



Enabling IPv6 in last miles

(IPv6 deployment of ctc)

10th April 2013

**Chubu Telecommunications Co., Inc.
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Table of contents

1. Corporate profile
2. IPv6 deployment of “commufa HIKARI”
3. IPv6 service development on “commufa HIKARI”
4. IPv6 statistics of “commufa HIKARI”
5. Conclusion

Table of contents

1. Corporate profile
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3. IPv6 service development on “commufa HIKARI”
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Corporate profile

- Chubu Telecommunications Co., inc. = ctc
- A telecommunications carrier in central Japan
- Number of Employees:

618 persons

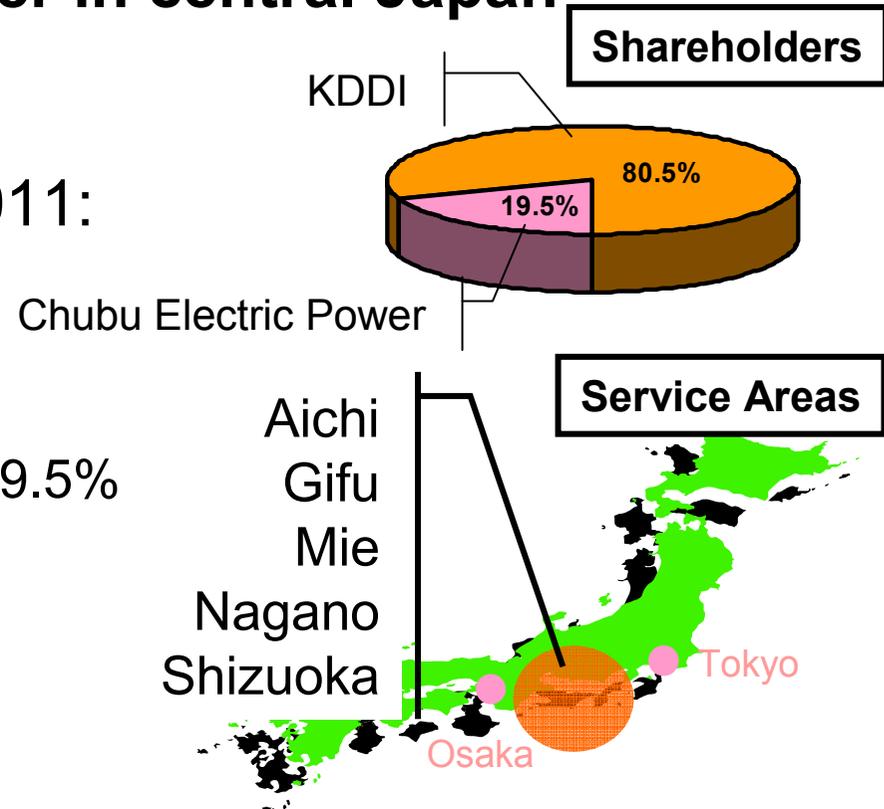
Total amount of sales in FY2011:

USD 657 million *USD1=JPY 94

Shareholders

KDDI Corporation : 80.5%

Chubu Electric Power Co., Inc. : 19.5%

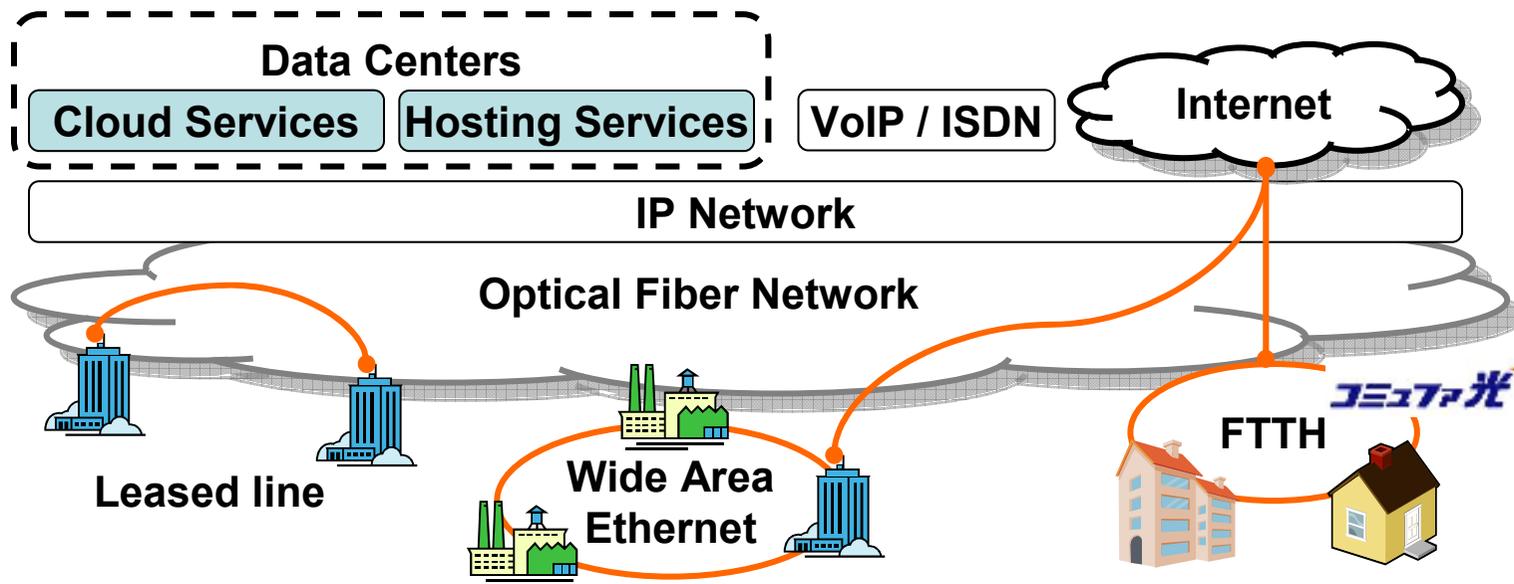


- The total length of optical fiber network built by ourselves is 94,000km.
(about 2.5 times longer than the circumference of the earth)

Services overview

Many kinds of telecom services are providing based on our optical fiber network

- Services for business
- Service for consumers (service name is “commufa HIKARI”)



“commufa HIKARI” overview

 **Number of Subscribers** *as of 2013.Mar : Approx. 570,000

 **Services : High-speed Internet access, VoIP, TV**

A line speed is max 1Gbps

the price of internet access is fixed charge.

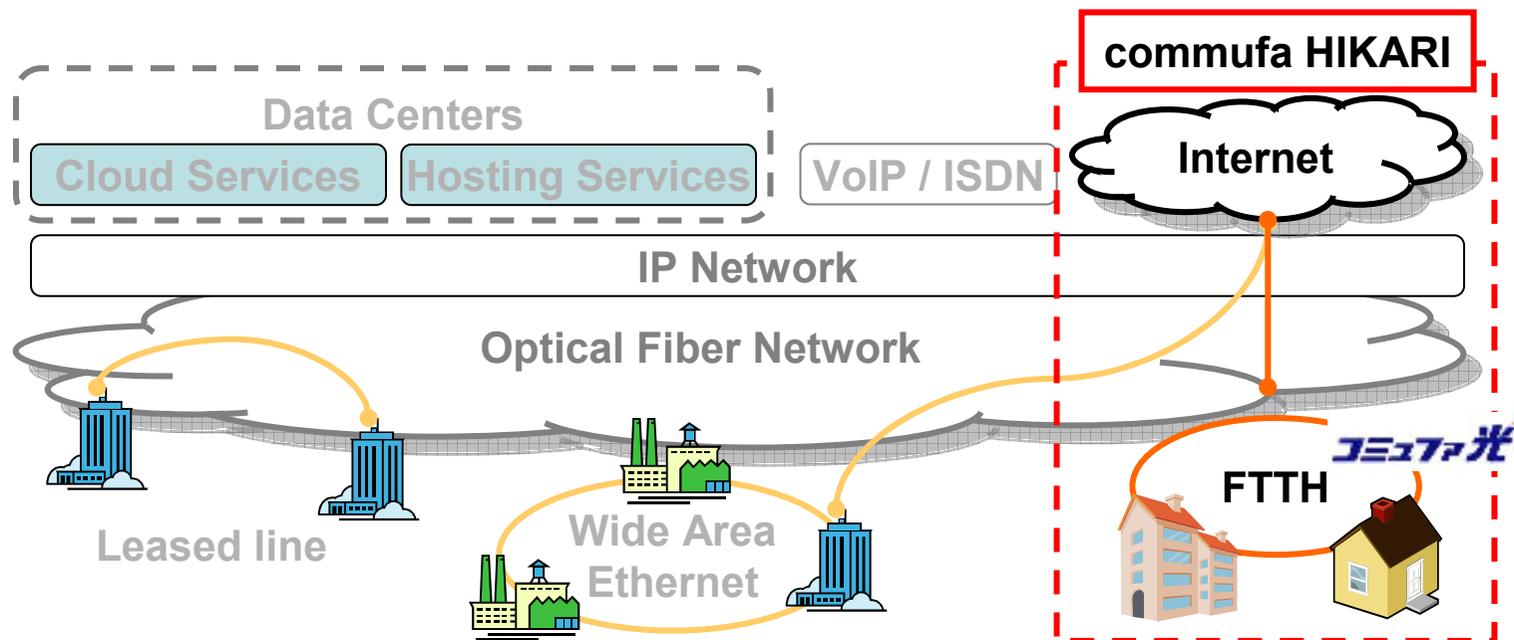
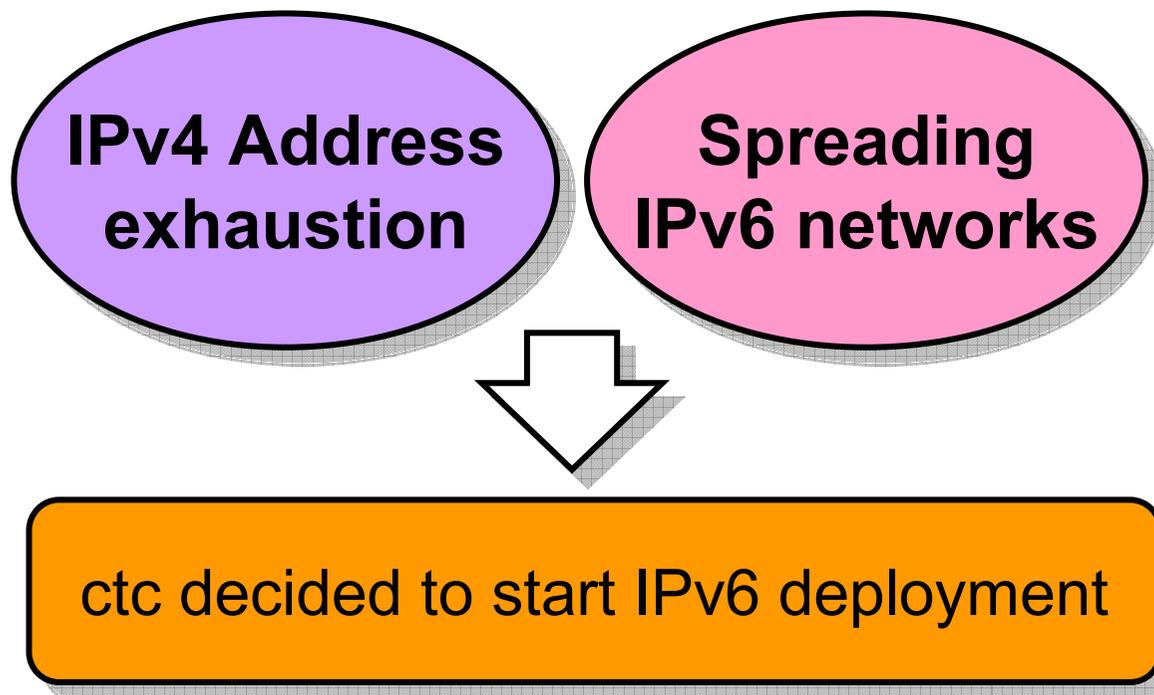


Table of contents

1. Corporate profile
2. IPv6 deployment of “commufa HIKARI”
3. IPv6 service development on “commufa HIKARI”
4. IPv6 statistics of “commufa HIKARI”
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Our motivation for IPv6 deployment

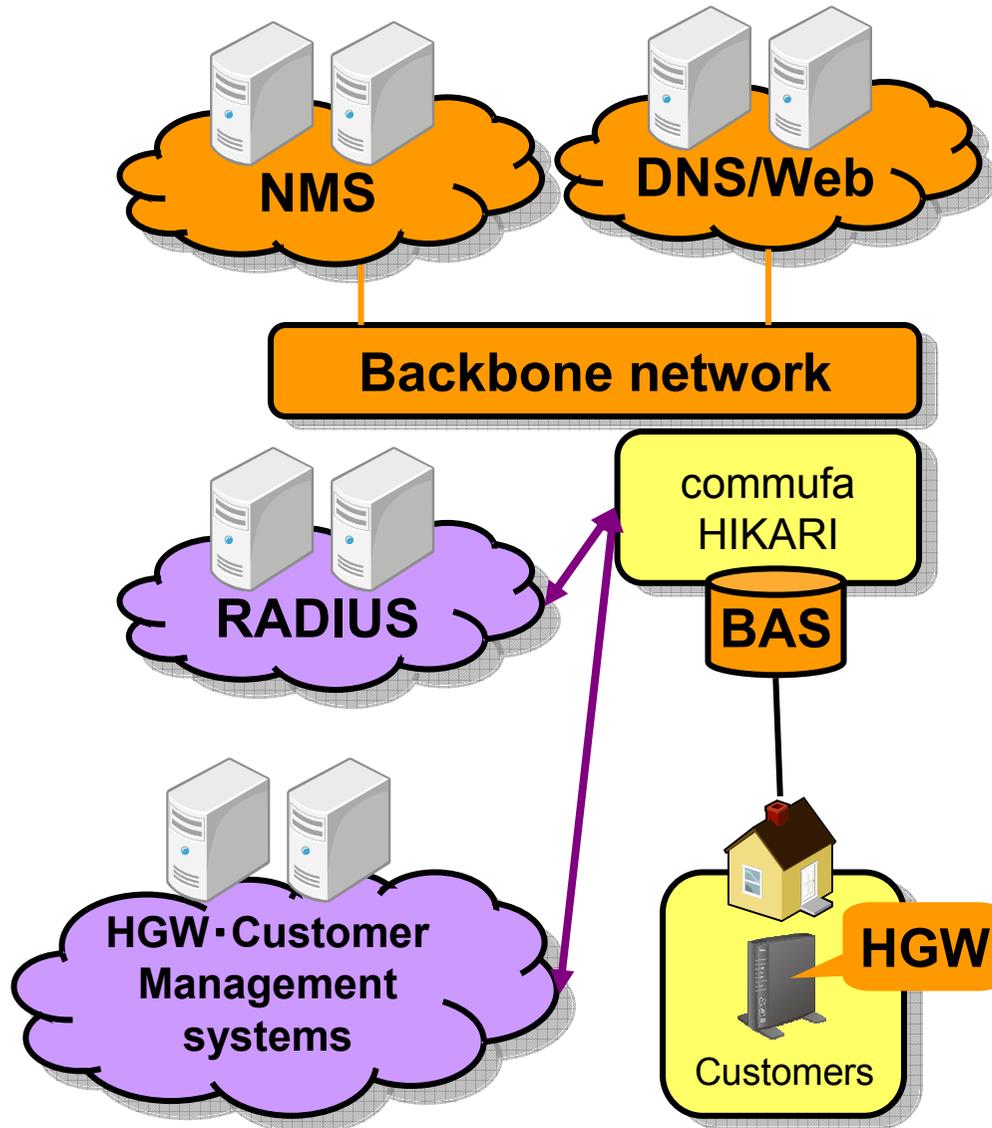
Worldwide



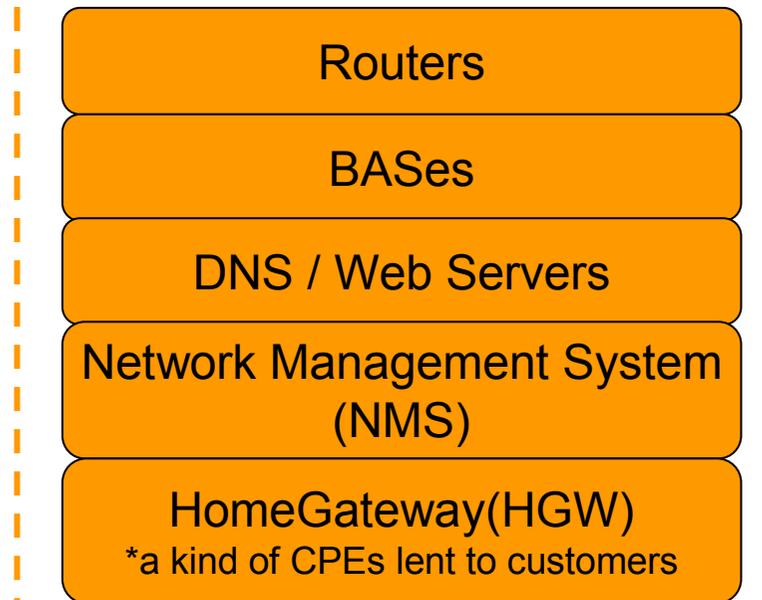
Mar. 2010 Start researching how to deploy IPv6

Mar. 2011 Start IPv6 deployment project

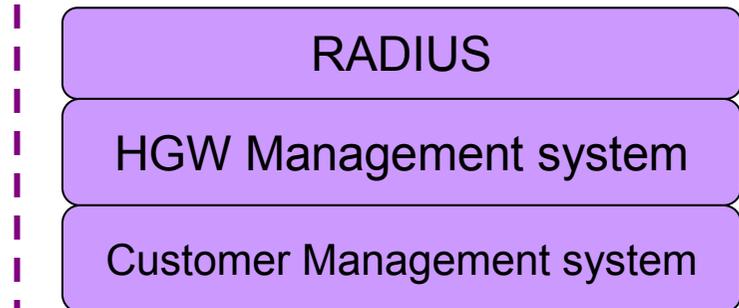
IPv6 deployment project overview



IPv4/IPv6 Dual Stacked Devices



Upgrading systems



1 year and a half later...

22nd August 2012
IPv6 access service was started
on “commufa HIKARI” !!

The results of IPv6 Deployment

7 months later...

 World IPv6 Launch measurement as of 22nd Mar. 2013

IPv6 Traffic : 13.16%

Rank sorted by IPv6 Traffic : 24th / 111 entries

 APNIC IPv6 measurement per AS number as of 25th Mar. 2013

v6 capable : 17.68%

⇒ about 100,000 subscribers are IPv6 capable

Rank sorted by v6 capable : 69th

Reference) <http://www.worldipv6launch.org/measurements/>
<http://labs.apnic.net/ipv6-measurement/AS/>

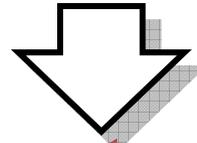
Table of contents

1. Corporate profile
2. IPv6 deployment of “commufa HIKARI”
3. IPv6 service development on “commufa HIKARI”
4. IPv6 statistics of “commufa HIKARI”
5. Conclusion

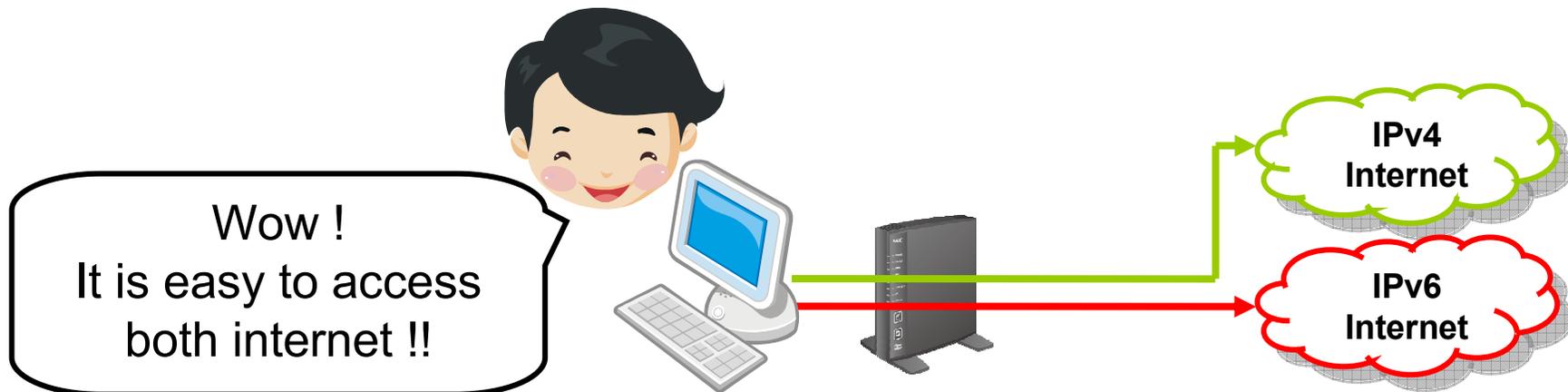
Service policy for IPv6 access service

Our idea for providing IPv6 access service

Customers easily access IPv4/IPv6 internet without care of IPv4 and IPv6 connectivity.



Providing the automatic IPv4/IPv6 internet connections



Approaches for automatic internet connections

 HomeGateway Development

 A new service menu

Approaches for automatic internet connections

 HomeGateway Development

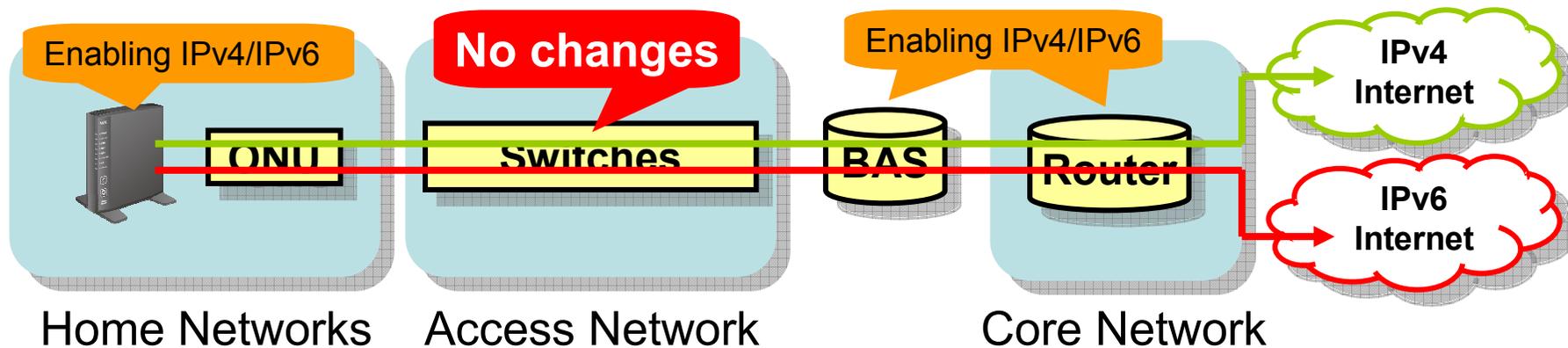
 A new service menu

HomeGateway development(1)

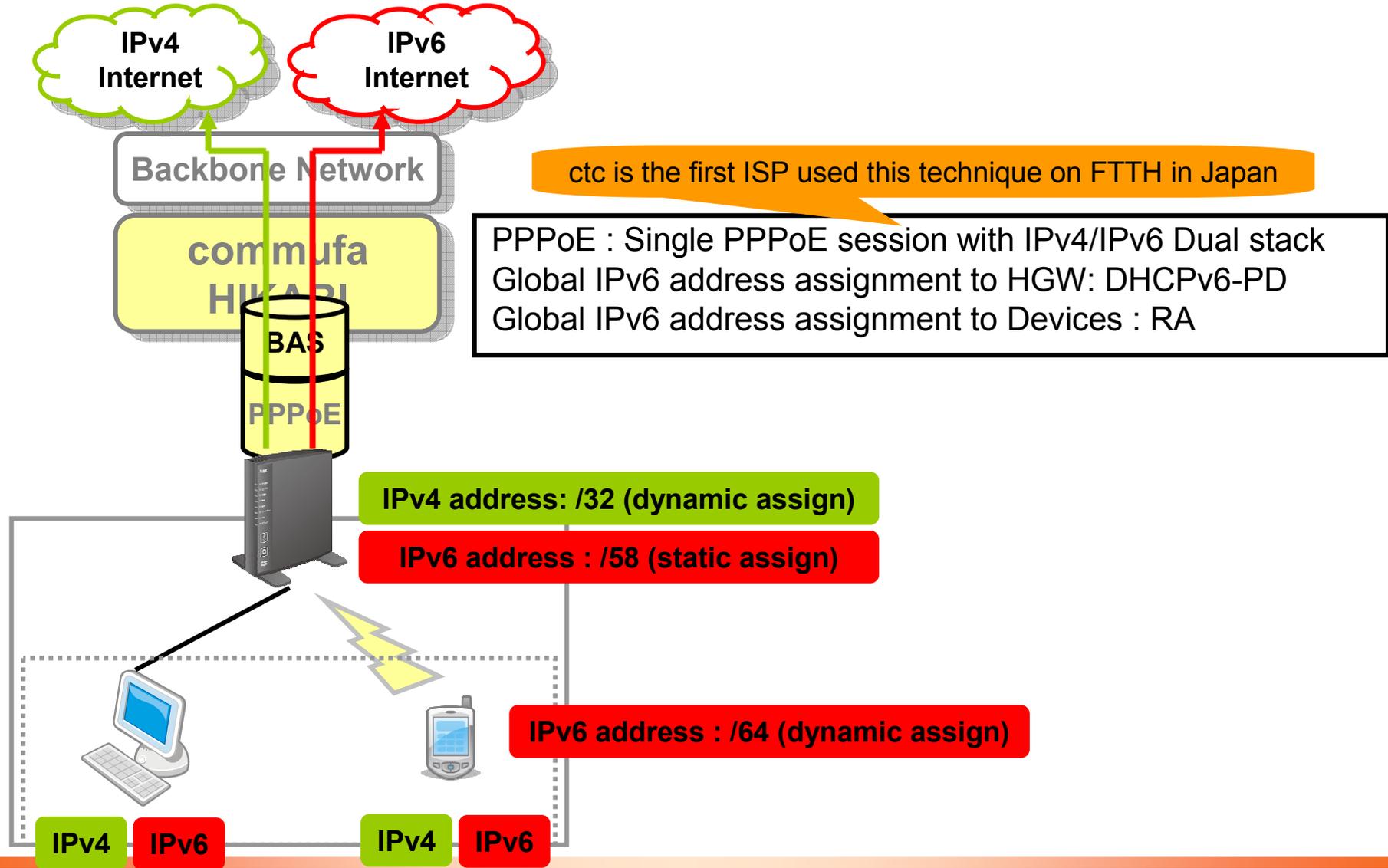
Adopting PPPoE as the access technique of subscribers for integrating IPv6 network into IPv4 network

Reasons:

1. PPPoE has been used as the access technique for providing IPv4 connectivity
2. No changes are required in existing access network



HomeGateway development(2)



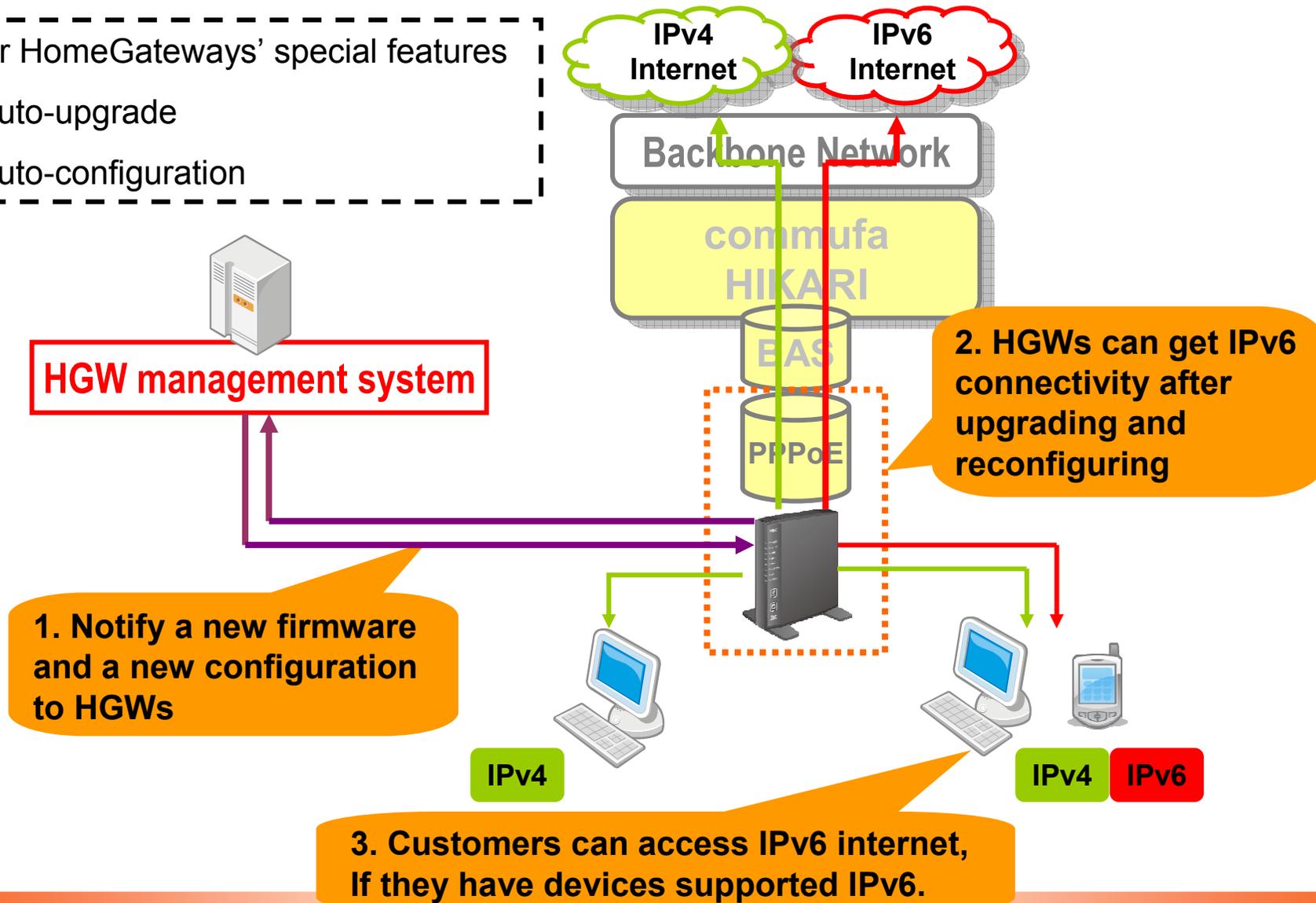
ctc is the first ISP used this technique on FTTH in Japan

PPPoE : Single PPPoE session with IPv4/IPv6 Dual stack
 Global IPv6 address assignment to HGW: DHCPv6-PD
 Global IPv6 address assignment to Devices : RA

How to deploy a developed function to existing HGWs

Our HomeGateways' special features

- Auto-upgrade
- Auto-configuration

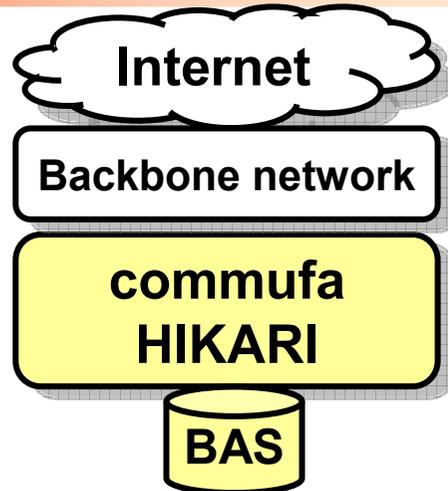


Approaches for automatic internet connections

 HomeGateway Development

 A new service menu

A new service menu



Providing as standard services

- A home gateway
- IPv4/IPv6 internet access

Monthly fee was max 40% off

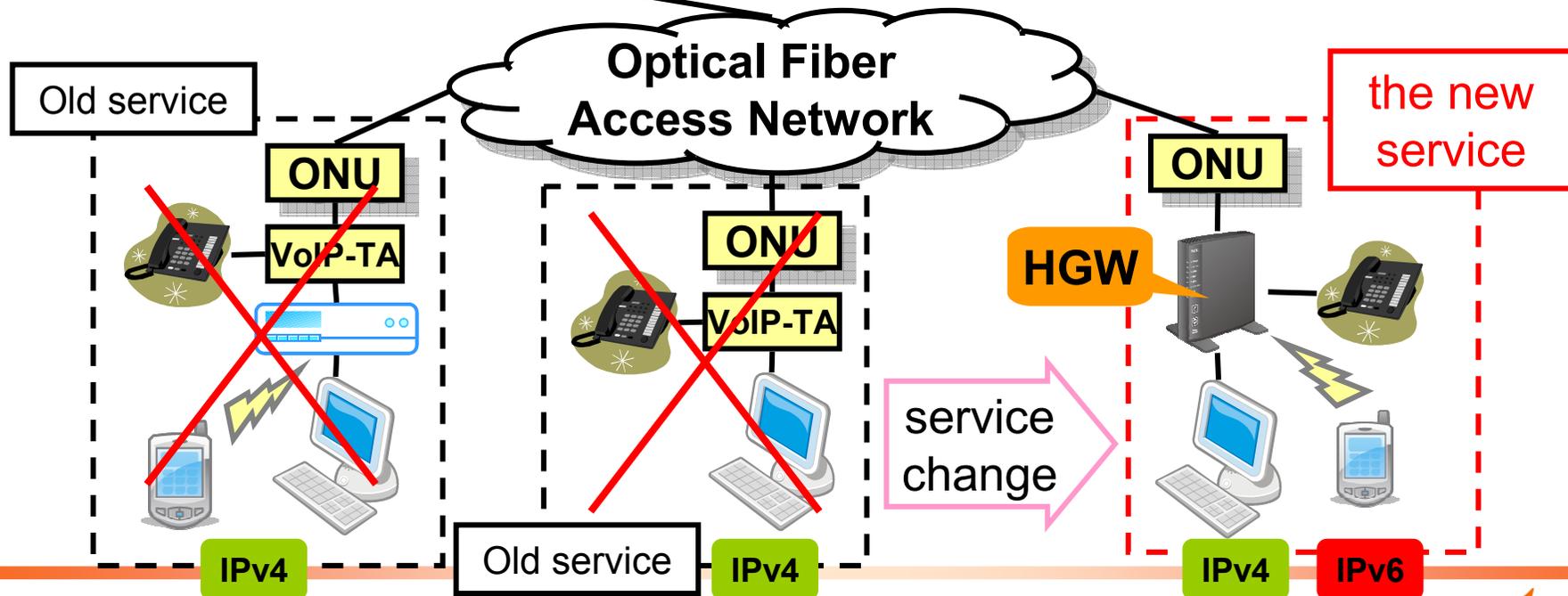
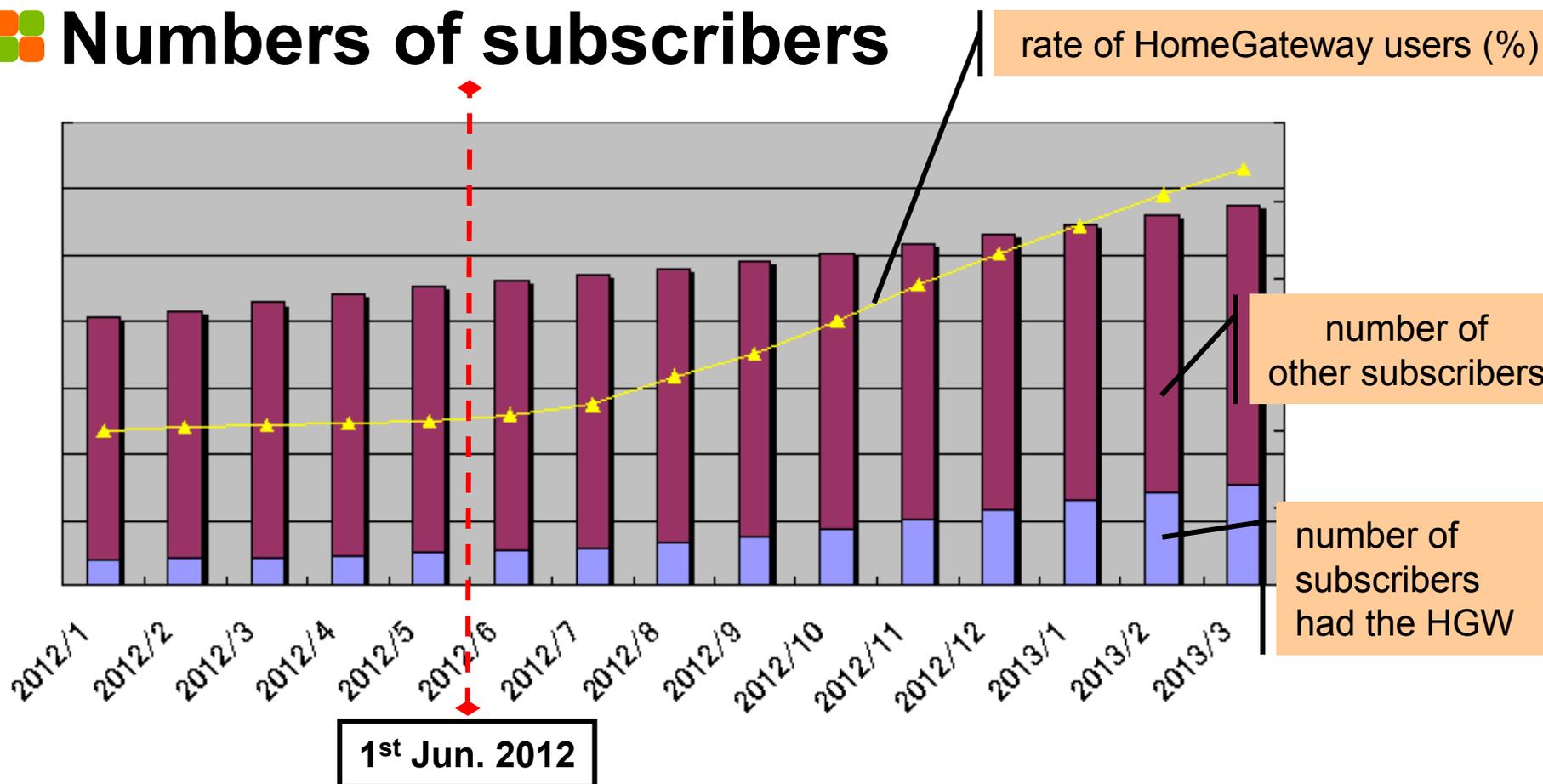


Table of contents

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The graph of increasing HomeGateway Users

Numbers of subscribers



The average increasing rate of HomeGateway users is 13% since Jun. 2012

IPv6 statistics of “commufa HIKARI”

IPv6 Traffic of a part of backbone

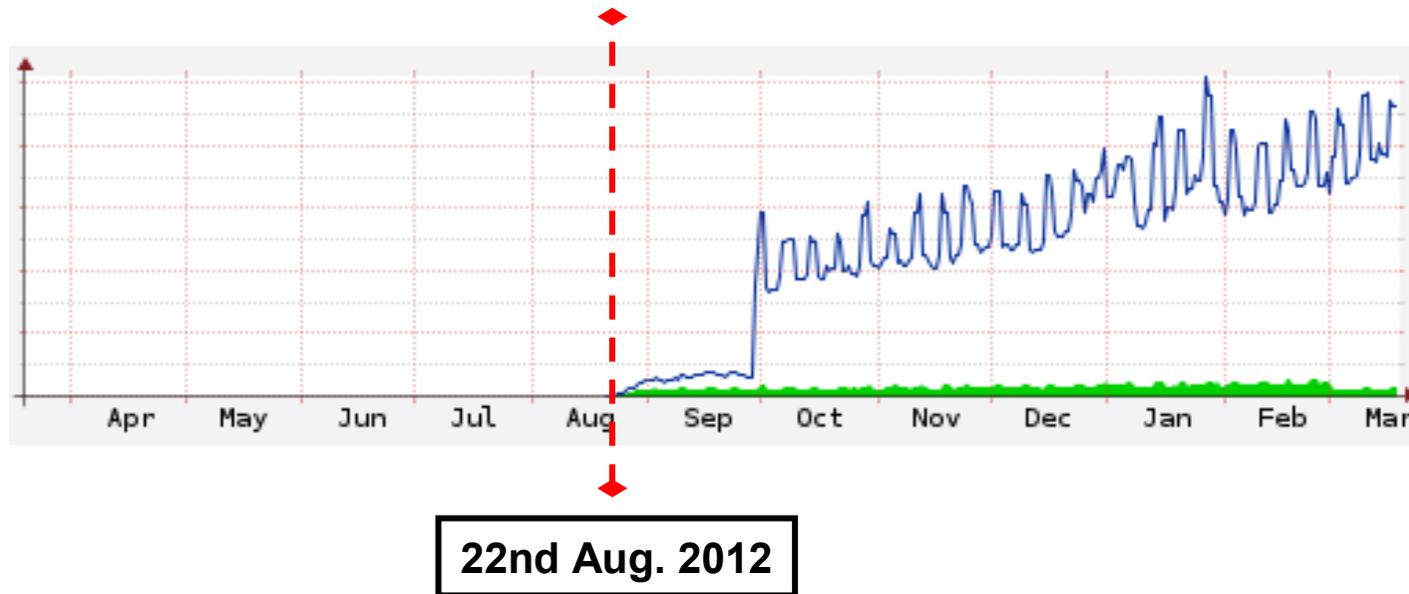


Table of contents

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Conclusion of CTC IPv6 Deployment

■ Routers and Servers became Dual-Stacked devices.
Management Systems of Home Gateways and Customers were upgraded

■ HomeGateway technical specification

- Single PPPoE session with IPv4/IPv6 Dual Stack
- IPv6 address assignment : DHCPv6-PD(HGW), RA(Devices)
- Auto-upgrade & Auto-configuration

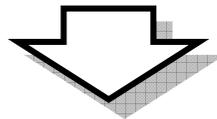
■ Features of ctc IPv6 deployment

By providing HomeGateways

- Customers can get IPv4/IPv6 connectivity automatically

By providing the new service menu

- The number of HomeGateway users is increasing



Spreading IPv6-capable home network

Thank you