IPv6 R&D and Deployment
Status in Korea

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NCA, KOREA
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INTRODUCTION
About NCA General

- Established in 1986 by the gov’t & 260 staffs
- As a leading agency for national IT strategy planning & implementation

Main Activities
- Research, Consulting, Standard, Audit & Project Mgmt in IT area
- Korea Information Infrastructure(KII), e-Gov’t, IT839 strategy, Broadband IT Korea,…

Future Agendas
- Effective execution of IT839 strategy
- Expand e-Gov’t services
- Setup NGN, BcN, u-Korea, etc
About NCA NCA IPv6 Activities

- Policy and Promotion
  - MIC IPv6 Policy Support
  - Secretariat office IPv6 Strategy Council (Chair: MIC Minister)
  - Set-up IPv6 National Strategy

- Network
  - Building and Operating IPv6 Network: 6NGIX, 6KANet, KOREAv6

- Application
  - Development and Deployment of IPv6 Application
  - KOREAv6 Pilot Project
About NCA IPv6 Activities

ROLES

- Standards
- TTA
- NCA: Pilot Projects Applications, Networks
- Common Carrier
- ETRI: R&D, Technology Transfer
- Commercial companies
- Internet address Management
- NIDA

MIC: Ministry of Communication and Communication
National IPv6 R&D Strategy in Korea

• IPv6 Transition Roadmap of Korea

Phase I
(~2001)
IPv4 Only
Experimental IPv6 Network

Phase II
(2002~2005)
IPv4 Ocean
IPv4 Island

Phase III
(2006~2010)
IPv6 Island
IPv6 Ocean
IPv4/IPv6 Translation Required

Phase IV
(2011~)
IPv6 Only

• Validation
• Operation
• Promotion

• IMT2000 Service
• Translation Service

Commercial IPv6 Service
(wire/wireless)

Complete native IPv6
National IPv6 R&D Strategy in Korea

8 Services
- WiBro service
- DMB (terrestrial/satellite)
- Home network service
- Telematics service
- RFID based service
- W-CDMA service
- Terrestrial D-TV
- Internet telephony (VoIP)

9 New Growth Engines
- NG mobile communications
- Digital TV
- Home network
- IT SoC
- Next generation PC
- Embedded SW
- Digital contents
- Telematics
- Intelligent service robots

3 Infrastructures
- BcN
- U-Sensor network
- IPv6

8 Services
- WiBro service
- DMB (terrestrial/satellite)
- Home network service
- Telematics service
- RFID based service
- W-CDMA service
- Terrestrial D-TV
- Internet telephony (VoIP)
# Overview of IPv6 R&D, Standardization and Deployment

<table>
<thead>
<tr>
<th>Year</th>
<th>R&amp;D</th>
<th>IPv6 Standardization</th>
<th>IPv6 Deployment</th>
<th>IPv6 Policy &amp; Promotion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>First IPv6 R&amp;D Project</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td></td>
<td>IETF Standardization Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td>TEIN IPv6 Network</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td></td>
<td></td>
<td>IPv6 Interoperability Test</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td>IPv6 Promotion Official Plan</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td>IPv6 Showroom</td>
<td></td>
</tr>
</tbody>
</table>

- **R&D**: Basic IPv6 Protocol, First IPv6 R&D Project, KRv6 Project
- **IPv6 Standardization**: IPv6 Basic Protocol Spec., RFC3338
- **IPv6 Deployment**: 6Bone-KR, Production IPv6 address
- **IPv6 Policy & Promotion**: KOREN IPv6 Network, IPv6 Forum Korea

**Projects**
- IPv4/IPv6 Transition GW
- IPv6 Router Equipments
- IPv6 Advanced Application Development
- IETF Standardization Activities
- IPv6 Network
- IPv6 Basic Research
- IPv6 Forum Korea
- Global IPv6 Summit in Korea Event
- IPv6 Promotion Official Plan
- IPv6 Interoperability Test
- IPv6 Showroom
IPv6 R&D Status
IPv6 R&D Status  Projects

<KRv6 Project (since 2001)

- 6TALK (www.6TALK.net)
  - Developing the IPv6 transition strategies and translation technologies
- 6ANTS (www.6ants.net)
  - Developing the IPv6-based Auto-configuration Networking Technologies
- 6NEAT (www.6neat.net)
  - Developing the IPv6 network infrastructure and IPv6 Applications
- R&D on Next Generation Router and IPv6 Service Technologies
  - Develop next generation access & backbone routers and IPv6 based service technologies

<Other projects

- Developing IPv6 Services (VPN, AAA, …)
- IPv6 Routers, 3G, Home Networking
## IPv6 R&D Status Equipments[1]

### Router
- Home, small, medium sizes are focused

<table>
<thead>
<tr>
<th>Size</th>
<th>Notifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Home</strong></td>
<td>Prototype developed</td>
</tr>
<tr>
<td></td>
<td>Apply to KOREAv6</td>
</tr>
<tr>
<td></td>
<td>IPv6 Ready Logo received</td>
</tr>
<tr>
<td><strong>Small</strong></td>
<td>Apply to KOREAv6</td>
</tr>
<tr>
<td></td>
<td>Prototype developed</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>Prototype developed</td>
</tr>
<tr>
<td></td>
<td>Apply to KOREAv6 as core router</td>
</tr>
<tr>
<td></td>
<td>IPv6 Ready Logo received</td>
</tr>
<tr>
<td></td>
<td>Hardware based IPv6 packet handling</td>
</tr>
</tbody>
</table>
IPv6 R&D Status - Equipments[2]

- **Home Gateway/Home Server**
  - Prototype developed
  - Announced and demonstrated at IT839 workshop
  - IPv6/IPv4 Dual Stack

- **Next Generation Internet Server developed**
  - Digital Home VoD server
  - Streaming Server for Broadcasting Service
  - Set top box

- **IPv6 VPN/IPSec security product**
  - Prototype developed
  - Apply for KOREAv6
  - Firewall
IPv6 R&D Status  Equipments[3]

🔶 Other Equipments
  - IPv6/IPv4 Interoperable Gateways
  - IPv6 NMS Server
  - AAAv6 Server/Client for user authentication

🔶 Portable Internet
  - 30 Mbps level WiBro system developed
  - Prototype developed

🔶 Other devices
  - Mobile Phone
  - WiBro
  - PDA
International Standardization Efforts

- IETF
  - IPv6 WG, v6ops WG, MANET WG, DHC WG, NEMO WG, etc.
- ITU-T SG-13
  - IPv6 over NGN (2004~)

Domestic Standardization Efforts

- TTA
  - Development of National Standards for IPv6
  - IPv6 Project Group
• IETF Activities of Korean

- IPv6 Working Group
  - IPv6 Basic Protocol Spec.

- Ngtrans, v6ops Working Group
  - IPv4/IPv6 Transition Mechanism
  - IPv6 Adoption Scenarios
  - RFC 3338

- NEMO & MANET Working Group
  - IPv6 Network Mobility
  - Mobile Ad-Hoc Networking

- Mobileip Working Group
  - IPv6 Mobility
  - (Basic Spec & Handoff Mech.)

- DHC & DNS Working Group
  - IPv6 Address allocation
  - Naming Standards
IPv6 Promotion & Deployment
KOREAv6 Pilot Project

- To verify IPv6 equipments & services and drive them to commercialize by using KOREAv6 (National-wide IPv6 based test network)

IPv6 Pilot Service
Providing IPv6 services for real users at home, campus, and a variety of areas

IPv6 Field Test
Testing stability and interoperability of IPv6 equipments & solutions in IPv6 network

Achieving phased IPv6 Commercialization from 2005 through successful KOREAv6 Project
Built the greatest IPv6 network in KOREA with connecting existing IPv6 networks

- The 6NGIX centric backbone including advanced networks (6KANET, KREONET, KOREN) and a commercial ISP
### KOREAv6 Trial Services

#### IPv6 pilot services in a variety of areas (10 Pilot Services, 35 Participants)

<table>
<thead>
<tr>
<th>Service</th>
<th>User</th>
<th>Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>VoD Service</td>
<td>Few IPv6 experts &amp; engineers (100 or less)</td>
<td>10MB or less</td>
</tr>
<tr>
<td>HD Video Conference Service</td>
<td>Pilot service users (About 1,400)</td>
<td>60 MB or less</td>
</tr>
<tr>
<td>Web Camera Monitoring Service</td>
<td>Few IPv6 experts &amp; engineers (100 or less)</td>
<td>10MB or less</td>
</tr>
<tr>
<td>Home Appliance Control Service</td>
<td>Pilot service users (About 1,400)</td>
<td>60 MB or less</td>
</tr>
<tr>
<td>Remote Medical Service</td>
<td>Pilot service users (10,000 or more)</td>
<td>200MB or more</td>
</tr>
<tr>
<td>Remote Lecture Service</td>
<td>Pilot service users (10,000 or more)</td>
<td>200MB or more</td>
</tr>
<tr>
<td>VolIPv6 Voice/Video Service</td>
<td>Pilot service users (10,000 or more)</td>
<td>200MB or more</td>
</tr>
<tr>
<td>SOHO wireless/wired IPv6 Gateway Service</td>
<td>Pilot service users (100 or less)</td>
<td>10MB or less</td>
</tr>
</tbody>
</table>

#### Increasing IPv6 traffics and real IPv6 users

- **Early 2004**
  - User: Few IPv6 experts & engineers (100 or less)
  - Traffic: 10MB or less

- **Sept. 2004**
  - User: Pilot service users (About 1,400)
  - Traffic: 60 MB or less

- **End of 2004**
  - User: Pilot service users (10,000 or more)
  - Traffic: 200MB or more
KOREAv6 Field Test

Field Trial Introduction
Test IPv6 equipments and solutions (18 participants, 39 products)

Background
- Develop & release IPv6 products from early 2004
- Needs for verifying stability & interoperability of the IPv6 Products

Identifying and verifying each function & interoperability among IPv6 equipments

Expected Effects
- Support stabilization of IPv6 equipments & solutions
- Providing a reference to IPv6 industries
IPv6 Network

  - First IPv6 experimental network in Korea (operated by ETRI)
  - 70+ organizations has involved in 6Bone-KR

- **KOREN IPv6 (since 1999)**
  - First native IPv6 network in Korea (operated by KT)
  - R&E IPv6 network

- **TEIN IPv6 (Since 2001)**
  - TEIN: Trans Eurasia Information Network
  - Continental IPv6 network between Asia and Europe

- **6NGIX (Since 2001)**
  - IPv6 Internet Exchange Point in Korea (operated by NCA)

- **IPv6 address in Korea**
  - 6Bone: 2 p/TLAs
    - ETRI/KR, 3ffe:2e00::/24 (98/5), APAN-KR, 3ffe:8040::/28 (99/7)
  - Production Address: 18 s/TLAs
    - Most of ISPs in Korea have a IPv6 s/TLA (KT, Hanaro, SKT, Hitel, etc)

- **KOREAv6 (Since 2004)**
  - National Wide IPv6 Trial Service Network in Korea
IPv6 Portal Service/Deployment

NCA IPv6 Show Room has been upgraded

IPv6 Showroom (KIESv6) Upgrades
- KIESv6 stands for Korea IPv6 Experience Sphere
- One-Stop IPv6 Experience Space (NCA Building, Seoul)
- Upgraded with new applications
- KOREAv6 Trial services’ demonstrations added
- [http://www.kiesv6.or.kr](http://www.kiesv6.or.kr)

IPv6 Portal Service upgrades
- Current registered users are more than 6500 people (Feb. 2005)
- Attract users with popular services (Web Album Service)
- Give away storage spaces (700Mb per user for free)
- [www.vsix.net](http://www.vsix.net)
International Collaboration KIESv6 [1]

- **KIESv6 as a window for int’l Collaboration**
  - Almost 30 different countries, 200 visitors
  - Learn or get consulting on IPv6
  - IPv6 trial services testing
  - Visitors are increasing every year (more than 1,000/yr)

Taiwan ITRI & Korea NCA
VoIPv6 service testing

People from Jordan
International Collaboration KIESv6 [2]

KIESv6 Overhead View

10 KOREAv6 Trial Services

IPv6 equipments & Transition Mechanism
IPv6 Routers
IPv6 PBX
IPv6 Phones

IPv6@HOME
Home Network Apps.
PLC controlled Services
Thank you

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