Orchestrating a brighter world

NEC

What Can We Do for IPv6 CE Router Deployment?

September 12, 2017

NEC Platforms, Ltd.
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APNIC 44 BoF: Discussion with IPv6 CE Vendors

Outline of Presentation

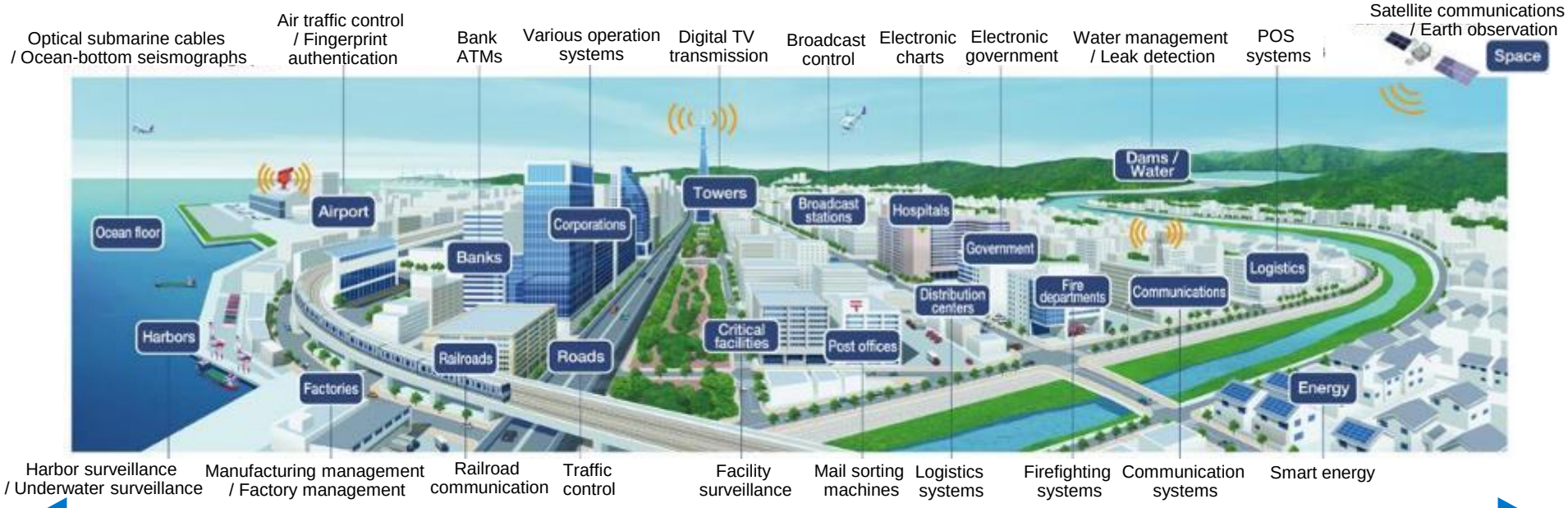
1. NEC Platforms' Activity for IPv6 Deployment
2. Why is It Hard to Deploy IPv6 CE Router?
3. What Can We Do for IPv6 CE Router Deployment?

NEC Platforms' Activity for IPv6 Deployment

NEC Platforms' Vision

Company Information
https://www.necplatforms.co.jp/en/

By leveraging our solution implementation capabilities for IT and network products, core technologies and manufacturing technologies, NEC Platforms contributes to social value creation.



ICT from NEC Platforms supporting NEC's Solutions for Society

Creating services...
"IT infrastructure technology" and "IoT technology"


TV conferences


Communications gateway


Supercomputers


Gate access control systems


Access control systems for airport security check areas


Firefighting / Disaster prevention

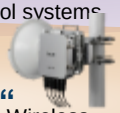
Connecting securely...
"Next generation network technology" and "Security technology"


Wi-Fi router for home


Routers for enterprise


Security appliances


Open platforms IoT gateway


Wireless communications equipment


Antenna equipment


High-end router switches
Devices for fiber-optic communication systems

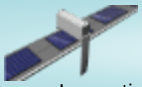

Optical submarine equipment

Collecting data...
"Sensors / interface technology" and "Terminal technology"


ATM

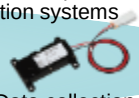

POS


Terminals for business use

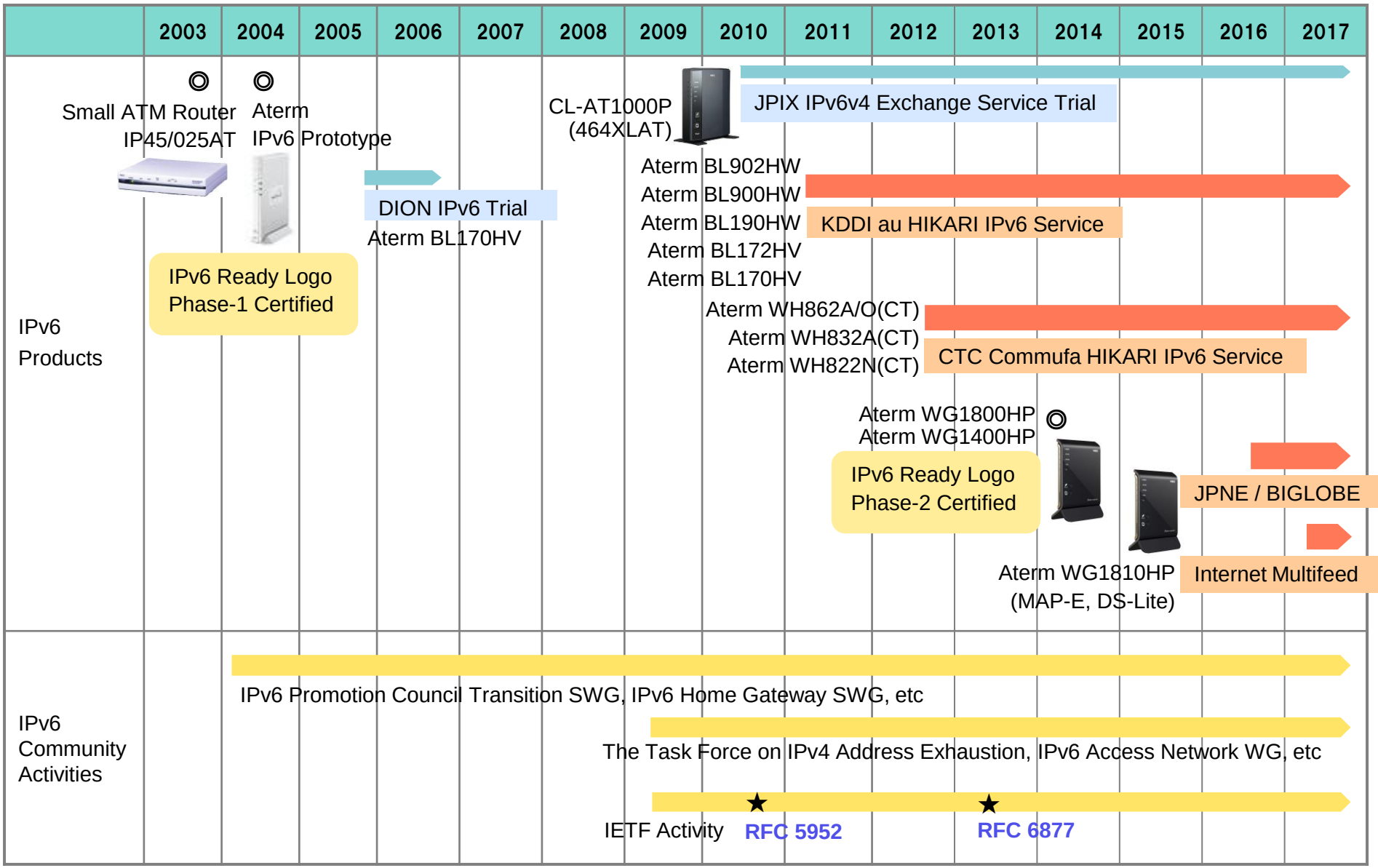

Inspection scanners


IoT access modules for harsh environments


Remote monitoring systems


Data collection solution (Secure sensor boxes)

NEC Platforms' IPv6 CE Router and Activities



IPv6 Deployment on the Global Internet

NEC Platforms is providing IPv6 CE Router to KDDI and CTC for their IPv6 deployment.

Rank 3 : KDDI

Rank 30 : CTC(Chubu Telecommunications)

Top 30 Telecom Carriers (As of 9th August 2017)

Rank	Participating Network	ASN(s)	IPv6 deployment
1	Comcast	7015, 7016, 7725, 7922, 11025, 13367, 13385, 20214, 21508, 22258, 22909, 33287, 33489, 33490, 33491, 33650, 33651, 33652, 33653, 33654, 33655, 33656, 33657, 33659, 33660, 33661, 33662, 33664, 33665, 33666, 33667, 33668, 36732, 36733	59.23%
2	ATT	6389, 7018, 7132	68.29%
3	KDDI	2516	26.85%
4	RELIANCE JIO INFOCOMM LTD	55836, 64049	84.07%
5	Charter Communications	7843, 10796, 11351, 11426, 11427, 12271, 20001, 20115, 33363	27.74%
6	T-Mobile USA	21928	88.25%
7	SoftBank	17676	20.81%
8	Verizon Wireless	6167, 22394	82.72%
9	Deutsche Telekom AG	3320	49.09%
10	British Sky Broadcasting	5607	81.12%
11	Vivo	10429, 11419, 19182, 26599, 27699	35.99%
12	SKTelecom	9644	50.71%
13	Cox Communications	22773	37.50%
14	AT&T Wireless	20057	44.15%
15	GVT	18881	29.36%
16	Orange Business Services	3215	27.78%
17	Rogers Communications	812, 20453	61.83%
18	Liberty Global	5089, 6830, 20825, 29562	14.64%
19	OTE SA	6799	48.96%
20	TELUS	852	52.32%
21	Orange Poland	5617, 43447	11.54%
22	TELMEX	8151	11.89%
23	FPT Telecom	18403	26.04%
24	Sprint Wireless	3651, 10507	56.15%
25	Free	12322	32.20%
26	Telekom Malaysia	4788	22.58%
27	Telenet	6848	72.03%
28	Telefonica del Peru	6147	17.90%
29	Belgacom	5432	49.81%
30	Chubu Telecommunications	18126	50.37%

http://www.worldipv6launch.org/measurements/

Why is It Hard to Deploy IPv6 CE Router?

Considerations for IPv6 CE Router Development

*Assumption : IPv6 CE Router needs to have transition technologies such as DS-Lite, MAP-E, etc.

CE Router Vendor

- Hardware Development
- Software Development
- Testing
- Customer Support

ISP or Telecom Carriers

- CE Router Provisioning, Management

End User

- How to Setup IPv6 CE Router

Most of Them are Cost Issues

*Assumption : IPv6 CE Router needs to have transition technologies such as DS-Lite, MAP-E, etc.

CE Router Vendor

- Hardware Development ⇒ Additional Memory
- Software Development ⇒ Additional Human Resources
- Testing ⇒ Additional Human Resources
- Customer Support ⇒ Additional Human Resources

They Want to Optimize Their System by Their Policy

*Assumption : IPv6 CE Router needs to have transition technologies such as DS-Lite, MAP-E, etc.

ISP or Telecom Carriers

- CE Router Provisioning, Management

  - Each company has own system by their policy, etc.

  - Different technology
    - IPv6oE, IPv6 PPPoE, DS-Lite, MAP-E, etc.

  - Different configuration method of transition technology
    - DNS, DHCPv6, HTTP, etc.

CE Router Vendors Have to Implement All Functions
If They Want to Connect ALL IPv6 Service

Complicated Setup, End User Must Have Knowledge

*Assumption : IPv6 CE Router needs to have transition technologies such as DS-Lite, MAP-E, etc.

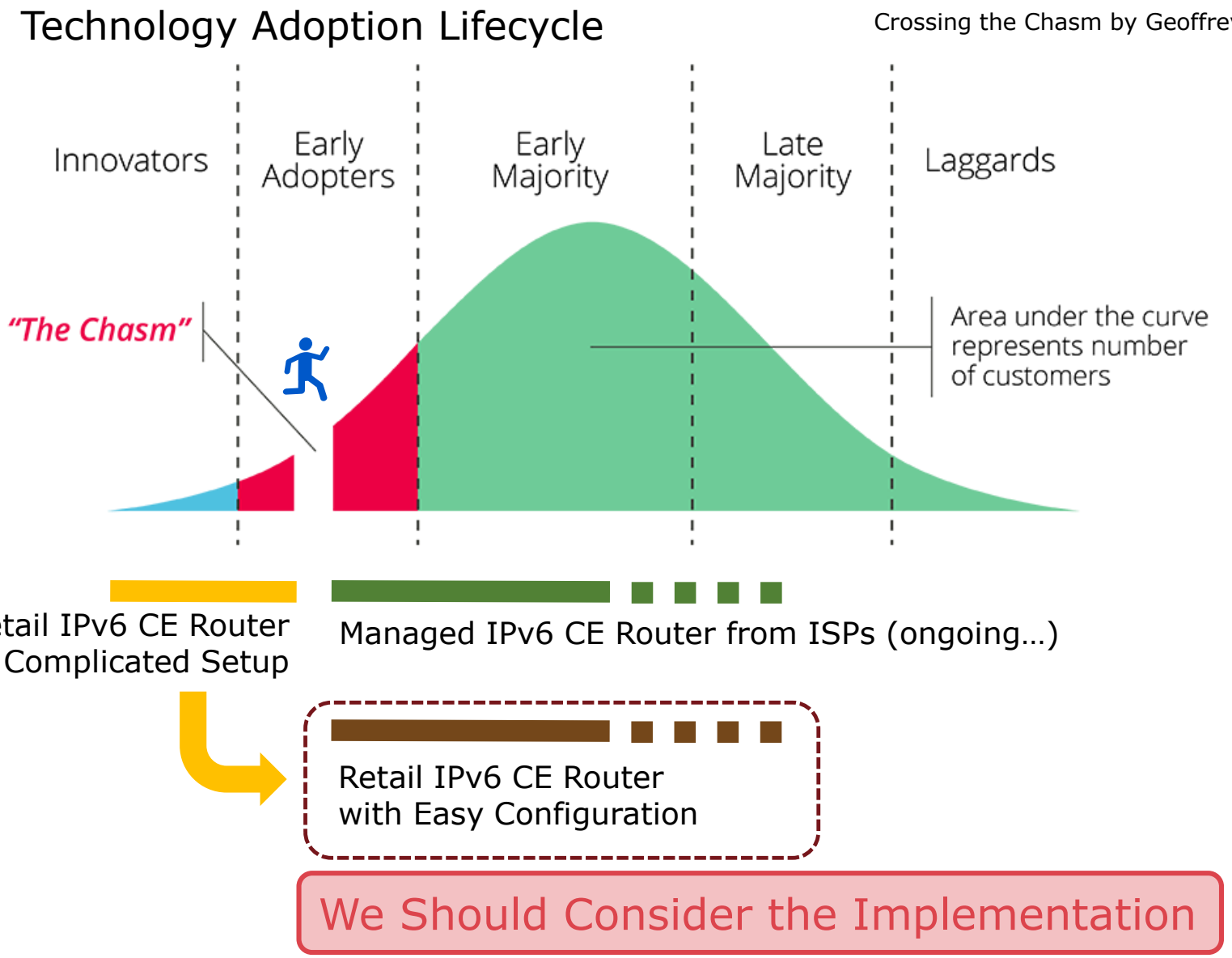
End User

- How to Setup IPv6 CE Router
  - [WAN] IPv6oE, IPv6 PPPoE, SLAAC, DHCPv6 Client, DS-Lite, MAP-E, etc.
  - [LAN] SLAAC, DHCPv6 Server, etc.

CE Router Vendors Should Provide
Easy Configuration or Zero Configuration

What Can We Do for IPv6 CE Router Deployment?

Let's Cross the Chasm



One of the Options That Can Be Taken is …

IPv6 CE Router needs to know uplink information in more detail

- In order to setup it **automatically** (≒Zero Configuration) or to provide **easy configuration wizard** to end user, CE Router needs more specific information.
  - Interface Type : IPv6oE, IPv6 PPPoE, etc.
  - Transition Technology : none, DS-Lite, MAP-E, etc.
  - Configuration Method : DHCPv6 Option, etc.

- There is similar mechanism such as **RFC8026**
  - Unified IPv4-in-IPv6 Softwire CPE : A DHCPv6-Based Prioritization Mechanism
    - » It only focuses on DS-Lite, MAP-E/T, Lw46.
    - » Some ISPs can't(won't) use DHCPv6 Option for some reason.

Conclusion

- CE Router Vendor Should Provide Retail IPv6 CE Router with Easy Configuration
  - Customers want solutions and convenience (Not Technology)

- We may be able to standardize simple method for IPv6 CE Configuration

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Orchestrating a brighter world

NEC brings together and integrates technology and expertise to create the ICT-enabled society of tomorrow.
We collaborate closely with partners and customers around the world, orchestrating each project to ensure all its parts are fine-tuned to local needs.

Every day, our innovative solutions for society contribute to greater safety, security, efficiency and equality, and enable people to live brighter lives.


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