



To get your infrastructure ready to gear up with IPv6 trend



Mega Earthquake – 11th March 2011, Japan



Earthquake Warning System in Japan

 NTT Communications is supporting the Japan Meteorological Agency (JMA), making use of IPv6 on earthquake early warning system

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 The system uses more than 1,000 sensors all around Japan that can detect early tremors that signal an earthquake is imminent



 The JMA server hands off the resulting data to NTT IPv6 multicast server, which distribute it via NTT IPv6 multicast network to end users End users receive alerts delivered to their terminals with voice warning when an earthquake is imminent. Even a few seconds of advance warning, it could buy time to take important counter-measures.



New Tokyo Tower – the Tokyo Sky Tree







Reference Sources:

http://en.wikipedia.org/wiki/File:BurjKhalifaHeight.svg, www.flickr.com, www.andrewmcgovernphoto.com, ecuapon.blogspot.com, http://www.bing.com/images/search?q=photos+of+tokyo+sky+tree&qpvt=photos+of+tokyo+sky+tree&FORM=IGRE



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- 1. Prompt actions are needed to gear up with IPv6
- 2. The whole world are "connected" $IPv4 \leftarrow \rightarrow IPv6$
- 3. Let's gear up with IPv6 hand-in-hand with complementary technologies like Cloud **IPv4 Exhaustion Counter**
- 4. Last but not the least ...

(IANA)





http://inetcore.com/project/ipv4ec/index en.html

Prompt actions are needed to gear up with IPv6

Allocation of IP Addresses by Country (US, Australia, NZ and EU)

Country	No. of IP Addresses (as at April 2012)	No. of Internet Users (as at Dec 2011)	Population (Wikipedia)	No. of IP Address / individual
United States	1,544,059,509	245,203,319	313,502,000	More than 4 (4.9)
Norway	15,643,944	4,560,572	5,009,100	More than 3 (3.1)
Sweden	26,992,704	8,441,718	9,490,683	More than 2 (2.8)
Netherlands	45,947,050	15,071,191	16,733,727	More than 2 (2.7)
Switzerland	21,622,047	6,430,363	7,952,600	More than 2 (2.7)
Finland	13,688,785	4,661,265	5,407,960	More than 2 (2.5)
Canada	83,509,876	27,757,540	34,791,000	More than 2 (2.4)
Denmark	12,756,813	4,923,824	5,580,516	More than 2 (2.2)
Australia	48,171,973	19,554,832	22,899,002	More than 2 (2.1)
United Kingdom	124,042,791	52,731,209	62,262,000	2
New Zealand	7,153,897	3,625,553	4,434,440	More than 1 (1.6)
Austria	11,910,057	6,143,600	8,452,835	More than 1 (1.4)
Germany	119,144,857	67,364,898	81,858,000	More than 1 (1.4)
France	78,950,316	50,290,226	65,350,000	More than 1 (1.2)

Reference Sources:

http://www.maxmind.com/app/techinfo, http://en.wikipedia.org/wiki/List_of_countries_by_population, http://www.internetworldstats.com/stats14.htm#north, http://www.internetworldstats.com/stats6.htm#oceania, http://www.internetworldstats.com/stats4.htm,



Prompt actions are needed to gear up with IPv6

Allocation of IP Addresses by Country (Asia)

Country	No. of IP Addresses (as at April 2012)	No. of Internet Users (as at Dec 2011)	Population (Wikipedia, 8 th May 2012)	No. of IP Address / individual
South Korea	112,147,226	40,329,660	48,580,000	More than 2 (2.3)
Japan	204,861,213	101,228,736	127,650,000	More than 1 (1.6)
Hong Kong	11,712,077	4,894,913	7,103,700	More than 1 (1.6)
Taiwan	35,408,140	16,147,000	23,239,268	More than 1 (1.5)
Singapore	5,840,948	3,658,400	5,183,700	More than 1 (1.1)
China	330,727,691	513,100,000	1,347,350,000	Less than 1 (0.24)
Malaysia	6,370,142	17,723,000	28,334,135	Less than 1 (0.22)
Vietnam	15,564,561	30,516,587	87,840,000	Less than 1 (0.17)
Thailand	8,562,096	18,310,000	65,479,453	Less than 1 (0.13)
Indonesia	18,861,081	55,000,000	237,641,326	Less than 0.1 (0.079)
Philippines	5,421,534	29,700,000	92,337,852	Less than 0.1 (0.058)
India	35,164,844	121,000,000	1,210,193,422	Less than 0.1 (0.029)
Cambodia	234,418	491,480	13,395,682	Less than 0.1 (0.017)
Laos	55,048	527,400	6,465,800	Less than 0.01 (0.0085)
Myanmar	25,428	110,000	48,337,000	Less than 0.01 (0.0005)

Reference Sources:

http://www.maxmind.com/app/techinfo, http://en.wikipedia.org/wiki/List_of_countries_by_population, http://www.internetworldstats.com/stats3.htm,

Taking Singapore as an example:



Taking Singapore as an example:





IPv6 enables us to go beyond limitations and innovations

- enabler for unlimited "connects" in the internet space
- enabler for advanced peer-to-peer solutions
- enabler for simple and efficiency
- enabler for new technologies and innovations
 → go beyond our imaginations



so far, who are the privers on ipv6 adoption Governments



Initiatives by Governments:

- Australia Australia Government Information Management Office: "A Strategy for the implementation of IPv6 in Australian Government Agencies", July 2009
- Hong Kong IPv6 internet exchange (HK6IX) started to operate from 2004, established an IPV6-enabled Government E-Service system, "IPv6 in Action" (http://www.ipv6now.hk/en/index.php)
- 3. India <u>http://www.tec.gov.in/National-IPv6-Deployment-</u> <u>Roadmap.pdf</u>
- US OMB's (U.S. Office of Management and Budget Memorandum 05-22) "Transition Planning for Internet Protocol Version 6", 2 August 2005; Memorandum for Chief Information Officers of Executive Departments and Agencies, Federal Government of US, "Transition to IPv6", 28 September 2010
- Japan ("Study Group on Internet's Smooth Transition to IPv6", June 2008 by The Ministry of Internal and Communications), Singapore

Japan Government guidelines

EXHAUSTION



Action Plan: Network Area (ISPs)

Action Plan for Network Players (ISPs)



Copyright (C) 2009, 2010 Task Force on IPv4 Address Exhaustion, Japan



Singapore Government initiatives

- IDA (Info-Communications development Authority of Singapore) published an Information Paper to promote nationwide IPv6 transition through a 2pronged approach:
 - 1. to catalyse IPv6 adoption
 - 2. to manage IPv4 exhaustion
- An IPv6 Task Force was set up
- Incorporate IPv6 specifications and supports as a requirement in major government-supported industry programs and government procurement
- IPv6 supported nationwide infrastructure the Next Generation Nationwide Broadband Network ("Next Gen NBN")
- Setting up of IPv6 Test bed, IPv6 specifications have been incorporated into government-supported industry projects (Singapore Internet Exchange, SGIX)
- Launch a one-stop information portal on IPv6, IPv6 Market Place to raise the general public awareness
- ➢ IPv6 components were integrated into National Infocomm Competency Framework ("NICF") → develop local pool of IPv6 competent workforce

Reference Sources:

Internet Protocol Version 6 Transit Plan for Singapore, IDA Singapore (June 2006); IPv6 Transition Program for Singapore, IDA Singapore (13th March 2011),

Information Paper: Internet Protocol Version 6 Phase 2 transition Plans for Singapore (April 2011), Singapore Internet Protocol Version 6 (IPv6) Profile, Telecommunications Standards Advisory Committee (TSAC), IDA Singapore (Jan 2012)

Now, it's our turn to act as drivers

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Now, it's our turn to act as drivers

- Acknowledge the need. The shortage of IPv4 address is limiting the growth of the Internet. IPv6 is the way to go, and the Internet will continue to grow running IPv6.
- Management Commitment. Allocate resource for the transition project. Identify a taskforce on the overall migration, providing training to related members.
- Itemize each component in the infrastructure for IPv6 readiness
- Design and plan for the transition.
- Keeping track of complementary technologies e.g. Cloud. New and complementary technologies will help and make the transitions easier.





To gear up with IPv6 – IPv6 and Cloud are complementary

Cloud technology – play a role in IPv4 \rightarrow IPv6

- IPv6 enabled cloud can help us in the transition
 Cloud components are IPv6 ready
 - Setup as test bed for existing applications / services in native IPv6 / dual stack environment

IPv6

IPv6 test server

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- IPv6 test clients
- Dual stack mix
- Host IPv6 ready services to the Internet
- Hands-on environment for engineers to gain IPv6 experience.





- IPv4 address is running out
- □ It's now our actions to gear up with IPv6
- You should not working alone and please be reminded to keep track with latest complementary technologies (e.g. IPv6 can be hand-inhand with Cloud)
- □ Consult with experience partners on IPv4→IPv6 transition and IPv6 adoption
- □ Join the party of World IPv6 Launch on 6th June 2012



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- The only Global Tier-1 from Asia
- · The most financially stable telecom
- A global, single ASN (#2914)
- Industry leading SLAs
- Award winning customer service
- Access speeds to 10GigE
- Industry leading IPv6 and dual-stack IP transit



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Thank You!



