IPv6 Deployment: Where are we now?

ASEAN ICT SMEs Conference, Vietnam

19 March 2014

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Agenda

- A quick overview of IPv6 readiness among in the AP region
  - Review of several statistics
  - Transit providers and Content Providers
  - IPv6 ready end users
- Governments' initiative in the AP region
  - Partnership between public and private sectors
- Growth path of the Internet
- Conclusion

IPv6 readiness in the world

Review of several statistics

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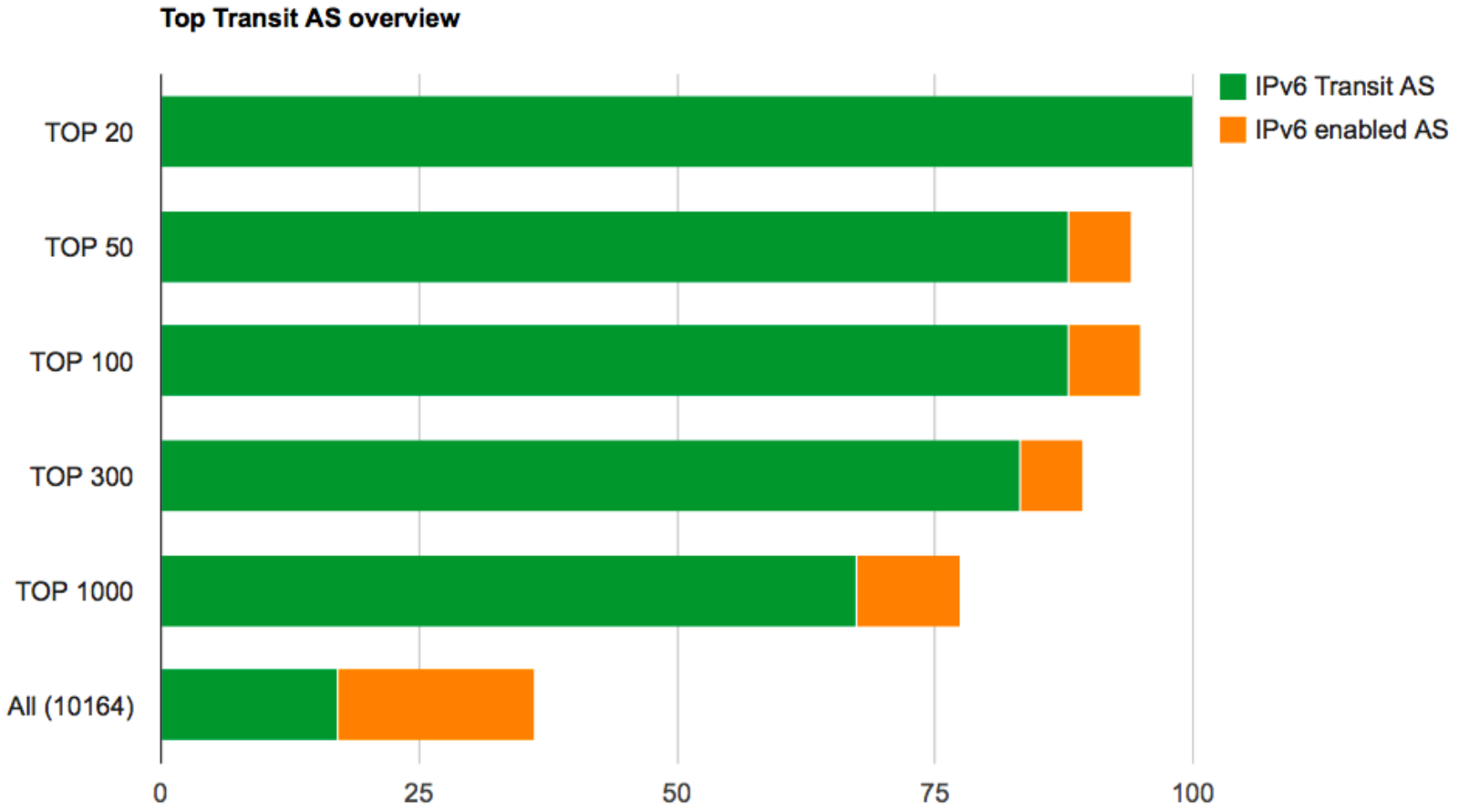
IPv6 adoption in Internet core networks

http://6lab.cisco.com/stats/cible.php?country=world



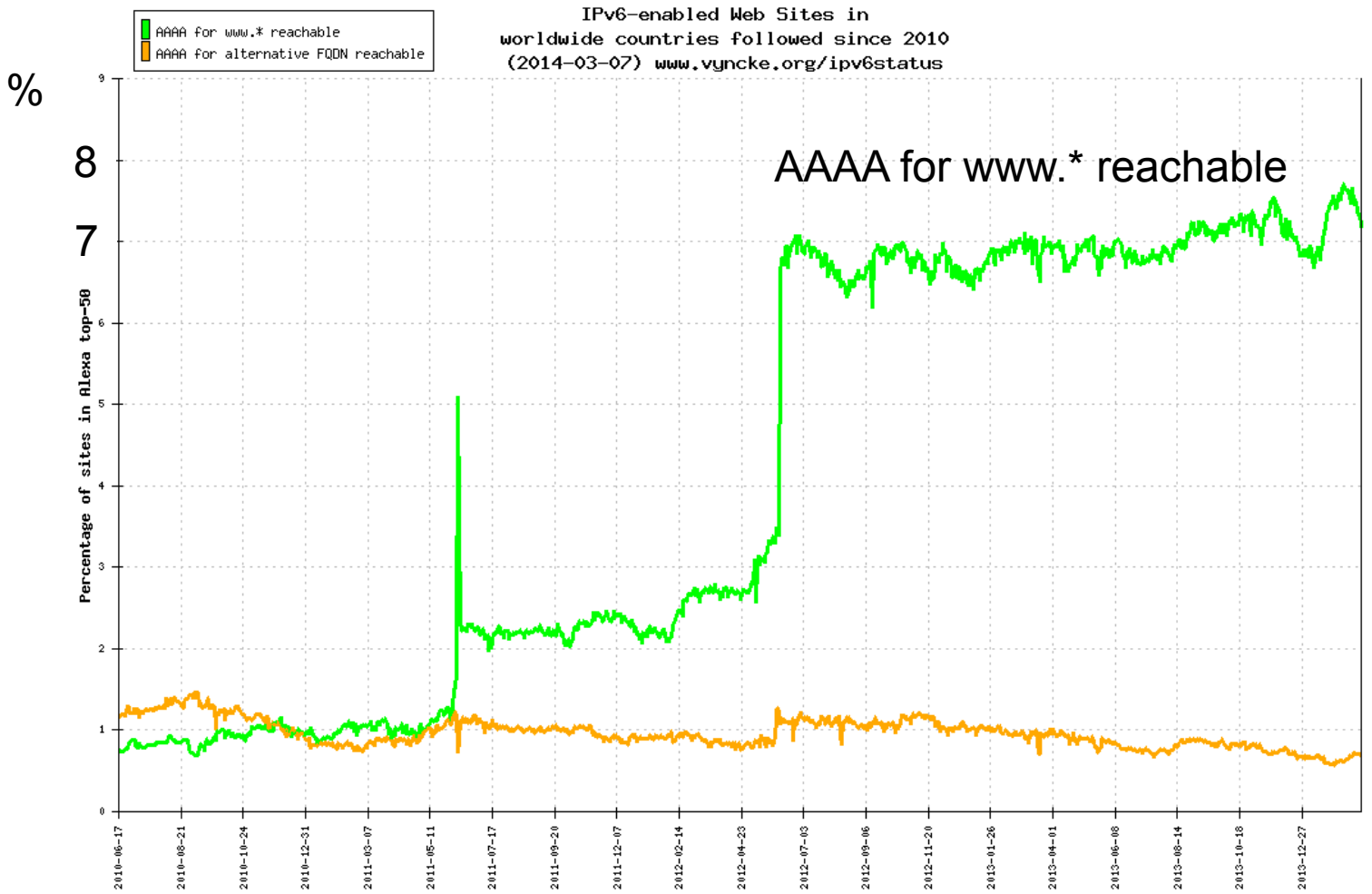
World ranking

IPv6 ready web sites http://www.vyncke.org/ipv6status/

Rank	Country	Sample	Green	Orange
1	Vanuatu	42	40.5% (17)	0.0% (0)
2	Maldives	13	30.8% (4)	0.0% (0)
3	Slovenia	50	30.0% (15)	0.0% (0)
4	Czech Republic	50	30.0% (15)	0.0% (0)
5	Brazil	50	28.0% (14)	0.0% (0)
6	United States of America	50	22.0% (11)	2.0% (1)
7	Singapore	50	22.0% (11)	0.0% (0)
8	Netherlands	50	18.0% (9)	4.0% (2)
9	India	50	16.0% (8)	0.0% (0)
10	Switzerland	50	16.0% (8)	0.0% (0)

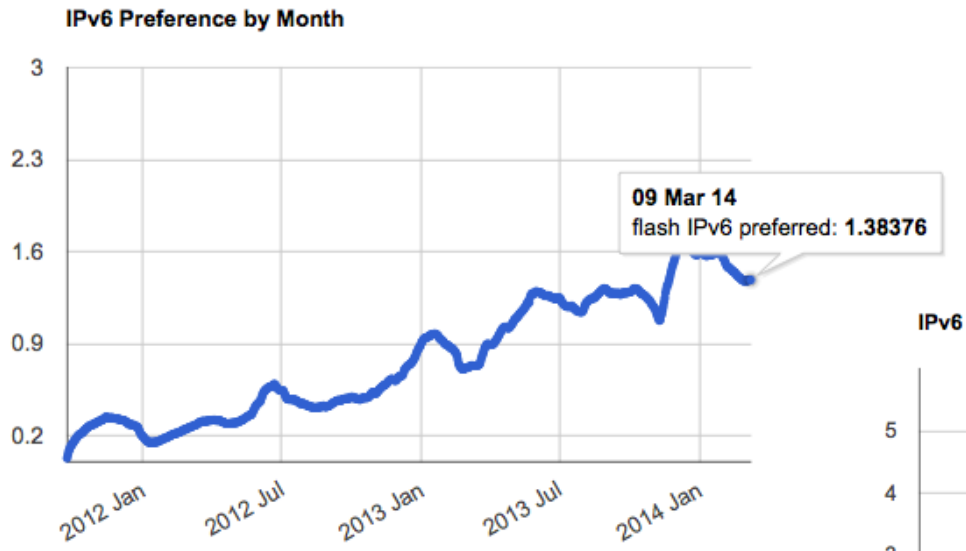
http://www.vyncke.org/ipv6status/ 07/03/2014

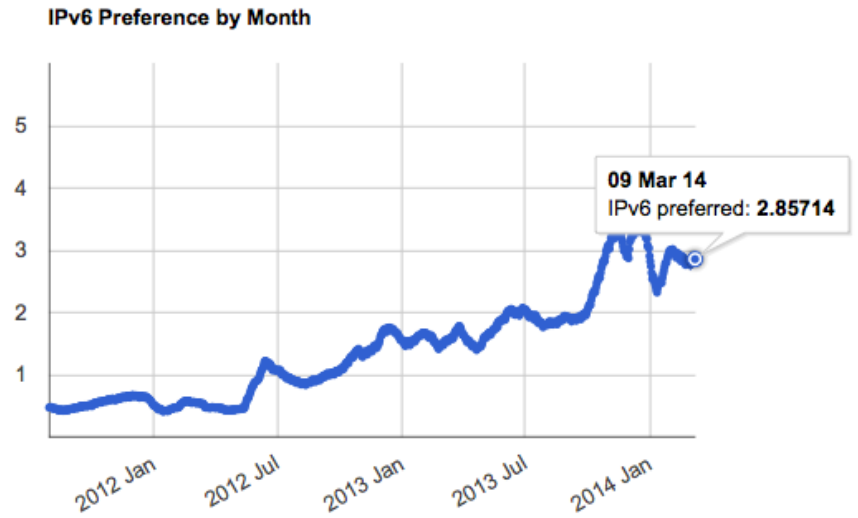
IPv6 enabled web sites among Alexa top-50



http://www.vyncke.org/ipv6status/plotsite.php?metric=w&global=legacy&pct=y07/03/2014

IPv6 measurement
End user readiness: World





Data source from “flash” and “JavaScript” and including viewers from mobile devices

http://labs.apnic.net/ipv6-measurement/Regions/001%20World/ as of 6/2/2014

IPv6 deployment leaderboard in the World (commercial operators)

ASN	Entity	Economy	IPv6 preferred rate
22394	Cellco Verizon Wireless	US	55.60
18126	CTCX Chubu Telecommunications Company; Inc.	JP	37.59
55430	STARHUBINTERNET-AS-NGNBN Starhub Internet Pte Ltd	SG	36.55
2516	KDDI CORPORATION	JP	30.06
3303	Swisscom (Switzerland)	CH	27.43
8708	RSC & RDS SA	RO	24.38
12322	PROXAD Free SAS	FR	22.89
20825	Unitymedia NRW GmbH	DE	22.19
6389	Bellsouth net Inc.	US	20.26
7018	AT&T Services Inc.	US	18.41
4739	INTERNODE-AS Internode Pty Ltd	AU	17.76
7922	Comcast Cable Communications	US	16.90
23655	Snap Internet Limited	NZ	15.87
21928	T-Mobile USA	US	12.26
4773	MobileOne Ltd Mobile/Internet Service Provider	SG	10.49

http://labs.apnic.net/ipv6-measurement/AS/ March 2014

IPv6 deployment status in the AP region

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Governments' support

- IPv6 awareness among governments' in the AP region is very high
  - Many initiatives from governments has been implemented
    - Partnership between the public and private sectors in various forms
    - Developing national policies and guidelines and roadmaps to enable IPv6
    - Enabling IPv6 in government networks
    - Mandating for IPv6 readiness in government procurement for ICT goods and services
    - Raising IPv6 awareness among key people in the government and industry
    - Providing timely skill up training
    - Monitoring IPv6 deployment measurement and share information with industry
    - Include the necessity of IPv6 deployment in ministerial statements
- Continuous engagement with industry will help

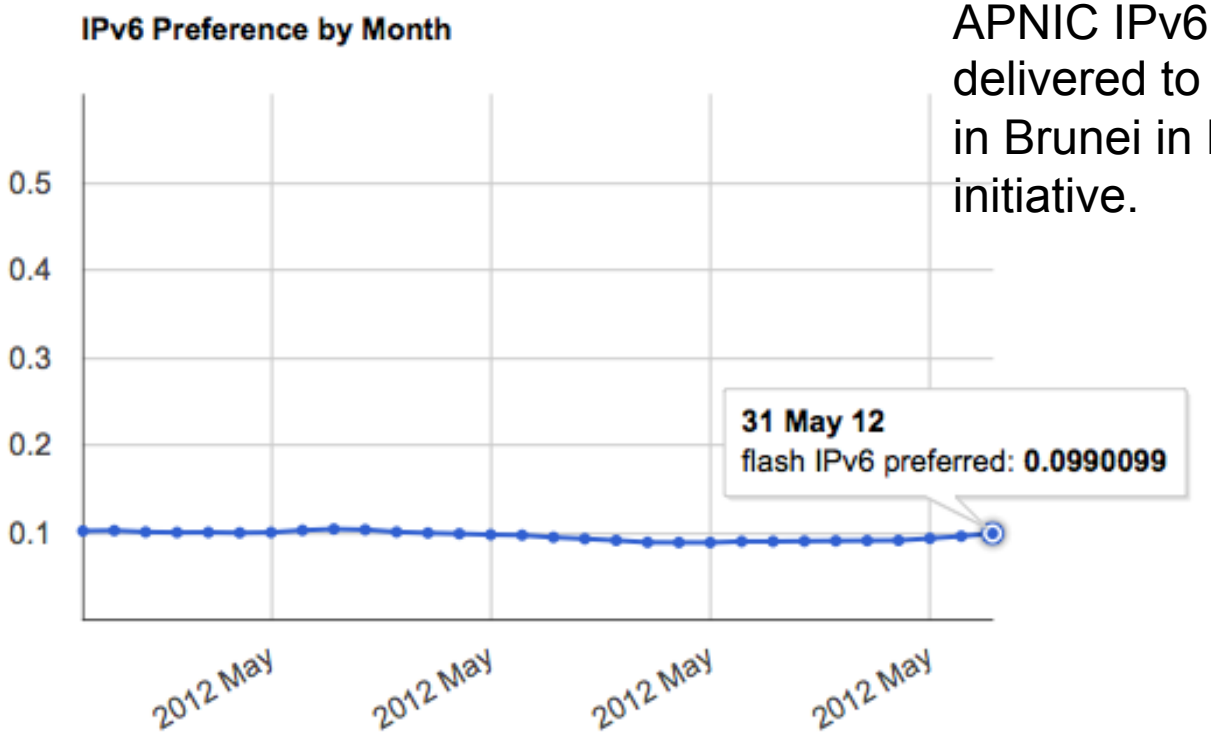
IPv6 end user readiness

- Let's look into some statistic for ASEAN nations
  - Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar , Philippines Singapore, Thailand, Vietnam
- Then we also look into other economies in the AP region
  - Anecdotal stories of governments' efforts to share
  - China, Japan, Singapore, Vietnam

Brunei

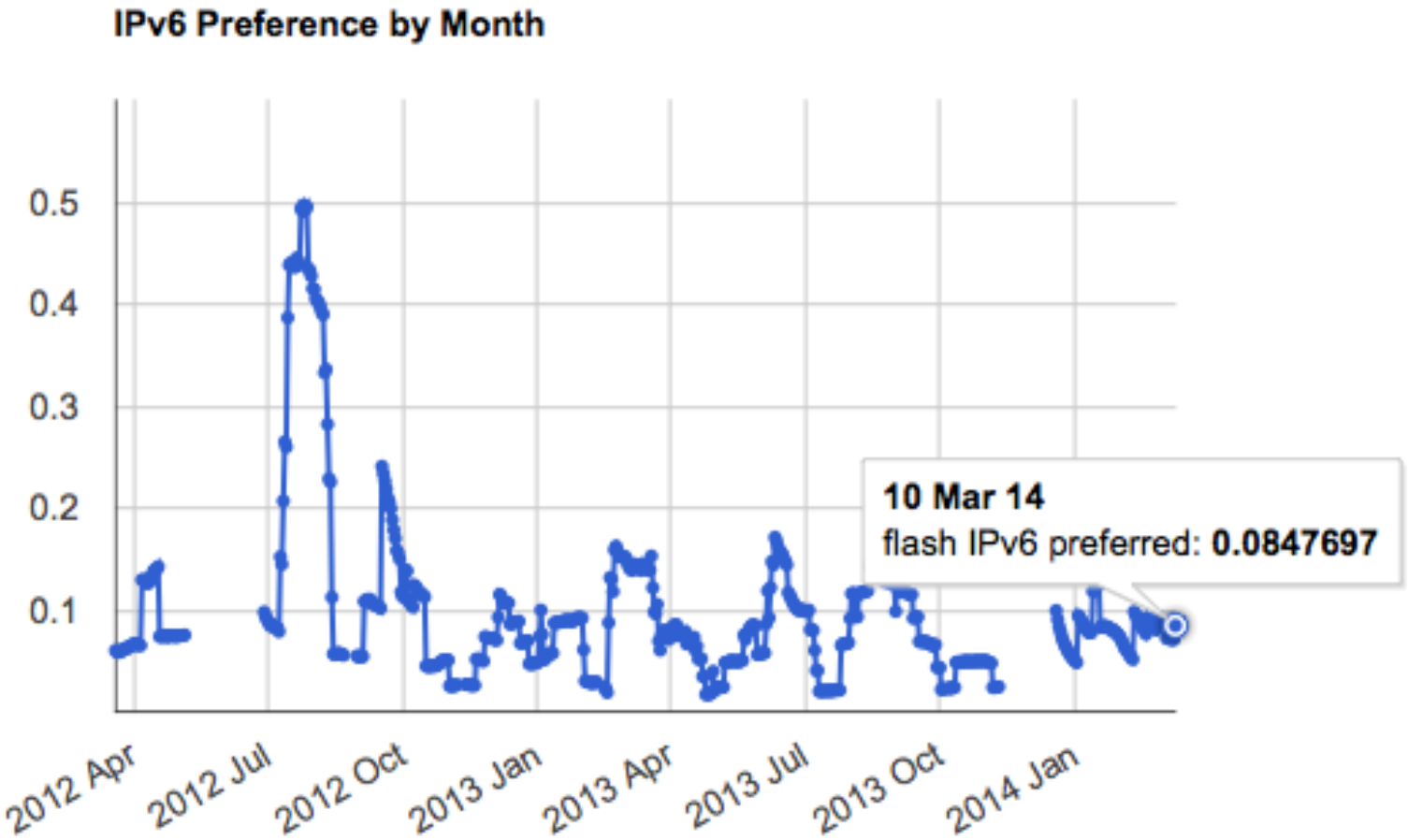
Authority of Info-communications Technology Industry (AITI) organized National IPv6 event in late 2013

APNIC IPv6 workshop will be delivered to assist network engineers in Brunei in March 2014 with AITI's initiative.



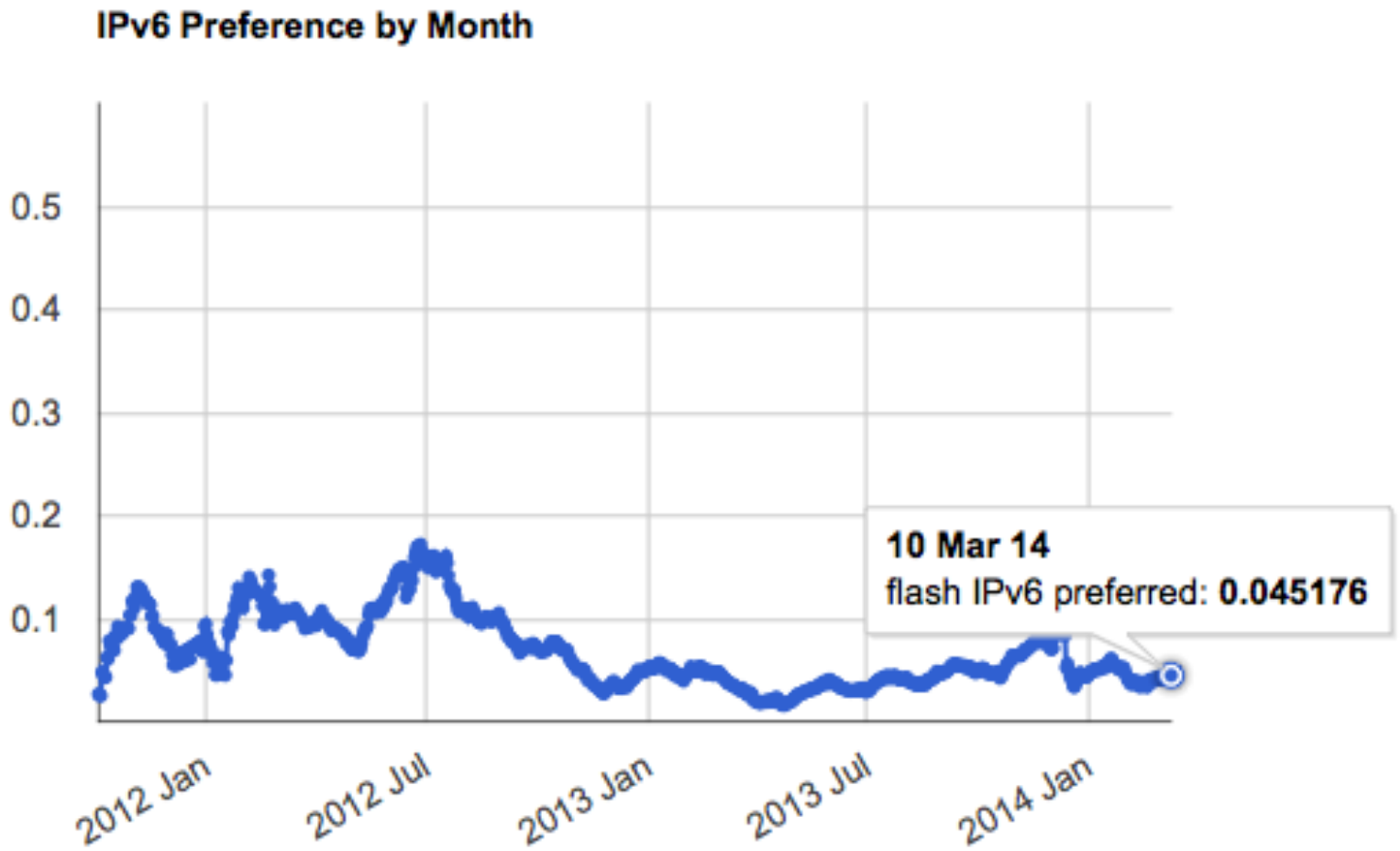
http://labs.apnic.net/ipv6-measurement/Economies/BN/

Cambodia



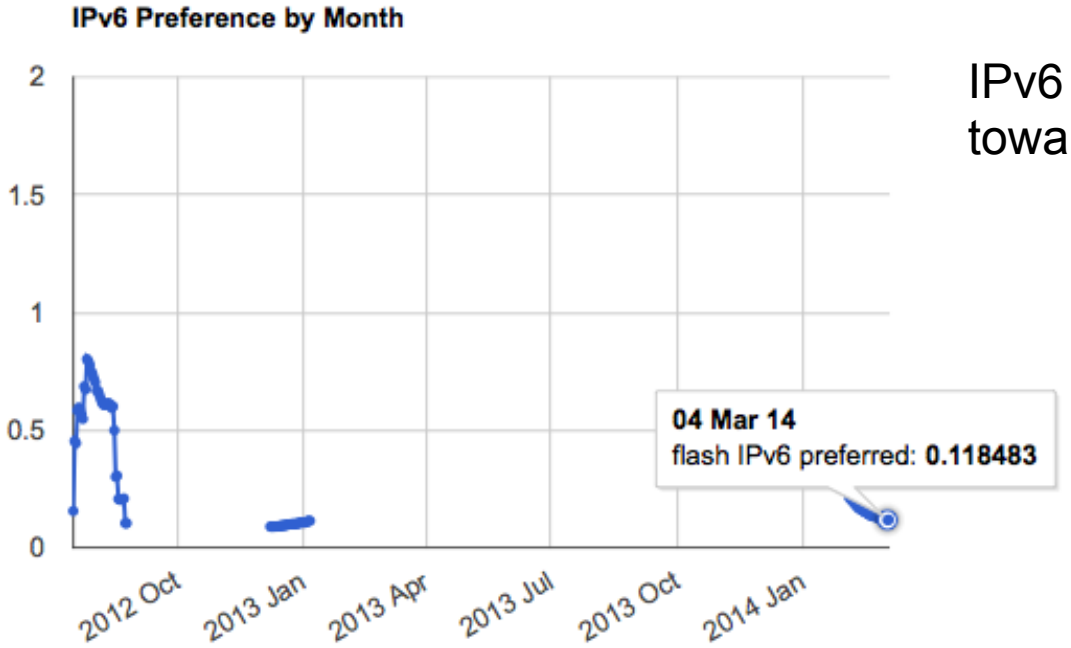
http://labs.apnic.net/ipv6-measurement/Economies/bn/KH

Indonesia



http://labs.apnic.net/ipv6-measurement/Economies/bn/ID

Laos

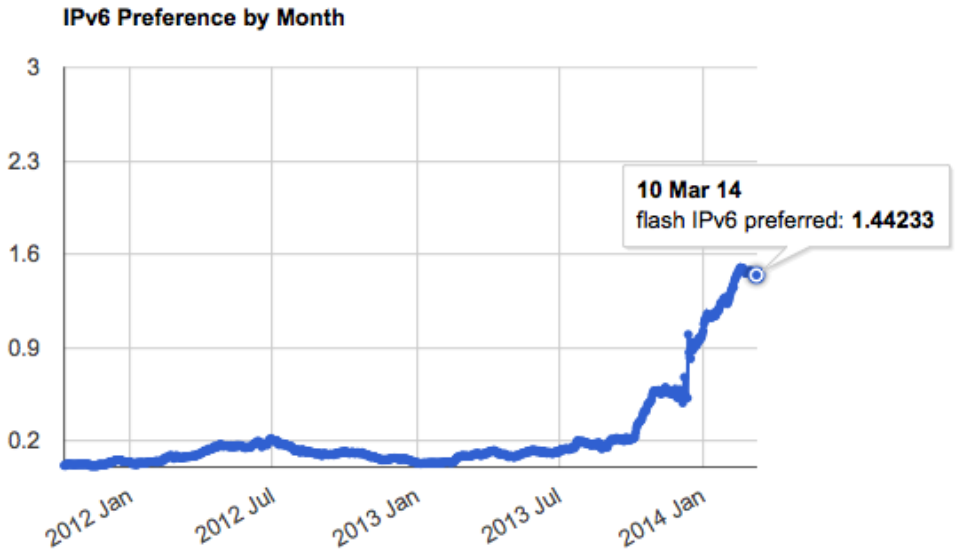


APNIC will deliver an IPv6 Workshop in May 2014 with support of LANIC

IPv6 capacity building is the first step toward IPv6 deployment

http://labs.apnic.net/ipv6-measurement/Economies/bn/LA

Malaysia



Malaysia National Agenda - MyICAMS886
IPv6 is par of the plan to support future growth of the infrastructure

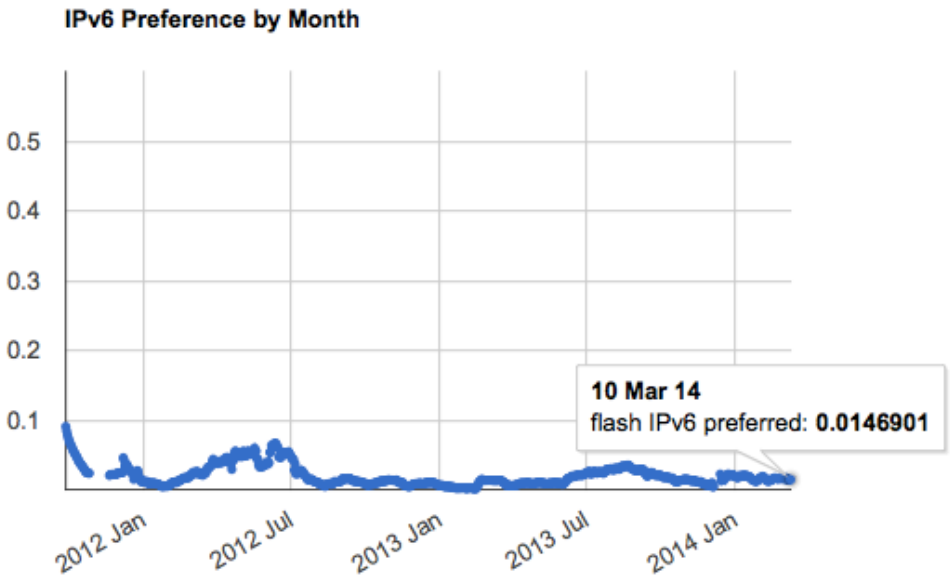
Government wise initiative on IPv6 to support partnership between public and private sectors

National Committee for IPv6 Monitoring and Development chaired by Ministry of Information, Communication and Culture (MICC) engaging:

- MOSTI
- MCMS
- MAMPU
- MTSFB

http://labs.apnic.net/ipv6-measurement/Economies/bn/MY

Philippines



Executive Order No.893 in 2010 "Promoting the development and use of IPv6"

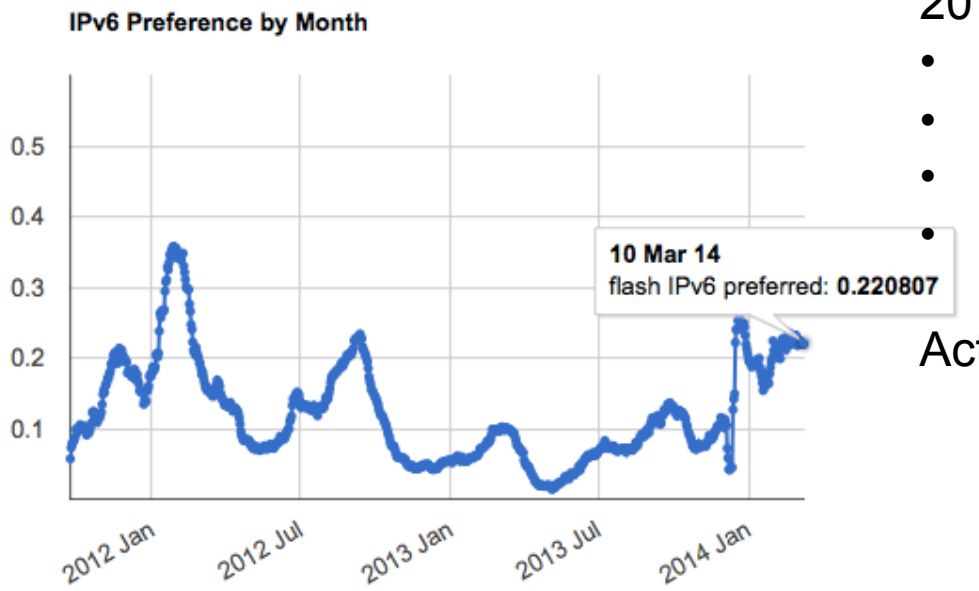
Policies support the industry's effort to adopt IPv6

Philippine Research, Education and Government Information Network (PREGINET) has enabled IPv6 in 2012

About 50% of PREGINET's traffic is via IPv6 (http://www.worldipv6launch.org/measurements/)

http://labs.apnic.net/ipv6-measurement/Economies/bn/PH

Thailand



IPv6 Thailand Master Plan issued in 2013

Royal Thai Government endorsed IPv6 Thailand National Plan for 2014 – 2016 (3 year plan)

- IPv6 infrastructure development
- Human resource development
- Services and supports
- Public awareness

Active IPv6 Forum Thailand

http://labs.apnic.net/ipv6-measurement/Economies/bn/TH

China

- Announcement made by the Chinese State Council in Nov 2011
  - IPv6 mandates to the Industry
    - "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" (People's Daily Online, Jan 2012, http://english.people.com.cn/90778/7696495.html)
    - 3 million users for each operators by 2013
    - 25 million users by 2015
  - Service Providers in China are responding to this mandate

China

IPv6 Plan of e-Government Extranet

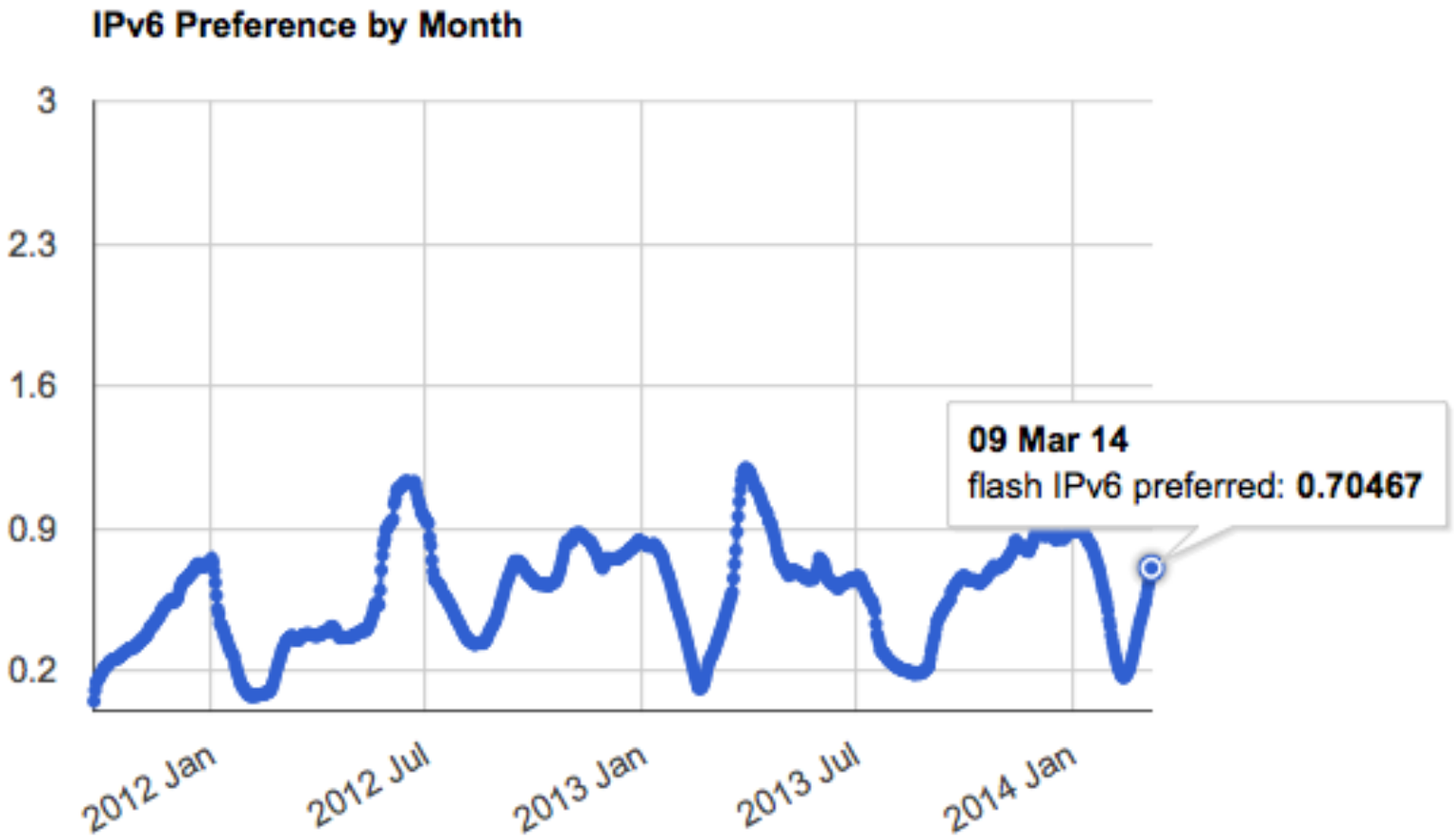
■Chinese authorities pay great attention on the Next Generation Internet based on IPv6 and have issued a series of announcements to specify the target and roadmap of development of next generation Internet, providing policy and financial supporting measures

■Following the important principle 'Government network must go first for the informatization', national e-government extranet (e-government public infrastructure) will take the lead in the field of e-government planning, deployment and pilot IPv6 related technologies

■IPv6 is a must for the e-government extranet, because with the expanding coverage of e-government network and increasing services& applications, IPv4 shortage is a big barrier for system deployment and providing new services

http://conference.apnic.net/data/36/cnnic-update_2013.8.27_1377563880.pdf

China: Stats



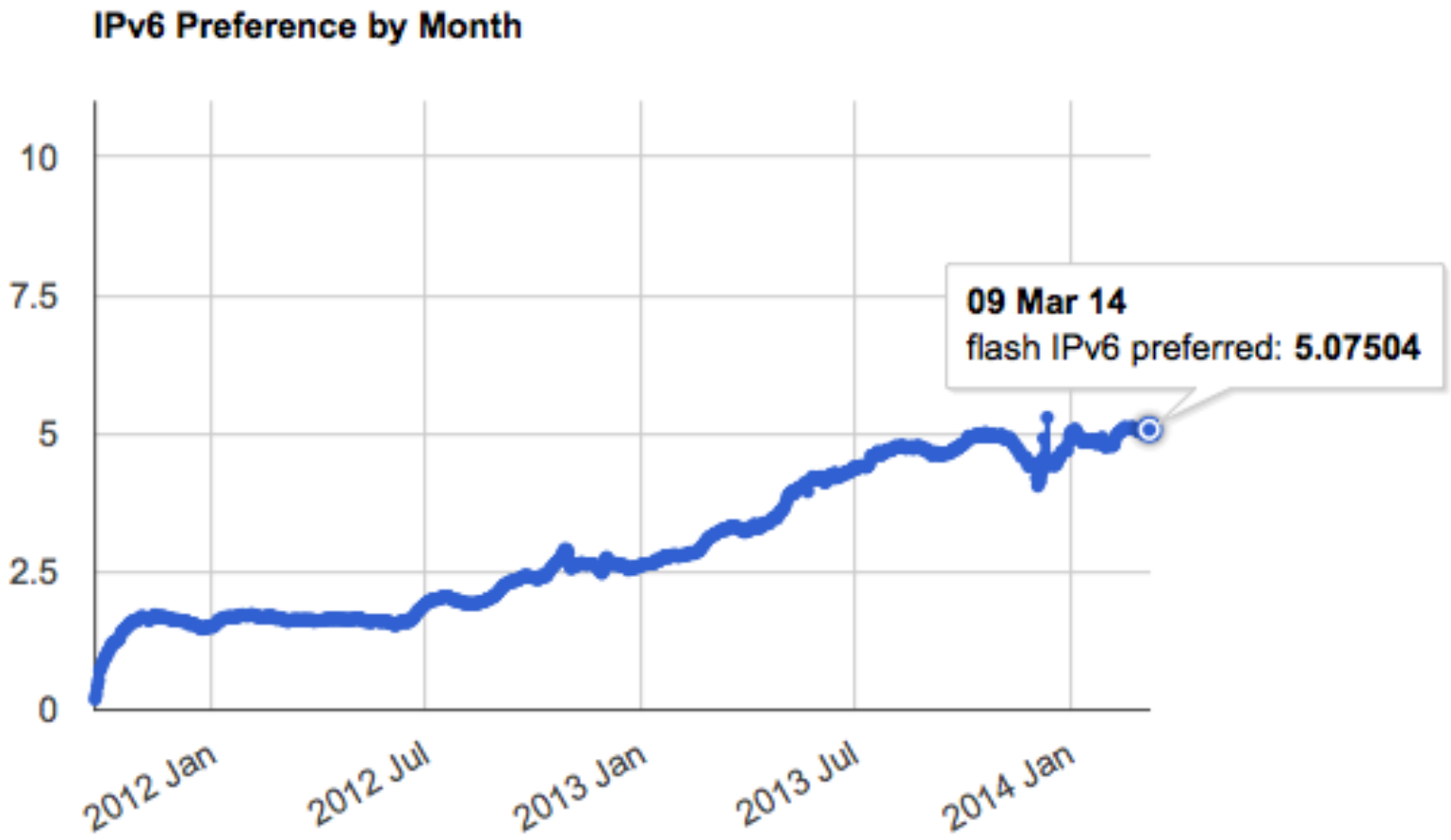
http://labs.apnic.net/ipv6-measurement/Economies/CN/

Japan

- Ministry of Internal Affairs and Communications conducts regular IPv6 Study Group
  - Partnership between the public and private sectors
    - Detailed field level discussions
  - Most recent one on July 2013
    - Active discussion on CGN: concerns on its relatively high costs, possible negative impact to end users
    - Update on usage of existing IPv6 test bed (APs and CPs)
    - Discussion on potential formats of IPv6 service deliveries: Default IPv6 services
      - Some providers are experiencing positive result
    - Discussion on IPv6 services in mobile networks
    - Discussion on developing IPv6 security guidelines

http://www.soumu.go.jp/main_sosiki/joho_tsusin/policyreports/chousa/ipv6_internet/02kiban04_03000222.html

Japan: Stats



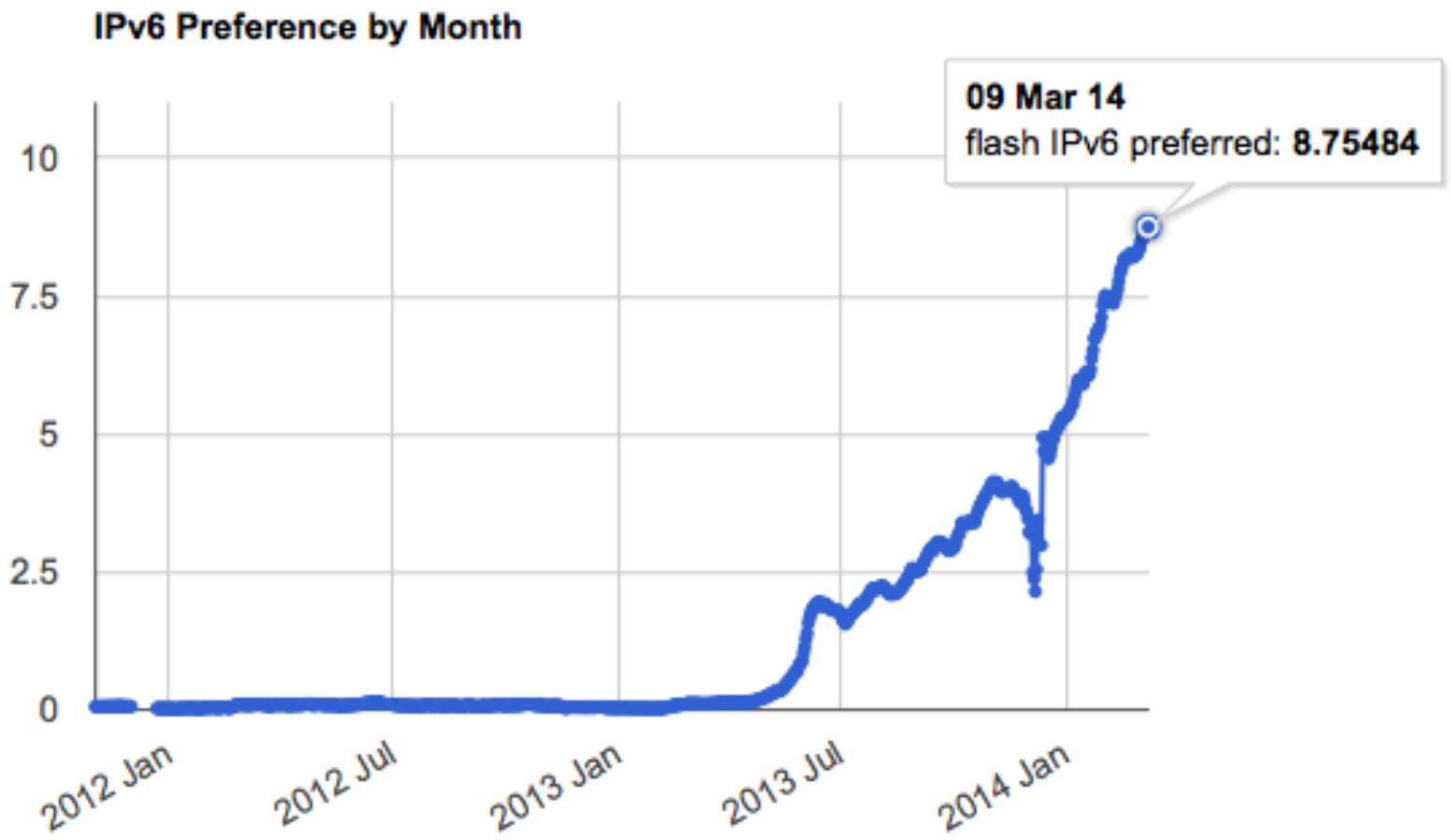
http://labs.apnic.net/ipv6-measurement/Economies/JP/

Singapore

- IPv6 Transition Program lead by Infocomm Development Authority (iDA) of Singapore
  - To apply multi-stakeholder approach in conjunction with “pull” and “push” strategies to support IPv6 adoption
    - Create Initial IPv6 demand by enterprises, government agencies, content and application providers
    - Create IPv6 supply by network providers
    - Drive competency across multi-stakeholders
    - Ensure IPv6 and IPv4 performance equity by hardware and software vendors
    - Raise awareness on IPv6 across multi-stakeholders
    - Managing IPv4 address exhaustion mainly by network providers
  - To address the issue of IPv4 exhaustion and to facilitate the smooth transition of the Singapore inforcomm ecosystem to IPv6
  - To promote IPv6 adoption in the local industry

http://www.ida.gov.sg/Infocomm-Landscape/Technology/IPv6

Singapore: Stats

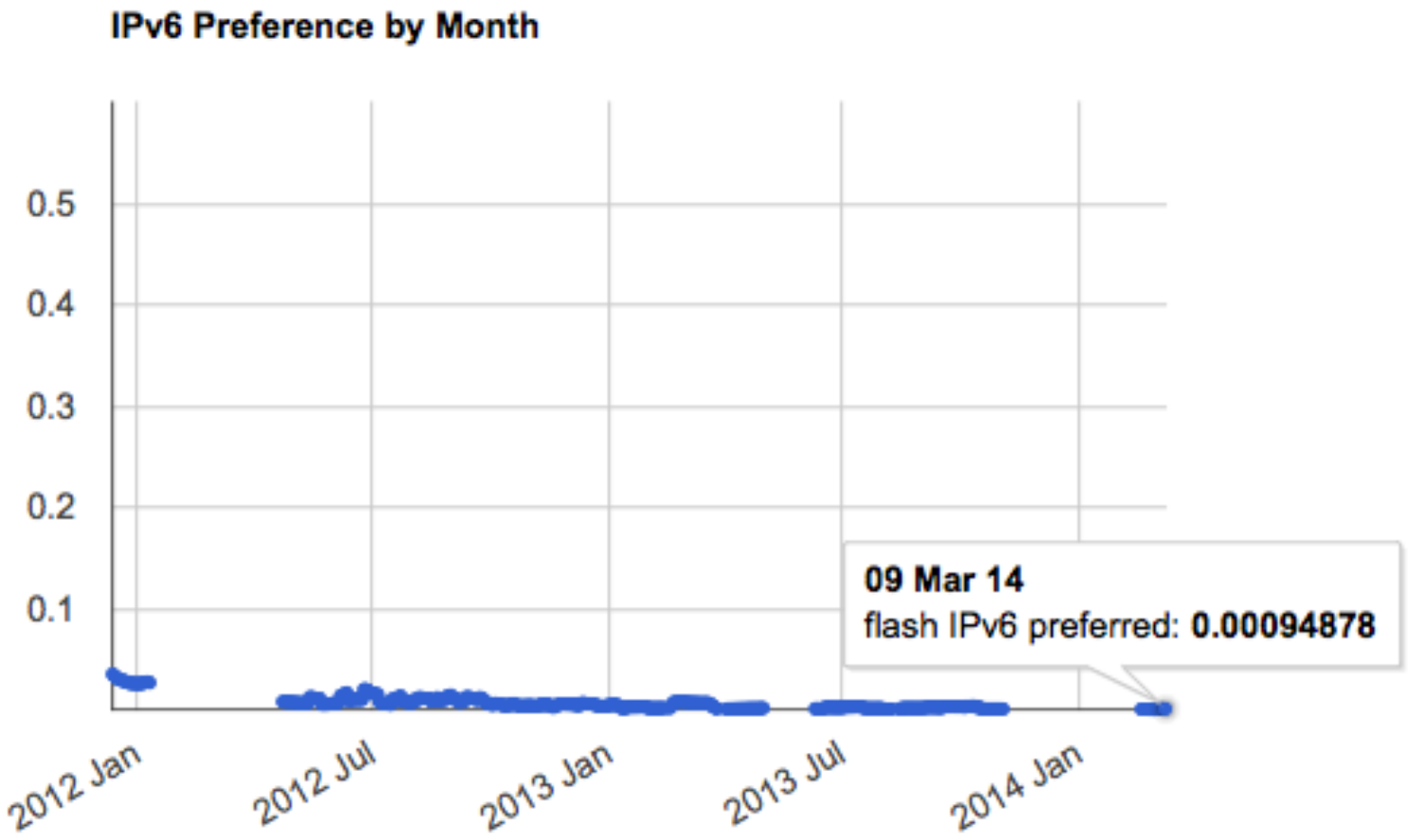


http://labs.apnic.net/ipv6-measurement/Economies/SG/

Vietnam

- Continuous support provided by Ministry of Information and Communications, Vietnam National IPv6 Task Force and VNNIC to raise IPv6 awareness and skill up trainings
  - Vietnam IPv6 Day Conference in 2012 and 2013
  - Vice Minister of MIC and CEOs of top 8 local ISPs officially launched IPv6 service, May 2013
  - IPv6 infrastructure security workshop for network engineers coordinated by VNNIC

Vietnam: Stats



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Growth path of the Internet

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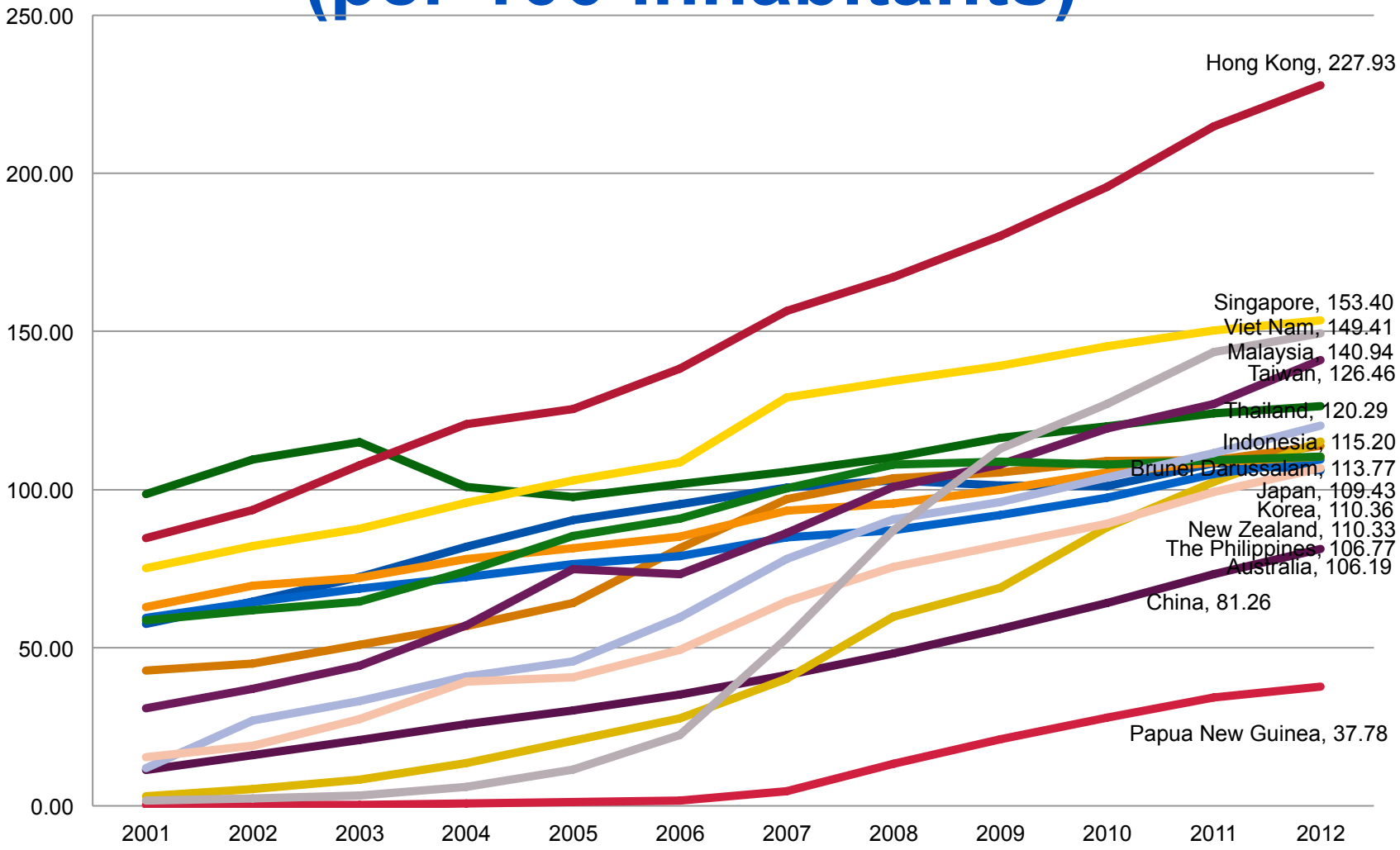
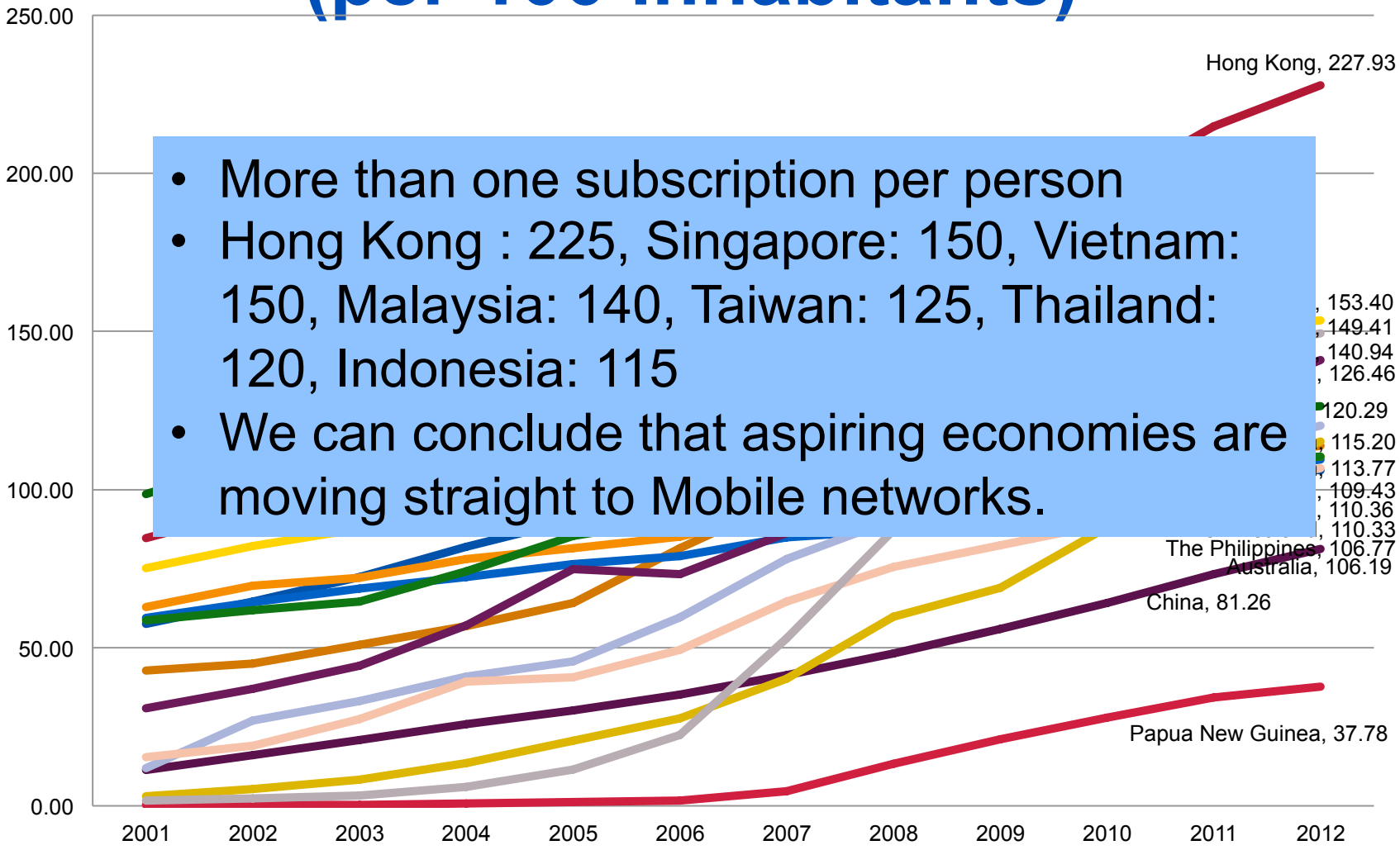
Mobile cellular subscription (per 100 inhabitants)



http://statistics.apec.org/index.php/key_indicator/index

Mobile cellular subscription (per 100 inhabitants)



- More than one subscription per person
- Hong Kong : 225, Singapore: 150, Vietnam: 150, Malaysia: 140, Taiwan: 125, Thailand: 120, Indonesia: 115
- We can conclude that aspiring economies are moving straight to Mobile networks.

http://statistics.apec.org/index.php/key_indicator/index

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 3G+, 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 of all-IP strategy?

http://lteconference.wordpress.com/

Conclusion

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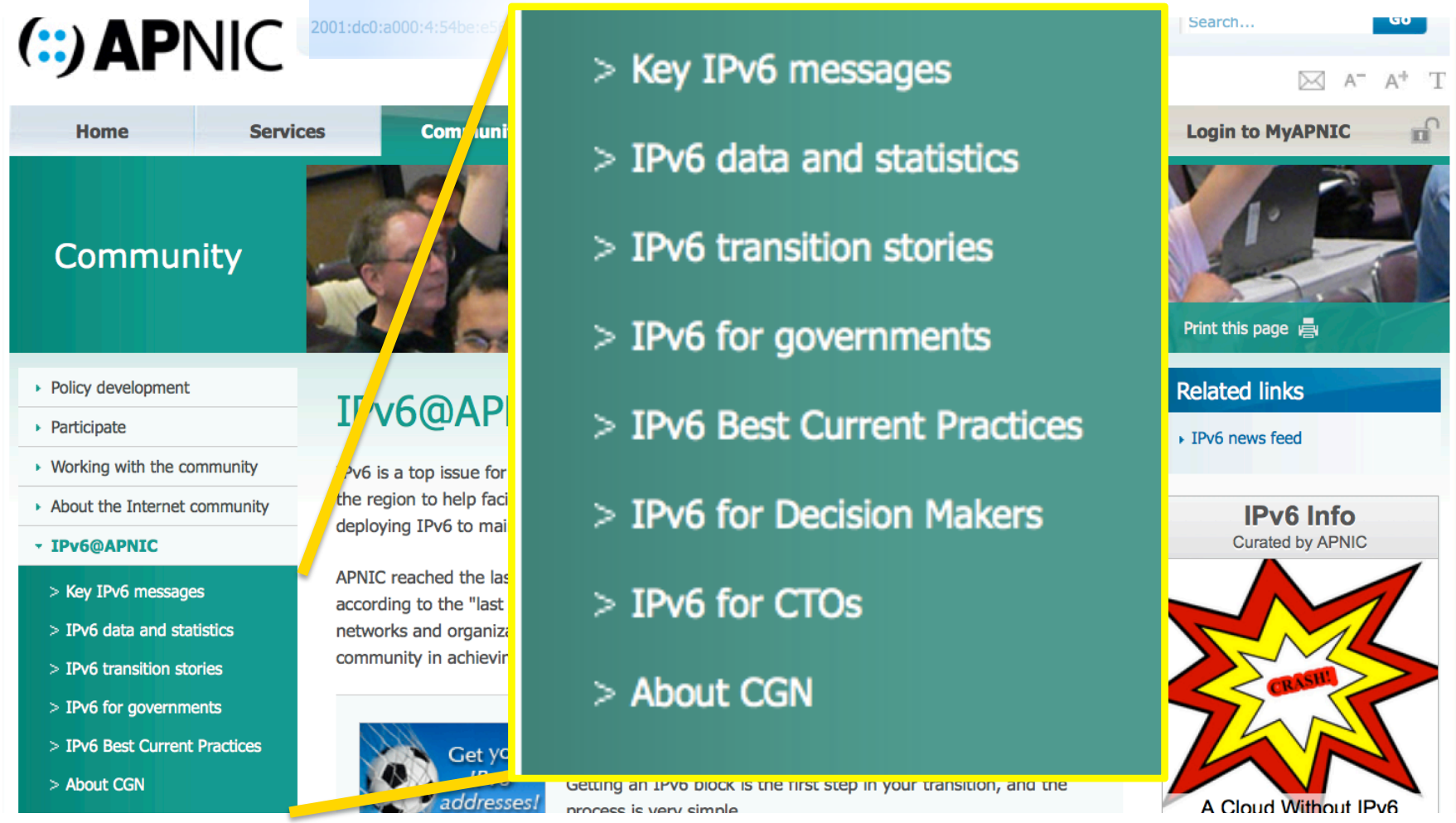
Support the current and future growth

- The end-to-end Internet principle allows many stakeholders to interact directly, and provide foundation for innovation
  - The Internet is a highly diverse and flexible amalgam of many components
  - The speed of innovation is rapid
- Internet industry is at a critical turning point
  - Choosing technologies that support the current business model, while establishing a foundation for a future business model is no simple task
    - There is no one strategy that fits all
  - Key success factor: Information sharing and continuous collaboration among multi-stakeholders of the Internet

www.apnic.net/ipv6

www.apnic.net/ipv6



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