World IPv6 Launch – One Year On

June 11, 2013

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Internet Society

Internet Society Deploy360 Programme

www.internetsociety.org/deploy360/

Providing real-world deployment info for IPv6, DNSSEC and other Internet technologies:

- **Case Studies**

- **Tutorials**

- **Videos**

- **Whitepapers**

- **News, information**

English content, initially, but will be translated into other languages.

A little more than one year ago…

www.worldipv6launch.org

World IPv6 Launch

When?

- Beginning 6 June 2012

What?

- IPv6 is part of regular business, on by default, no special configuration necessary for anyone anywhere

Who?

- Access networks, home router vendors, websites

Why?

- **Acceleration**: those already planning to roll-out IPv6 should accelerate their plans

- **Adoption**: those who don't have plans yet – it's safe now, please start

- **Definition**: industry leaders have established IPv6 as the new normal

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World IPv6 Launch – one year on, what now?

- Updates on the Internet Technology Matters Blog:

   www.internetsociety.org/blog/tech-matters/

- Global IPv6 use has **doubled** among World IPv6 Launch participants, with some reporting significantly higher percentages

- IPv6 is an integral part of the global Internet today

- Major parts of the Internet today have IPv6 enabled by default

- Operators are beginning to consider **IPv6-only** deployments

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Significant Growth In IPv6 Usage (Google)
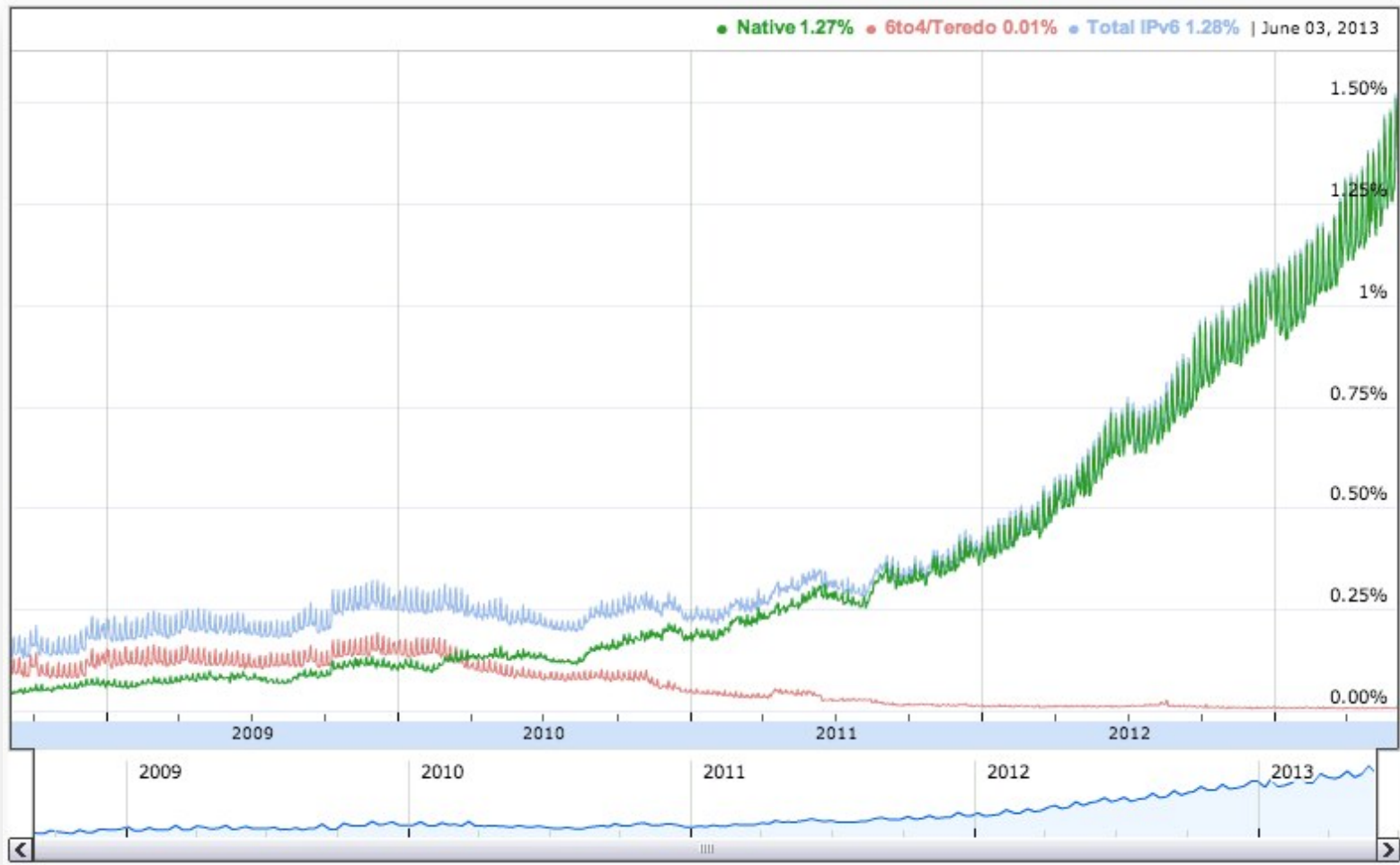
www.google.com/ipv6/statistics.html

Significant Growth In IPv6 Usage (Akamai)
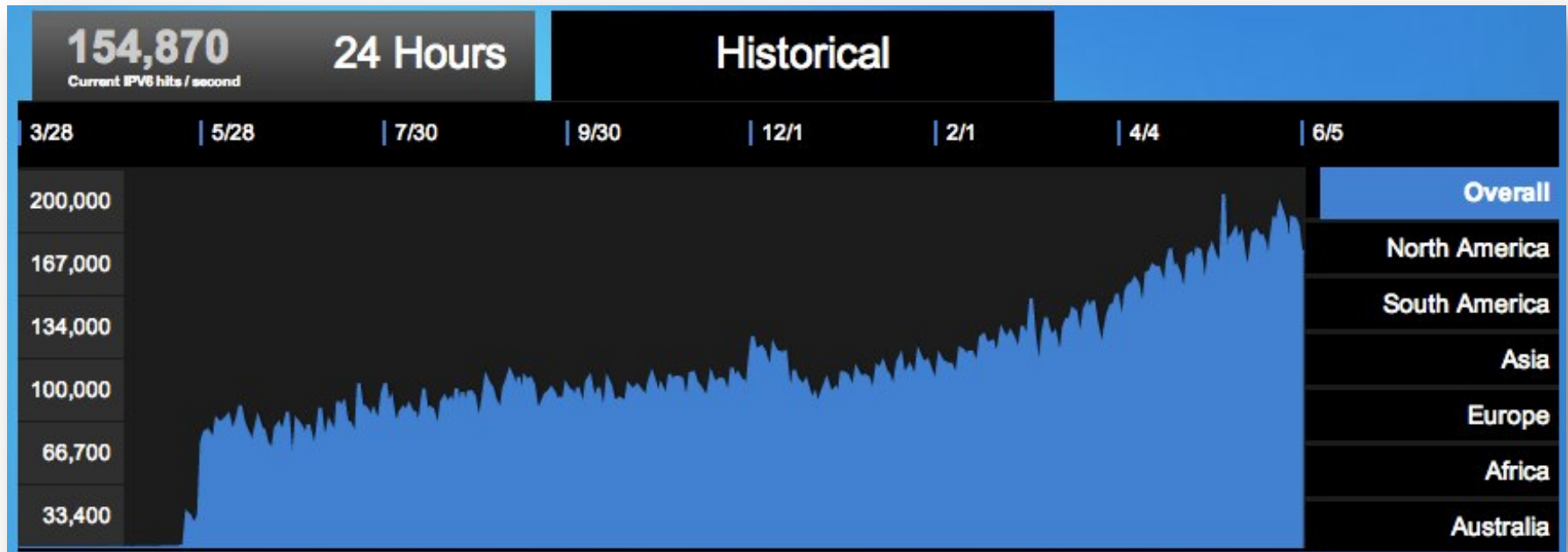

www.akamai.com/ipv6/

Percentage of IPv6 Use has Doubled

- Google reports IPv6 traffic as a percentage of its overall traffic has **doubled** in the past year

- Akamai reports **250 percent growth** in requests to use since this time last year

- The number of users enabled with IPv6 has **more than doubled** with many network operators worldwide including KDDI, DT, and Swisscom
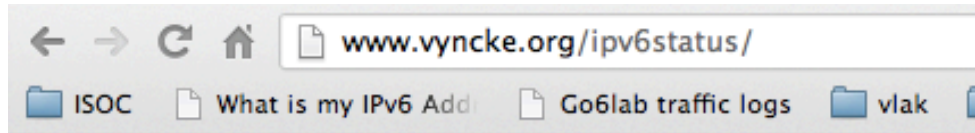
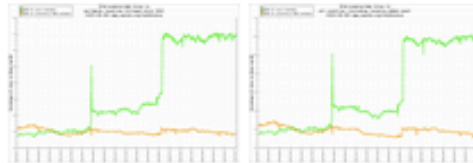*Internet Society*

Significant Growth In IPv6 Usage (DE-CIX)
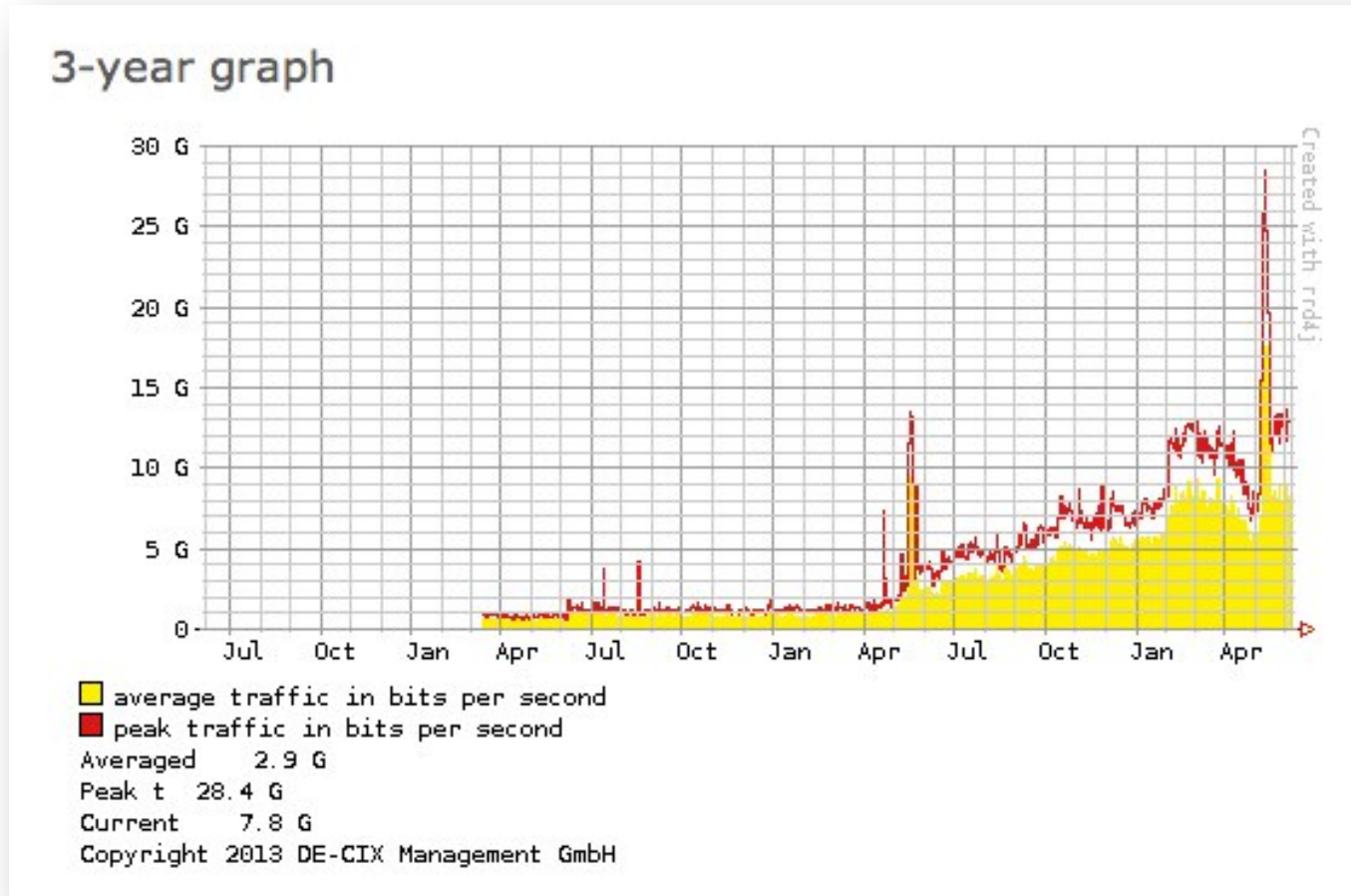
www.de-cix.net/about/statistics/

Slovenia and IPv6

www.vyncke.org/ipv6status/

ISOC   What is my IPv6 Add   Go6lab traffic logs   vlak

Web

Rank	Country	Sample	Green	Orange
1	Slovenia	50	36.0% (18)	0.0% (0)
2	Czech Republic	50	34.0% (17)	0.0% (0)
3	Brazil	50	26.0% (13)	0.0% (0)
4	United States of America	50	22.0% (11)	4.0% (2)
5	Singapore	50	22.0% (11)	0.0% (0)
6	Greenland	18	16.7% (3)	0.0% (0)
7	Switzerland	50	16.0% (8)	2.0% (1)
8	Poland	50	14.0% (7)	6.0% (3)

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Slovenia and IPv6

IPv6-enabled Web Sites in Slovenia
(2013-06-10) www.vyncke.org/ipv6status

Legend:
- AAAA for www.* reachable
- AAAA for alternative FQDN reachable

Y-axis: Number of sites in Alexa top-50
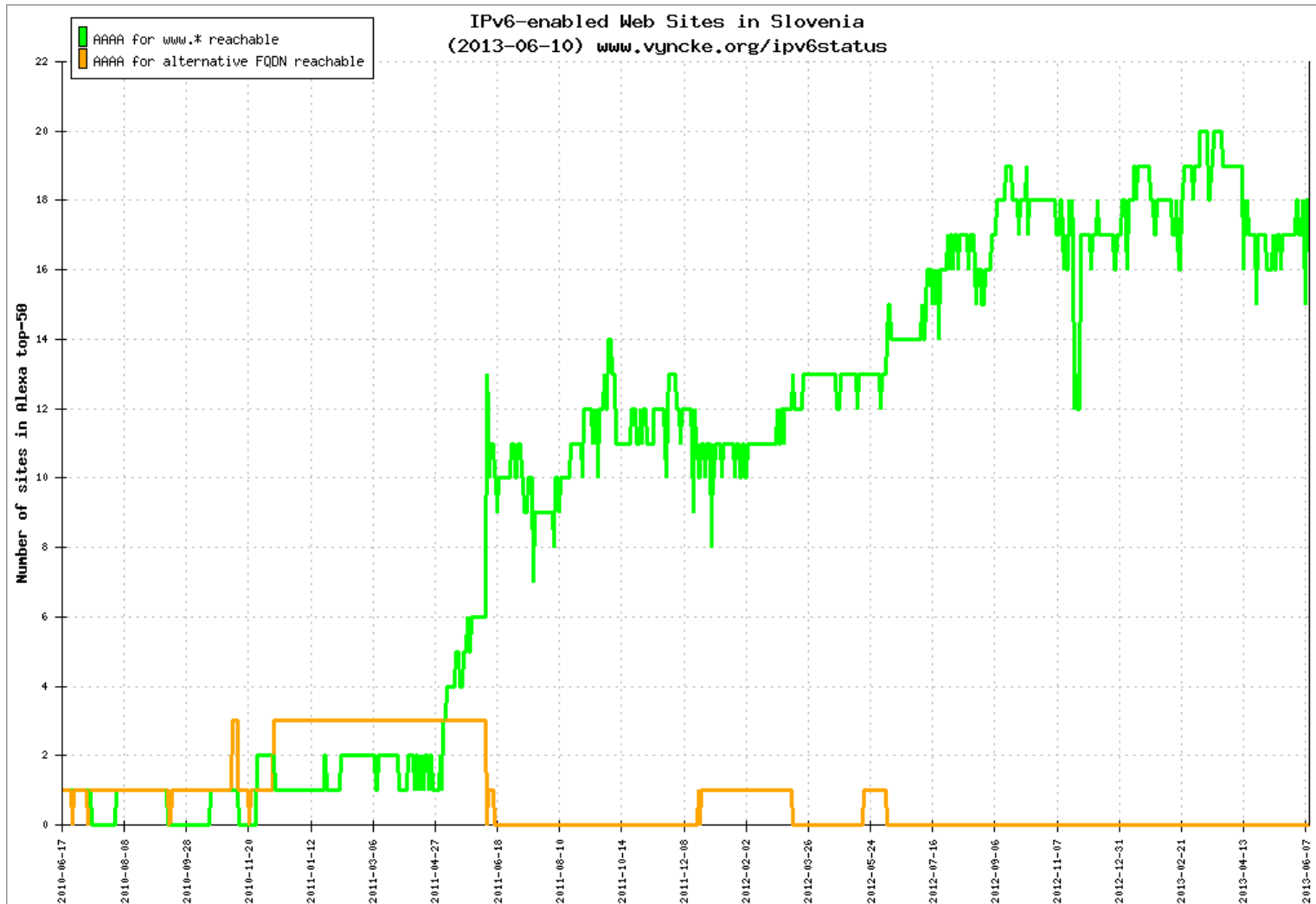
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Growth In % Of Networks Announcing IPv6

IPV6-ENABLED **INTERNET NETWORKS** BY REGION

This graph shows the percentage of networks (ASes) that announce an IPv6 prefix for RIR regions, according to RIPE NCC as of 30 April 2013.

AMERICAS (ARIN)
12.27%

EUROPE AND MIDDLE EAST (RIPE NCC)
17.99%

ASIA PACIFIC (APNIC)
19.72

AFRICA (AFRINIC)
14.4%

LATIN AMERICAN (LACNIC)
15.35%

PERCENTAGE OF NETWORKS

10   12   14   16   18   20

www.worldipv6launch.org/infographic/

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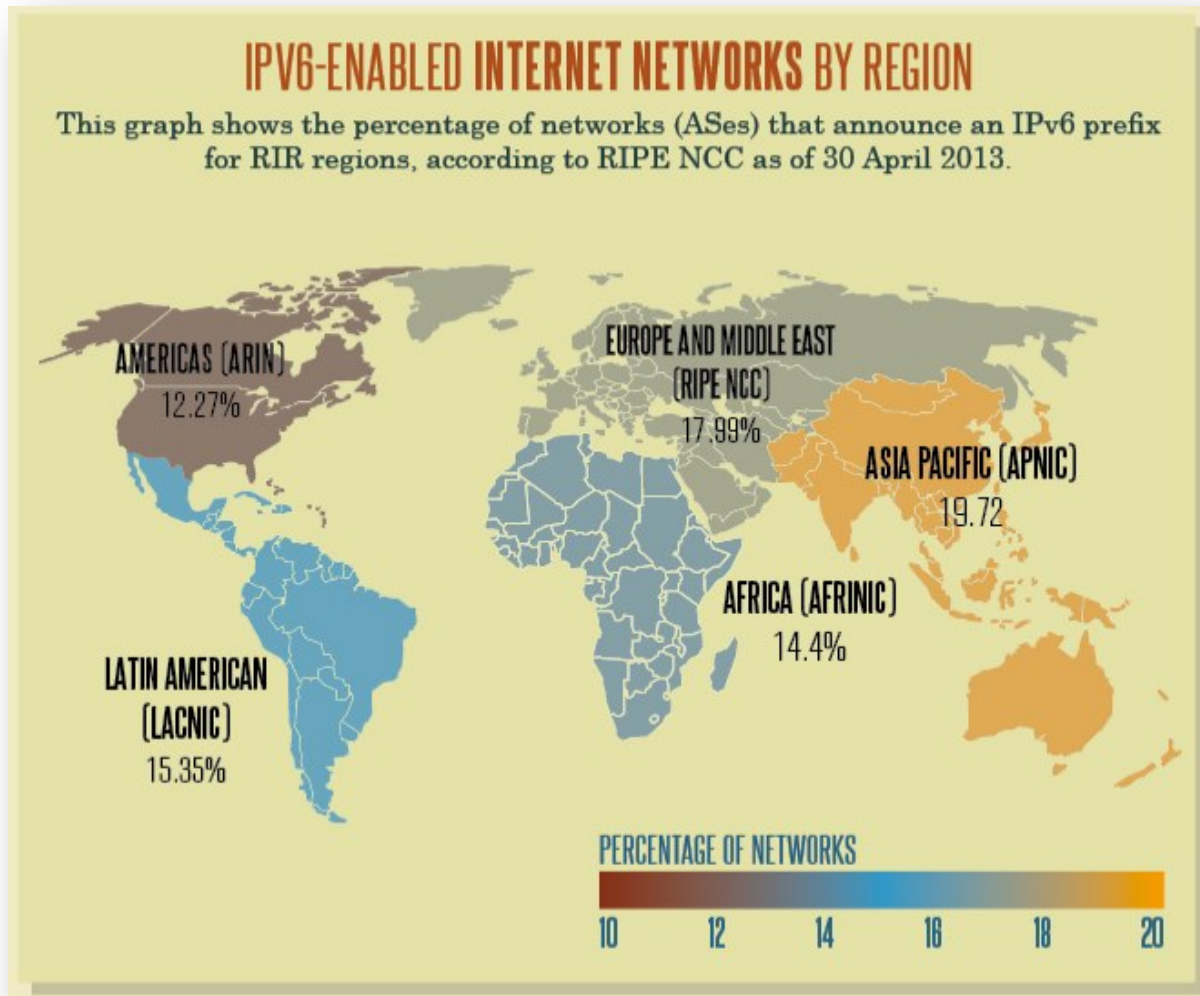
Strong Momentum
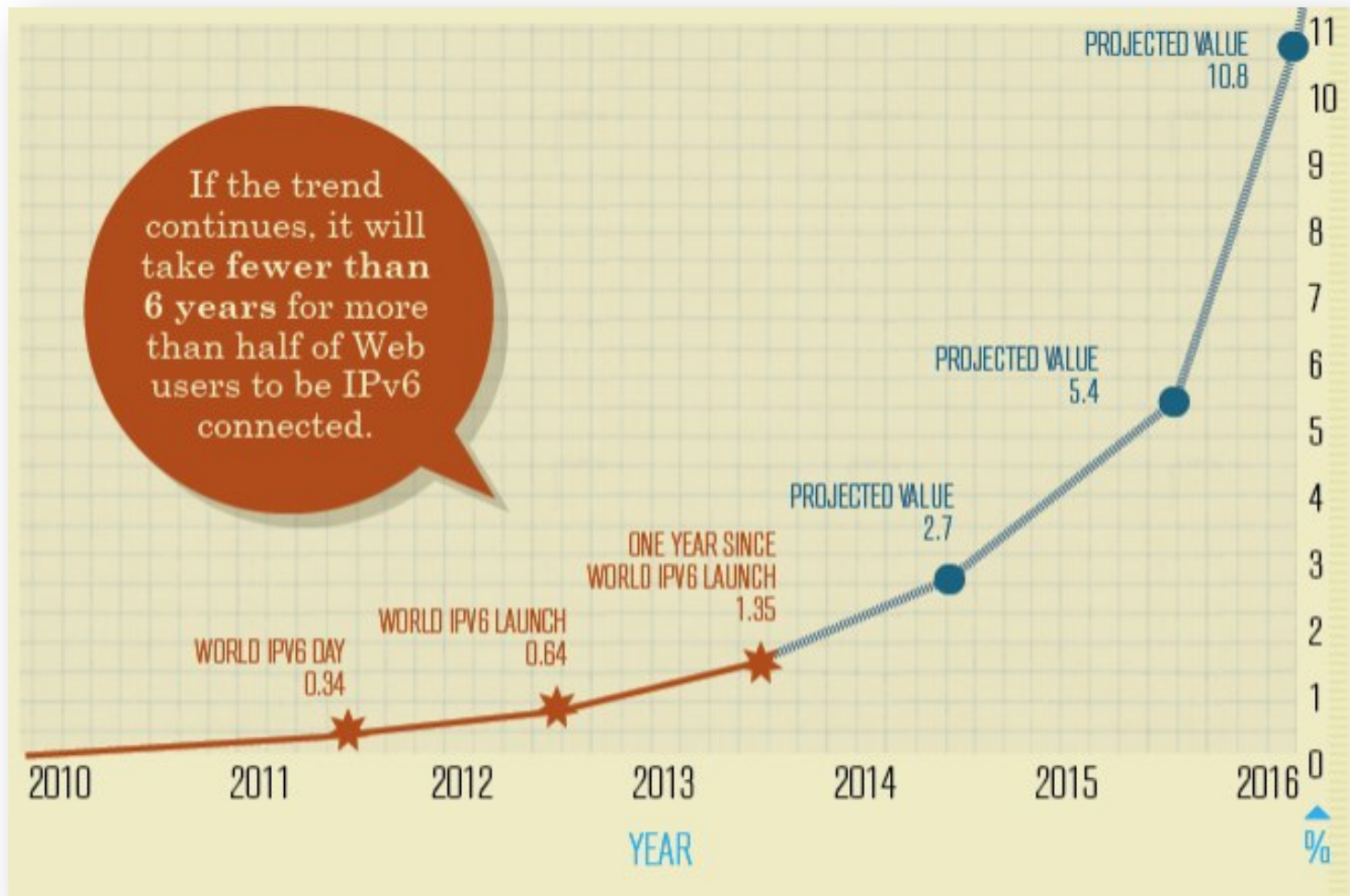
www.worldipv6launch.org/infographic/

World IPv6 Launch: Access Networks

Who?

- ATT, Comcast, Free, Internode, KDDI, Time Warner Cable, and XS4ALL initially

- 69 networks achieved a measurable deployment with an average of at least 0.1% by 6 June 2012

- *110 networks* now reporting measurements

- This includes deployments in regions around the world with significant new deployments in Europe (DT and Swisscom), South America (Telefonica del Peru), and Asia (Softbank and StarHub)

World IPv6 Launch Measurements

Network operator measurements, 22nd May 2013 ([notes](#))

Show [25 ‡] entries   Search: [   ]

Participating Network	ASN(s)	IPv6 deployment
ATT	6389, 7018, 7132	9.26%
KDDI	2516	8.64%
Free	12322	18.11%
Verizon Wireless	6167, 22394	30.68%
RCS & RDS	8708	16.72%
Comcast	7015, 7016, 7725, 7922, 11025, 13367, 13385, 20214, 21508, 22258, 33287, 33489, 33490, 33491, 33650, 33651, 33652, 33653, 33654, 33655, 33656, 33657, 33659, 33660, 33661, 33662, 33664, 33665, 33666, 33667, 33668, 36733	1.69%
Deutsche Telekom AG	3320	3.65%
Swisscom	3303	14.88%
SoftBank BB	17676	0.93%
VOO	12392	22.78%
Telefonica del Peru	6147	1.77%
Chubu Telecommunications	18126	14.52%
XS4ALL	3265	15.43%

www.worldipv6launch.org/measurements/

Note: This shows the % of IPv6 traffic seen from these networks by Google, Facebook and Yahoo!

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www.internetsociety.org/deploy360/

World IPv6 Launch Measurements (sorted)

Network operator measurements, 22nd May 2013 ([notes](#))

Show [25 ▾] entries   Search: [_____]

Participating Network ⇕	ASN(s) ⇕	IPv6 deployment ▾
Virginia Tech	1312	51.81%
SPAWAR	22	43.28%
Rensselaer Polytechnic Institute	91	42.73%
NetAssist	29632	41.29%
DreamHost	26347	40.22%
Verizon Wireless	6167, 22394	30.68%
Hurricane Electric	6939	29.57%
Leibniz Supercomputing Centre	12816	28.69%
DegNet GmbH	20902	28.55%
Marist College	6124	26.82%
Louisiana State University	2055	26.39%

www.worldipv6launch.org/measurements/

Note: This shows the % of IPv6 traffic seen from these networks by Google, Facebook and Yahoo!

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Mobile IPv6 – LTE

Verizon Wireless IPv6 Deployment

www.internetsociety.org/blog/tech-matters

Note: This shows the % of IPv6 traffic seen from this network by Google, Facebook and Yahoo!

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Swisscom Surges

Swisscom IPv6 Deployment
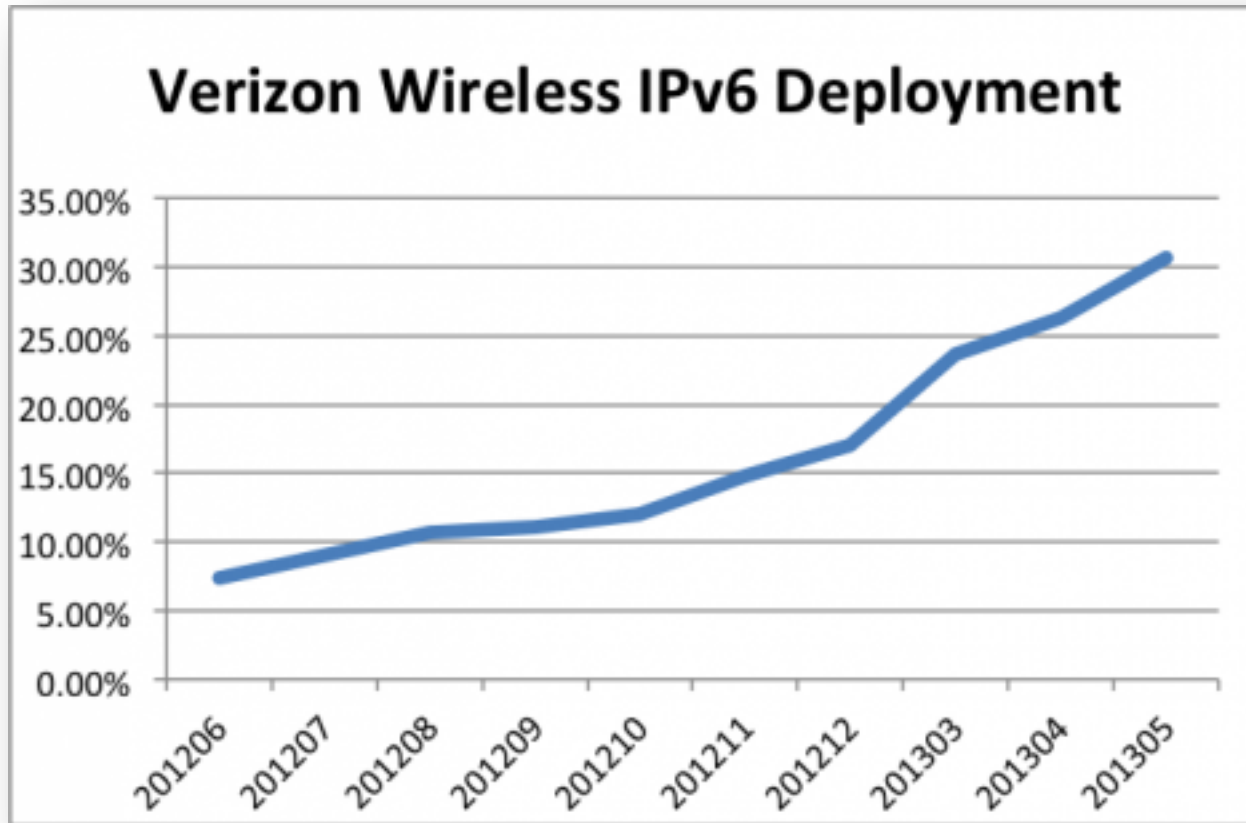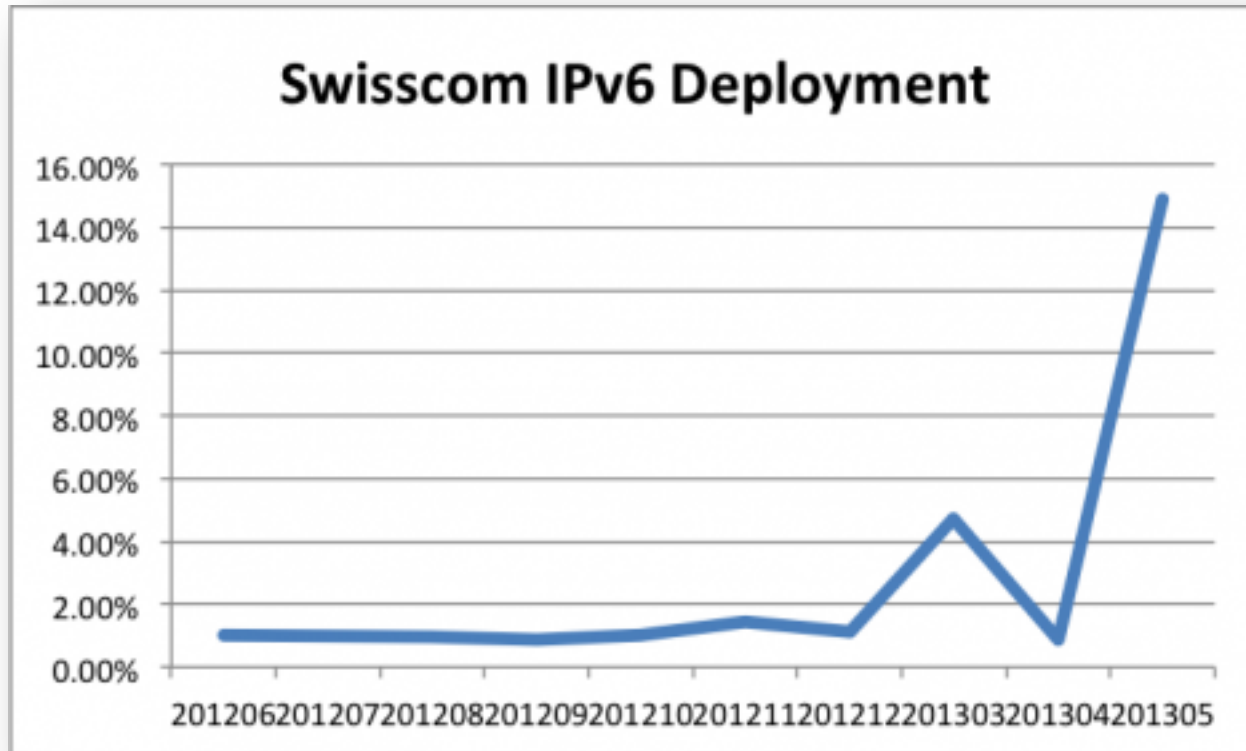
www.internetsociety.org/blog/tech-matters

Note: This shows the % of IPv6 traffic seen from this network by Google, Facebook and Yahoo!

World IPv6 Launch: Home Router Vendors

Who?

- Cisco and D-Link initially
- Now 10 vendors - 8 other home router vendors joined
- See: **www.iol.unh.edu/services/testing/hnc/cerouter.php**

IPv6 is part of Regular Business now

- Majority of products shipping with IPv6 on by default

- No user configuration is required to use IPv6

- V6 interoperability verified by UNH-IOL

- Great start - much work remains to be done for all sorts of consumer devices

IPv6 Home Routers

IPv6 CE Router Tested List

The following routers have passed IPv6 testing and provide a high level of confidence operating in an IPv6 environment.

Company	Product	Product Version	Test Scenario Version	Date Listed
Actiontec	MI424WR	40.99.2.4	1.0.0.b6	11/9/11
Broadcom	BCM 93380 WVG	5.5.6	1.0.0.b6	11/9/11
Broadcom	BCM 93383 WVG	5.5.7	1.0.0.b9	6/5/12
Cisco Systems	Linksys E4200v2 and EA4500	Firmware 2.0.37	1.0.0.b8	2/2/12
Cisco Systems	Linksys E4200	v1 Firmware 1.0.04	1.0.0.b8	1/12/12
D-Link	DIR 652	v1.00	1.0.0.b6	11/9/11
D-Link	DIR 825	v2.00	1.0.0.b6	11/9/11
D-Link	DIR 835	v1.02	1.0.0.b9	5/25/12
Lantiq	Broadband Router/Gateway/XRX100/XRX200/XRX300	UGW-5.x series Router/Gateway	1.0.0.b6	11/9/11
Motorola Mobility LLC	SGB6580	v6.3.0.0	1.0.0.b9	9/05/12
NDM Systems	ZyXEL Keenetic series	NDM Firmware v2.0	1.0.0.b9	5/17/12
NEC AccessTechnica	Aterm BL190HW	v2.1.12a (*)	1.0.0.b9	5/30/12
Yamaha	Giga Access VPN Router RTX1200	10.01.40 (build 10)	1.0.0.b9	6/4/12
ZyXEL	VMG1213	v1.32	1.0.0.b9	6/4/12

www.iol.unh.edu/services/testing/hnc/cerouter.php
List as of 5 June 2013

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World IPv6 Launch: Websites

Who?

- Facebook, Google, Microsoft Bing, and Yahoo! initially

- 2300 websites turned up IPv6 for 2013 launch – *MANY* more now!

- Big content available over IPv6 now: Google, Facebook, YouTube, Yahoo!, Bing, Wikipedia, Netflix, etc.

IPv6 is part of Regular Business now

- IPv6 is enabled on the main website

- No IPv6 specific URLs (www.ipv6.example.com) or mirror sites

- IPv6 enabled users use IPv6 without doing anything

- Over 10% of Alexa top 1,000 sites serve IPv6 now

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World IPv6 Launch - Impact

IPv6 is an integral part of the Internet now

- Major websites (Google, Facebook, Yahoo!, Wikipedia, Bing) are using IPv6 continuously

- ISPs continue to deploy IPv6 for end users

- Home router vendors are shipping with IPv6 enabled by default

IPv6 allows network operators to avoid costly workarounds to IPv4 address exhaustion (such as address sharing schemes involving Carrier Grade NAT (CGN))

- IPv4 is effectively gone in Asia-Pacific

- IPv4 is effectively gone in Europe

- IPv4 will soon be gone in N. America

World IPv6 Launch: What's next?

Measurements

- Google, Facebook, and Yahoo! continued to measure v6 traffic to their sites:

  – **www.worldipv6launch.org/measurements/**

- These measurements will continue through 2013. Each month we will summarize the results.

- If you are doing measurements that have a large footprint and would like to contribute please contact us.

- More measurement sites:

  – **www.internetsociety.org/deploy360/ipv6/statistics/**

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- **http://www.internetsociety.org/deploy360/ipv6/**

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Create Content
– Help us develop materials based on your experiences

Contact us: deploy360@isoc.org

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Thank You!

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