
Deployment Status and Case Studies of IPv6 in Japan

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Motivations to deploy IPv6

- Revive the end-to-end property
 - it's true that NAT can do the same thing...
 - ...but NAT vendors really want to avoid it
 - too many types of NATs, too many kludges
 - customers keep calling help desks
 - -> we can do it smoothly with IPv6
- Business opportunity
 - becoming world-wide ISPs, network vendors
 - new area of applications, new markets

How to deploy

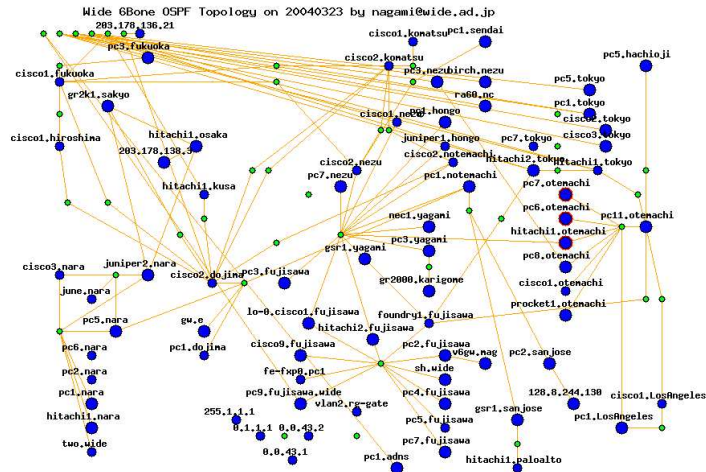
- Current status
 - Network equipments are ready
 - Applications are coming
 - The missing piece is deployment of IPv6 networks
- Our approaches in Japan
 - Incentive from address allocation policy
 - give "IPv6-friendly" ISPs wider IPv4 address space
 - Provide initial opportunity for aggressive users
 - Feel6: a contract-based configured tunneling service
 - Avoid tunneling as much as possible
 - suboptimal path, lower bandwidth, delay
 - security concerns in automatic tunneling techs

Deployment status in live networks

IPv6 deployment in the WIDE project

- The WIDE project
 - <http://www.wide.ad.jp/>
 - the largest research activity on the Internet in Japan
 - committed to IPv6 since 1995 (started KAME in 1998)
- WIDE IPv6 backbone
 - "native" backbone
 - no tunnel in the backbone
 - many leaf sites are connected without tunnels
 - nation-wide, global connectivity
 - over 50 BB routers, more than 60 "/48" sites
 - about 50 EBGPeers
 - production quality network

WIDE IPv6 backbone as of today

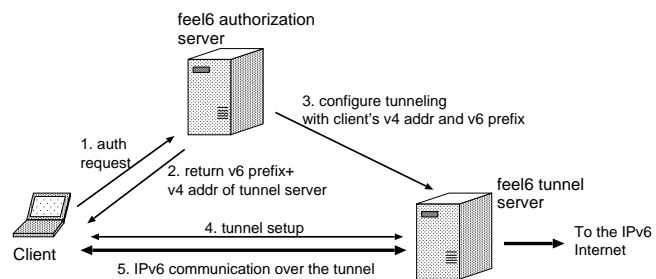


Commercial ISPs

- NTT communications
 - one of the largest ISPs in Japan
 - provide various IPv6 commercial services
 - operate world-wide commercial IPv6 backbone (since 2001)
 - ADSL v4/v6 dual service (since 2002)
 - Dual stack backbone (since late 2003)
- IJ (Internet Initiative Japan)
 - Provided various IPv6 commercial services since the early stage of IPv6
 - tunneling/native/dual stack/data center
 - <http://www.ij.ad.jp/en/IPv6/>
- Many others provide experimental services

Feel6 tunnel connection service

- A "tunnel broker" for early trials
 - free client side tools for Windows and Macintosh
 - a free service at the moment to promote the deployment
 - <http://start.feel6.jp/en/index.html>



New applications with IPv6

Current trends of IPv6 deployment

- Home network appliances
 - expecting wider deployment with plug-and-play
 - configurable by a mobile phone or PDA
 - thanks to the e2e property
- Other p2p applications
 - IP phones, games
- Brand-new applications
 - not available/deployed even with IPv4
 - censor network
 - Internet cars
 - building automation

Examples from exhibitions

- IPv6 ShowCase at Network + Interop Tokyo
 - new apps have been exhibited since 2001
- IPv6 business summit in Feb. 2004

Internet Home Appliances

- WLAN digital camera (SANYO)
- Air-con and oven (Panasonic)
- Internet Refrigerator (Toshiba)
- "CoCoon" HDD/DVD recorder (Sony)



Other cool stuff (1)

- CD audition system (Yokogawa)
 - customers can check songs over the net



Other cool stuff (2)

- IP "string-phone" (Takara)
 - kind of a toy
 - a dedicated, secret line between two individuals
 - pick up blue -> the red phone is ringing
 - pick up red -> start communication
 - communication is encrypted by IPsec
 - no configuration is necessary since it's a dedicated line

