

Japan IPv6 Measurement

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NTT/IPv6 Promotion Council in Japan

IPv6 Readiness Measurement BoF

APNIC 43

28 February 2017

■ Networks

- Major three cellular carriers announced they would start full IPv6 service in 2017.
 - One of them has started their IPv6 service.
- Many fixed-line ISPs have started their commercial IPv6 service for both enterprise and consumer users.
 - Some ISPs have been migrating their existing IPv4 only users to dual stack environment.

■ Contents

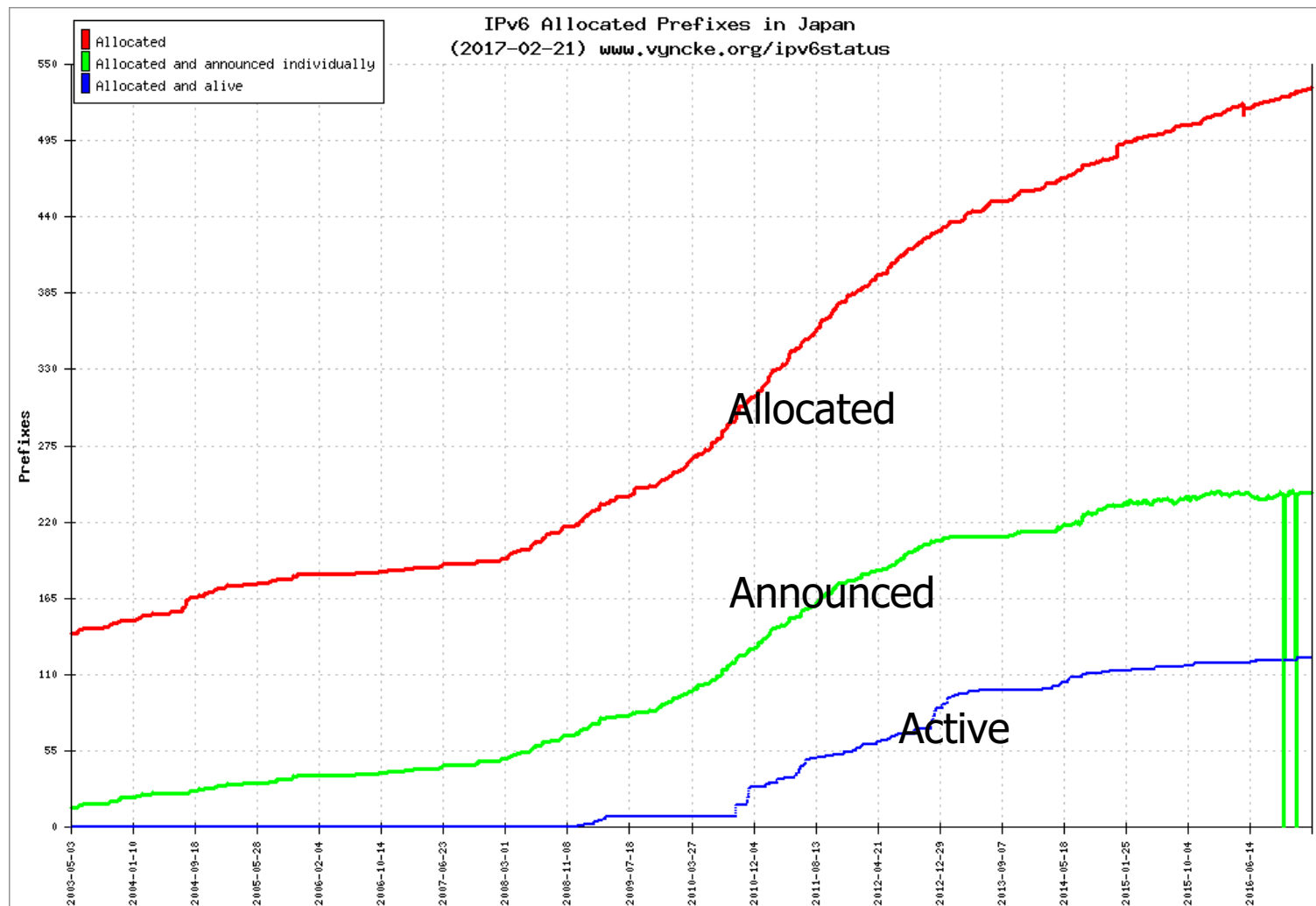
- IPv6 ready Government's services are increasing.
- Large contents providers do not support IPv6 yet.
 - Start considering to implement.

IPv6 readiness measurement in JP



- Core Network
 - IPv6 allocated prefixes
 - IPv6 penetration rate in Internet backbone
 - Number of IPv6 enabled of Transit AS in BGP routing tables.
- Access Network
 - IPv6 consumer service penetration rate
- User traffic
 - IPv6 traffic to Google servers
- Applications
 - IPv6 penetration rate : web servers
 - IPv6 servers in .jp domain
 - Government IPv6 services
- Products
 - IPv6 Ready logo products

IPv6 allocated prefixes in Japan



<http://www.vyncke.org/ipv6status/plotbgp.php?country=jp>

JPNIC address distribution trends

(# of PA)

(# of PI)

250

200

150

100

50

0

— Number of allocation (PA)
— Number of assignemnet (PI)

45

40

35

30

25

20

15

10

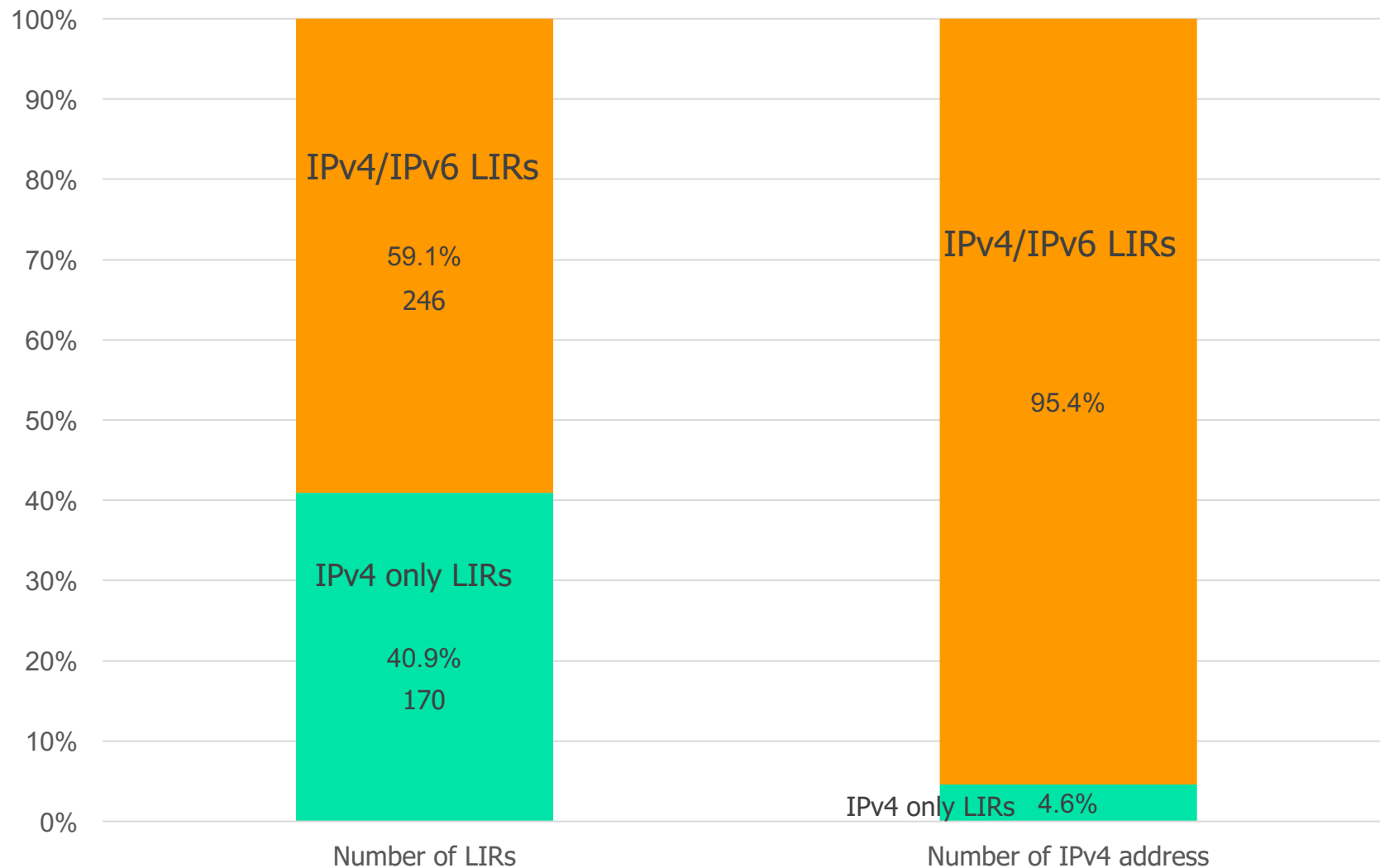
5

0

年 '01 '02 '03 '04 '05 '06 '07 '08 '09 '10 '11 '12 '13 '14 '15 '16 '17

(As of 31 Jan. 2017)

IPv6 Address distribution status in JPNIC

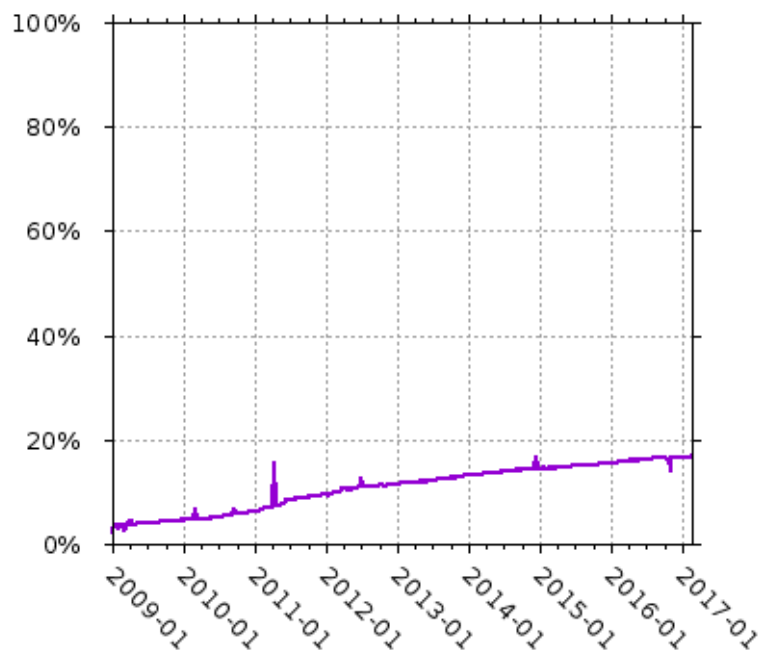


IPv6 penetration rate in Internet backbone



The number of IPv6 enabled Transit AS in BGP routing tables (as of 21st February 2017).

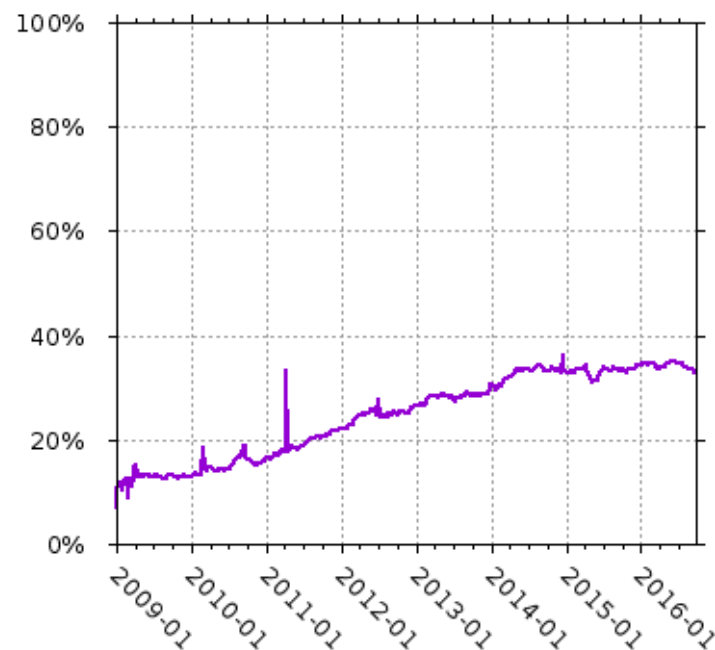
IPv6 Enabled Network in the World (weekly)



Copyright © INTEC Inc.

Ratio of IPv6 enabled transit AS

IPv6 Enabled Network in Japan (weekly)



Copyright © INTEC Inc.

Ratio of IPv6 enabled transit AS

http://v6pc.jp/jp/spread/ipv6spread_02.phtml

IPv6 consumer service penetration rate in Japan

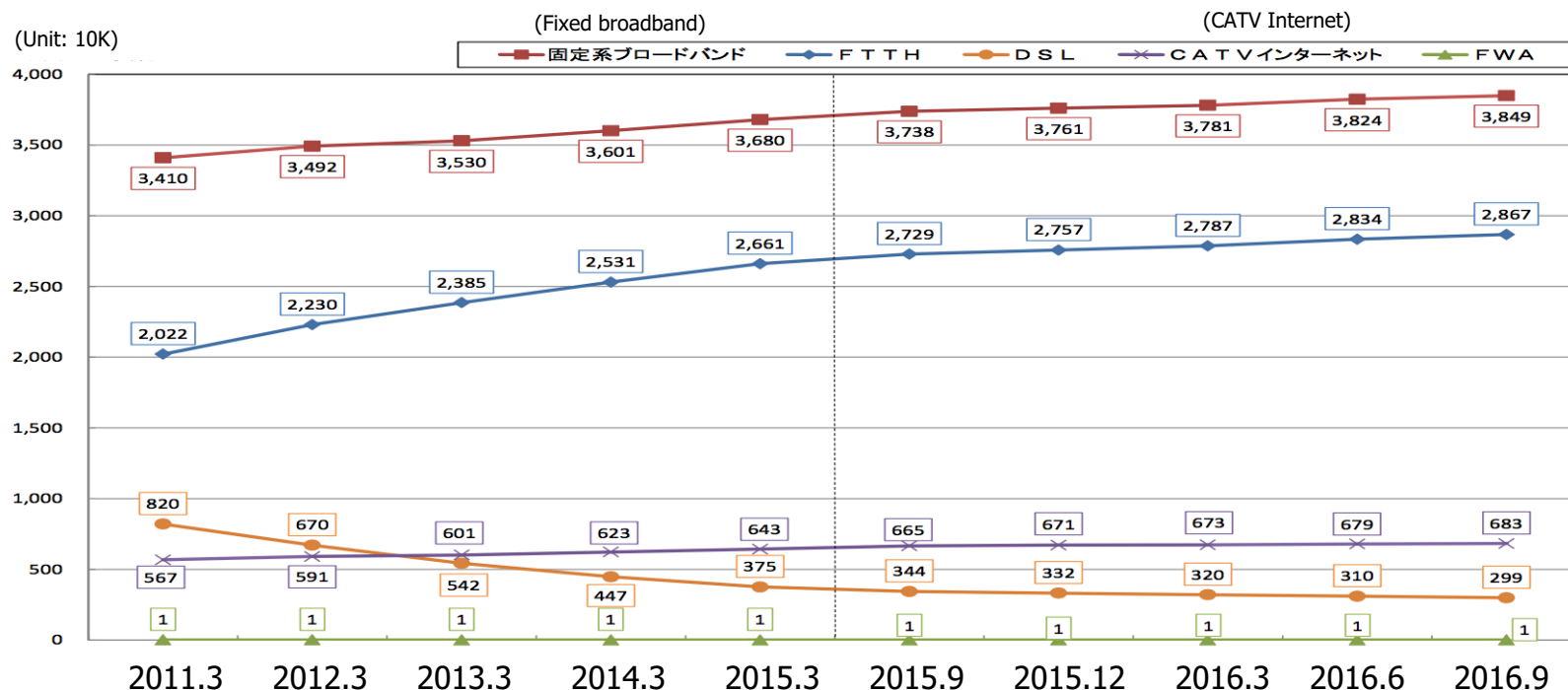


- Target services:
 - ISPs using NTT East & West Internet access platform (Flets)
 - For reference:
 - KDDI au Hikari (KDDI)
 - Chubu Telecommunication co, Inc. (CTC)
- % of IPv6 users in above services.
- These statistics has been collected and announced by IPv6 Promotion Council.

Fixed Internet access service in Japan

- Fiber service is about 74% of the total.

Number of subscribers in fixed broadband access

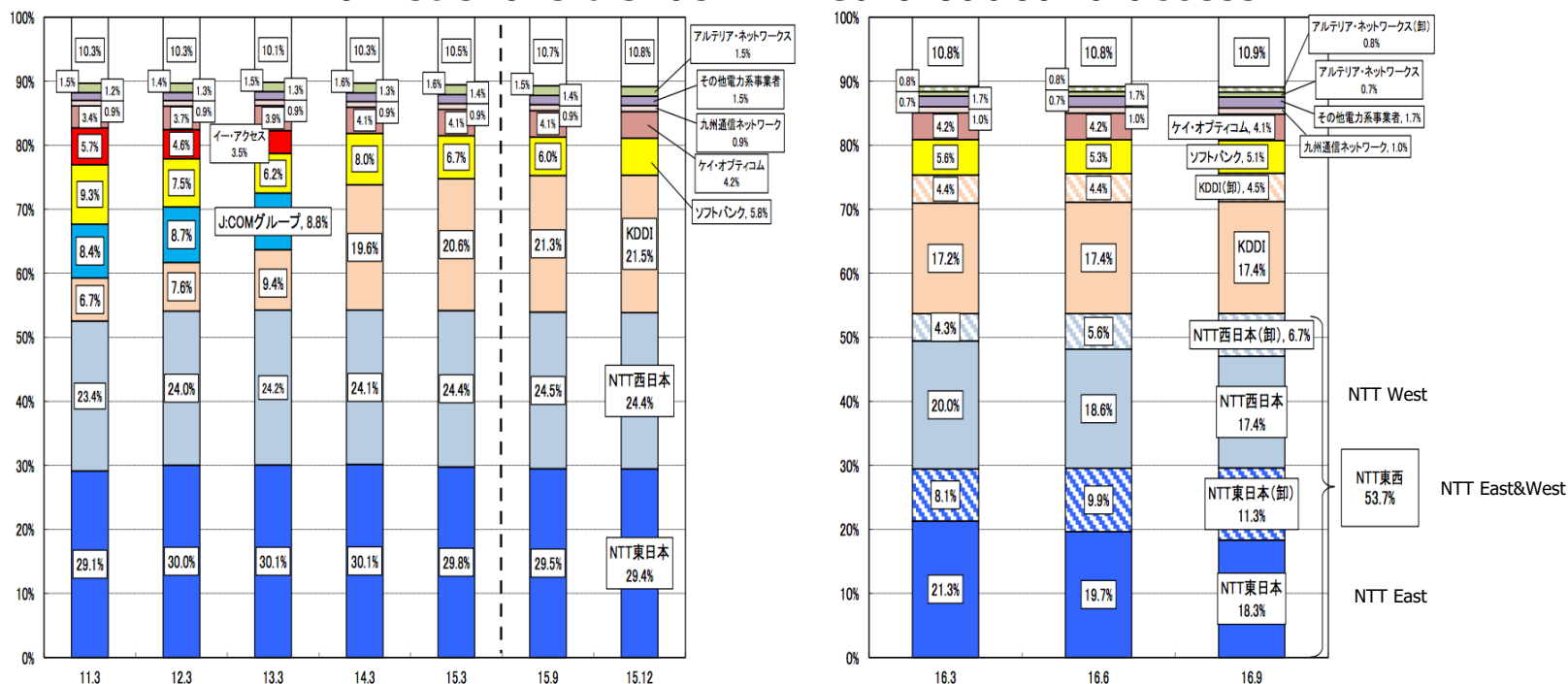


http://www.soumu.go.jp/main_sosiki/joho_tsusin/kyousouhyouka/data.html

Fiber access line service share in Japan

- Over 50% ISPs use NTT East & West Internet access platform (called 'Flets')
 - NTT's access platform supports IPoE and PPPoE to access IPv6 Internet

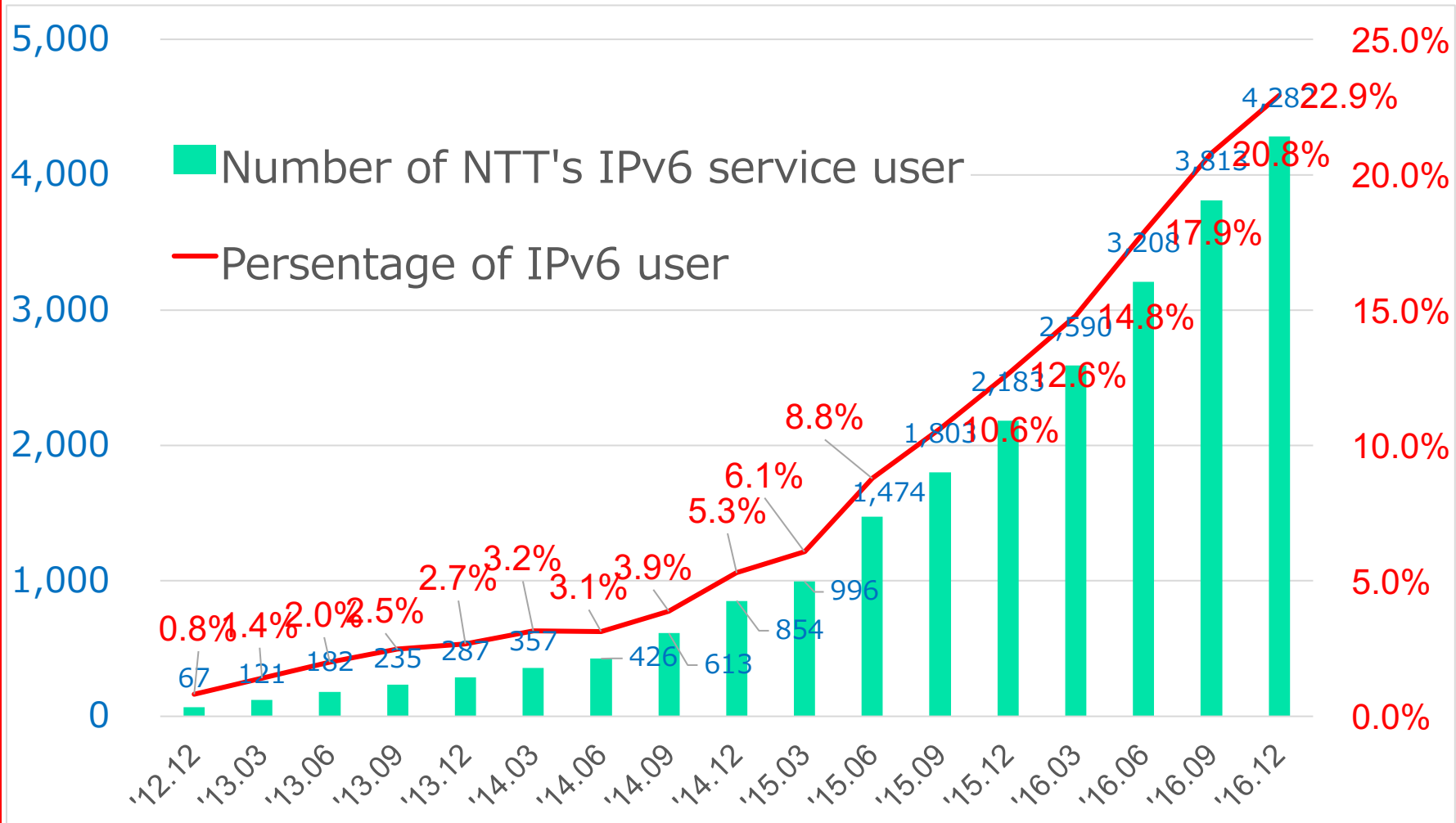
FTTH market share trends in fixed broadband access



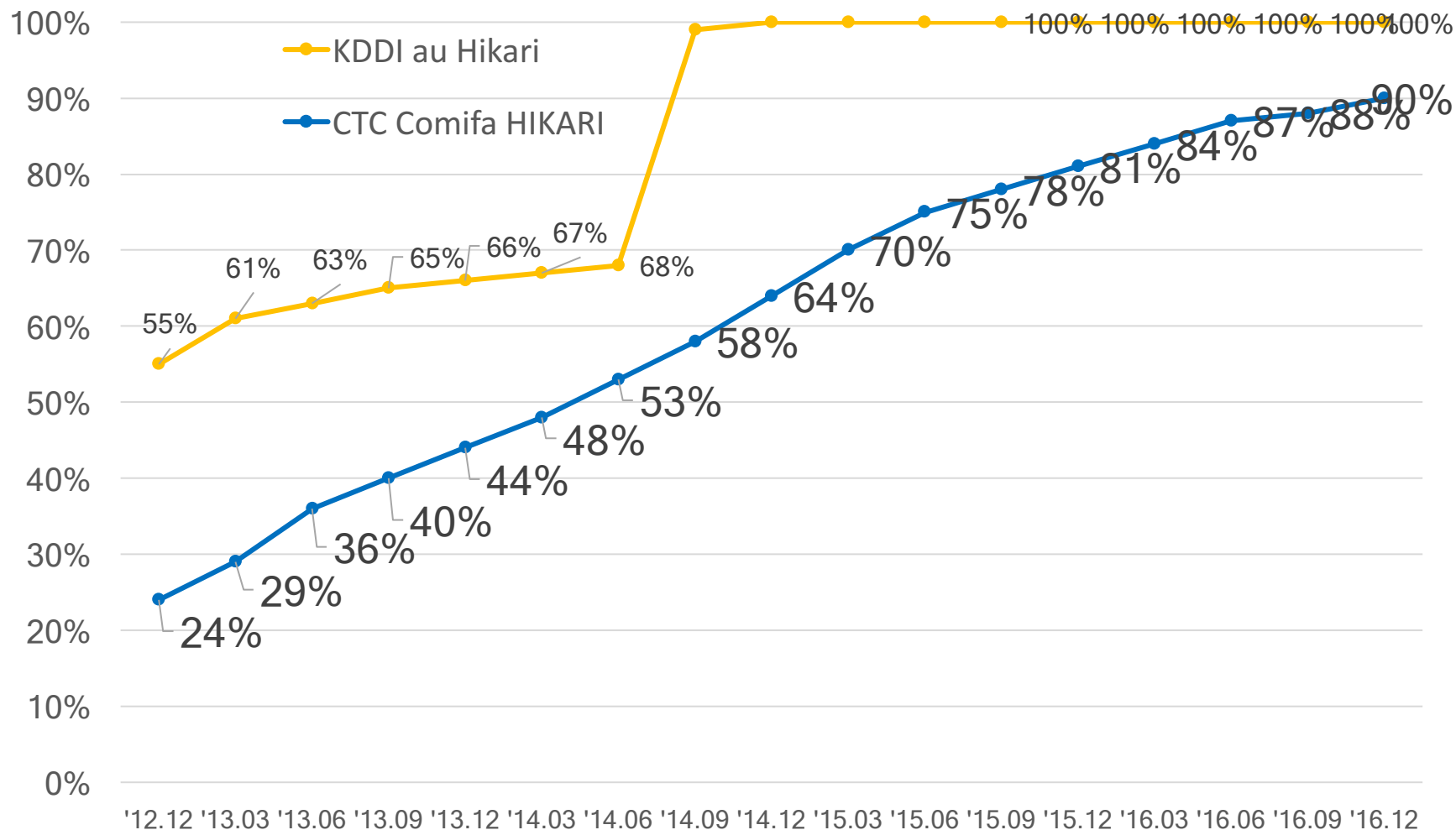
From http://www.soumu.go.jp/main_sosiki/joho_tsusin/kyousouhyouka/data.html

IPv6 consumer service penetration rate in Japan - NTT's service platform users-

Unit: 1K

Produced from: http://v6pc.jp/jp/spread/ipv6spread_03.phtml

IPv6 consumer service penetration rate in Japan -KDDI and CTC-



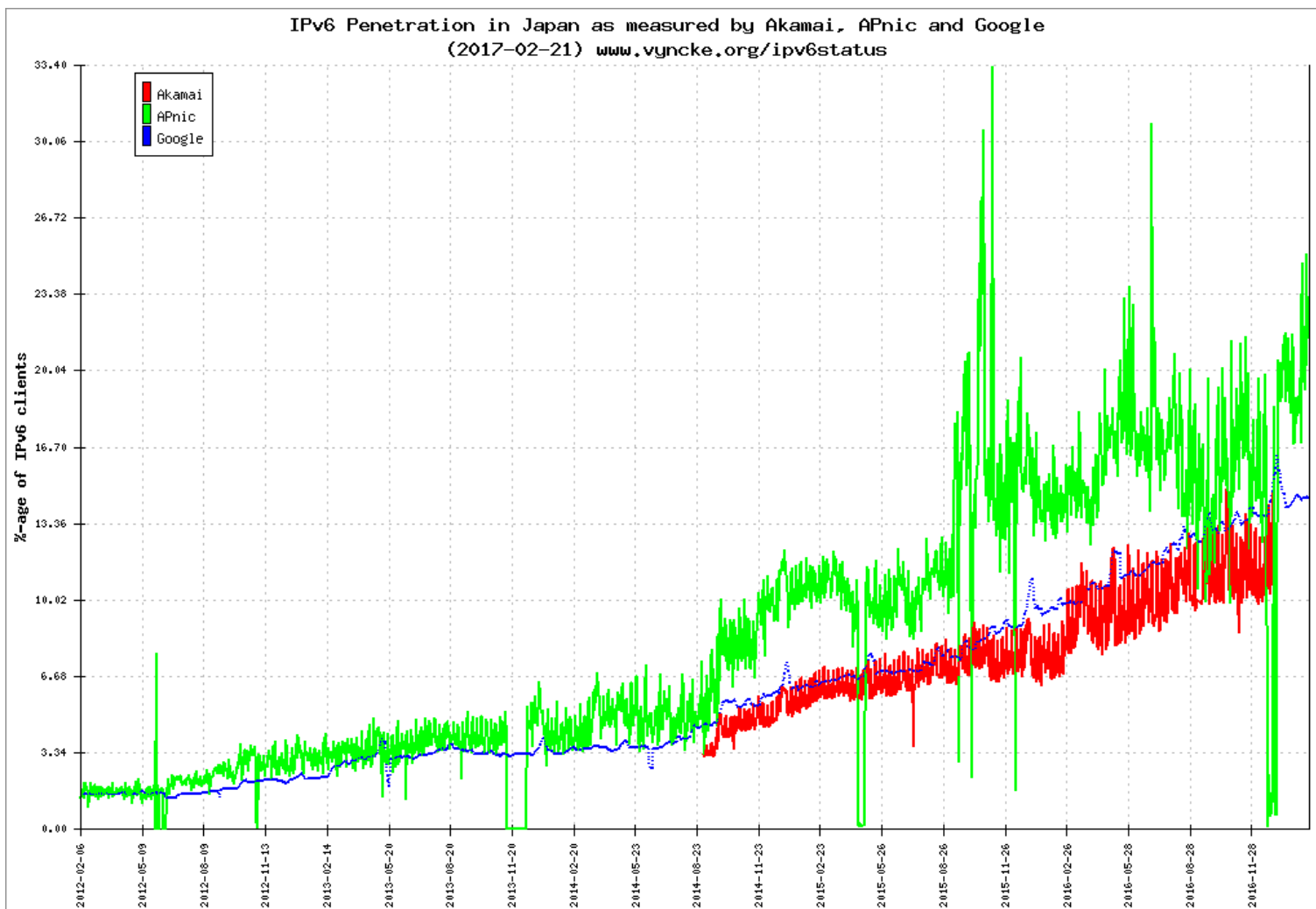
IPv6 traffic to Google servers



Rank	Name	ASNs	IPv6
1	KDDI	2516	32.79%
2	SoftBank BB	17676	23.23%
3	OCN / plala	4713	8.27%
4	So-net	2527	33.88%
5	ctc	18126	63.37%
6	TOKAI	10010	25.88%
7	IJJ	2497	10.28%
8	@nifty	2510	8.65%
9	BIGLOBE	2518	2.43%
10	ITSCOM	9365	9.71%
11	Sony Global Solutions	9619	99.55%
12	bit-drive	9600	12.17%
13	star cat	17529	9.00%
14	K-Opticom	17511	0.30%
15	SINET	2907	1.86%
16	SuperCSI	2506	41.82%
17	Keio University	38635	50.32%
18	VECTANT	2519	0.42%
19	TDNC	9354	1.69%
20	NTT docomo	9605	0.02%

- This table shows the amount of IPv6 traffic from the major networks (ASNs) in Japan to Google.
- Absolute number of IPv6 traffic is ranked higher.
- Of the total number of access, right-most column shows the proportion of the IPv6 access.

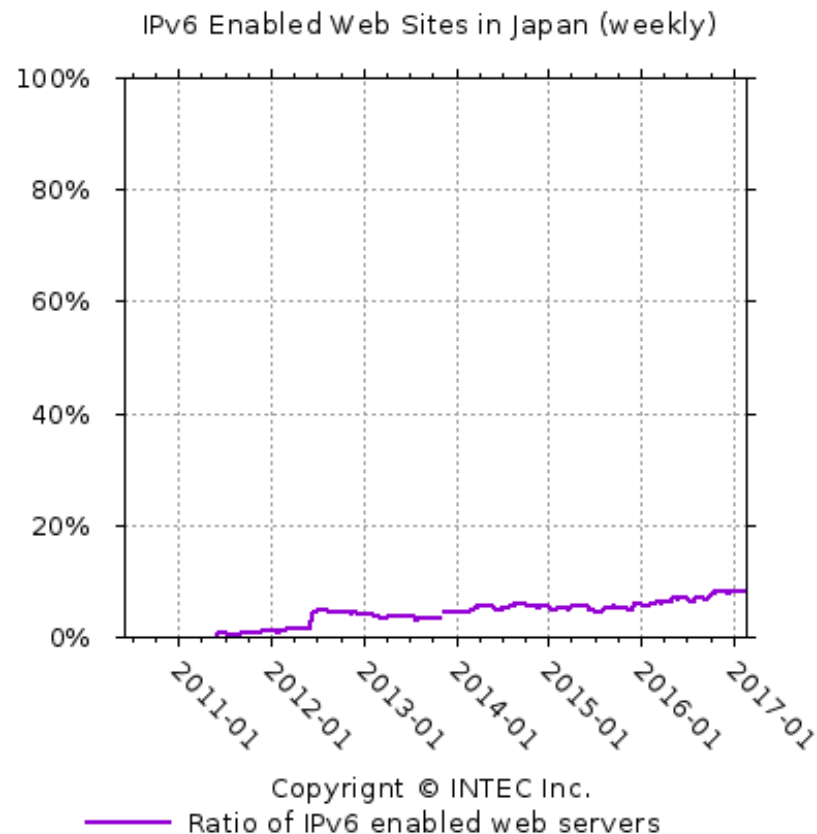
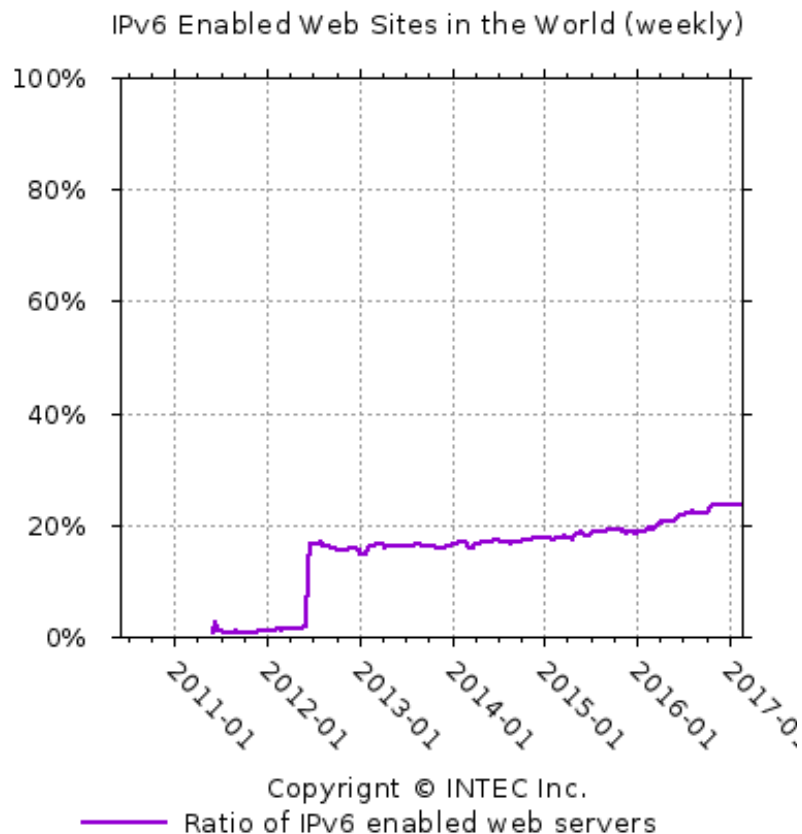
IPv6 Users penetration measured by Akamai, APNIC and Google



<https://www.vyncke.org/ipv6status/plotpenetration.php?country=jp>

IPv6 penetration rate : web servers

The number of IPv6 enabled site in the top 500 web sites which is published by Alexa Internet, Inc (as of 21st Feb. 2017).

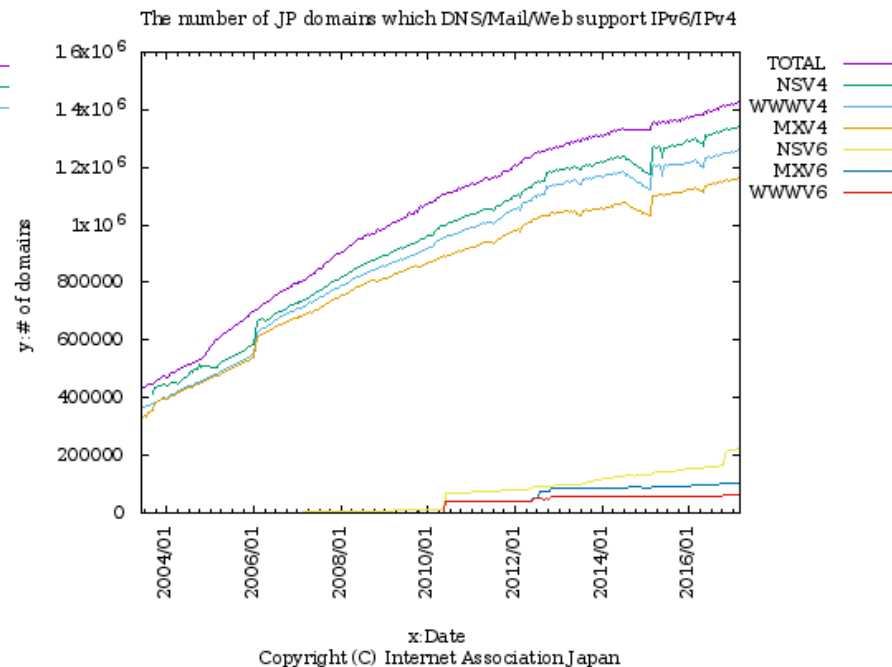
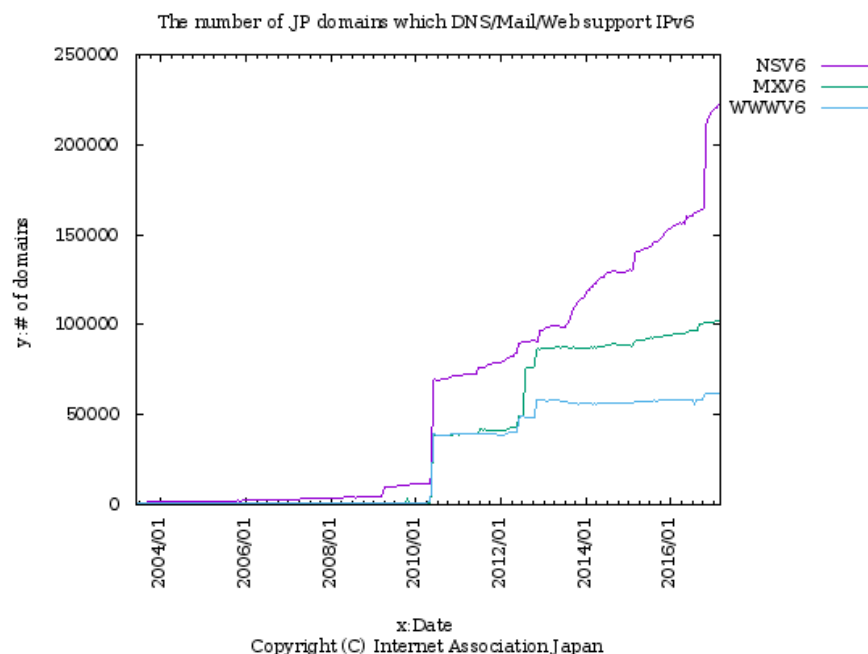


<http://www.inetcore.com/project/metrics/index.html.en>

IPv6 supported .jp domain servers

■ IPv6 supported .jp domain servers

as of 21st Feb. 2017



<http://v6metric.jp/html/st04/04.php>

<http://v6metric.jp/html/st04/02.php>

IPv6 services in Governments

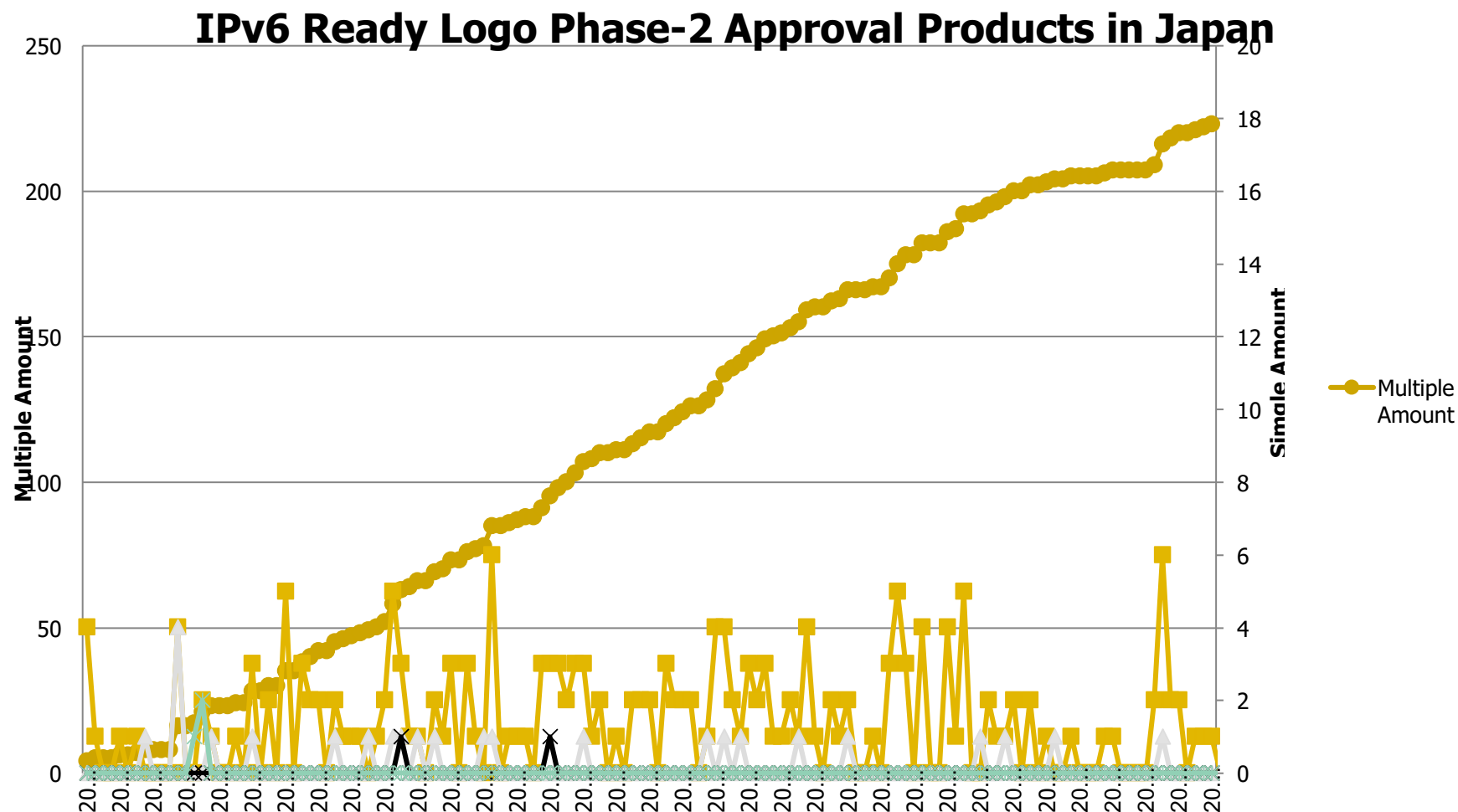


- Japanese governments' service has been implementing IPv6.
 - In 34 servers:

	2013/11/29	2015/9/2	2016/2/15	2016/9/27	2017/2/21
Web	32%	50%	59%	59%	61%
Mail	18%	26%	26%	26%	32%
DNS	62%	76%	94%	94%	94%

<http://www.attn.jp/ipv6status/jp/go/>

Number of products with IPv6 Ready Logo (JP)



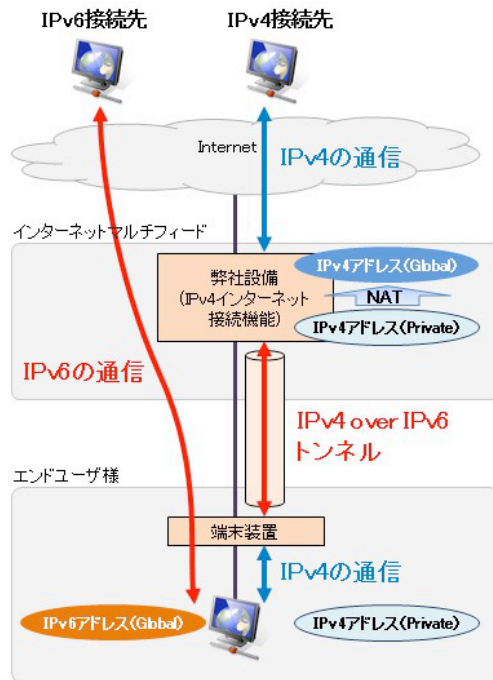
as of 15th Feb. 2017

- Cost of dual stack network management is so high.
 - Implementation of “IPv4 as a Service (IPv4aaS)” is ongoing world-widely.
 - IPv4aaS: Providing IPv4 Internet access service on IPv6 only network.
 - Some U.S. cellular carriers have implemented IPv4aaS, and some U.S. contents providers consider to migrate their internal network to IPv6 only.

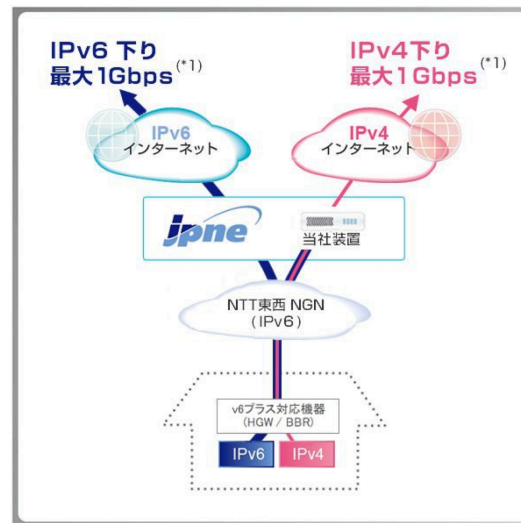
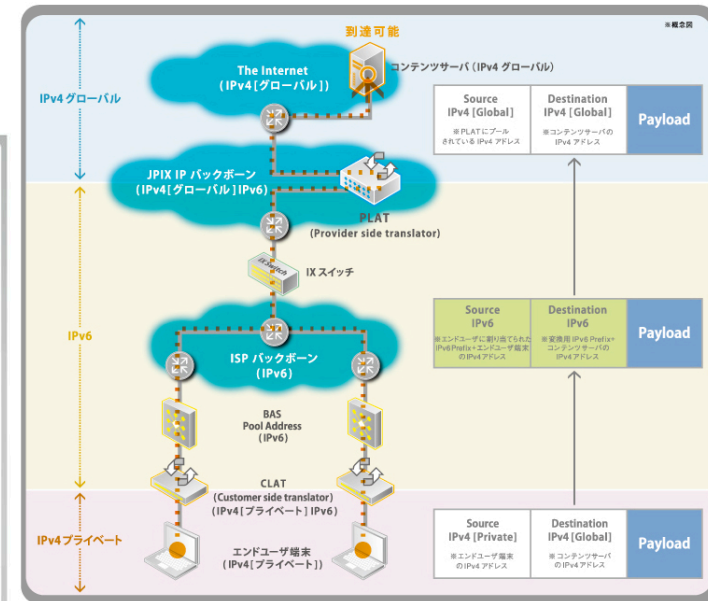
IPv4aaS in Japan

- Some IPv4aaS implementations in Japan

Transix: DS-Lite by IMF
<http://www.mfeed.ad.jp/transix>



IPv6v4 Exchange: 464XLAT by JPIX
<http://www.jpix.ad.jp/jp/service/ipv6v4.html>



v6Plus: MAP-E by JPNE
<http://www.jpne.co.jp/service/v6plus/>

(Trial)

Summary

- Major mobile carriers, NTT Docomo, KDDI and Softbank will start full IPv6 service in this year.
 - Softbank already started their IPv6 service.
- Many ISPs are IPv6 ready, and user migration from IPv4 only to dual stack environment is ongoing.
- Need to tackle to improve contents area:
 - Some big content providers start to consider to implement IPv6.

Questions?