IPv6 Deployment Activities in Korea

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### Status in Korea

<table>
<thead>
<tr>
<th>Country</th>
<th>No. of IP Addresses (as at April 2012)</th>
<th>No. of Internet Users (as at Dec 2011)</th>
<th>Population (Wikipedia, 8th May 2012)</th>
<th>No. of IP Address/individual</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Korea</td>
<td>112,147,226</td>
<td>40,329,660</td>
<td>48,580,000</td>
<td>More than 2 (2.3)</td>
</tr>
<tr>
<td>Japan</td>
<td>204,861,213</td>
<td>101,228,736</td>
<td>127,650,000</td>
<td>More than 1 (1.6)</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>11,712,077</td>
<td>4,894,913</td>
<td>7,103,700</td>
<td>More than 1 (1.6)</td>
</tr>
<tr>
<td>Taiwan</td>
<td>35,408,140</td>
<td>16,147,000</td>
<td>23,239,268</td>
<td>More than 1 (1.5)</td>
</tr>
<tr>
<td>Singapore</td>
<td>5,840,948</td>
<td>3,658,400</td>
<td>5,183,700</td>
<td>More than 1 (1.1)</td>
</tr>
<tr>
<td>China</td>
<td>330,727,691</td>
<td>513,100,000</td>
<td>1,347,350,000</td>
<td>Less than 1 (0.24)</td>
</tr>
<tr>
<td>Malaysia</td>
<td>6,370,142</td>
<td>17,723,000</td>
<td>28,334,135</td>
<td>Less than 1 (0.22)</td>
</tr>
<tr>
<td>Vietnam</td>
<td>15,564,561</td>
<td>30,516,587</td>
<td>87,840,000</td>
<td>Less than 1 (0.17)</td>
</tr>
<tr>
<td>Thailand</td>
<td>8,562,096</td>
<td>18,310,000</td>
<td>65,479,483</td>
<td>Less than 1 (0.13)</td>
</tr>
<tr>
<td>Indonesia</td>
<td>18,861,081</td>
<td>55,000,000</td>
<td>237,641,326</td>
<td>Less than 0.1 (0.079)</td>
</tr>
<tr>
<td>Philippines</td>
<td>5,421,534</td>
<td>29,700,000</td>
<td>92,337,852</td>
<td>Less than 0.1 (0.058)</td>
</tr>
<tr>
<td>India</td>
<td>35,164,844</td>
<td>121,000,000</td>
<td>1,210,193,422</td>
<td>Less than 0.1 (0.029)</td>
</tr>
<tr>
<td>Cambodia</td>
<td>234,418</td>
<td>491,480</td>
<td>13,395,682</td>
<td>Less than 0.1 (0.017)</td>
</tr>
<tr>
<td>Laos</td>
<td>55,048</td>
<td>527,400</td>
<td>6,465,800</td>
<td>Less than 0.01 (0.0085)</td>
</tr>
<tr>
<td>Myanmar</td>
<td>25,428</td>
<td>110,000</td>
<td>48,337,000</td>
<td>Less than 0.01 (0.0005)</td>
</tr>
</tbody>
</table>

(source : To get your infrastructure ready to gear up with IPv6 trend, Theodoric Chan, NTT Singapore, 31th May 2012)
1. Status in Korea

**IPv6 Addresses**

- **US**: 27,450 (1st)
- **CN**: 14,609 (2nd)
- **DE**: 11,643 (3rd)
- **JP**: 11,244 (4th)
- **KR**: 5,237 (8th)

Unit: $2^6$

**IPv6 Readiness**

- **Private Sector (ISPs)**
  - Backbone N/W: 91.2%
  - Access N/W: 19.0%
  (Source: KISA)

- **Public Sectors**
  - N/W: 72.8%
  - Security: 19.1%
  - Server: 68.7%
  (Source: NIA)
1. Status in Korea

- APNIC IPv6 measurement - labs.apnic.net
II. Efforts and Limits

National Drives for IPv6

2004
IPv6 Deployment & Promotion Plan I
- R&Ds for Next Generation Internet
- IPv6 Killer Services Development

2007
IPv6 Deployment & Promotion Plan II
- Pilot Projects with Public Sectors and Research Institutes
- Policy Improvement for IPv6

2010
IPv6 Transition Plan ('10)
- Joint Pilot Projects with ISPs and Service Networks
- Supporting Program in response to IPv4 Depletion

* Government Investment is KRW 40.5 Billion (USD 36.9 Million) from 2000 to 2013
II. Efforts and Limits

What’s causing the delay?

- Have We Popped the Champagne Too Early?
  - Korea’s IPv6 activities started from early 2000
    - Few actual demand from the market existed and technology wasn’t mature
  - After 10 years drives, people get tired of IPv6 and wait for real transition happening from outside

- Is There Any Way to Build Ecosystem for IPv6 Deployment?

Source: Alain Fiocco, Hugo Kaczmarek
III. Problems

What’s causing the delay?

- **Major Reasons for not Deploying IPv6**
  - 549 organizations responded on a survey by KISA in Apr. 2013
  - Cost (66.5%), Uncertainty about Operational Stability (48.9%), Lack of IPv6 Professional Engineers (36.3%)

- **Obstacles in IPv6 Deployment by Targets**
  - ISPs: Replacement costs for CPEs in access networks (Only 19% is ready in Korea)
  - CPs: S/W rewriting cost for IPv6
  - Vendors: Lack of trust on IPv6 performance and functionality
III. New Opportunities

• **Mobile Revolution (big consumer)**
  – Tablet PCs, Smart Phones
  – Total mobile subscribers in Korea: 54 Million (LTE: 21M)
  – South Korean population: 50 M
  – IPv4 address: 112M
    
    *Ratio of mobile device supporting IPv6: 14% (1 Billion) in 2012, 41% (4.2 Billion) in 2017

• **Demand occurrence from market**
  – Mobile telecom’s voluntary efforts in adopting IPv6
  – Reached to limits on Private IP usage
  – Difficulties in IPv4 administration (Double NAT...)

III. New Opportunities

Projects with Mobile Telcos

- **2012**: Conducting KISA-SKT Joint Pilot Project
  - Deploying IPv6 to SKT’s mobile networks (LTE and WiFi) covering Seoul metropolitan city
  - Mobile IPv6 portal service launch
- **2013**: Holding Stakeholders Meeting to support First IPv6 Mobile Service in Korea
  - Participated by 3 major mobile telcos (KT, SKT, LG U+), 3 Major smart phone vendors (Samsung, LG, Pantech)

< Network Topology >

< Mobile IPv6 Portal >
• **IANA IPv4 Exhaustion Announcement (‘11)**

• **Additional IP Demand Increasing**
  - Smart phones, Smart TVs, IoT

• **Substantial Changes Arising from Major countries and Global Companies**
  - World IPv6 Launch: Participated by 3,100 companies including Google, Facebook ...

• **IPv6 for Next Generation Internet**
  - IoT, Cloud, Big data ..
IV. National IPv6 Deployment Roadmap

- National IPv6 Deployment Roadmap TF
  - Participated by 30 experts from Governments, Industry, Academia, Research Institute,
  - Consists of 5 WGs: Legislation, Infra, Service, H/W, Security
  - 5 Year Plan (‘13 ~ ‘17)
  - Developing from Apr. ‘13 to end of ’13

- MSIP/KISA
- MOSPA

- KR IPv6 Forum Chair
- Legislation WG
- Infra WG
- Service WG
- H/W WG
- Security WG

- MSIP : Ministry of Science, ICT and Future Planning
- MOSPA : Ministry of Security and Public Administration
IV. National IPv6 Deployment Roadmap

Key Tasks (Tentative)

Task 1 : IPv6 Service Launch from Korean ISPs

- **IPv6 Mobile Telecommunication Service Launch** (’14)
  - Backbone network and LTE access network
  - IPv6 function implementation in smart phones released in KR
- **Wired Internet IPv6 Deployment**
  - IPv6 based network service for customers
  - IPv6 traffic peering among networks
  - 100% IPv6 capable on .kr, .한국 DNSes

Task 2 : Preemptive IPv6 Deployment in Gov’t / Public Sectors

- **Government Network Service (GNS)**
- **National Network Project using IPv6**
  - Giga Internet, Free Public WiFi ...

Task 3 : IPv6 based Application Service

- **IPv6 Enabling on Major Websites**
  - Korea IPv6 Day, Matching Fund Investment
- **R&D for New Services like IoT, Smart TV**
IV. National IPv6 Deployment Roadmap

Key Tasks (Tentative)

Task 4: IPv6 Supporting H/W Development
- IPv6 supporting rate 100% by 2017
- Providing IPv6 test beds

Task 5: Revision of Relevant Laws/Policies
- Private/public policy development

Task 6: Safe IPv6 Environment Building
- IPv6 requirements and profile developing for N/W security solutions
- Certifications: CC(Common Criteria), IPv6 Ready Logo

Task 7: Comprehensive IPv6 Supporting System
- IPv6 deployment measuring and obstacles removing
- Training, Consulting, International Cooperation
- Multi-stakeholder council accommodating government, businesses, academia, vendors and research institutes
Thank You