

APNIC 35 CONFERENCE

SINGAPORE
25 February - 1 March 2013

IPv6@APNIC

28 February 2013, Singapore

Miwa Fujii <miwa@apnic.net>

Senior IPv6 Program Specialist



Agenda

- IPv6 support provided by APNIC
- Renewed IPv6@APNIC website
- Way forward: Responding to the community's needs

IPv6@APNIC

- Distributing IPv6 addresses
 - APNIC Services Team
- IPv6 training and education
 - APNIC Training Team
- Monitoring IPv6 deployment
 - APNIC R&D Team
- Supporting IPv6 deployment
 - APNIC IPv6 Program

Renewed IPv6@APNIC website

- Objectives
 - To support real and tangible IPv6 deployment in the AP region
- Current main content
 - Key IPv6 messages
 - IPv6 data and statistics
 - IPv6 transition stories
 - IPv6 for governments
 - IPv6 Best Current Practices
 - About CGN
 - Useful and up to date information: Scoop.it!
- www.apnic.net/ipv6

www.apnic.net/ipv6



2001:dc0:a000:4:54b:e565

via v6

Contact us | Press | Jobs | Site map | Search...

Go

✉ A⁻ A⁺ T

Home

Services

Community

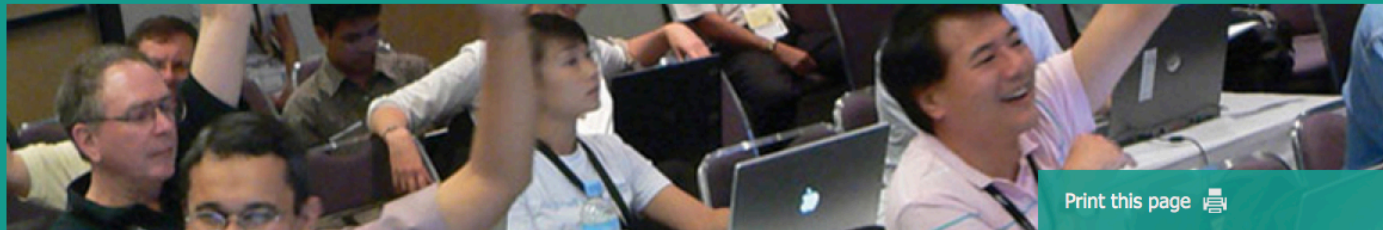
Events

Publications

About us

Login to MyAPNIC

Community



Print this page

- Policy development
- Participate
- Working with the community
- About the Internet community
- ▾ **IPv6@APNIC**

- > Key IPv6 messages
- > IPv6 data and statistics
- > IPv6 transition stories
- > IPv6 for governments
- > IPv6 Best Current Practices
- > About CGN

IPv6@APNIC



IPv6 is a top issue for the Asia Pacific Internet community. APNIC engages in activities throughout the region to help facilitate a smooth transition. The greater goal is to support the Asia Pacific in deploying IPv6 to maintain a scalable Internet for everyone.

APNIC reached the last /8 of IPv4 addresses in April 2011, and now delegates IPv4 resources according to the "last /8 policy". The scarcity of IPv4 makes IPv6 deployment critical for all networks and organizations in the Asia Pacific. Here's what APNIC is doing to support the community in achieving real and tangible IPv6 deployment:



Distributing IPv6 addresses

Getting an IPv6 block is the first step in your transition, and the process is very simple.

Related links

- IPv6 news feed

IPv6 Info

Curated by APNIC



A Cloud Without IPv6

www.apnic.net/ipv6

IPv6 in numbers

- Policy development
- Participate
- Working with the community
- About the Internet community
- ▾ IPv6@APNIC
 - > Key IPv6 messages
 - ▾ IPv6 data and statistics
 - > IPv6 transition stories
 - > IPv6 for governments
 - > IPv6 Best Current Practices
 - > About CGN
- IPv4 exhaustion

IPv6 in Numbers

Current data from APNIC Labs show IPv6 deployment in absolute terms is still quite low across several layers. However, looking at the past 18 months, there is strong growth. There is now adequate information available for your region, economy, and network to benchmark IPv6 readiness.

This is a graph from APNIC Labs end user IPv6 accessibility measurements, showing the global average. Visit [APNIC Labs](#) and click on the map to see available data for your economy.



APNIC Labs

IPv6 end user readiness data for geographical regions, economies, ASNs

Interesting reading

"Measuring the Deployment of IPv6: Topology, Routing, and Performance" (Nov 2012, CAI et al)

"Measuring IPv6 - Country by Country" (June 2012, Geoff Huston)

www.apnic.net/ipv6

IPv6 transition stories

- Policy development
- Participate
- Working with the community
- About the Internet community
- ▾ IPv6@APNIC
 - > Key IPv6 messages
 - > IPv6 data and statistics
 - ▾ IPv6 transition stories
 - > IPv6 for governments
 - > IPv6 Best Current Practices
 - > About CGN
- IPv4 exhaustion

IPv6 transition stories

Today's Internet developed as a result of progressive deregulation of the telecommunication environment. Network operators both fiercely compete in the market economy, while cooperating to overcome common technical challenges by sharing knowledge, experience, and forming best current practices to reference in daily operations. The success of global IPv6 also depends on sharing knowledge and experiences. APNIC encourages operators to share their stories to help their peers around the world. Here is some useful information we've curated:

Internet Service Providers

Presentation	Abstract
Implementing IPv6 in RCS&RDS Network (RO) , RIPE 65, 2012 <ul style="list-style-type: none">• Video• Slides	RCS&RDS is a network operator in Romania (RIPE region). Their goal for "IPv6 for every residential customer", started with an IPv6 pilot deployment and they enabled IPv6 in their production networks in 2011. RCS&RDS is one of the top 5 Service Providers in the world with the highest IPv6 traffic in their networks. Their main strategy is to provide IPv6 to all customers and avoid CGN.
KDDI (JP) IPv6 deployment, APNIC 33 2012 <ul style="list-style-type: none">• Video• Slides	KDDI did a firmware upgrade with IPv6 on Home Gateway equipment from the KDDI network operation center, so customers with IPv6 enabled devices could access their IPv6 networks without taking any actions. KDDI is one of the top 5 Service Providers in the world with highest IPv6

About MAP

Mapping Address and Port (MAP) presentation by Mark Townsie Sept 2012.

- Video
- Slides

MAP, the newest IPv6 transition mechanism, proposes a stateful architecture. The scalability MAP can provide makes it an attractive long-term approach. If you are considering DS-Lite, 6RD, or NAT64, you may evaluate MAP well. Some vendors are currently enabling this protocol in their products.

IPv6 for governments

- Policy development
- Participate
- Working with the community
- About the Internet community
- ▾ IPv6@APNIC
 - > Key IPv6 messages
 - > IPv6 data and statistics
 - > IPv6 transition stories
 - √ IPv6 for governments
 - > IPv6 Best Current Practices
 - > About CGN
- IPv4 exhaustion

IPv6 for governments

The APNIC IPv6 Program has engaged with various governmental stakeholders since 2009 by sharing the latest IPv6 deployment status and how to move forward amid concerns as they emerge. Several governments and intergovernmental organizations have responded to our support by providing IPv6 adoption support to the Internet industries in their respective economies. Governmental support for IPv6 transition may include but is not limited the following activities:

Economy	Document	Publication date
Australia	A Strategy for the Implementation of IPv6 in Australian Government Agencies by AGIMO	July 2009 (version 2)
China	"China will put Internet Protocol version 6 (IPv6) into small-scale commercial pilot use and form a mature business model by the end of 2013, the State Council recently said at an executive meeting about the main goals and road map for the China Next Generation Internet project." reported by China People's Daily Online	Jan 2012
Hong Kong	IPv6 Deployment in Hong Kong by HK OGCIO	Dec 2012
Japan	Study Group on Advanced Use of Internet with IPv6 Final Report by Japan MIC	Jan 2010
Singapore	IPv6 adoption guide for Singapore, report for iDA by Analysys Mason and Tech Mahindra	March 2011

IPv6 Best Current Practices

▸ Policy development

▸ Participate

▸ Working with the community

▸ About the Internet community

▾ IPv6@APNIC

> Key IPv6 messages

> IPv6 data and statistics

> IPv6 transition stories

> IPv6 for governments

▾ IPv6 Best Current Practices

> About CGN

▸ IPv4 exhaustion

IPv6 Best Current Practices

Just as IPv4 network operations have evolved to their current states by identifying and implementing various Best Current Practices (BCP), IPv6 network operations are also evolving. Network operators around the world are constantly finding better ways to manage IPv6 deployment through their operational experiences, and from the shared experiences of others. This page provides the latest information on BCPs that are currently discussed and applied among technical stakeholders to support IPv6 deployment in your networks.

IPv6 addressing

Establishing a practical and scalable plan for deploying IPv6 addressing on an operational network is an important part of any IPv6 deployment. Advice on address planning is one of the most commonly asked questions at APNIC. An IPv6 address is 128 bits long - four times longer than the 32-bit IPv4 addresses. Address planning for such a large space might seem counter-intuitive for many network operators. What are the best current practices for IPv6 addressing for scalable and manageable network operations?

Presentation	Links	Summary
IPv6 addressing planning, Dr Phillip Smith, APNIC, August 2012	Video Slides	This presentation covers IPv6 address planning for infrastructure and customer links, gives an example of a deployable address plan, and some useful addressing tools.
Preparing an IPv6 Addressing Plan, SurfNet (translated by the RIPE NCC), March 2011	Slides	Implementing an efficient and logical IPv6 addressing plan in your subnets provides several advantages for operators. This presentation describes how to achieve efficient IPv6 addressing.

About CGN

▸ Policy development

▸ Participate

▸ [Working with the community](#)

▸ About the Internet community

▾ IPv6@APNIC

> Key IPv6 messages

> IPv6 data and statistics

> IPv6 transition stories

> IPv6 for governments

> IPv6 Best Current Practices

▾ About CGN

▸ IPv4 exhaustion

About Carrier Grade NAT (CGN)

Carrier Grade NAT (CGN) and Large Scale NAT (LSN) are often presented as "IPv6 Transition Technologies". In reality CGN, LSN, or any other mechanisms that provide IPv4-to-IPv4 connectivity on Network Address Translator (NAT) platforms are **NOT transition mechanisms to IPv6**. They are **technologies to prolong IPv4 address availability** by using private IPv4 address space in Service Provider (SP) networks.

Some SPs may need to deploy CGN/LSN to manage the IPv4 address shortage in their networks while deploying IPv6 services to customers. However, SPs who do not deploy IPv6 services simultaneously with CGN/LSN will need to revisit the same issue in a few years' time and resolve the same scaling problem as their customer base continues to expand. If there is no IPv6 in customer access networks then customers cannot secure IPv6 reachability.

Deploying CGN/LSN without deploying IPv6 services come with some of the negative consequences of using NAT:

- Breaks the end-to-end model of IP
- Breaks end-to-end security
- Serious consequences for lawful intercept
- Non-NAT friendly applications mean more upgrades
- Mandates the network keeps the state of the connections

Way forward

- APNIC Survey 2012 revealed collective input from the AP Internet community
 - “APNIC should step up efforts regarding IPv6 deployment and training”
 - Best current practice information on IPv6 deployment
 - Advice and consultation on IPv6 deployment
 - More practical hands-on trainings on IPv6 deployment
 - Raise awareness among stakeholders on IPv6
 - More facilitation with local Internet communities to help IPv6 uptake
 - APNIC Conferences – Interesting and useful sessions
 - IPv6 Conference sessions: 37.4%
 - Half and full day tutorial and technical topics: 31%
 - Multiple-day workshops with detailed content: 23.6%

Way forward

- APNIC is responding to such requests: Plans in 2013
 - More hands-on IPv6 trainings
 - Engineering assistance on IPv6 deployment
 - Constantly update the IPv6 website with up to date data and information
 - Keep providing cutting edge IPv6 deployment stories from the field at APRICOT and APNIC Conferences
 - Continue community outreach on IPv6

APNIC 35
CONFERENCE

SINGAPORE
25 February - 1 March 2013

Thank you!

