

Where are we now? IPv6 deployment update

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ITU ASP CoE Program on IPv6 Infrastructure Security

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APNIC

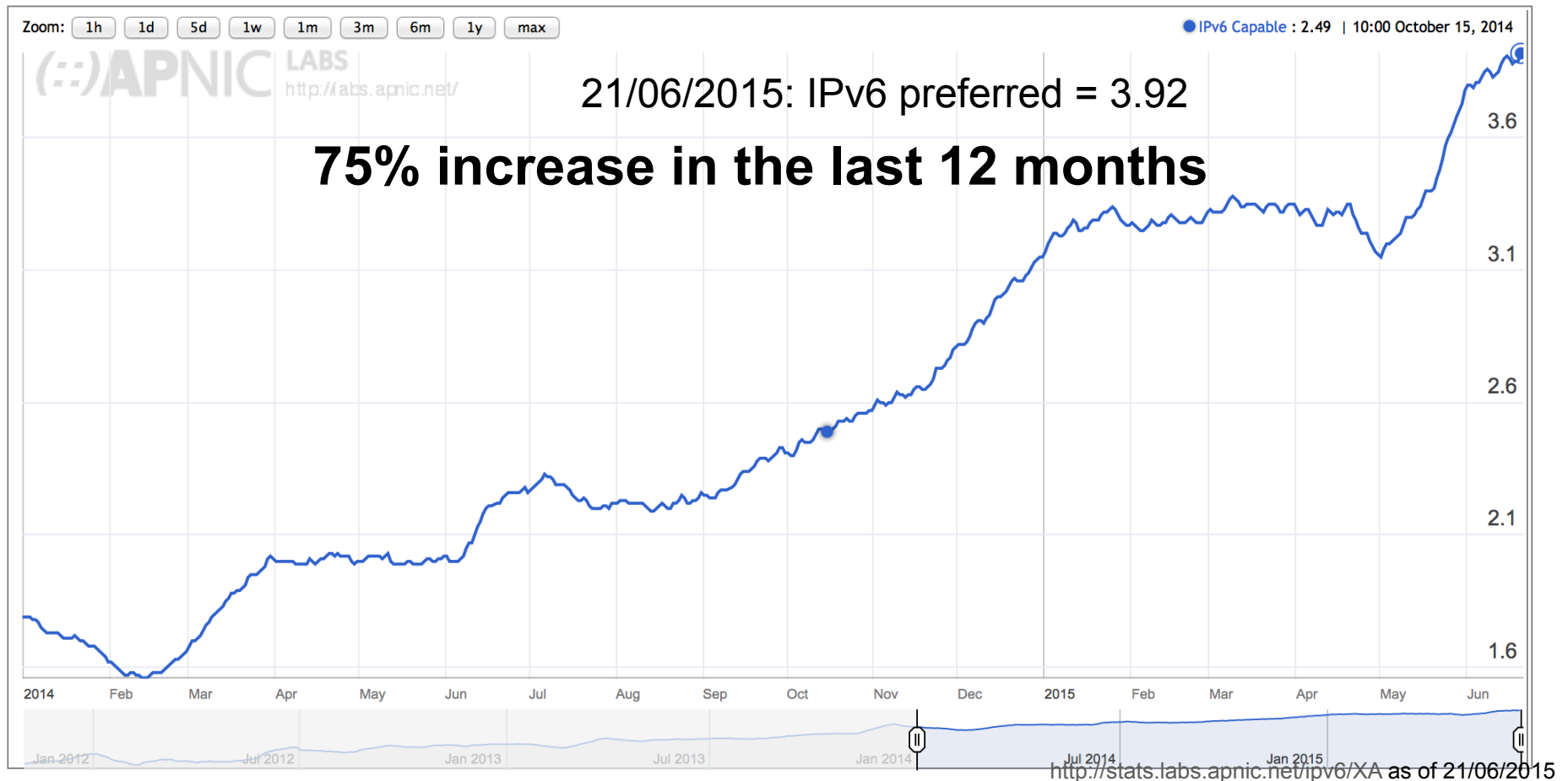


Agenda

- Update on IPv6 in the world and APNIC region
 - Review of statistics as examples
 - Trend on new organizations with IPv6
 - Source: IPv6 ready end users measurement:
<http://labs.apnic.net/ipv6-measurement/>
 - Conclusion

IPv6 measurement

End user readiness: World



The IPv6 economy league table

IPv6 capable %

Rank	CC	Country	IPv6 Ratio
1	BE	Belgium	40.58%
2	US	United States of America	22.21%
3	DE	Germany	19.43%
4	PE	Peru	18.86%
5	LU	Luxembourg	13.54%
6	CH	Switzerland	12.42%
7	PT	Portugal	11.42%
8	NO	Norway	10.33%
9	MY	Malaysia	10.08%
10	JP	Japan	9.65%
11	CZ	Czech Republic	9.10%
12	GR	Greece	8.82%
13	RO	Romania	8.00%

<http://stats.labs.apnic.net/ipv6/> as of 15/06/2015

The IPv6 economy league table

Estimated population

Rank	CC	Country	IPv6 Users (est.)
1	US	United States of America	62,741,470
2	DE	Germany	13,831,728
3	JP	Japan	10,558,763
4	CN	China	4,973,938
5	BE	Belgium	3,732,790
6	FR	France	3,159,830
7	PE	Peru	2,448,743
8	MY	Malaysia	2,069,077
9	BR	Brazil	1,811,104
10	IN	India	1,732,298
11	SA	Saudi Arabia	1,287,441
12	CH	Switzerland	886,914
13	RO	Romania	859,643

<http://stats.labs.apnic.net/ipv6/> as of 15/06/2015

Japan



<http://stats.labs.apnic.net/ipv6/JP> 21/06/2105

Japan IPv6 leaderboard

ASN	Organization	IPv6 capable (%)
2516	KDDI	42.40
18126	CTC Chube Telecommunications	38.43
7522	STCN STNet	28.19
10010	Tokai Communications Corporation	19.43
2527	So-net Entertainment Corporation	17.61
17676	Softbank BB Corp	9.35
9365	Its communications Inc	7.68

http://stats.labs.apnic.net/ipv6/JP_01/06//2015

ASN 2516 KDDI and ASN 18126 CTC



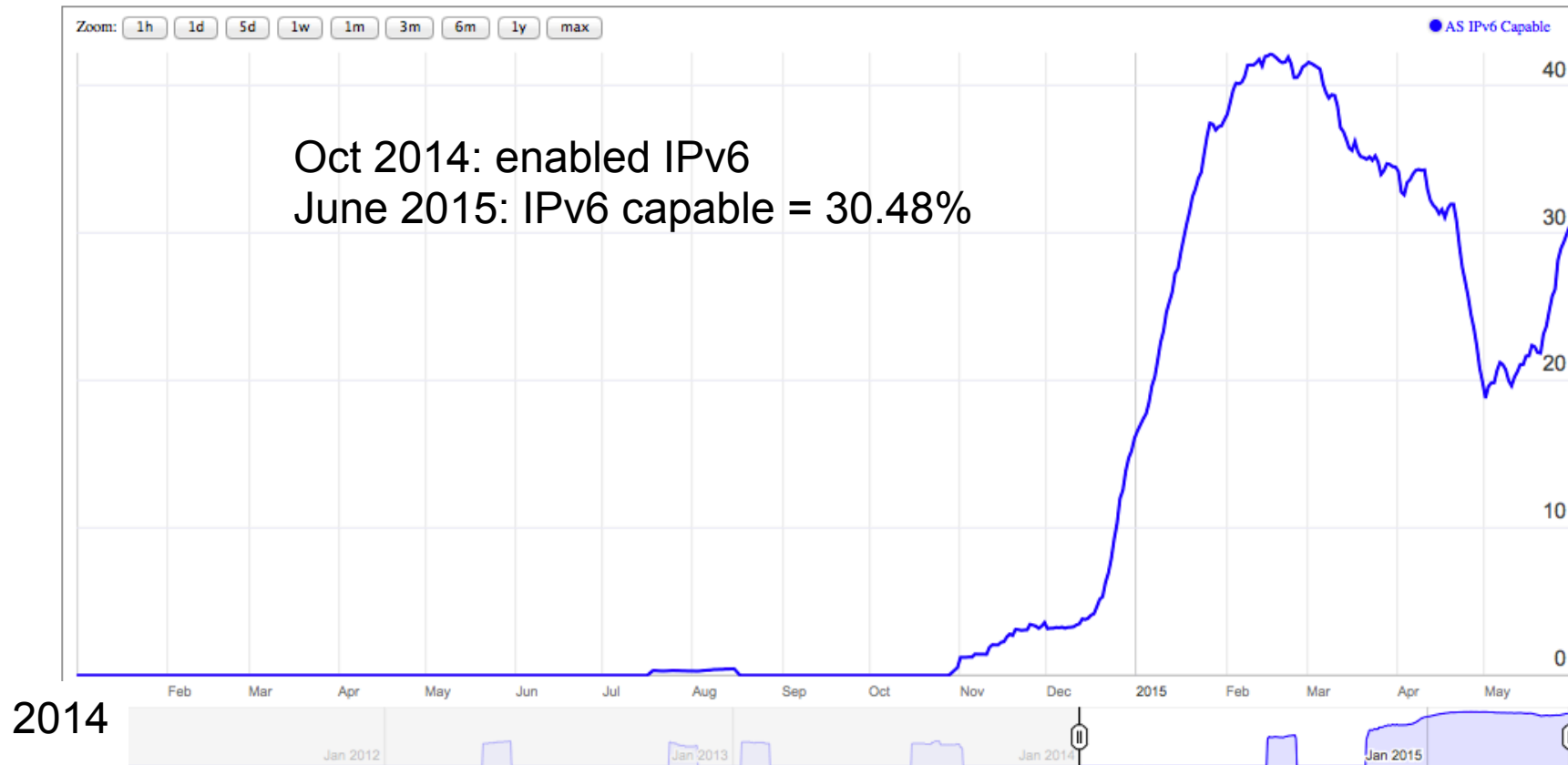
KDDI
20/06/2015: IPv6 capable = 46.78

CTC
20/06/2015: IPv6 capable = 44.76



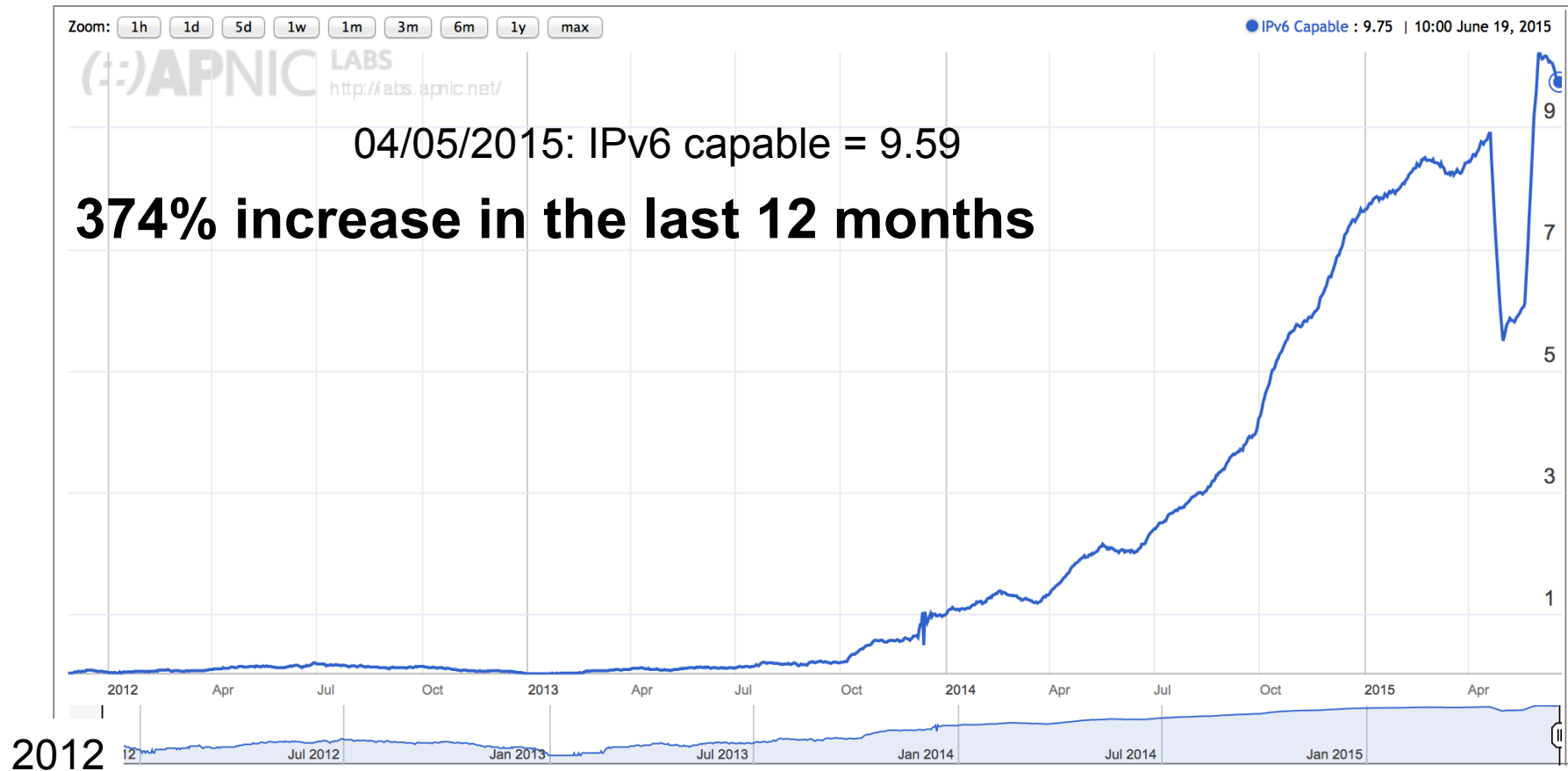
labs.apnic.net, 21/06/2015

ASN 7552 STnet



<http://stats.labs.apnic.net/ipv6/AS7522> 21/06/2015

Malaysia



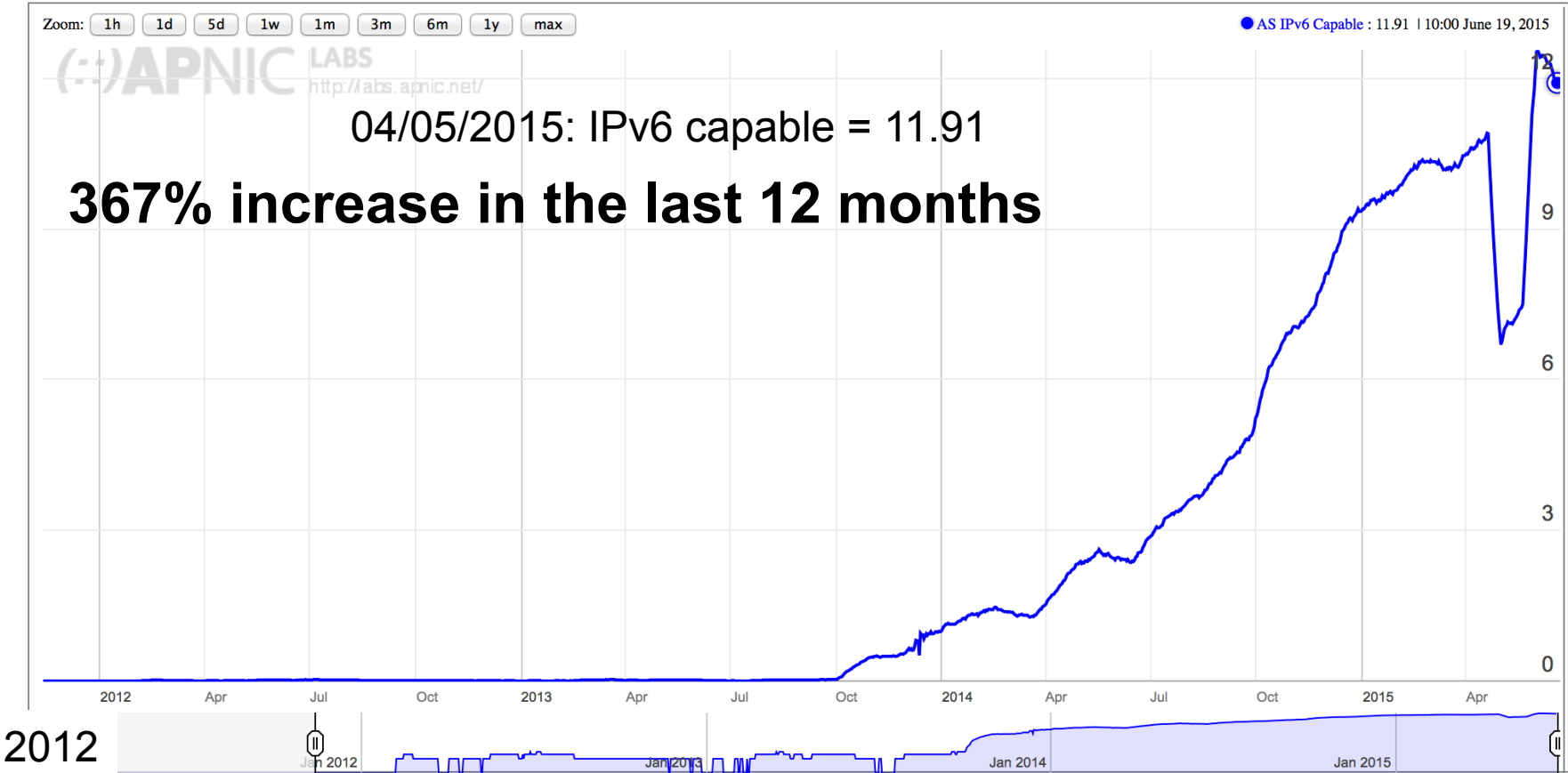
<http://stats.labs.apnic.net/ipv6/MY> 21/06/2015

Malaysia IPv6 leaderboard

ASN	Organization	IPv6 capable (%)
4788	TMTNET	9.95
38044	GITN Network	7.62

<http://stats.labs.apnic.net/ipv6/MY> 21/06/2015)

AS4788 TM Net



<http://stats.labs.apnic.net/ipv6/AS4788>, 21/06/2015

AS38044 GITN Network



<http://stats.labs.apnic.net/ipv6/AS38044> 21/06/2015

Conclusion

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Observations

- IPv6 deployment is increasing steadily
 - New organizations are rapidly getting ready with IPv6
 - But varies among regions, economies, and individual ASNs
 - Not happening simultaneously
 - Some economies and ASNs have been very active in terms of IPv6 deployment
 - Close to 50% of end users are via IPv6 in some ASNs
 - Particularly some mobile network operators and cable TV operators
 - Regional smaller size operators shows higher level of IPv6 readiness
 - Once they enable IPv6 in their network and handsets, their end user readiness grows VERY rapidly
 - It strongly impact respective economy's IPv6 readiness level

IPv6 in mobile networks

- T-Mobile USA (USA)
 - Deployed IPv6 transition technology (464XLAT) in Oct 2012
- Telstra Australia (Australia)
 - Testing IPv6 transition technology (464XLAT) since 2011
 - Final stage of testing 464XLAT
- SK Telecom (Korea)
 - Deployed IPv6 transition technology (464XLAT) in July 2014
 - Why did SKT adopt IPv6 in their mobile networks?
 - CAPEX for Network Address Translator (NAT) equipment
 - Difficult to operate duplicated networks
 - Korean government's encouragement

IPv6 enabled devices

- Generic Google devices
 - Nexus 5, Nexus 7
- Samsung
 - Note Family
 - Galaxy S4
- Sonny
 - Xperia Z Family
 - Xperia SP
- HTC
 - One M8
- LG
 - 3G
- And more...

Recent Industry Updates

- Apple iPhone
 - Apple will require IPv6 support for All iOS 9 Apps (June 2015)
- Alcatel Lucent
 - Whitepaper published in April 2015
 - 4G/LTE in mobile networks: IPv6 migration strategies for mobile networks
 - https://www.apnic.net/community/ipv6-program/IPv6_Migration_Strategies_for_Mobile_Networks_Whitepaper.pdf
 - “To cope with the increasing demand for IP addresses, most mobile network operators (MNOs) have deployed Carrier Grade–Network Address Translation (CG-NAT). Introducing IPv6 in the mobile network reduces the CG-NAT bandwidth required by the mobile operator resulting in reduced CAPEX.”

Mobile networks

- The business competency of mobile network operators:
 - Shifting from being a traditional voice and messaging provider to a mobile broadband service provider
 - Services on voice, messaging and data are converging on IP based services
 - Rapidly increasing LTE deployment in the region
- Decision makers' (mobile network operators) view
 - Ready to move to Voice over LTE?
 - Mobile cloud computing on top of the LTE network?
 - What are key building blocks for all-IP strategy?
- Geoff Huston on the mobile Internet
 - <https://www.youtube.com/watch?v=EPBIg18-v-c>

<http://lteconference.wordpress.com/>



www.apnic.net/ipv6

- ▶ Policy development
- ▶ Participation
- ▶ Community activities
- ▶ IANA transition
- ▶ Internet ecosystem
- ▶ Security@APNIC
- ▼ **IPv6@APNIC**
 - ▶ Key IPv6 messages
 - ▶ IPv6 data and statistics
 - ▶ IPv6 transition stories
 - ▶ IPv6 for governments
 - ▶ IPv6 for mobile networks
 - ▶ IPv6 Best Current Practices
 - ▶ IPv6 for Decision Makers
 - ▶ IPv6 for CTOs
 - ▶ About CGN
- ▶ IPv4 post-exhaustion
- ▶ IPv4 exhaustion

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.

[Kickstart IPv6 - one click to IPv6](#)

IPv6 training and education

Is your technical staff ready to deploy IPv6? Gaining technical knowledge does not happen overnight. Plan and implement training for your personnel. APNIC Training is constantly updating our IPv6 content, to reflect the industry's best current practices.

[Upcoming training events](#)

Monitoring IPv6 deployment

Do you offer your services over IPv6? Understand your clients' capabilities, facing your website and network assets. [APNIC Labs](#) has designed a javascript test system that reports on end-user capability in Google Analytics. Anyone can use the IPv6 Tracker, even without native IPv6 capability.

[Learn more about APNIC Labs IPv6 measurements.](#)

Supporting IPv6 deployment

IPv6 deployment is an issue that affects all Internet stakeholders. APNIC wants to give you the most current, relevant, and customized information on IPv6 deployment. The APNIC IPv6 Program brings regional and global experts to various forums through conferences, workshops, and individual meetings.



www.apnic.net/ipv6

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activities throughout the region to help in deploying IPv6 to maintain a scalable Internet

IPv4 resources according to the "last /8" and organizations in the Asia Pacific. Here's IPv6 deployment:

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APNIC Technical Assistance Service (TAS)

- To support APNIC Members' effort to deploy and maintain:
 - Scalable and resilient networks
 - Best practices in network operations
- TAS content is built around **APNIC's core competencies and core services, eg:**
 - Supporting IPv6 deployment, reverse DNS delegation, ROA creation and RPKI, open and neutral IXPs and root server deployments
- Meet and discuss with world-class technical experts and APNIC Hostmaster and Helpdesk staff
- Any inquiry: contact helpdesk@apnic.net

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