

# IPv6 in IX

## – JPNAP's case –

Katsuyasu Toyama  
Director, General Manager of  
Technology Department  
INTERNET MULTIFEED CO.



# Agenda

---

- Company overview
- Internet Exchanges in Japan
- JPNAP
  - Overview
  - IPv6 deployment in JPNAP

# Company overview



# INTERNET MULTIFEED CO.

- Established in September 1997
- by NTT Communications and Internet Initiative Japan, with some big ISPs and content providers.





# Our business

---

## **MultiFEED** since 1997

- One of the first Internet Data Centers in Japan
- Located at Otemachi, Tokyo
- Effective for quality-conscious customers
  - just like financial companies

**MultiFEED**

## **JPNAP** “JaPan Network Access Point” since 2001

- Internet exchange
- The largest IX in Japan in Traffic



## **transix** since 2011

- IPv6 Internet access (eyeball network) over NTT-NGN

**transix**



# Internet Exchanges in Japan

✓ JPIX



✓ JP NAP



✓ Equinix



- In Japan, commercial companies operate IX, and compete with each other from business point of view.



# Major IXPs in Japan

	Start	Type	Carrier group	Traffic	Members
<b>JPIX</b>	<b>1997</b>	<b>Commercial</b>	<b>KDDI group</b>	<b>140G</b>	<b>130</b>
<b>JP NAP</b>	<b>2001</b>	<b>Commercial</b>	<b>NTT/IIJ group</b>	<b>300G (TOTAL), 240G (Tokyo)</b>	<b>90</b>
<b>EQUINIX</b>	<b>2007</b>	<b>Commercial</b>	<b>(US company)</b>	<b>60G?</b>	<b>?</b>



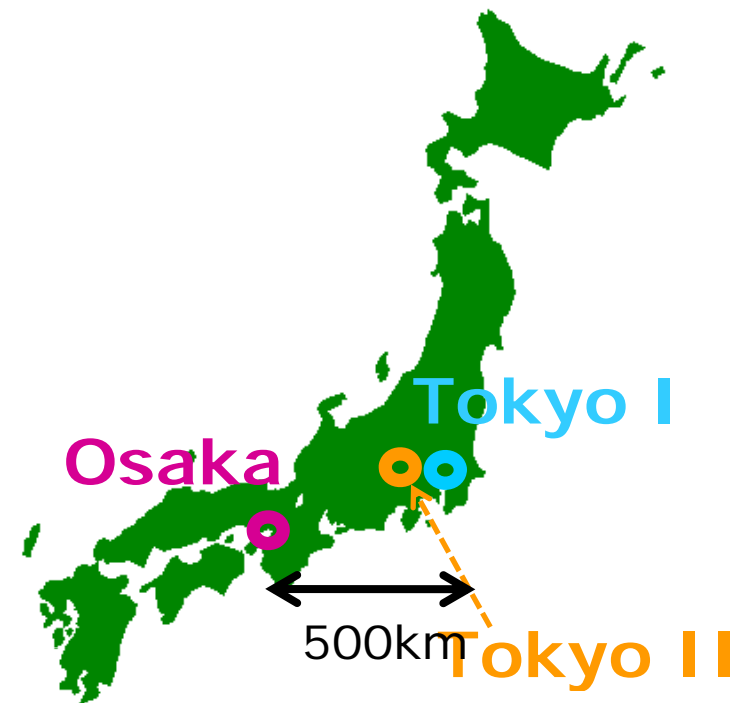
---

# JPNAP



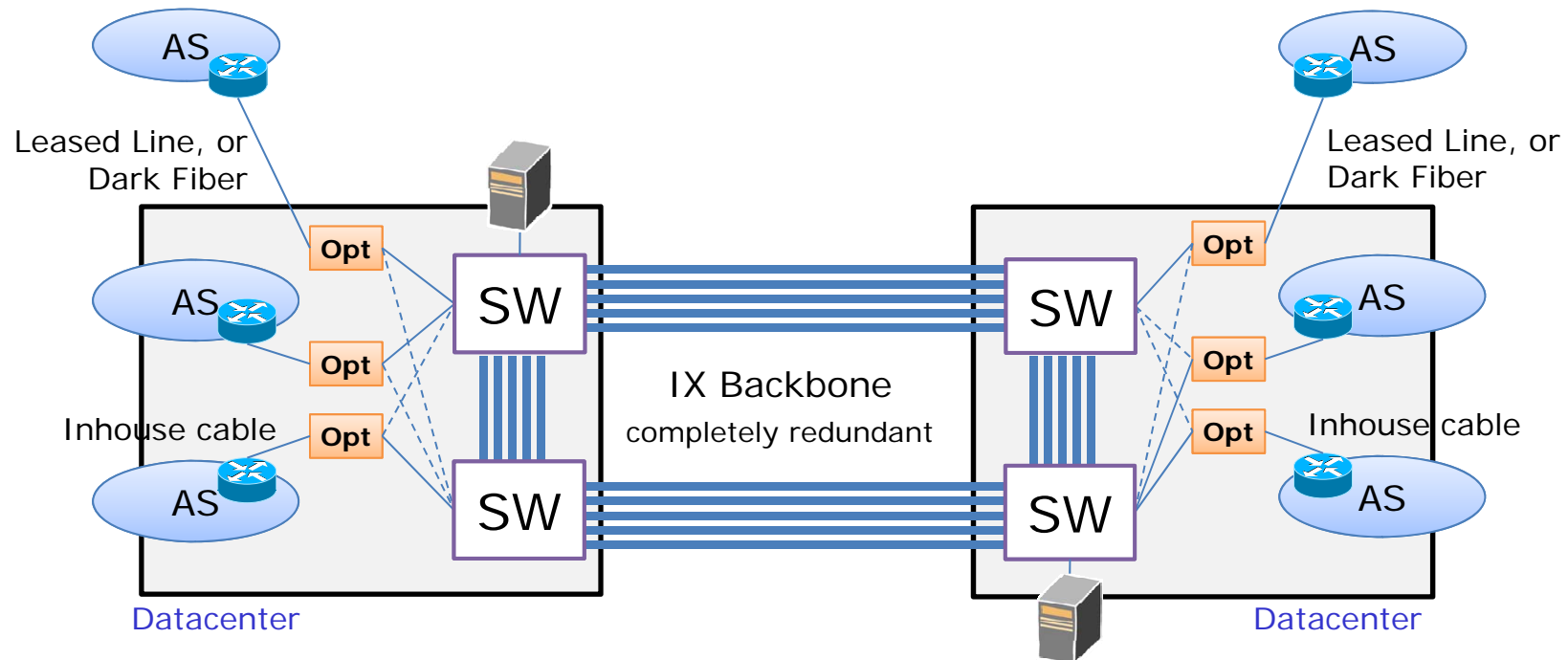
# JP NAP Overview

- Internet Exchange in Japan
- Commercial
- Ethernet based (Layer 2 IX)
- 3 exchange points in Japan
  - Tokyo I, II and Osaka
  - independent networks



# JPNAP Network

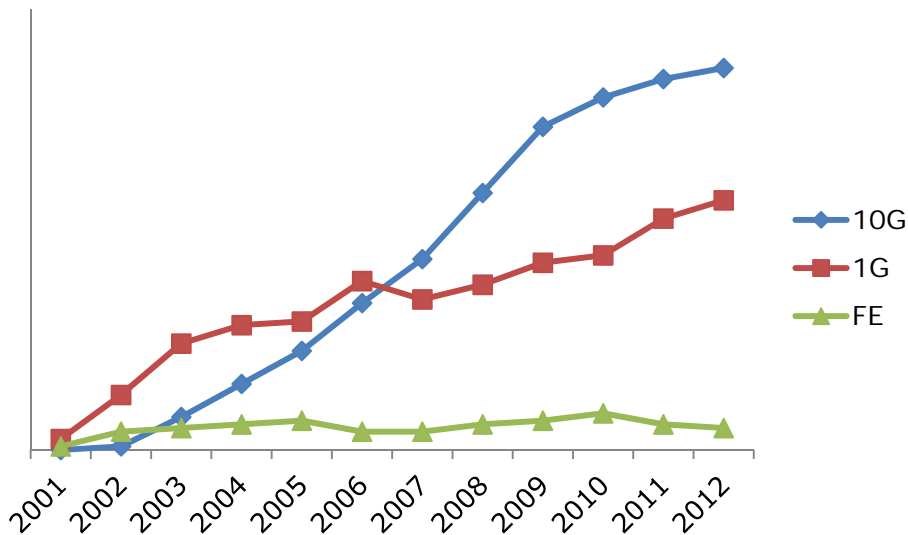
- High Availability
  - Prepare main and backup switch in each POP.
  - Optical switch changes a port to backup in case of Ethernet switch failure.



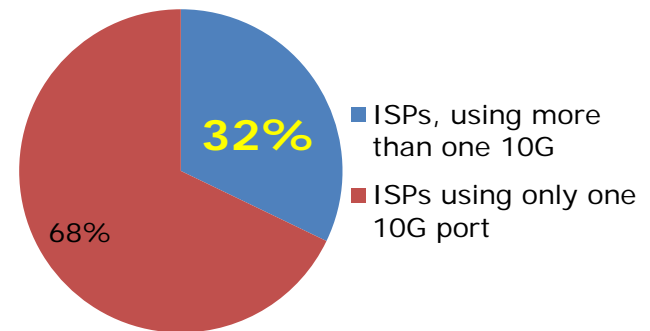
# Broadband-oriented IX

- 10G is the most popular interface in JP NAP

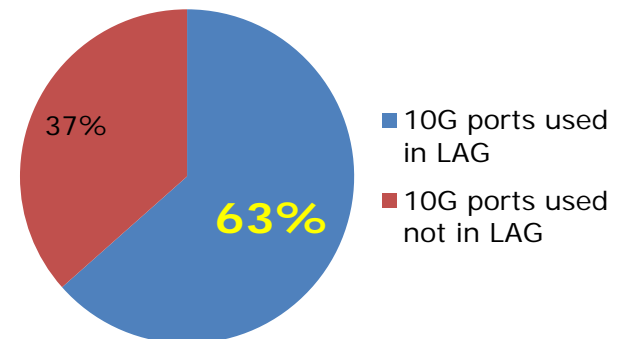
✓ Growth of each type of ports



✓ ISPs using multiple 10G ports



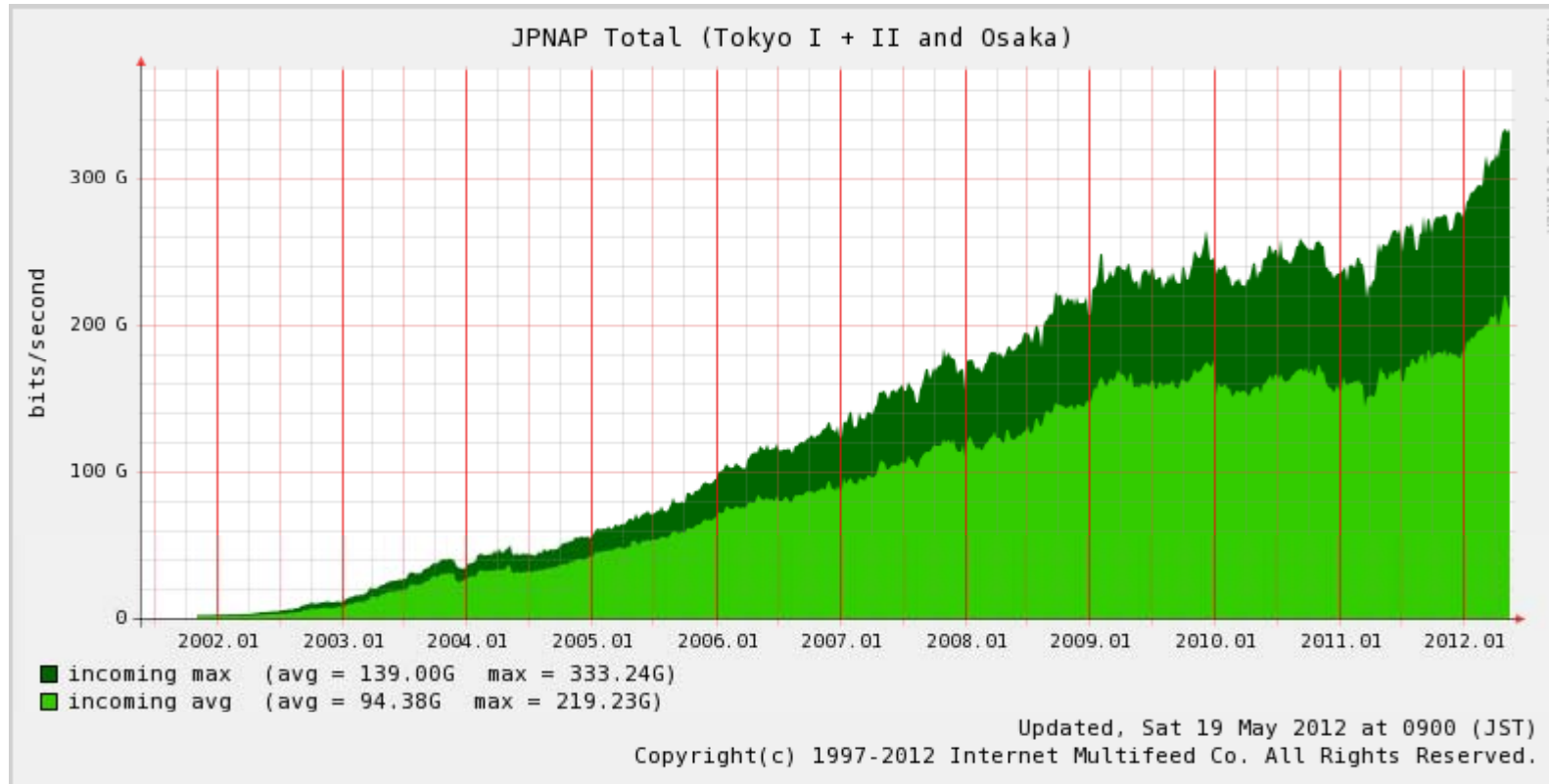
✓ 10G ports used in LAG





# Total traffic

- Peak: 333Gbps



# IPv6 Deployment in JP NAP

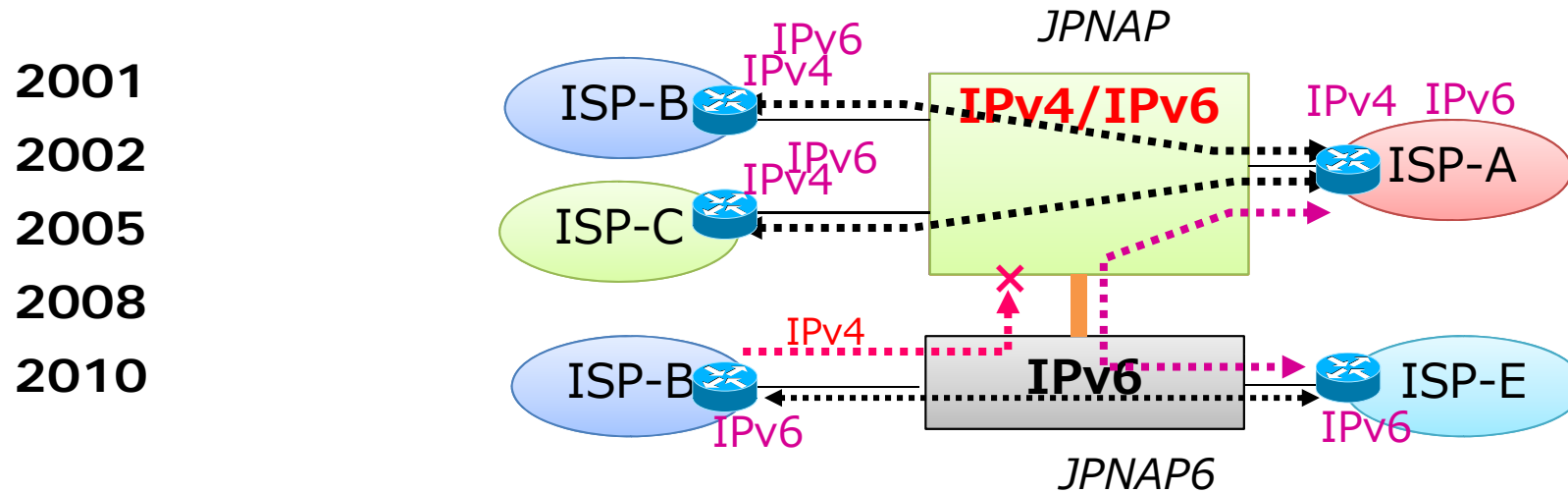


## Current IPv6 implementation in JP NAP

---

- Dual stack VLAN
  - IPv4 and IPv6 on the same VLAN
- No multicast available
- Addressing scheme:
  - ASN in decimal number is embedded into interface ID.
- Prohibited packets:
  - ICMPv6 Router Advertisement
- MP-BGP (RFC2545 and RFC4760) for exchanging routes
- Multi-lateral Peering provided by route servers.

# History of IPv6 in JPNAP

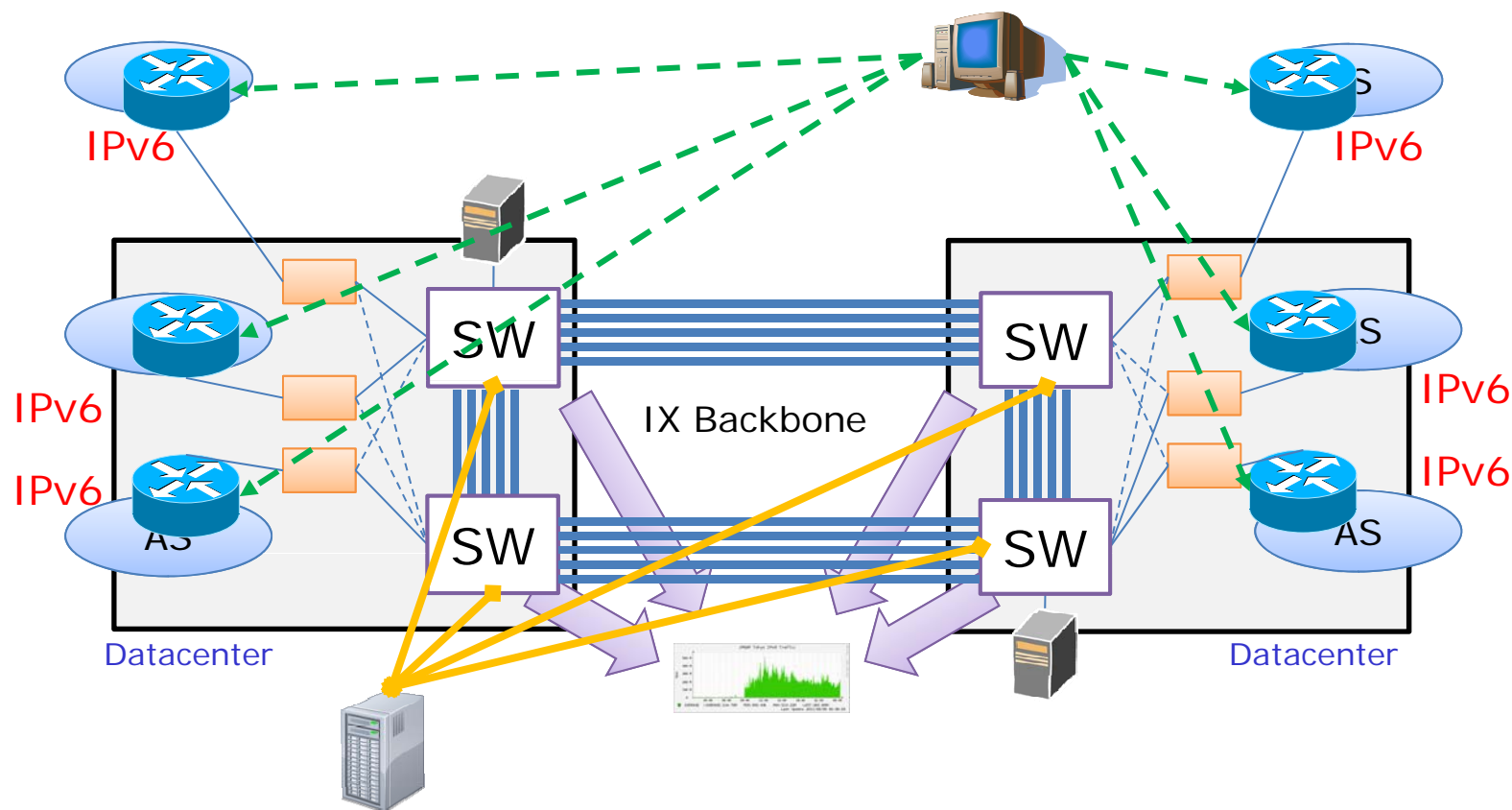


- In 2002, launched experimental IPv6 network, "JPNAP6".
- In 2005, started IPv6 trial in production networks.
- In 2008, formally offered IPv4/IPv6 in the production networks after confirming it does not affect our service level.



# What should be provided for IPv6 in IX?

- On main LAN
  - IPv6 address assignment and management
  - Monitoring customer interface (ping6 and bgp+)
  - Monitoring disallowed types of packet (Route Advertisement)
  - Traffic flow of IPv6

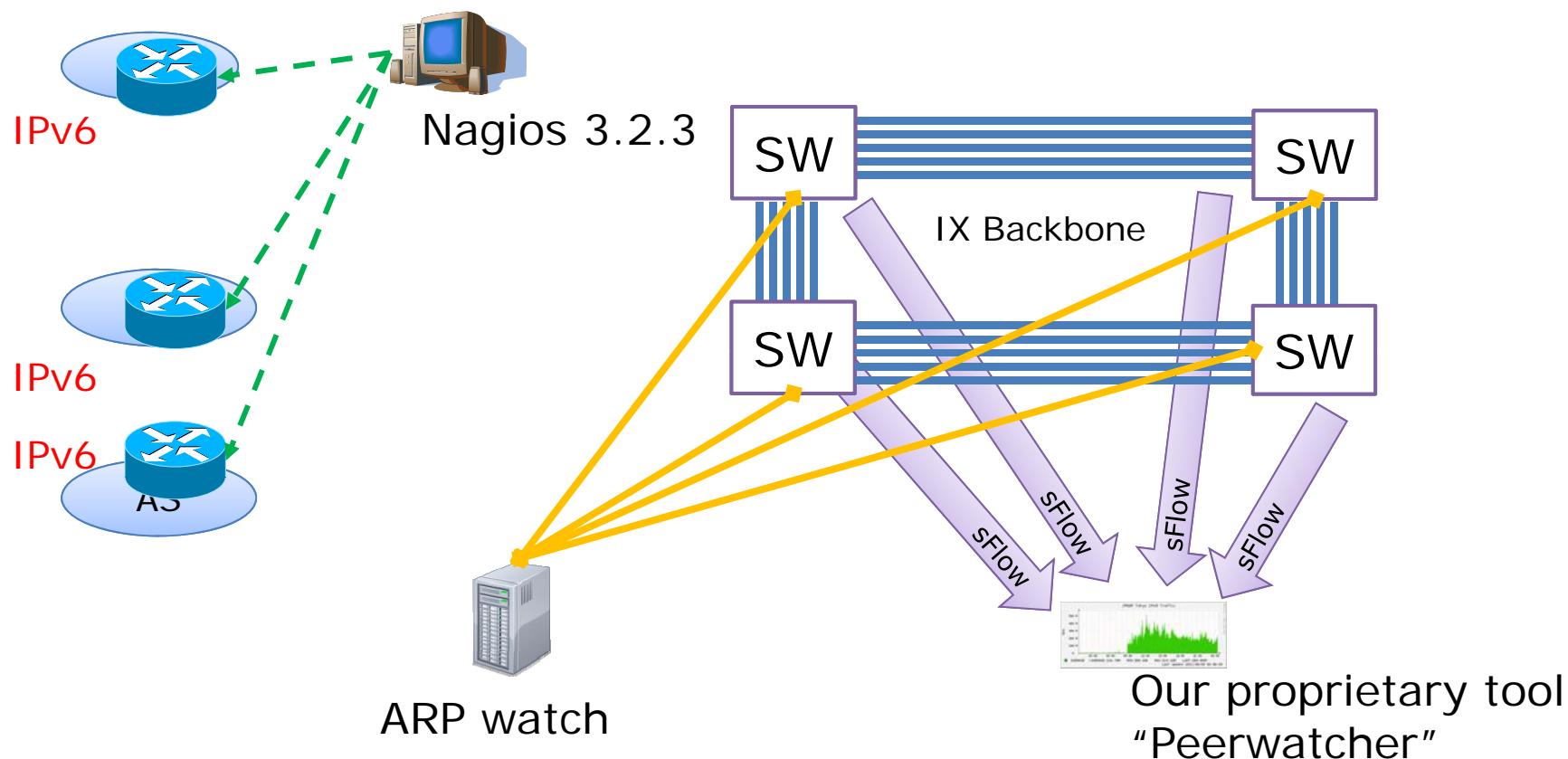






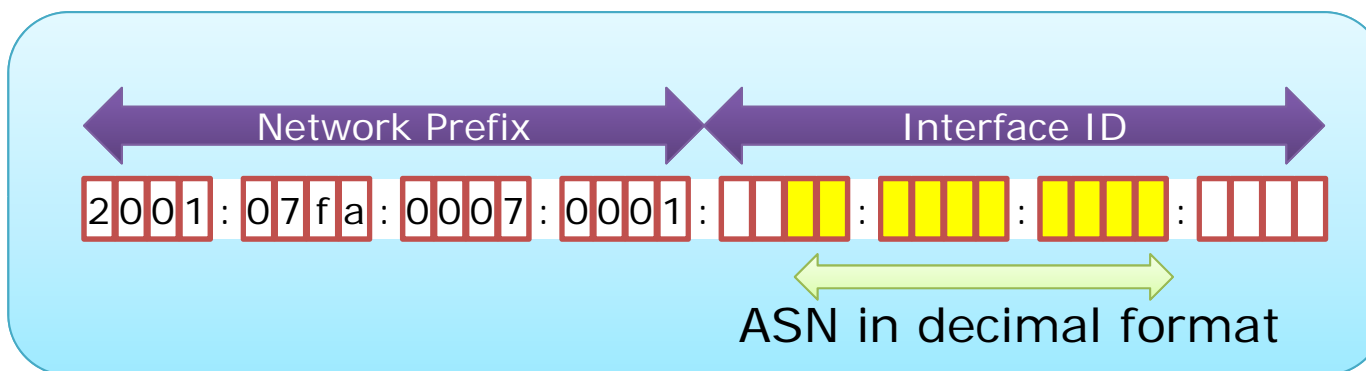
# What should be provided for IPv6 in IX?

- Tools
  - Monitoring customer interface
  - Monitoring disallowed types of packet
  - Traffic flow of IPv6





# Address Assignment Scheme

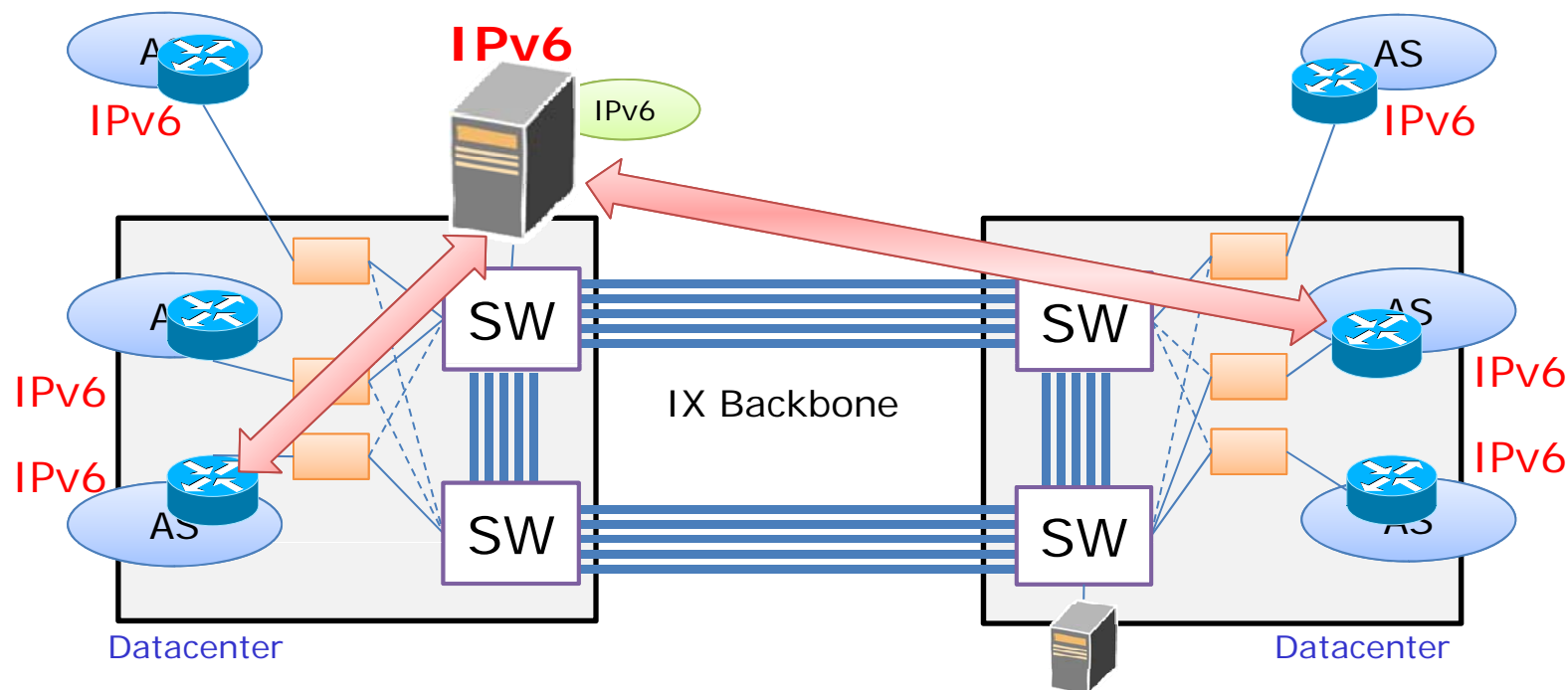


	Tokyo I	Tokyo II	Osaka
IPv6	2001:07fa:0007:0001::/64	2001:07fa:0007:0003::/64	2001:07fa:0007:0002::/64
Scheme	For AS7521 2001:07fa:0007:0001:0000:0000:7521:0001  For AS131079 (AS2.7) 2001:07fa:0007:0001:0000:0013:1079:0001  For AS4294967295 (AS65535.65535) 2001:07fa:0007:0001:0042:9496:7295:0001		
IPv4	210.173.176.0/24	218.100.45.0/24	210.173.178.0/25



# What should be provided for IPv6 in IX?

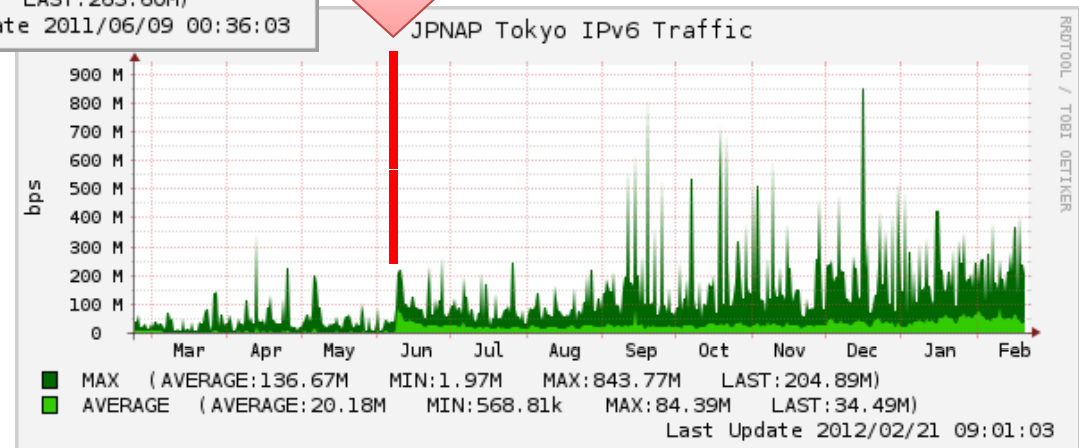
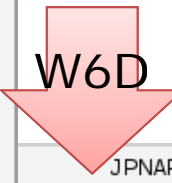
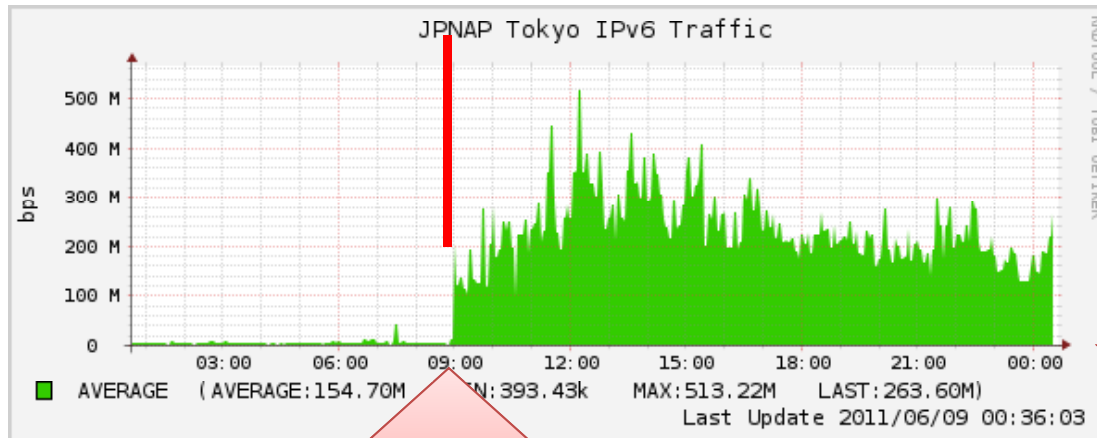
- On route servers
  - Exchanging IPv6 routes
    - IPv6 NLRI
    - MP-BGP on IPv6 transport





# IPv6 Traffic around World IPv6 Day

- World IPv6 Day on 8 June 2011
- IPv6 traffic in JPNAP increased suddenly.
- So far IPv6 traffic is staying at the same level as on the World IPv6 Day.





# Thank you!

---

- Any questions and comments?
- Contact:
  - [toyama@mfeed.ad.jp](mailto:toyama@mfeed.ad.jp)
  - Katsuyasu Toyama
  - INTERNET MULTIFEED CO.