IPv6 deployment Status in Japan

Tomohiro Fujisaki

HKNOG 3.0

NTT Network Technology Laboratories

Summary of IPv6 deployment status in Japan

Innovative R&D by NTT

Networks

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.

A few cellular carriers provide IPv6 connectivity.

- Major three cellular carriers announced they will start full IPv6 service in 2017.

Contents

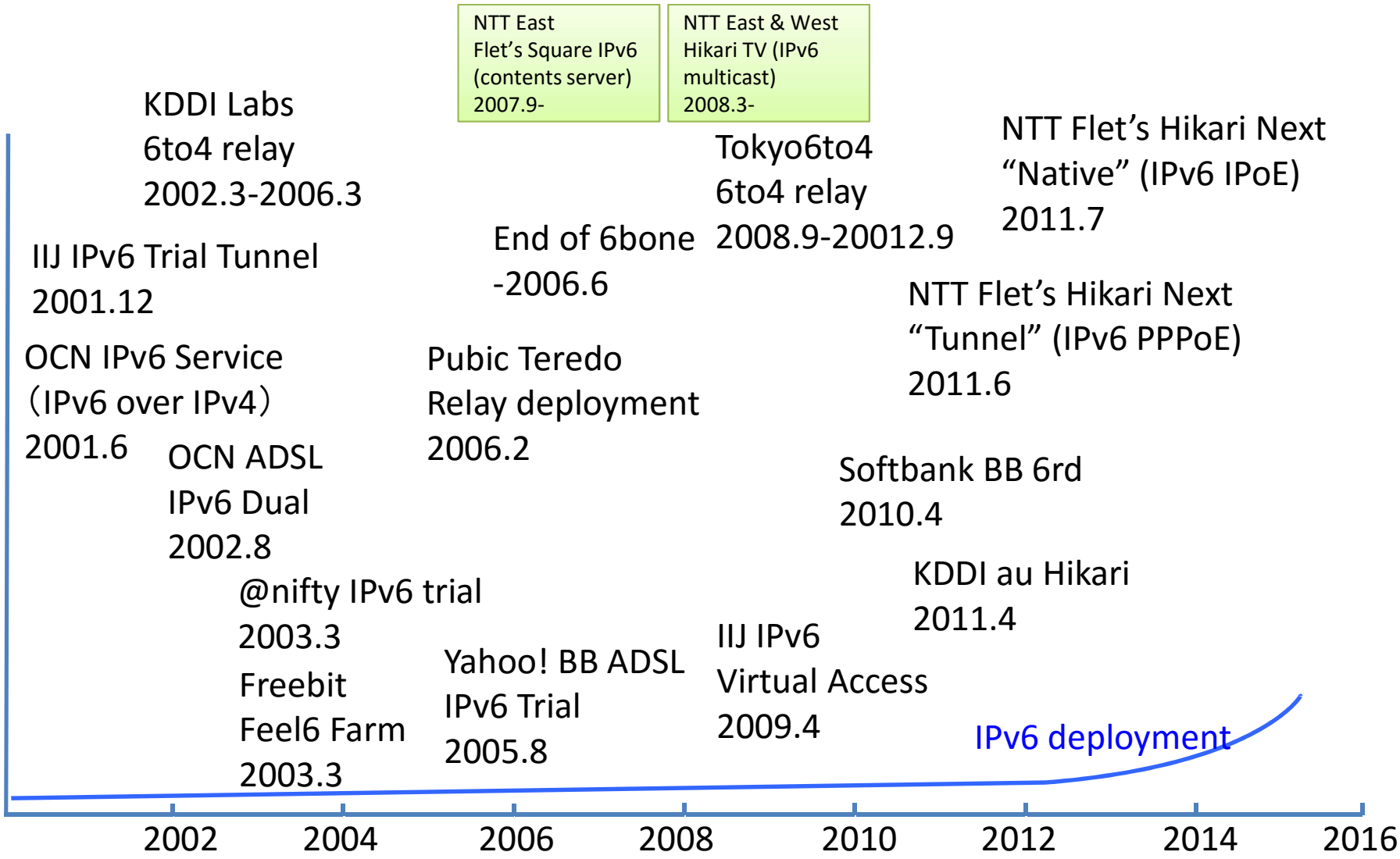
IPv6 ready Government's services are increasing.

Large contents provides do not support IPv6 yet.

NTT ipv6 IPv6 Promotion Council

IPv6 Service in Japan & NTT

History of IPv6 service for residential users in Japan



IPv6 Deployment Status in Japan

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.

Applications
- IPv6 penetration rate : web servers
- IPv6 servers in .jp domain

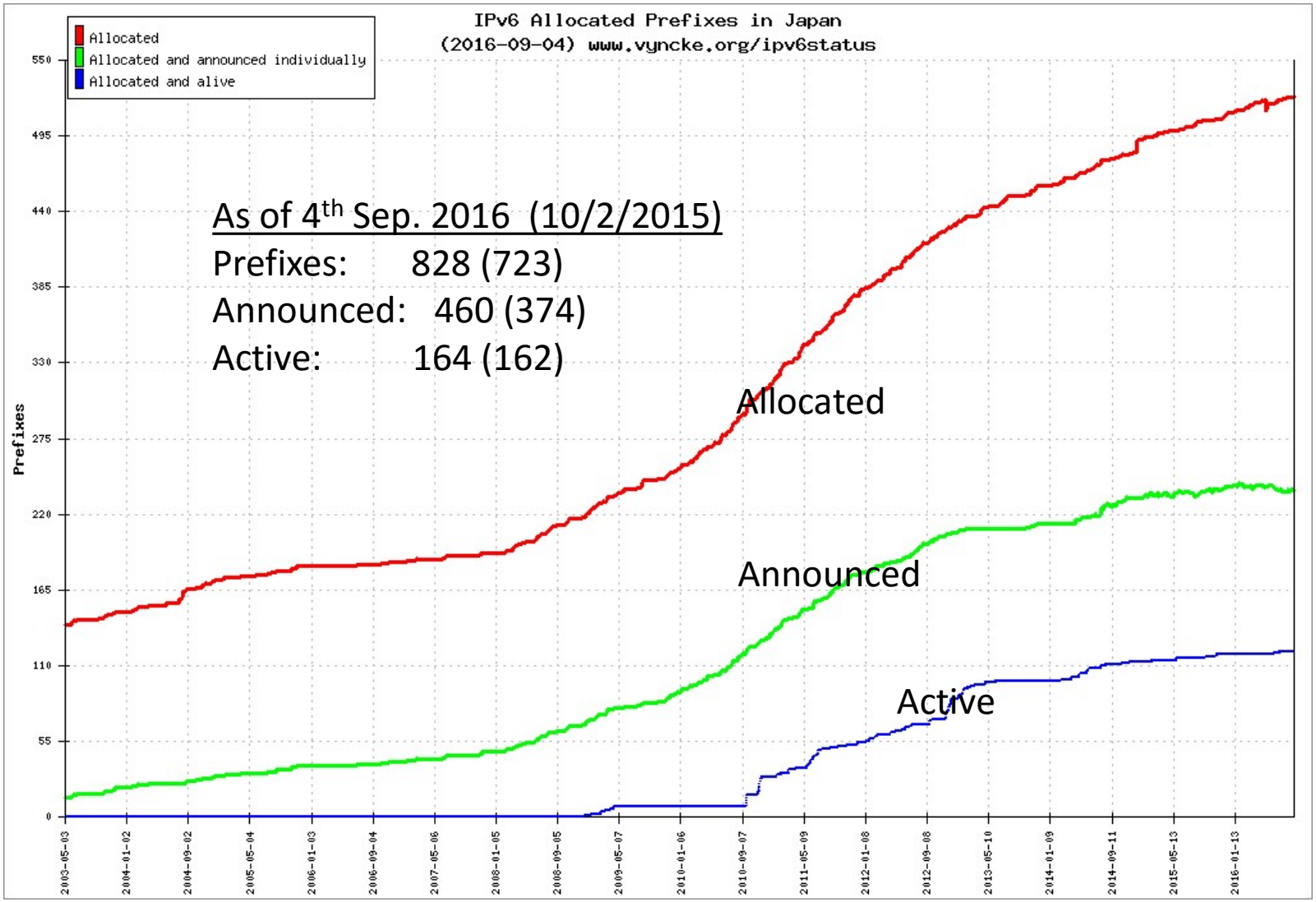
Access Network
- IPv6 consumer service penetration rate

Users
- IPv6 traffic to Google servers

Products
- IPv6 Ready logo products

Government IPv6 service

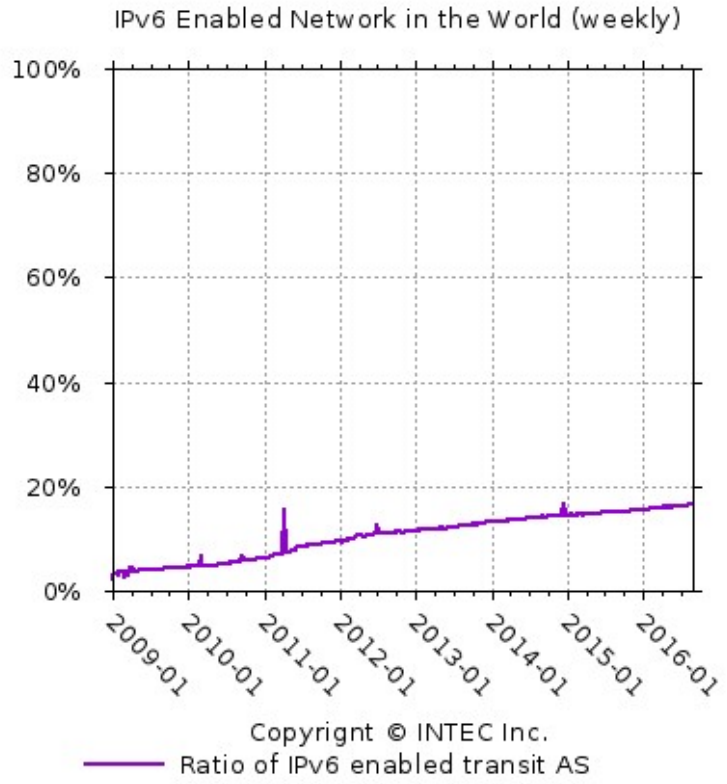
IPv6 allocated prefixes in Japan

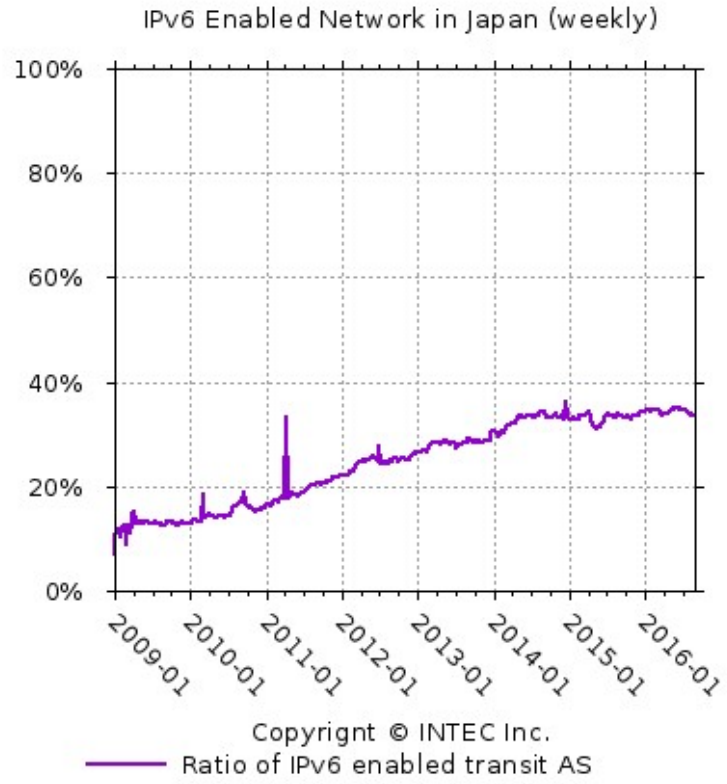


http://www.vyncke.org/ipv6status/plotbgp.php?country=jp

IPv6 penetration rate in Internet backbone

The number of IPv6 enabled Transit AS in BGP routing tables (as of 4th September 2016).





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)

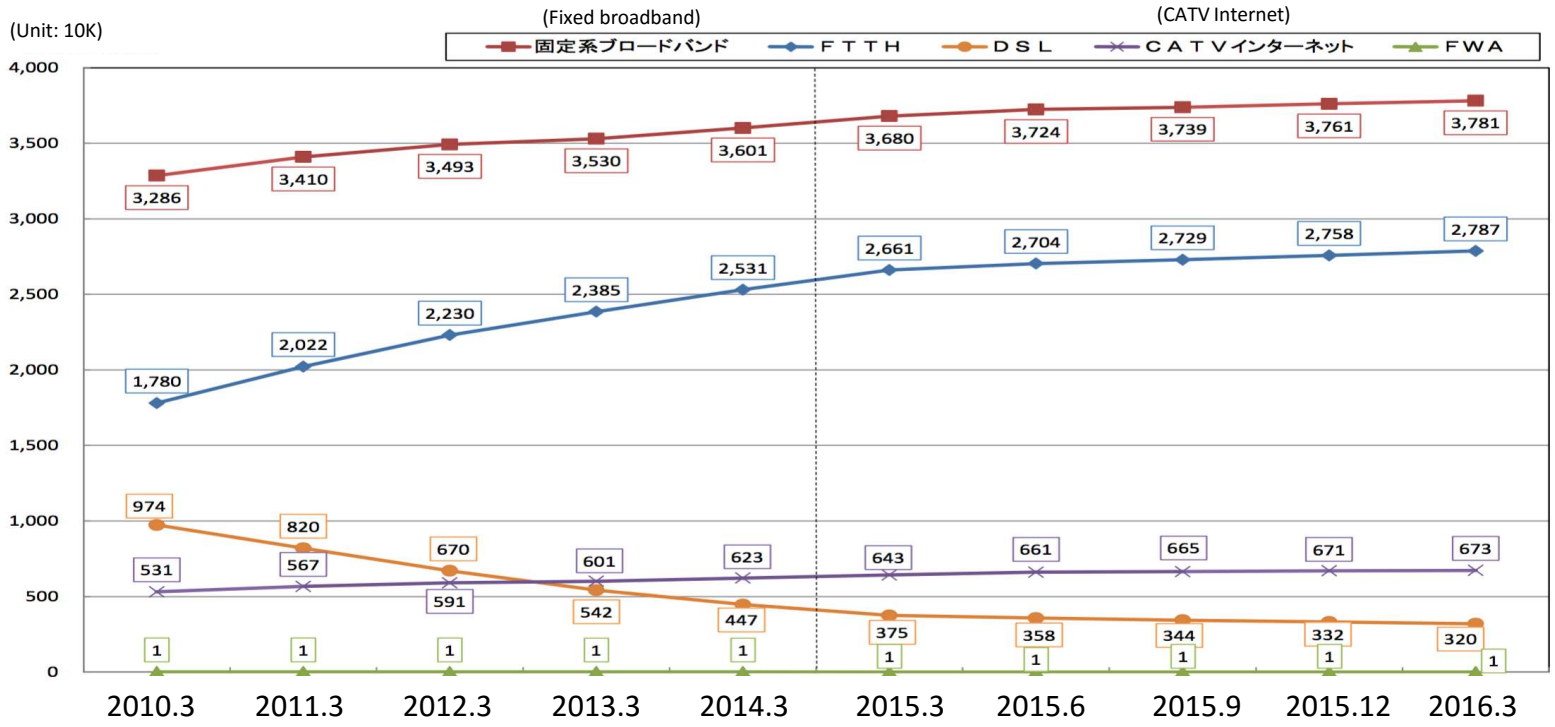
% of IPv6 users in above services.

Fixed Internet access service in Japan

Innovative R&D by NTT

Fiber service is about 73% of the total.

Number of subscribers in fixed broadband access



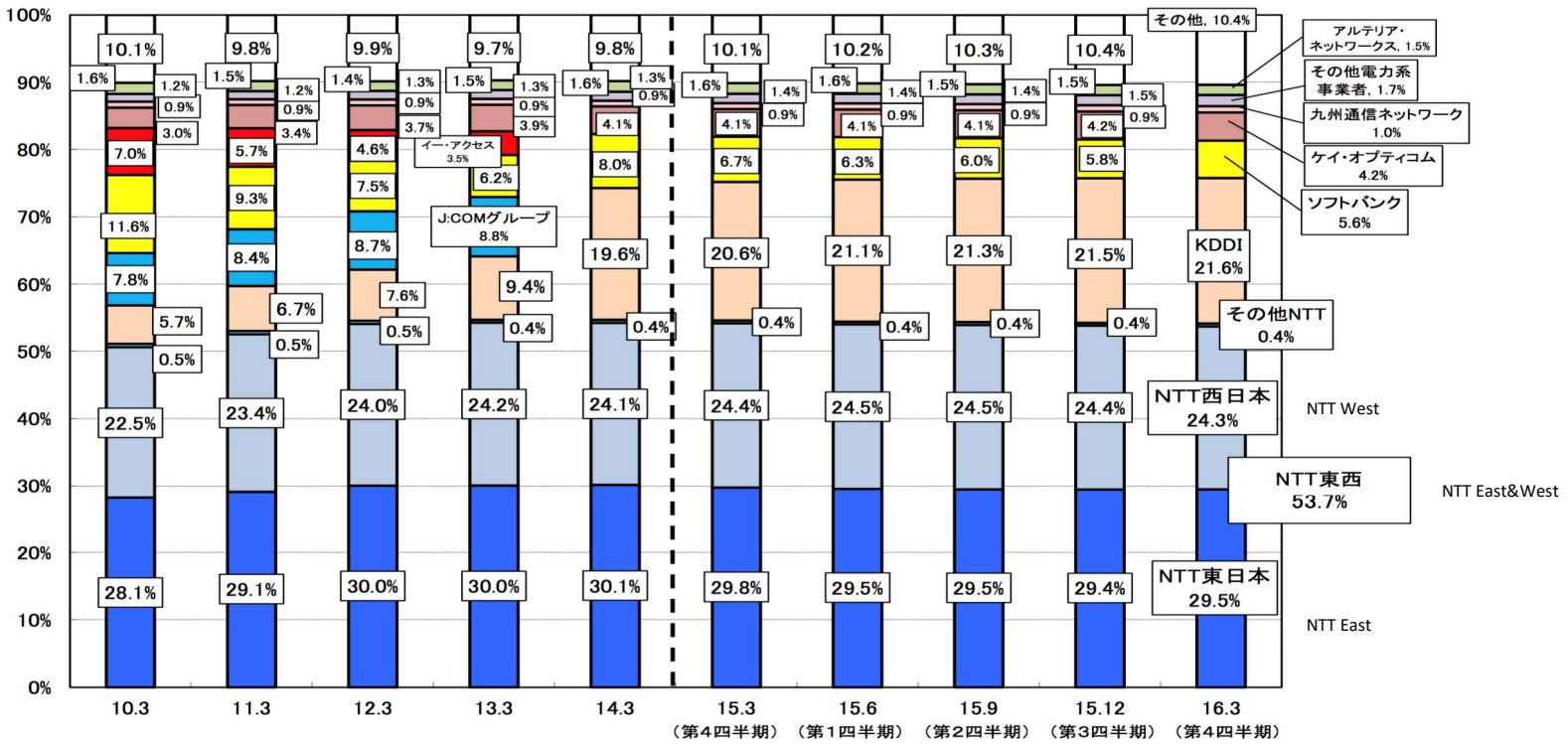
http://www.soumu.go.jp/main_sosiki/joho_tsusin/kyousouhyouka/data.html

NTT ipv6 IPv6 Promotion Council

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

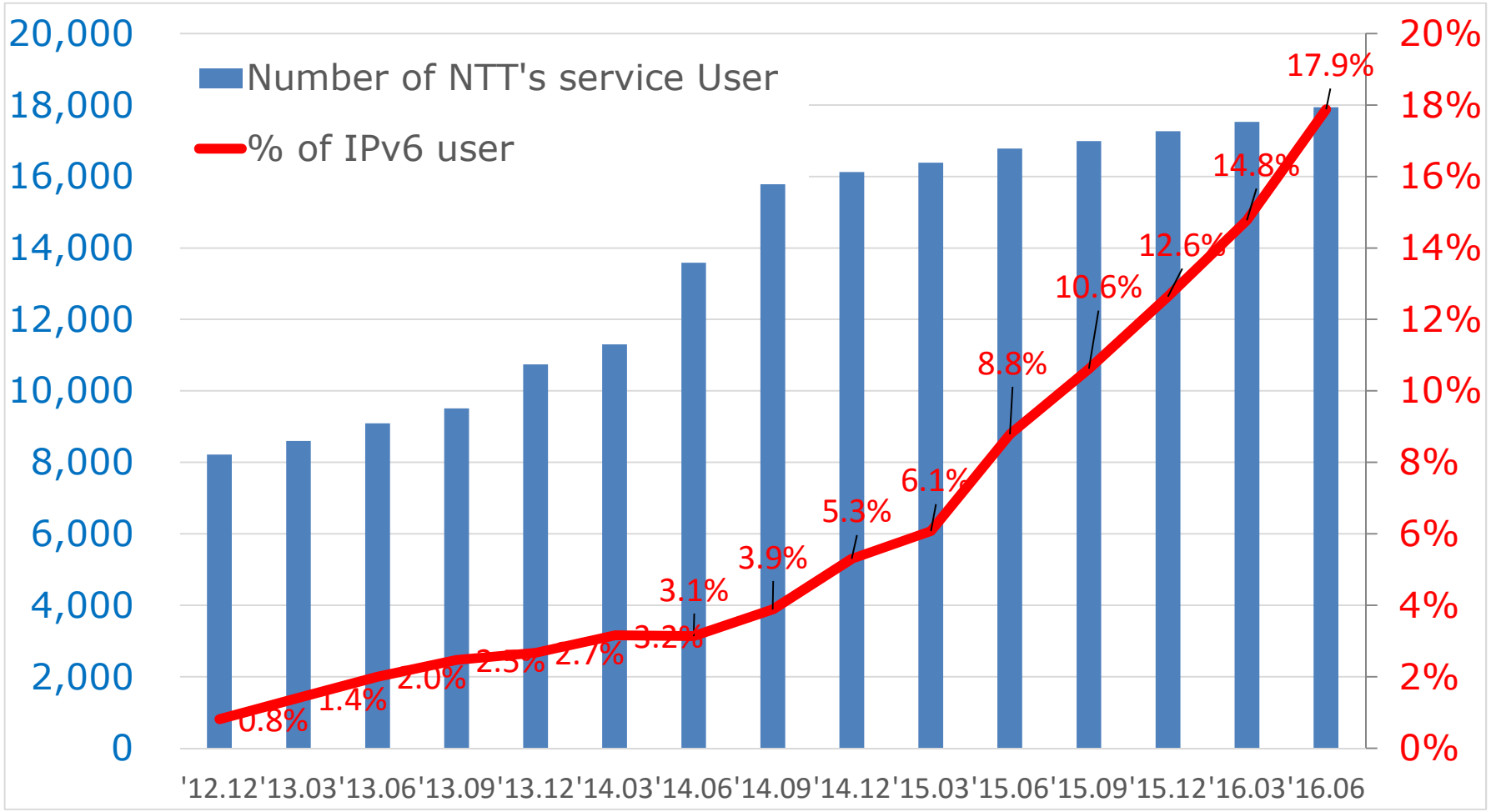
FTTH market share trends in fixed broadband access



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

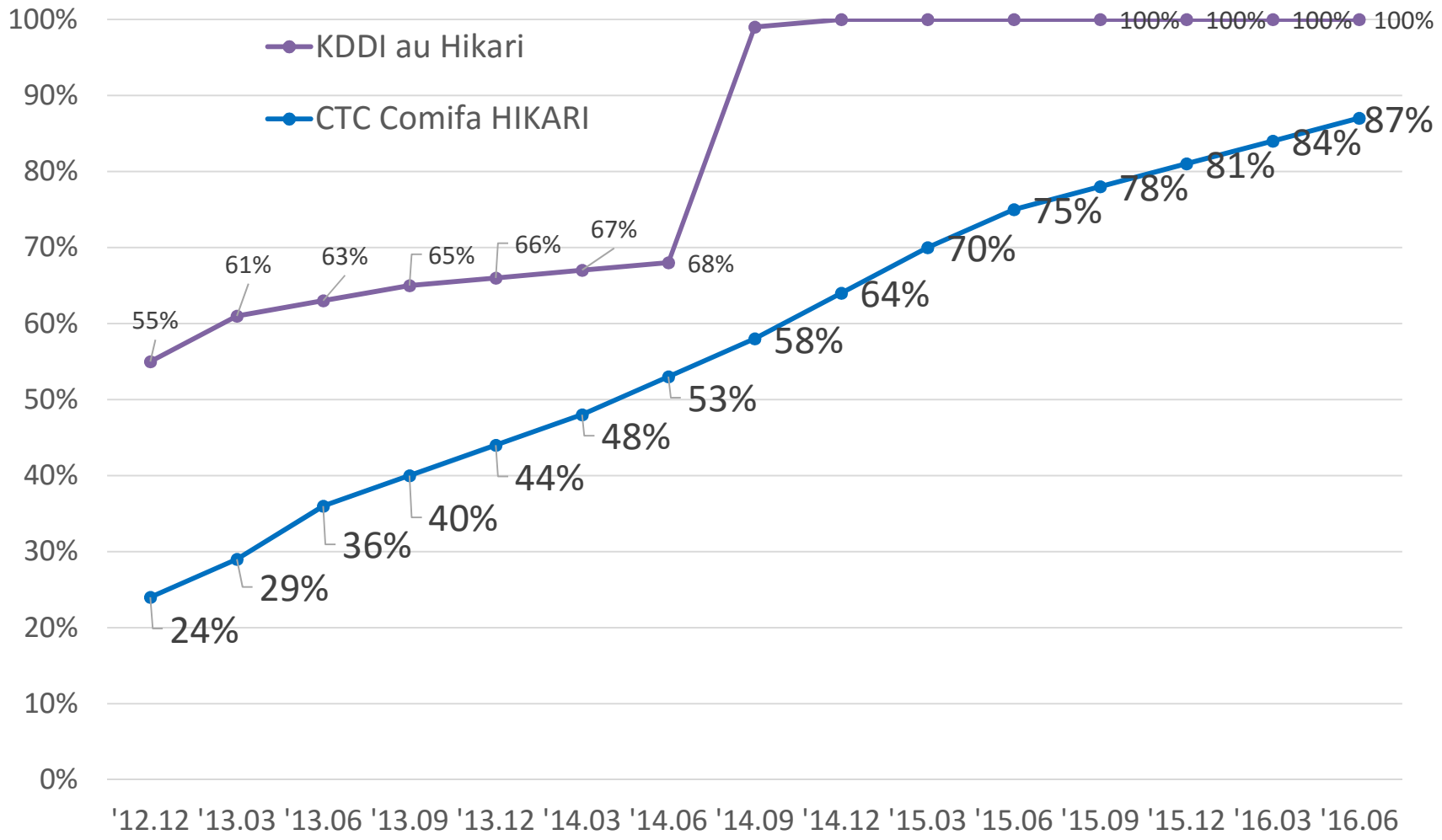
IPv6 consumer service penetration rate in Japan
- NTT's service platform users-

Unit: 1K



Produced from: http://v6pc.jp/jp/spread/ipv6spread2013_03.phtml

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



Produced from: http://v6pc.jp/jp/spread/ipv6spread2013_03.phtml

IPv6 traffic to Google servers

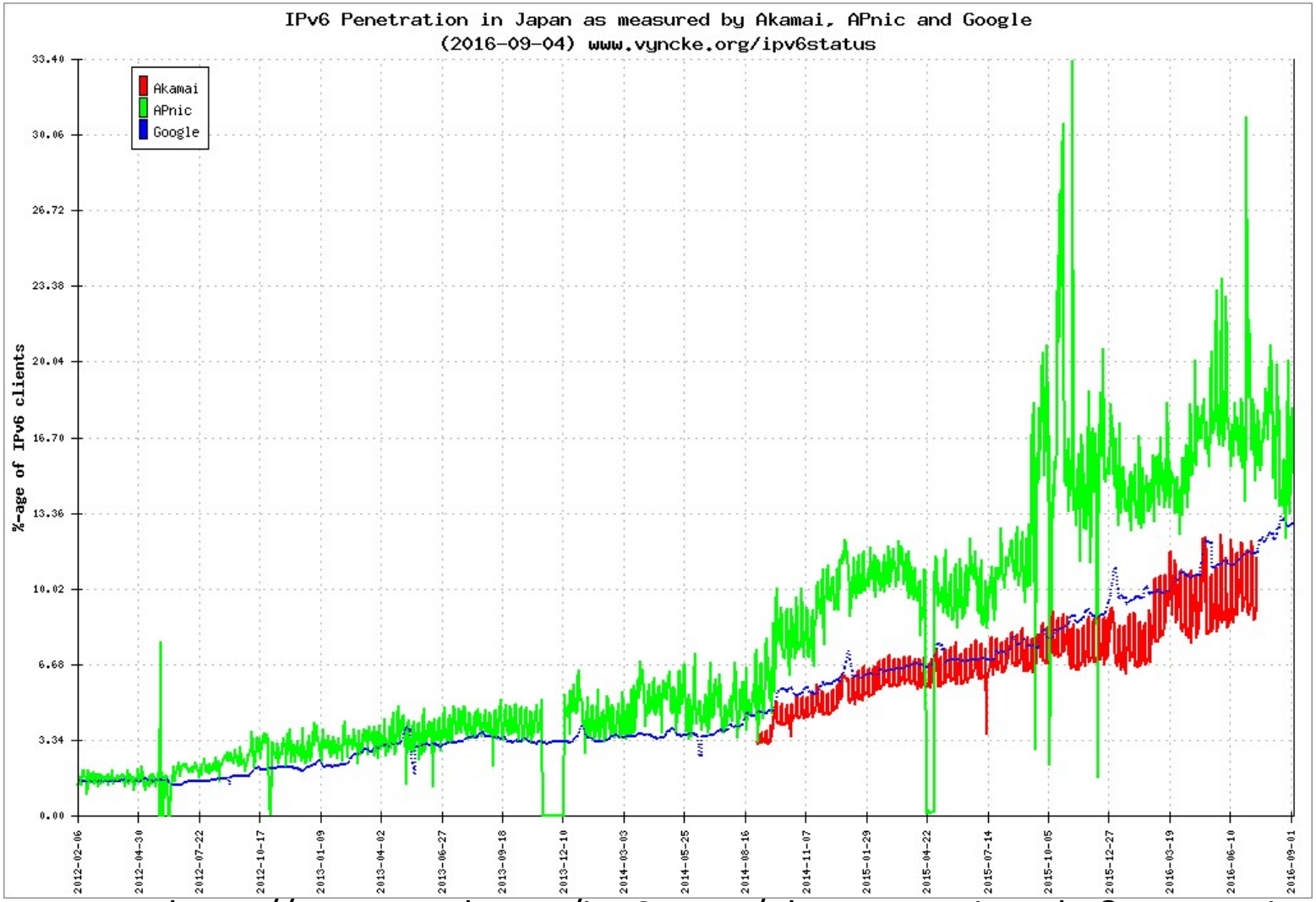
Rank	Name	ASNs	IPv6
1	KDDI	2516	31.87%
2	SoftBank BB	17676	17.88%
3	OCN / plala	4713	6.96%
4	So-net	2527	31.48%
5	ctc	18126	62.46%
6	TOKAI	10010	23.13%
7	IIJ	2497	7.84%
8	@nifty	2510	7.77%
9	iTSCOM	9365	9.90%
10	Sony Global Solutions	9619	99.76%
11	NTT docomo	9605	0.30%
12	BIGLOBE	2518	1.01%
13	bit-drive	9600	10.95%
14	star cat	17529	8.80%
15	K-Opticom	17511	0.27%
16	SINET	2907	1.89%
17	VECTANT	2519	0.51%
18	TDNC	9354	2.03%
19	SuperCSI	2506	39.93%
20	Keio University	38635	42.91%

- 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.

NTT ipv6 IPv6 Promotion Council

As of 25th August 2016

JP IPv6 Users penetration measured by Akamai, APNIC and Google

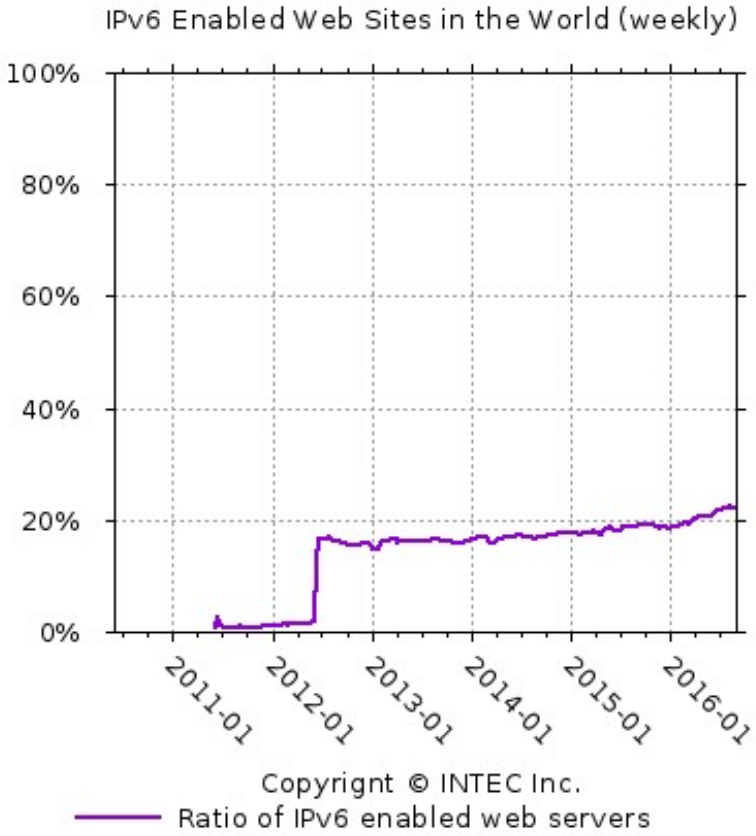


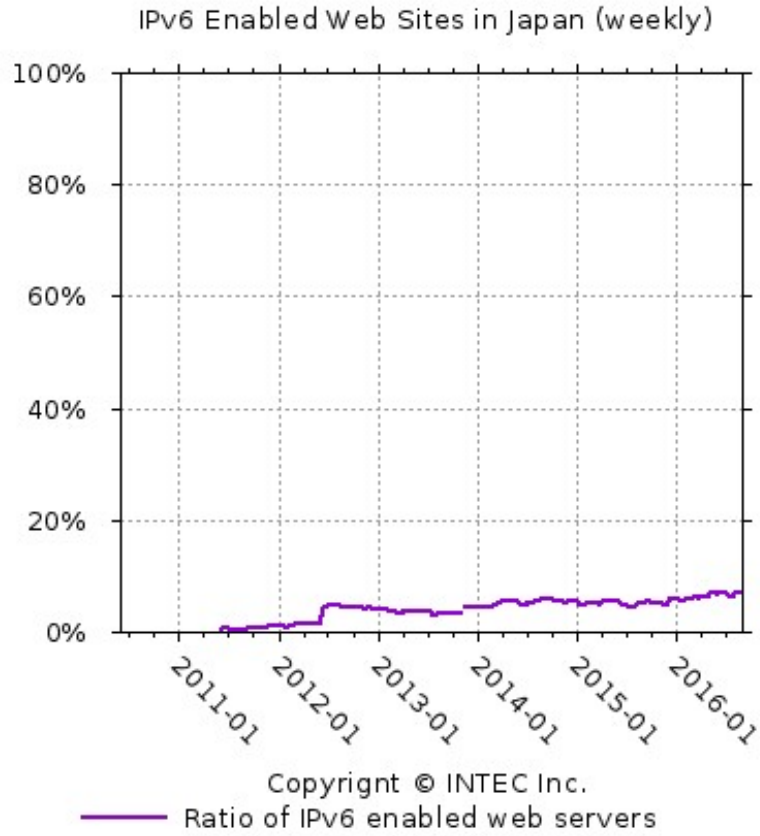
https://www.vyncke.org/ipv6status/plotpenetration.php?country=jp

As of 4th September 2016

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 4th Sep. 2016).



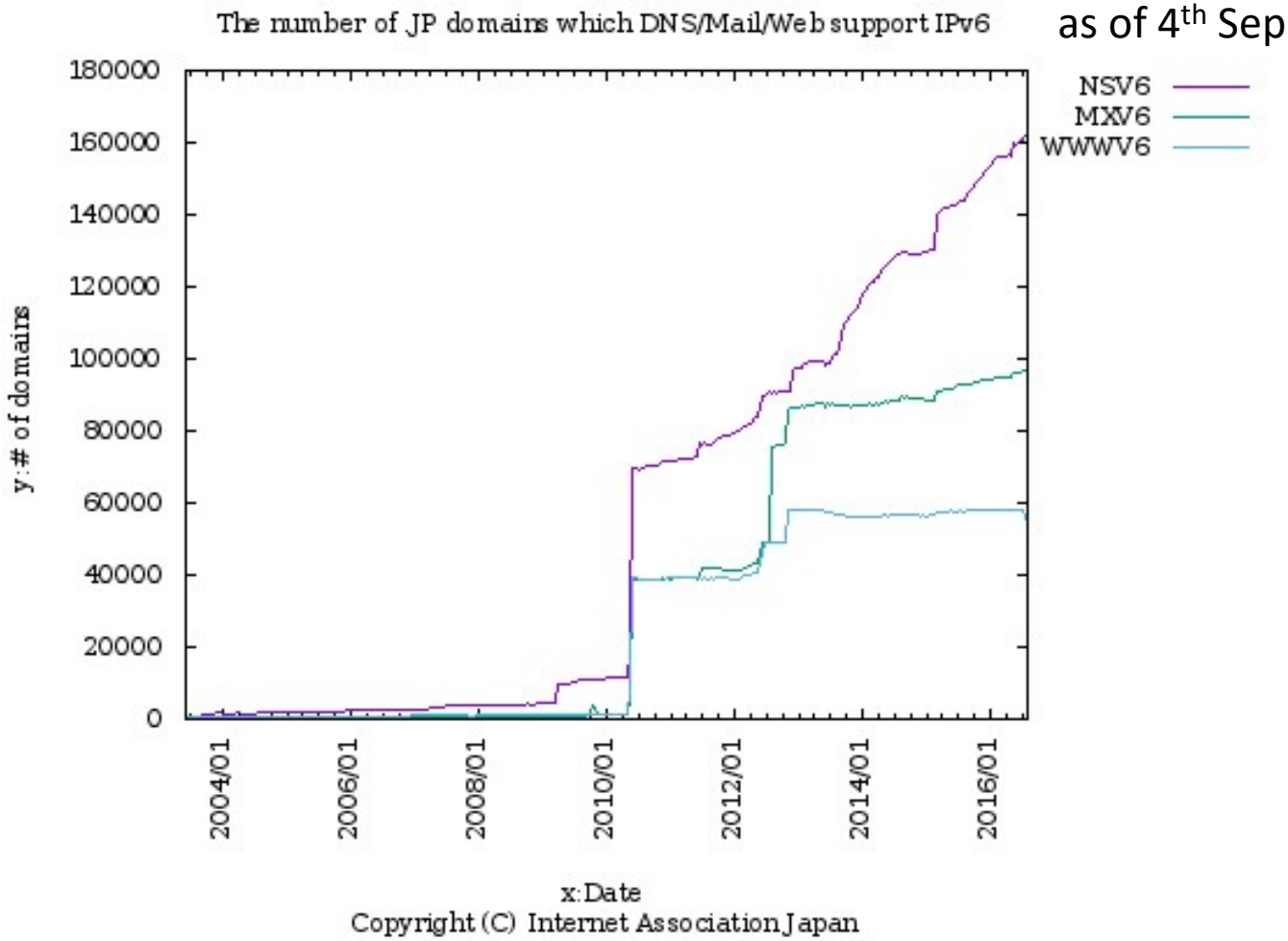


http://www.inetcore.com/project/metrics/index.html.en

IPv6 supported .jp domain servers

IPv6 supported .jp domain servers

as of 4th Sep. 2016



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

IPv6 services in Governments

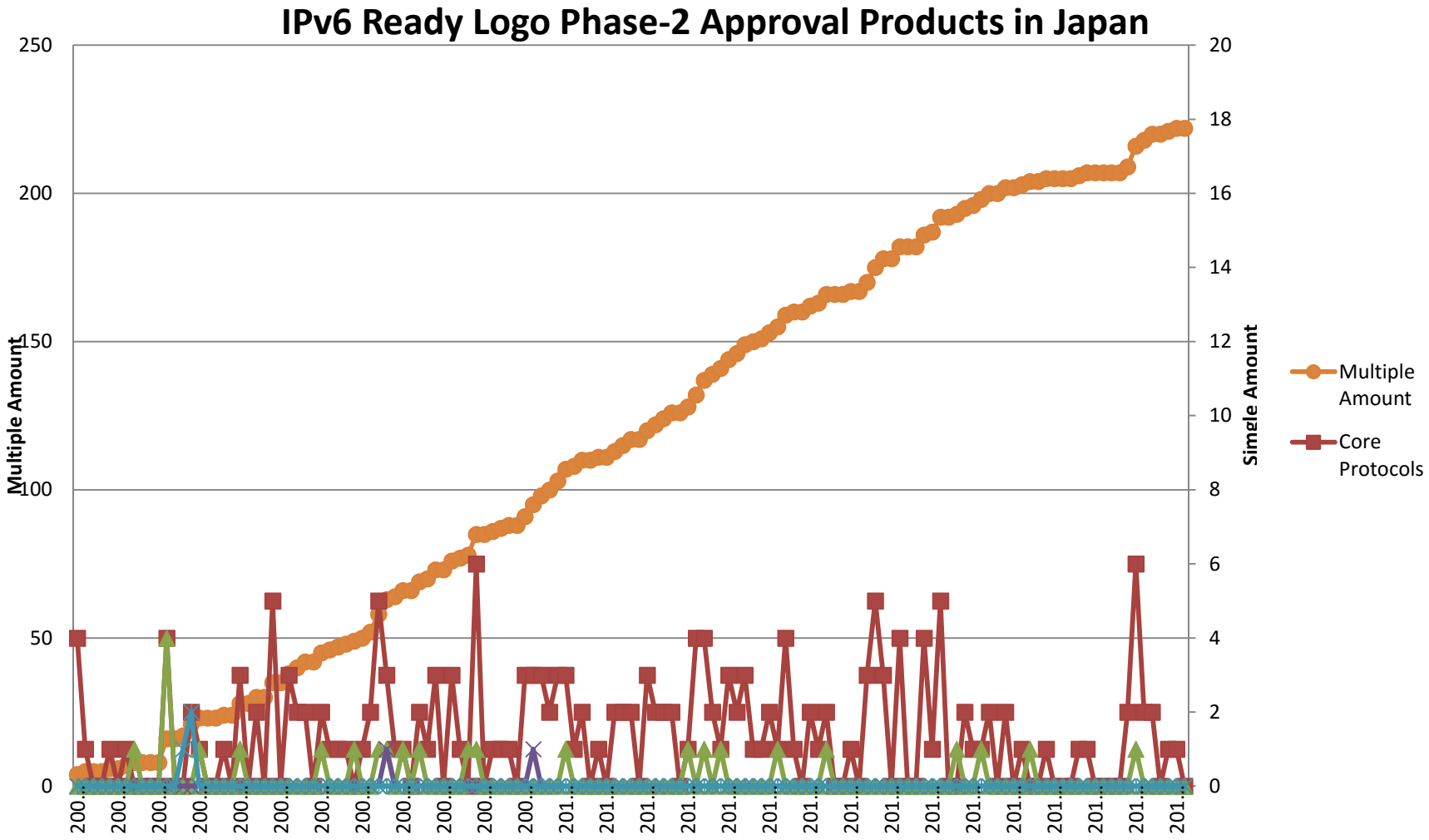
Japanese governments' service has been implementing IPv6.

In 34 servers:

	2013/11/29	2015/9/2	2016/2/15	2016/9/4
Web	32%	50%	59%	59%
Mail	18%	26%	26%	29%
DNS	62%	76%	94%	94%

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

Number of products with IPv6 Ready Logo (JP)



as of 24th Aug. 2016

IPv6 deployment: key issues in Japan

- Last one mile implementation
  - Lines between ISP and users
    - Especially for consumer users
- Home gateway (HGW) implementation
  - HGW provided by ISPs / HGW in electronics retail store
- Transition of existing IPv4 users
  - Providing IPv4/IPv6 dual stack service by default to new users is not so hard.
- Applications

Last one mile implementation 1/2

NTT East & West started IPv6 Internet access platform service in 2011.

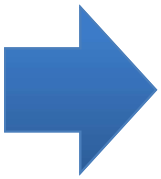
- IPv6 services was available almost every where in Japan.
  - Since then, only a few ISPs provided IPv6 service with IPv6 over IPv4 tunnel, etc.
- Other FTTH providers also implemented IPv6.

At the beginning, number of IPv6 users did not increase so much.

Last one mile implementation 2/2

Recently, 3 major cellular companies (NTT Docomo, KDDI and Softbank) stated:

- From 2017, they will start IPv4/IPv6 dual stack service for all consumer users.
  - No additional fee
  - No special service order by users



IPv6 readiness statistics will jump in Japan!!

Home gateway implementation

- IPv6 capable routers are increasing in Japan.
  - Home gateways provided by NTT East & West are IPv6 capable.
  - NTT Communications provides IPv6 capable router (DS-RA01) for USD 80.
  - Many HGWs provided by ISPs with their service are almost IPv6 capable.
- Some HGW venders in Japan started to provide IPv6 capable routers.

$80

DS-RA01 (NTTCom)
http://service.ocn.ne.jp/ipv6/access/ds-ra01/

$200

WXR-1900DHP2(Buffalo)
http://buffalo.jp/news/2015/12/02_03/

$100

WG1400HP (NEC)
https://121ware.com/product/atermstation/product/warpstar/wg1400hp/

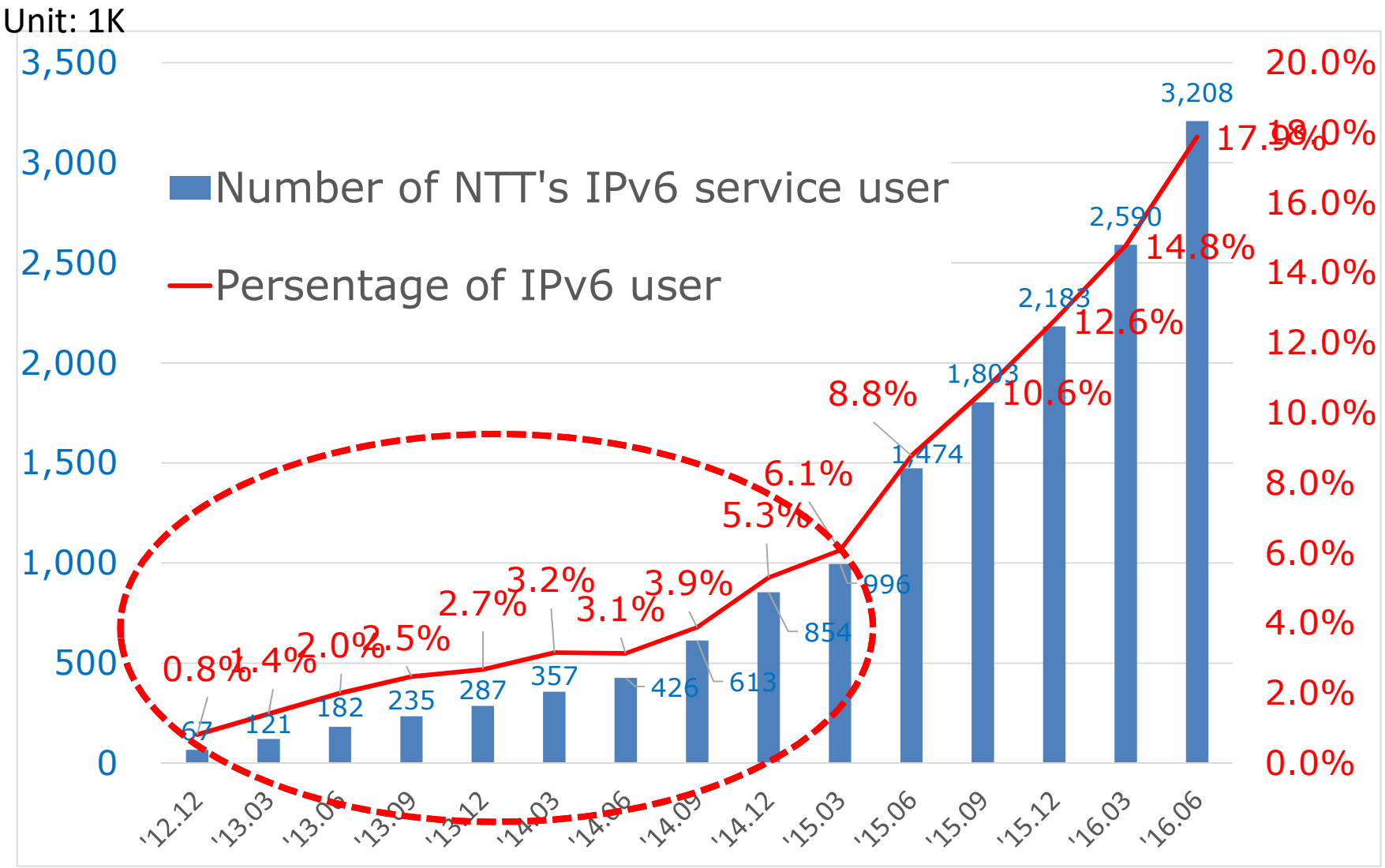
Transition of existing IPv4 users

After NTT East & West IPv6 platform implementation in 2011, IPv6 services was available almost every where in Japan.

- At that time, ISPs provide IPv6 service as an ‘optional’ service.
  - Users need to order IPv6 service.
- Then, ISPs started to provide IPv4/IPv6 dual stack service by default to new customers.

Number of IPv6 users did not increase so much.

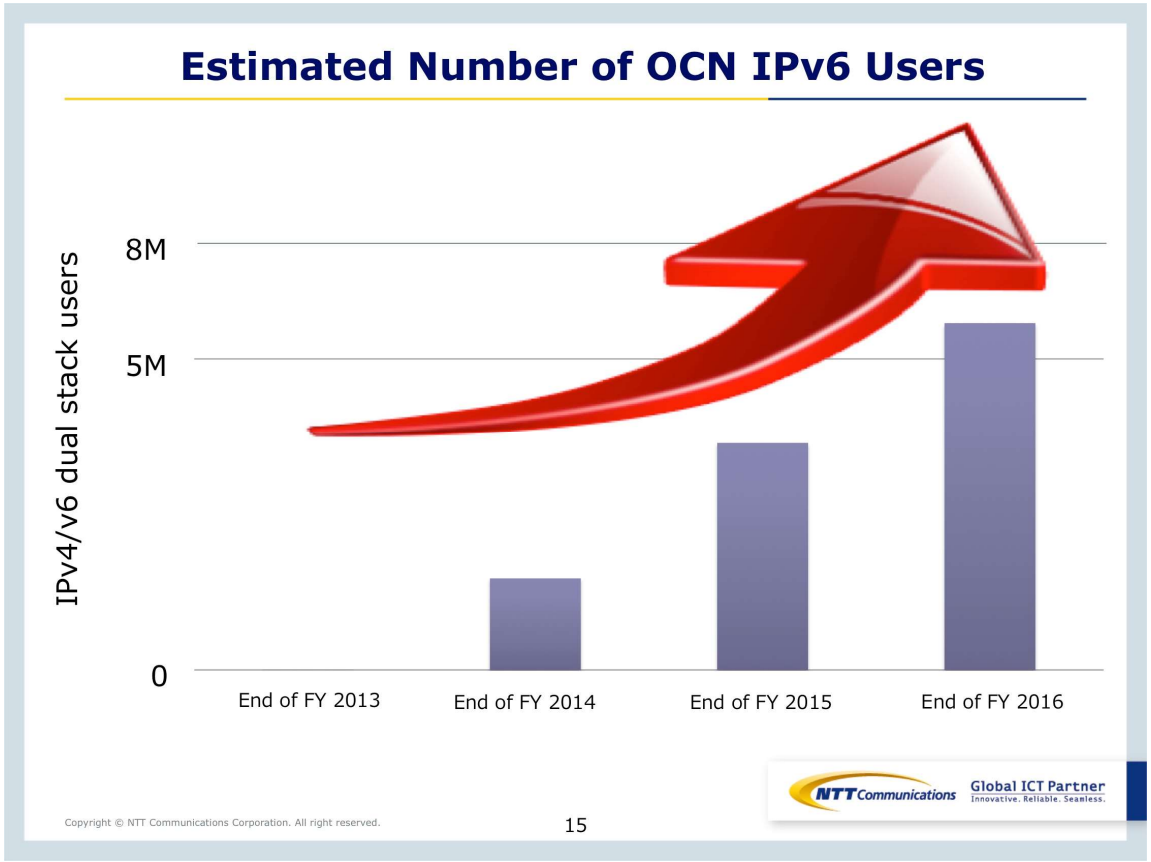
IPv6 consumer service penetration rate in Japan
- NTT's service platform users-



Produced from: http://v6pc.jp/jp/spread/ipv6spread2013_03.phtml

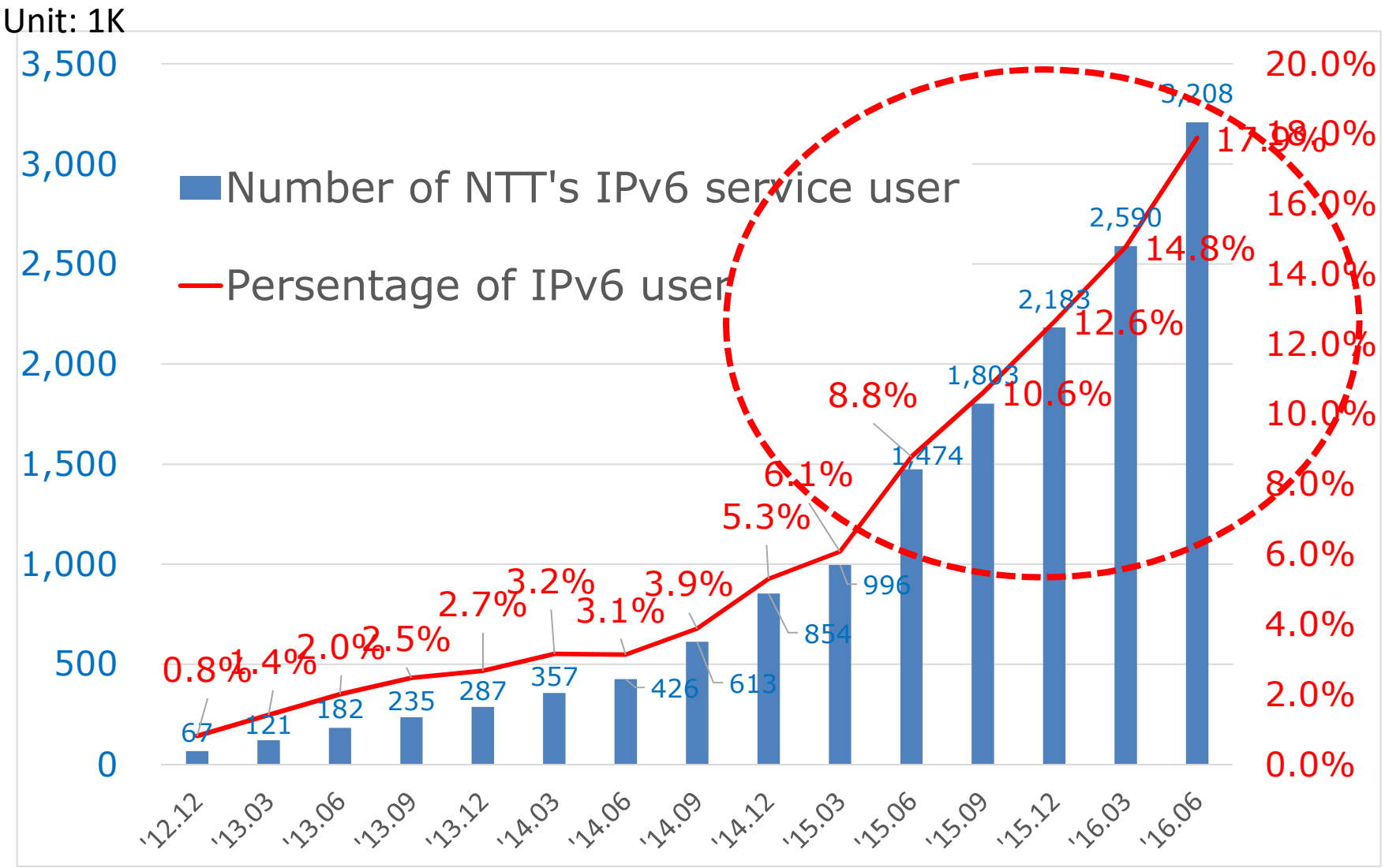
Transition of existing IPv4 users

Several ISPs started to transit their existing IPv4 customers to dual stack environment.



Presentation slide in Vietnam IPv6 Day 2014 by NTT Com.

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



Produced from: http://v6pc.jp/jp/spread/ipv6spread2013_03.phtml

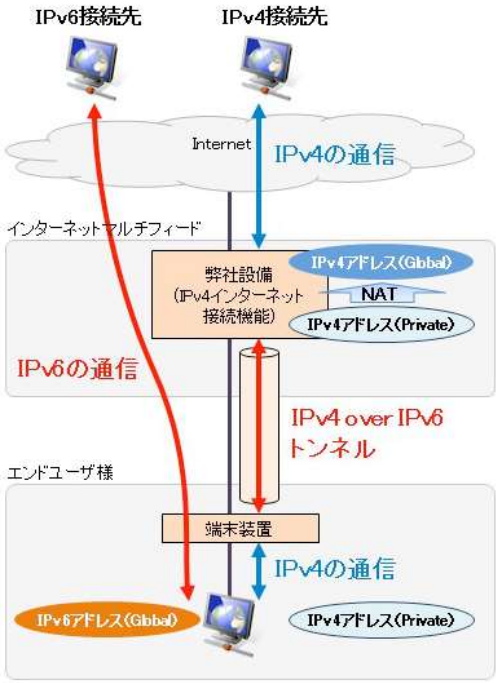
Applications

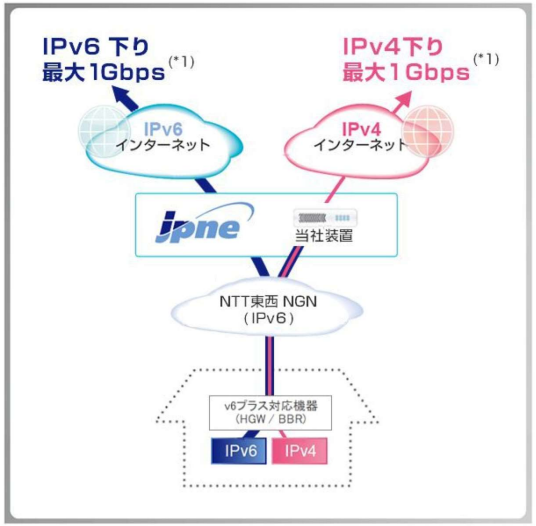
- “IoT” (Internet of Things) will be a possible killer application
  - But need to implement IPv6 network widely
- New service : “IPv4”
  - Trend for IPv4 service implementation
    - “IPv4 as a service”
      - Discussed in IETF
      - Implemented some networks in U.S.

IPv4 as a service (IPv4aaS)

- Some commercial IPv4aaSs in Japan

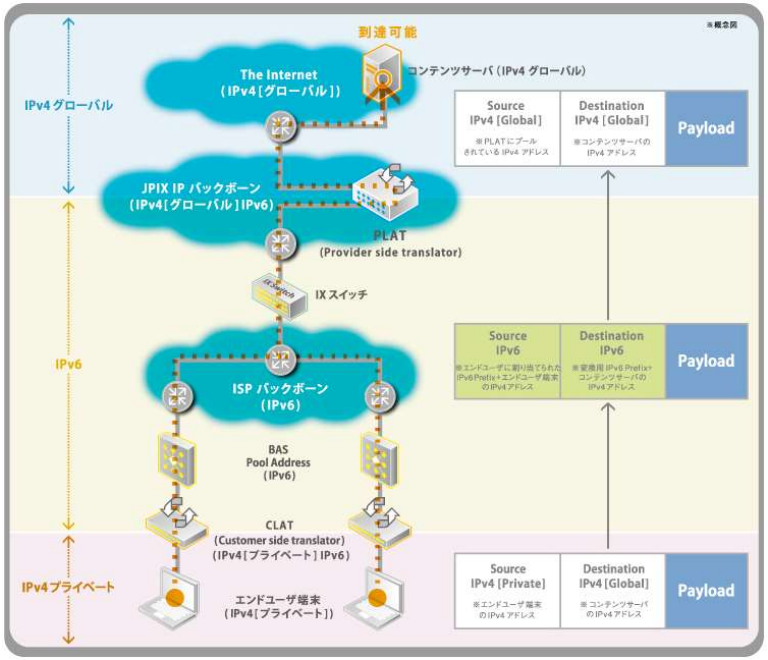
Transix: DS-Lite by IMF
http://www.mfeed.ad.jp/transix/





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

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



Summary

- In Japan, IPv6 become popular
  - IPv6 is available almost everywhere in Japan.
  - Many ISPs are IPv6 ready, and started to migrate their IPv4 only users to dual stack environment.
  - Mobile carriers, NTT Docomo, KDDI and Softbank will start full IPv6 service in 2017.