.1 Business user (Daejeon)</td>
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<table>
<thead>
<tr>
<th>Adoption method &amp; Coverage</th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
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</thead>
<tbody>
<tr>
<td>- Seoul, Daejeon, Daegu, Busan, Gwangju, etc.</td>
<td>- Seoul, South Jeolla Province, Daegu</td>
<td>- Seoul, Daejeon, Busan</td>
<td>- Seoul, Daejeon, Busan</td>
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<table>
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<tr>
<th>Trial service for end-to-end verification</th>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
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<tr>
<td>.IPv6 based web portal service</td>
<td>.Real-time atmosphere &amp; weather condition monitoring service</td>
<td>.IPv6 based mobile contents portal service</td>
<td>.IPv6 based mobile contents portal service</td>
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<tr>
<td>.IPv6 based wireless internet connection service</td>
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</table>
Group A – IPv6 over MPLS (6PE)

IX

Core Backbone Network

Backbone Network

User

IPv6 DNS

IPv4 user

IPv6 end-user

Seoul city hall

4/6PE

4 IPE

4 GW

100M

6 IX

IX

6 NGIX

[AS17832]

6 IPE

6 IX

Seoul1

Seoul2

Anyang

Daejeon

Daeju

Busan

Gwangju

IPv6 end-user

User

Seoul city hall

4/6PE

4 IPE

4 GW

100M

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

IPv6 IX

IPv6-USN service

6NGIX

Dual Stack Router (for Backbone)

Dual Stack Router (for Access)

Dual Stack Router (for subscriber)

Tunnel

IPv4 IX

IPv4 IX

IPv4 IX

IPv4 IX

South Jeolla province office

IPv6-USN service

IPv6 web service

South Jeolla province office

IPv6-USN service

IPv6 web service

Daegu city hall

IP-USN video collecting server

IP-USN Web/ Streaming server

Service provider

DB

Backbone Network

IPv6 DNS

legend

Dual Stack Router (for Backbone)

Dual Stack Router (for Access)

Dual Stack Router (for subscriber)

Tunnel
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

- 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
• It took 6 months for deploying IPv6 on each group

<table>
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<tr>
<th>Schedule (2009)</th>
<th>6</th>
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<td>Consortium Establishment and Contract</td>
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<td>H/W Equipment Order</td>
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<td>Network Analysis</td>
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<td>Service Analysis</td>
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<td>Design</td>
<td>Network Design</td>
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<td>Network Operation Policy Making</td>
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<td>Network Building</td>
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<td>Network Test</td>
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<td>Service Building (DNS, Web etc.)</td>
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<td>Test Run (Network/Service)</td>
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<td>Stabilization (Network/Service)</td>
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<td>Report and Review</td>
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3. Current Strategy in 2010
So, what we have been doing is…

Contents

IPv6 Internet

Positive Circulation

IPv4 Internet

IX and Backbone

Access network for 6NGIX (IPv6)

6NGIX (IPv6)

IX & ISP (IPv4/IPv6)

Access Network

ISP Access Networks (IPv4)

Public Sector (IPv6/IPv4)

Research Center (IPv6/IPv4)

Enterprises, Schools, etc (IPv4)

Home (IPv4)

Subscribers

2008

2009

Contents

Public Sector (IPv6/IPv4)

Research Center (IPv6/IPv4)

Enterprises, Schools, etc (IPv4)

Home (IPv4)

2008

2009
Current strategy in 2010 (1/3)

<table>
<thead>
<tr>
<th>&lt; The Example of Negative Circulation &gt;</th>
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<tbody>
<tr>
<td>① No ISPs can support IPv6 Users</td>
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<td>② No IPv6 Users request IPv6 Application Service</td>
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<tr>
<td>③ No org. request IPv6 connection service to ISP</td>
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<table>
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<th>&lt; The Example of Positive Circulation &gt;</th>
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<td>③ Org. requests IPv6 connection service to ISP</td>
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- 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 users’ confidence regarding the use of IPv6 increased

In details of Korea strategy

- Secure local internet service's continuity.
  => Provide internet service without any disconnection while on use
  => Provide customized service

continued next page
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 allocation 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 address management system for IPv4 depletion.
- Improve stakeholders' understanding by media, online campaign, education and etc, and promote continuously.
### Timeline

<table>
<thead>
<tr>
<th>Action</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
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<tbody>
<tr>
<td>Raising awareness of IPv4 address depletion</td>
<td></td>
<td>Training, promotion</td>
<td></td>
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<tr>
<td>Cooperating with ISPs &amp; government for developing a IPv6 backbone network in ISP</td>
<td>IPv6 adoption in each area</td>
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<td>IPv6 adoption plan for public sector</td>
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<tr>
<td>Supporting contents service provider's network (IPv4 → IPv6)</td>
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<tr>
<td>Various IPv6 Trial in several area</td>
<td>Trial</td>
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</table>
Thank you!

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

Email : v6webmaster@kisa.or.kr