(APNIC56 in Kyoto)

IPv6 Deployment and Activities in Japan, 2023

IAjapan (IPv6 Deployment Committee)

JPIX

Akira Nakagawa

Myself

Akira Nakagawa

- Job
  - 2010 ～ 2017　JPIX & JPNE
  - 2017 ～ 2020　JPIX
  - 2020 ～ 2021　JPIX & Cabinet Secretariat (Gov.)
  - 2021 ～ Now　JPIX & Digital Agency (Gov.)

- Activities
  - JPOPF Operation　JPOPF-ST (Staring Team) Chair
  - Internet Week　JPNIC Internet Week Program Committee
  - IPv6 Summit　IAjapan, IPv6 Deployment Committee
  - Speed Test site　iNonius Project　(inonius.net)
  - RFC6888 CGN　Co-author

Agenda

- **Major Internet infrastructure in Japan**
- IPv6 Deployment in JP
- IPv6 related tools in JP
- IPv6 Communities in JP

Japanese Internet guys always say

“IPoE” and “PPPoE”.

What are these ?

Background of NTT

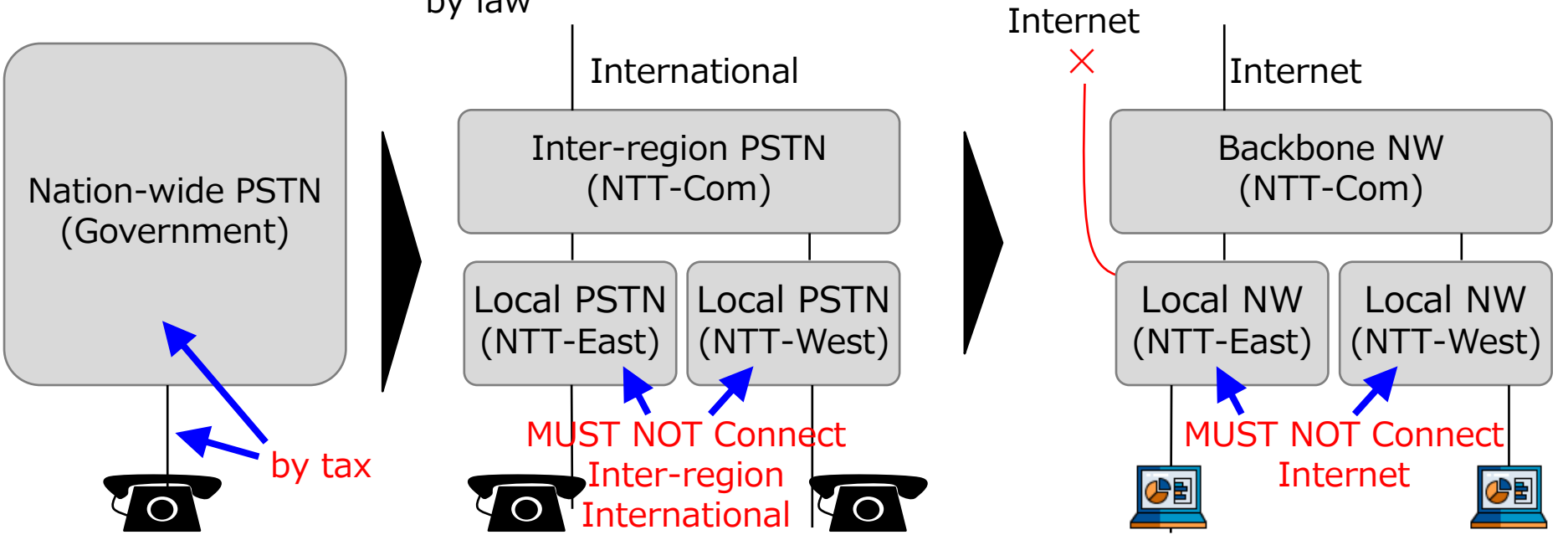
NTT-East/West cannot connect Internet by NTT law.

~1985

Constructed by tax

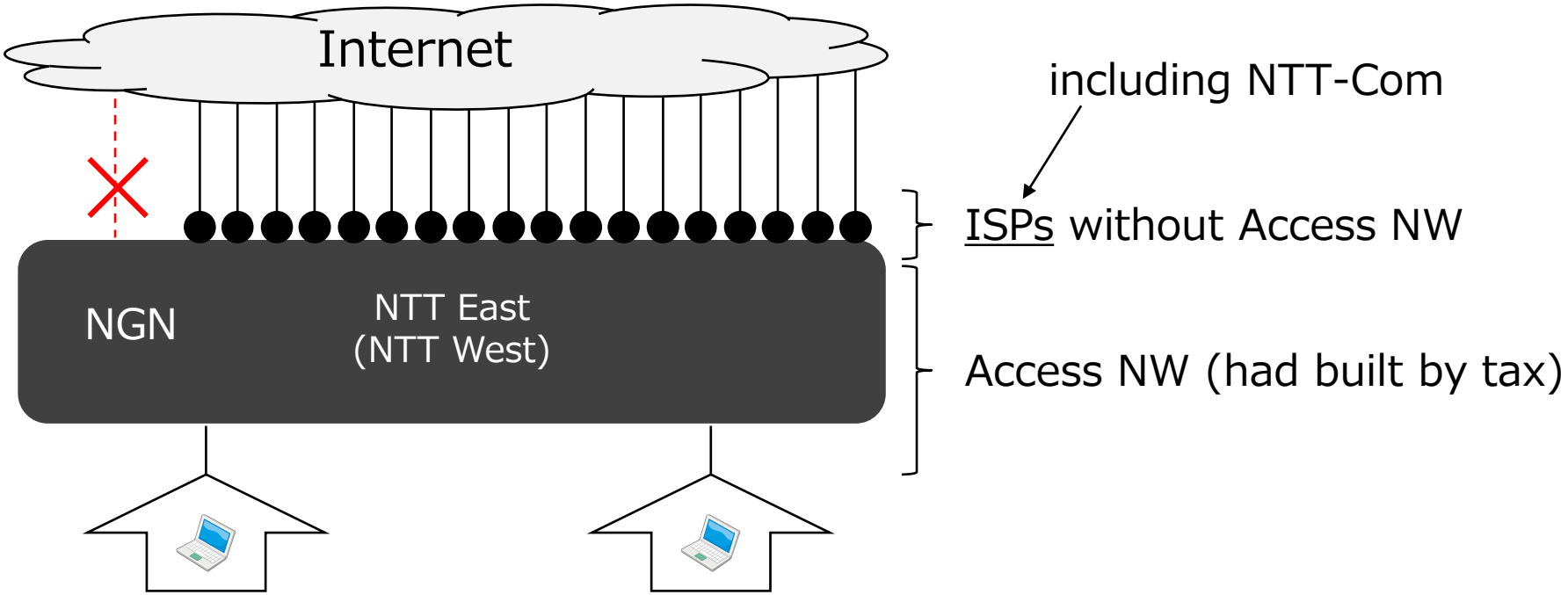
1985～ Privatized
1999～ Divided
NTT-E/W is for Local NW-only by law

Now
NTT-E/W
can't connect Internet by law !!



NTT East/West and ISPs

NGN is an access NW platform
where private ISPs can enter their business.

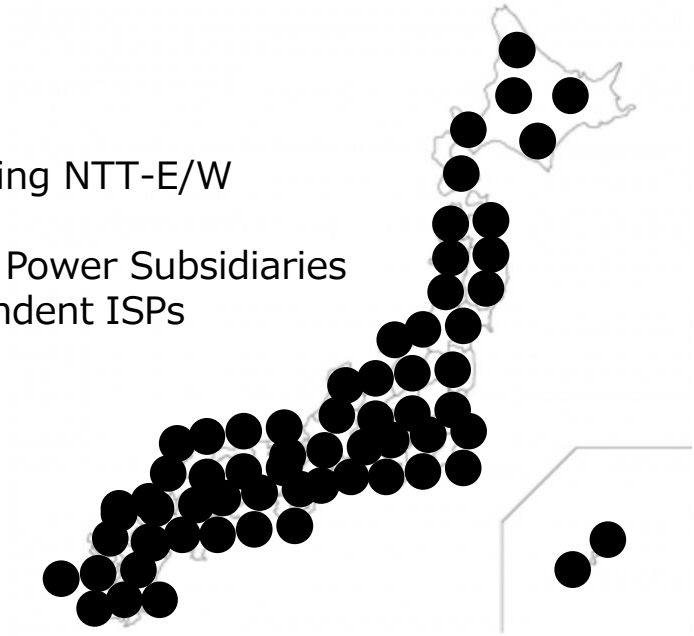


Fixed Network Operators in Japan

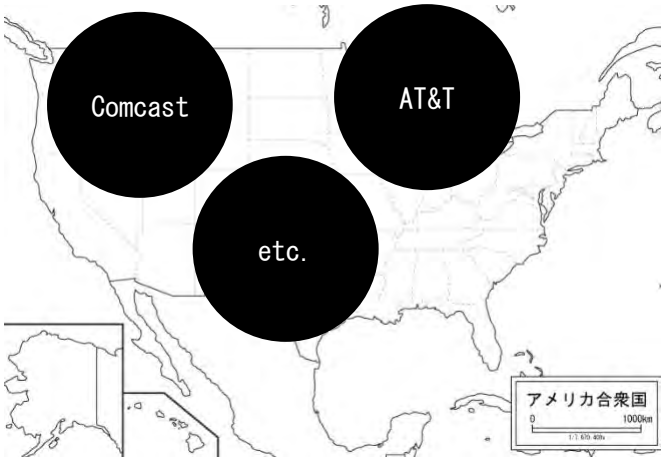
A lot of NW operators in Japan !!

Japan

includes
- ISPs using NTT-E/W
- CATVs
- Electric Power Subsidiaries
- Independent ISPs
- etc.



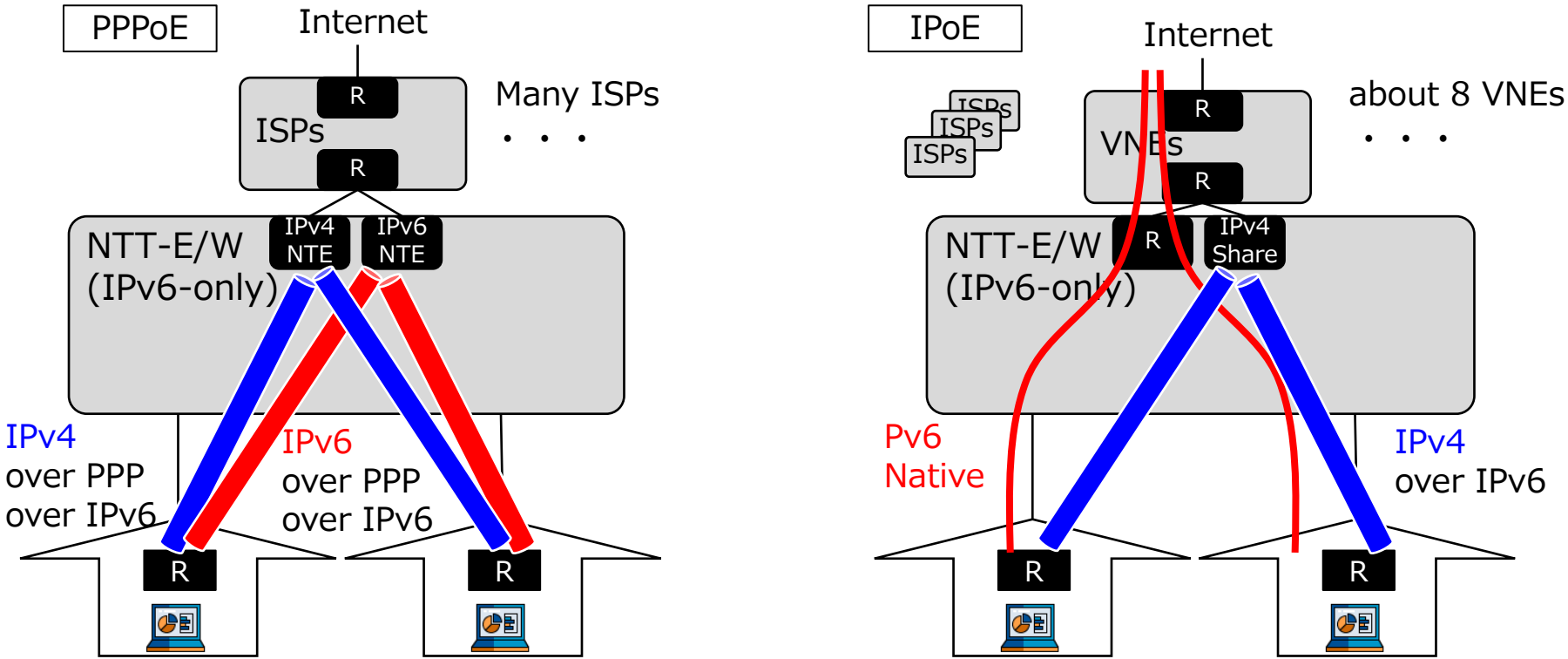
US



Two models of NGN (NTT-E/W NW)

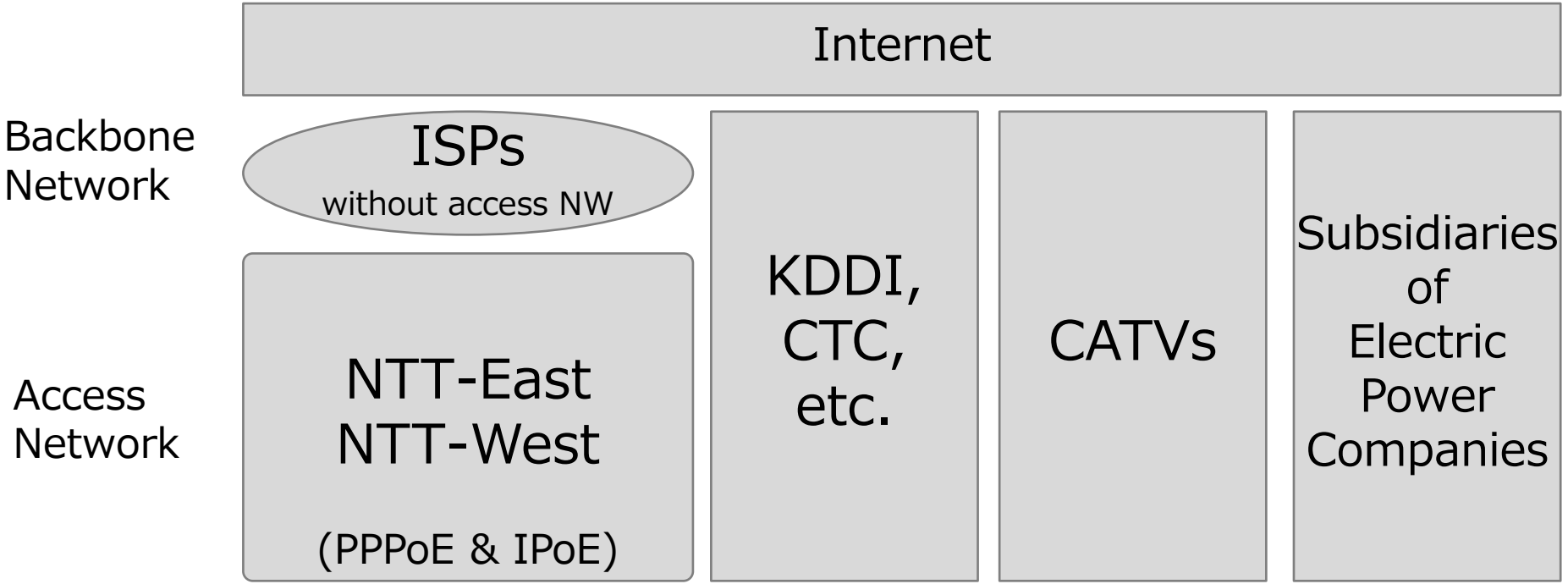
IPoE is majority !! (now, approx. 70%)

End Users have been switching their contract from PPPoE to IPoE.



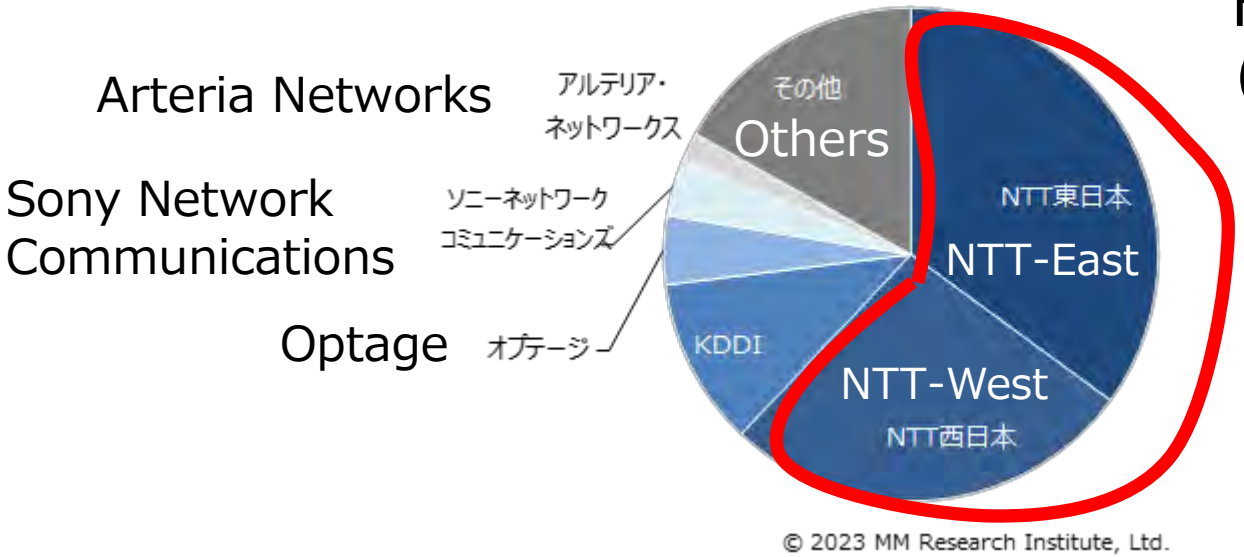
Access NWs in Japan

NTT-East/West with ISPs are the majority.



Share of FTTH (NOT IPv6 Rate)

62% of “FTTH Share” is NTT-East/West.



FTTH Share (Mar. 2023)

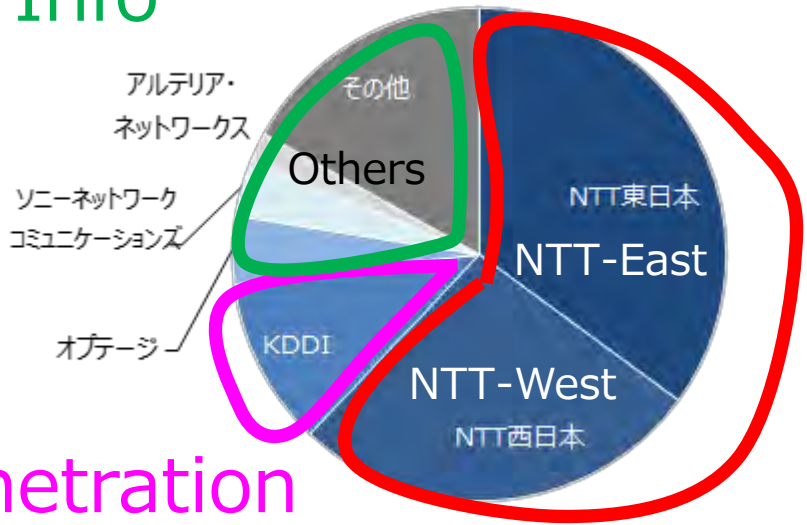
62%

https://www.m2ri.jp/release/detail.html?id=579
https://www.v6pc.jp/jp/spread/ipv6spread_03.phtml

IPv6 penetration rate of FTTH (Mar. 2023)

Approx. 3/4 of Japanese FTTH are IPv6 according to the public info.

No Public Info



IPv6 Penetration
More than 80%
(90% now ?)

IPv6 Penetration
100%

https://www.m2ri.jp/release/detail.html?id=579
https://www.v6pc.jp/jp/spread/ipv6spread_03.phtml

Agenda

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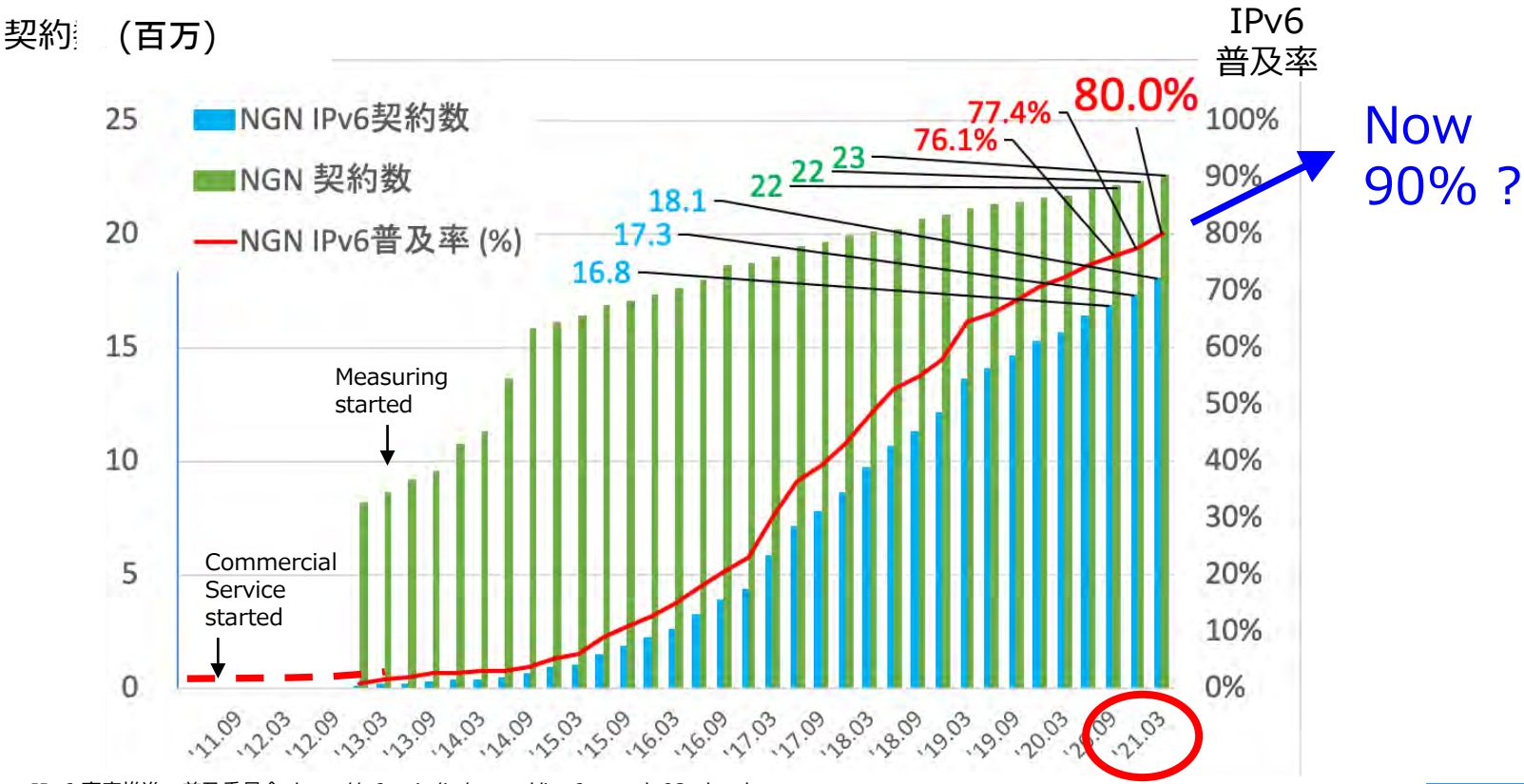
- **IPv6 Deployment in JP**
- IPv6 related tools in JP
- IPv6 Communities in JP

IPv6 Penetration rate of NTT-East/West

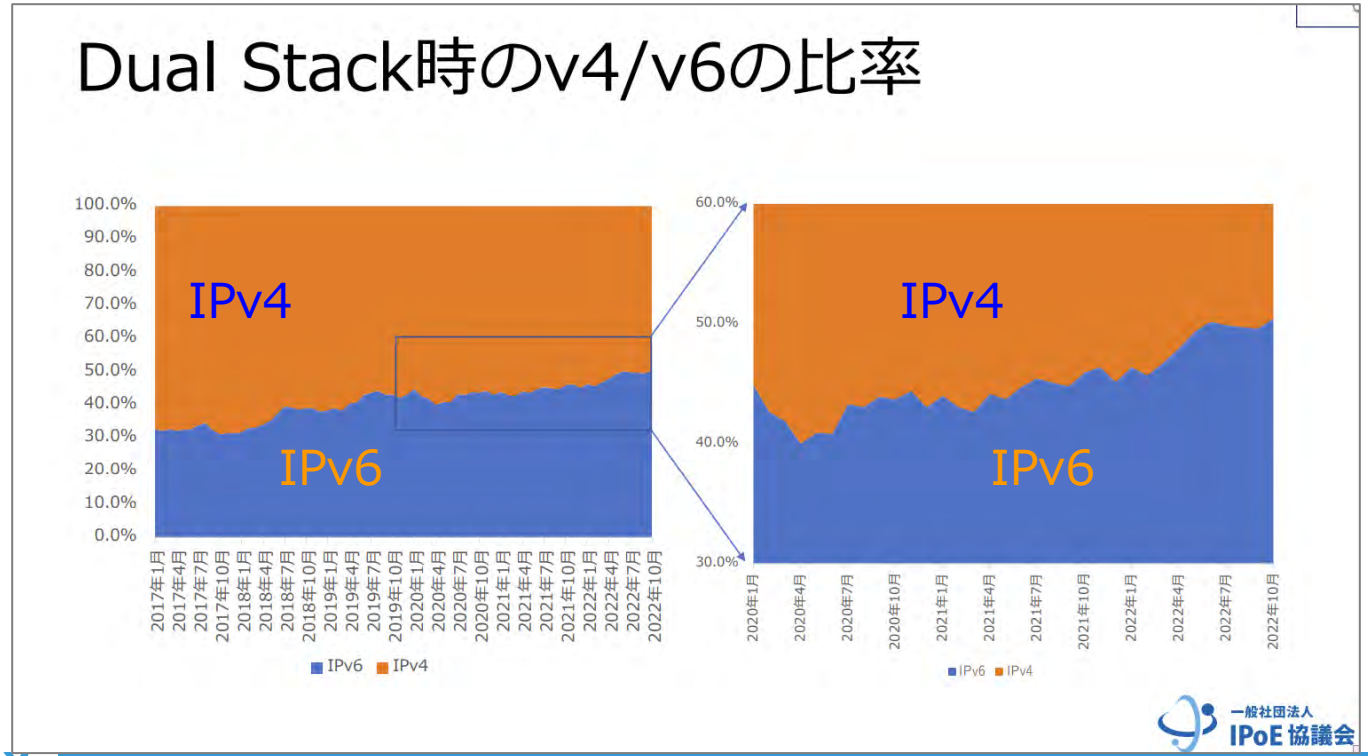
Measuring terminated in 2021, completed !!



IPv6 Traffic rate of Dual Stack Service (Observed by VNE(ISP))

IPv6 Traffic rate of IPoE is 50%.

(IPoE : One of major method of NTT-NGN, IPv6 + IPv4aaS)



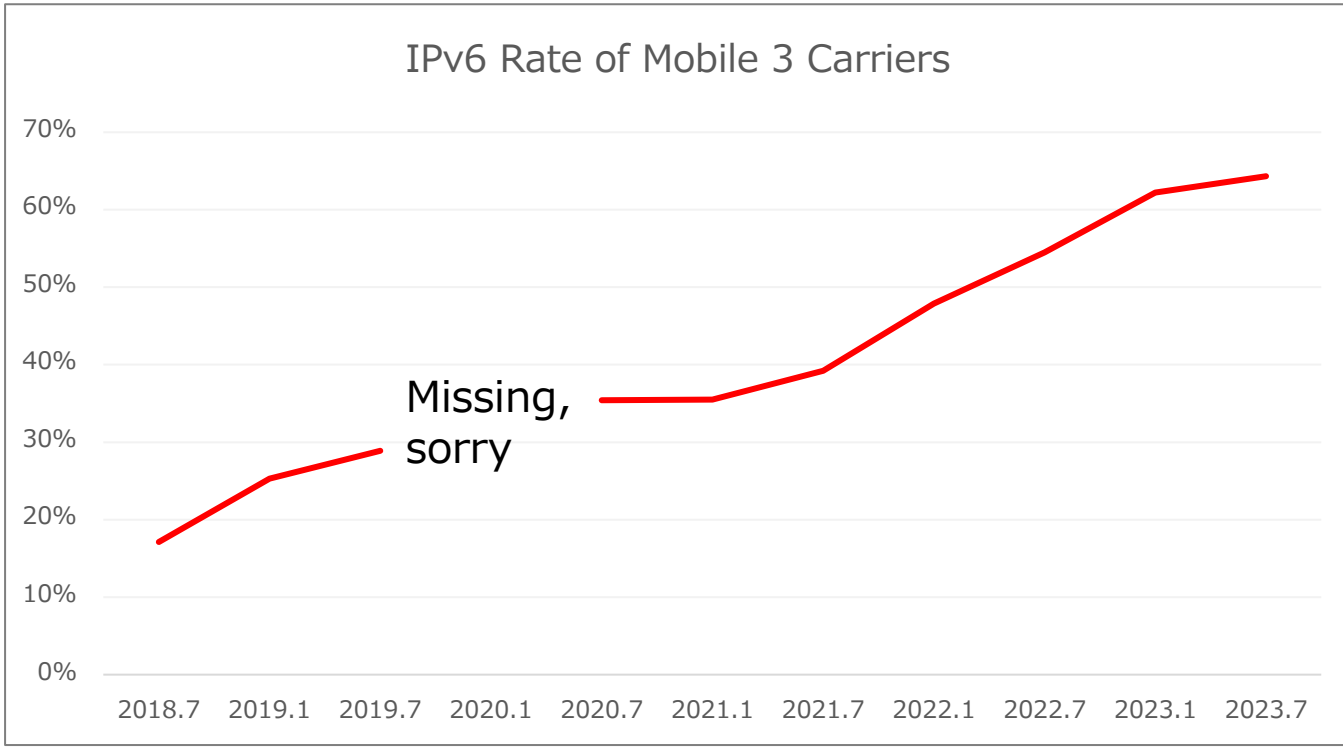
https://www.jp.ipv6forum.com/timetable/program/20221216_3-3_IPv6Summit2022_IPv6IPv4aaS.pdf

IPv6 penetration rate of Mobile. (as of July. 2023)

2/3 of Mobile Users are using IPv6.

Three mobile carriers in Japan :

- NTT docomo
- KDDI
- SoftBank

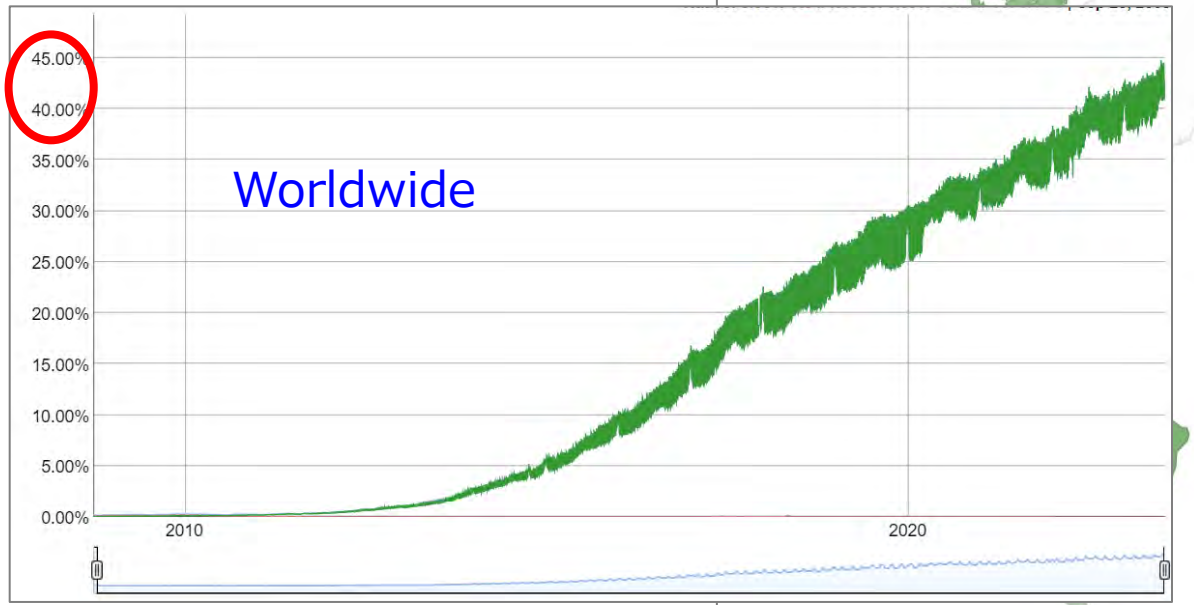


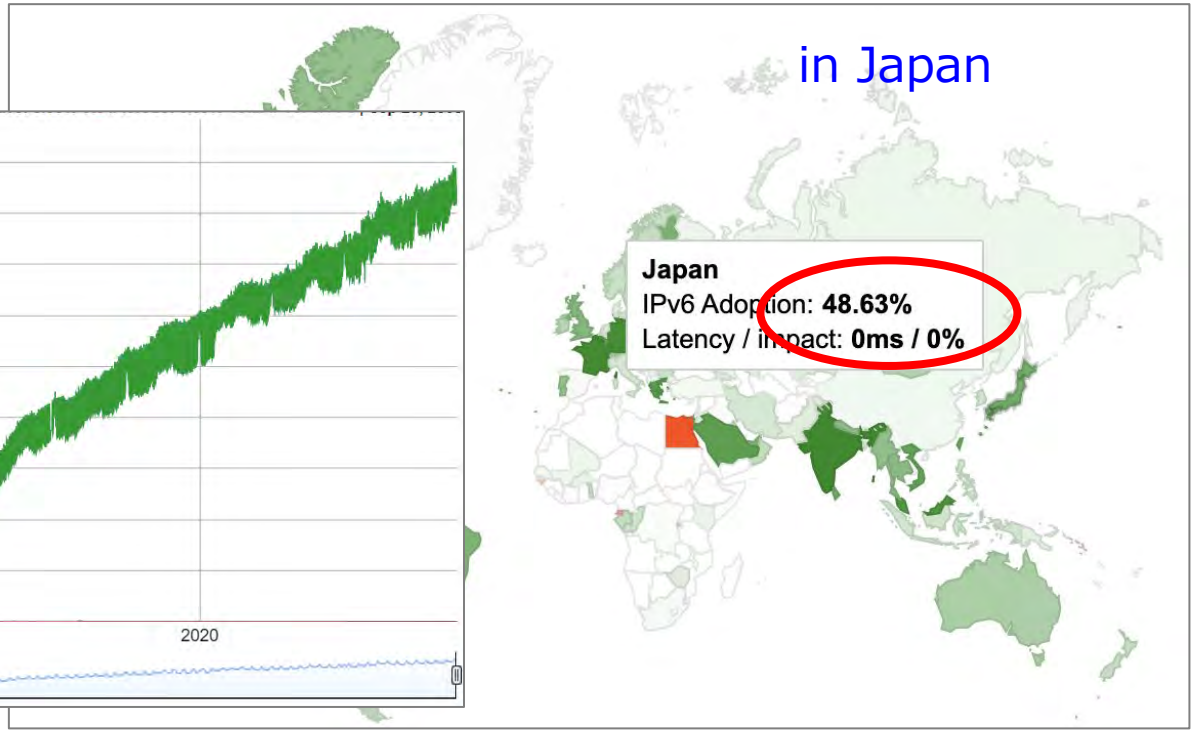
Source:
Facebook timeline of mobile guy.

IPv6 rate in Japan comparing to World-wide

IPv6 rate in the world is 40-45% !!

IPv6 rate in Japan is 50% !!





https://www.google.com/intl/ja/ipv6/statistics.html#tab=ipv6-adoption

Major traffic is Streaming. Streaming supports IPv6.

IPv6対応状況 –動画-

- トップページ・アプリの動画はIPv6対応済
- トラフィックの大半は動画

V6コンテンツ

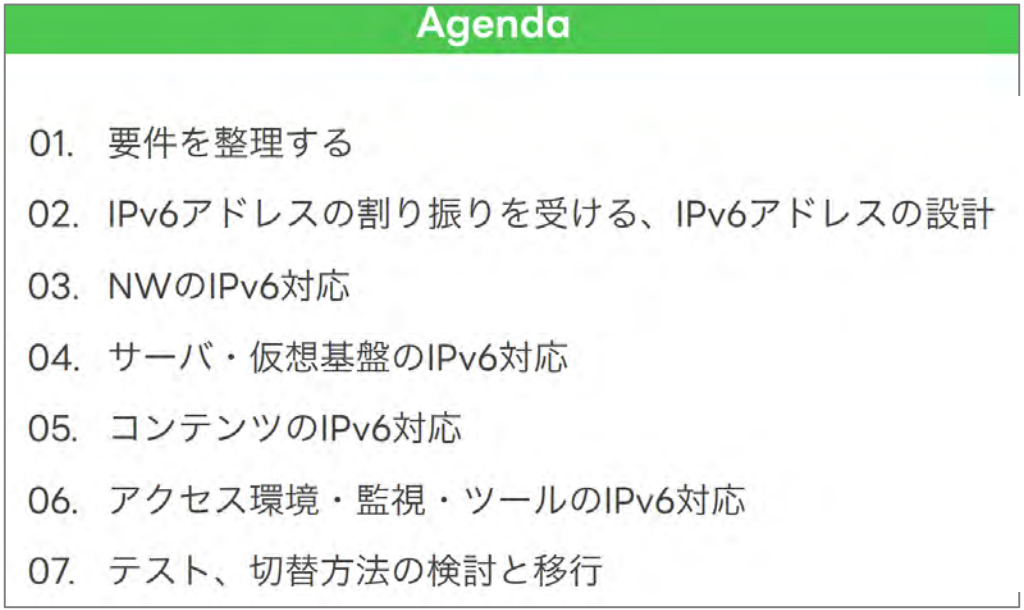
IPv6対応中

3

Janog47 :
https://www.janog.gr.jp/meeting/janog47/wp-content/uploads/2020/11/janog47_ipv6_takasawa.pdf

LINE, SNS Operator in Japan, adopted IPv6

LINE showed us how they implemented IPv6 as a CP at Internet Week 2022.



01 Requirement
02 IPv6 Address Planning
03 IPv6 NW
04 IPv6 Server/Virtual Infra.
05 IPv6 Content
06 IPv6 Mgmt., tools, etc.
07 Test and Transition.

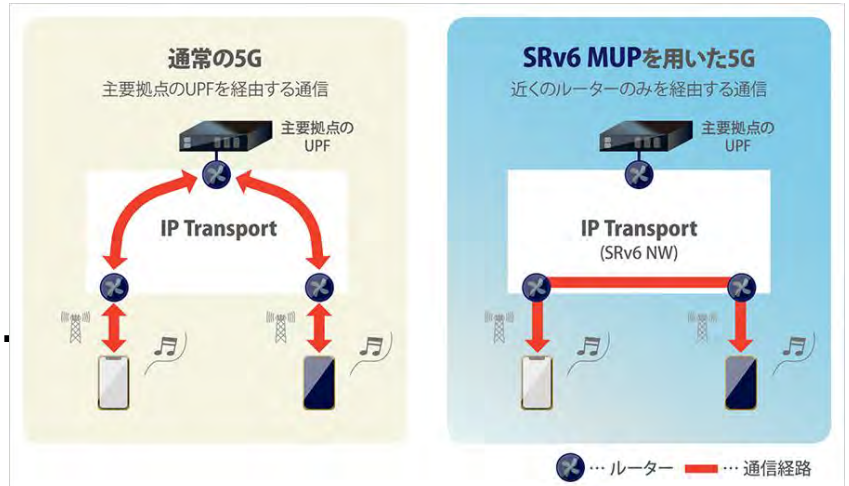
https://www.nic.ad.jp/ja/materials/iw/2022/proceedings/c21/c21-nakamizo.pdf

Yamaha SYNCROOM (Multipoint Online Music Performance)

IPv6 Ready !!

- For using Fixed NW
  - Yamaha recommends NTT-NGN IPoE IPv6.
  - Because Packets bypass ISP(VNE) and locally communicate in NGN which achieves Low Latency.
- For using Mobile NW
  - Yamaha and Softbank started trials on SoftBank's 5G commercial network using SRv6 MUP.
  - Packets bypass Softbank Backbone NW.

* Yamaha also started SYNCROOM in Korea.



IPv6 Summit 2020
https://www.jp.ipv6forum.com/2020/timetable/program/20201202_2_IPv6summit_yamaha_hara_1130.pdf
Press Release
https://www.softbank.jp/en/corp/news/press/sbkk/2023/20230807_01/

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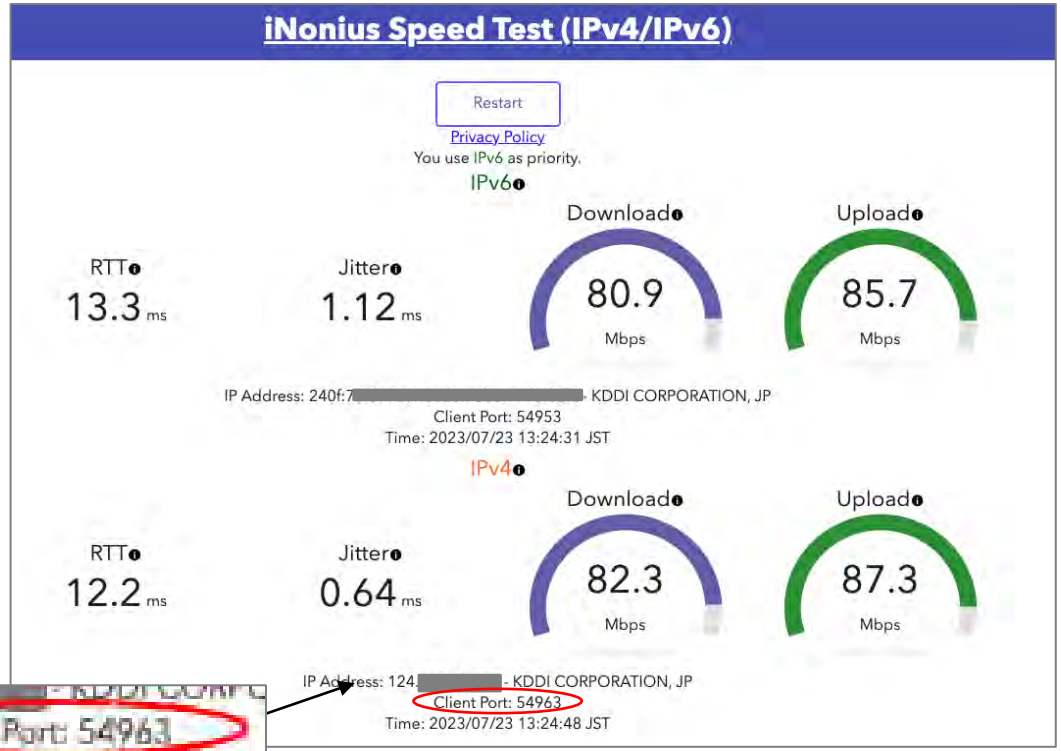
Speed Test Site (by iNonius)

Home Router maker “I-O DATA” adopted this function in its smartphone app.

Speed Test Site with IPv6 and 10 Gbps Interface is ready !!

It’s in BBTower NW connected to JPIX in Tokyo.



New

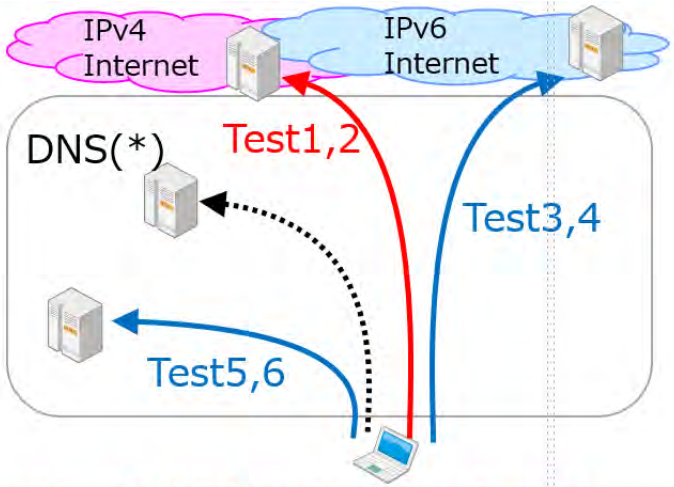
Port Number

https://inonius.net/

https://www.iodata.jp/product/app/network/wifimireru/

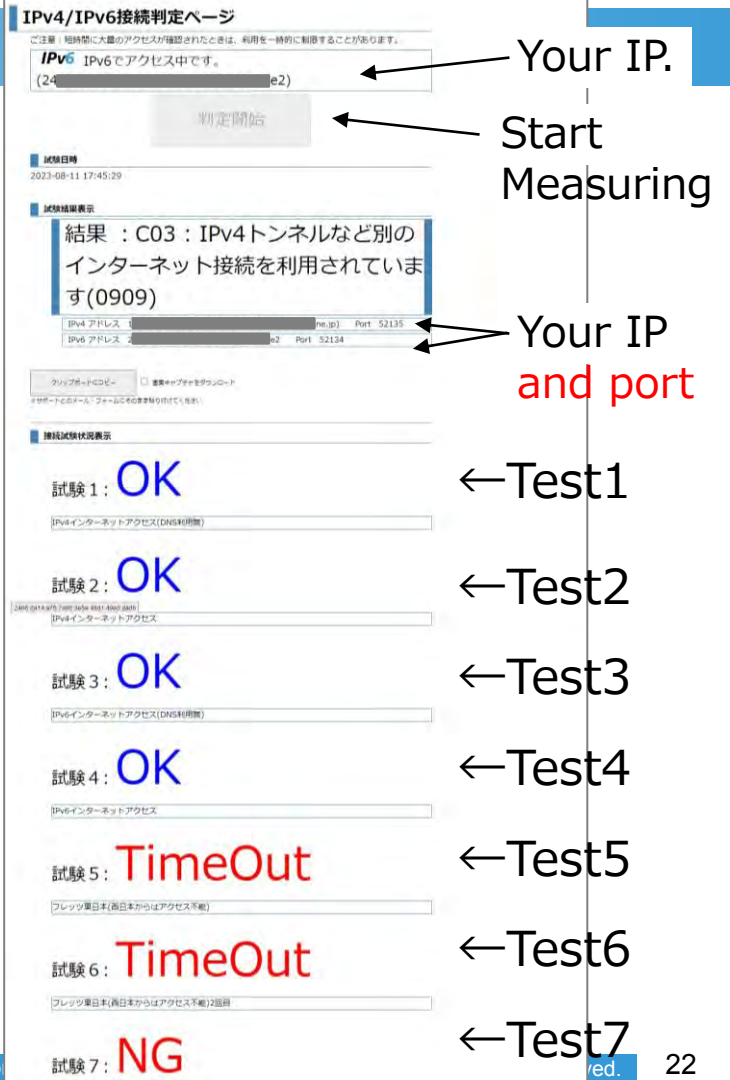
IPv6/IPv4 Trouble Shooting (by JPIX)

A tool by JPIX (former JPNE),
Simplifying trouble shooting.



Test 1 : IPv4 Internet	IP reachability	v4
Test 2 : IPv4 Internet	with Name resolution (*)	
Test 3 : IPv6 Internet	IP reachability	v6
Test 4 : IPv6 Internet	with Name resolution (*)	
Test 5 : IPv6 Backbone	IP reachability	v6
Test 6 : IPv6 Backbone	with Name resolution (*)	

http://kiriwake.jpne.co.jp/



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Focusing on Operational issues, now.

We are focusing on

- WHOIS accuracy
- Abuse
- etc.

※ I'll make a presentation about it later, today

- NIR Sig
- 16:30 – 18:00 (UTC+9:00)
- Annex Hall 2

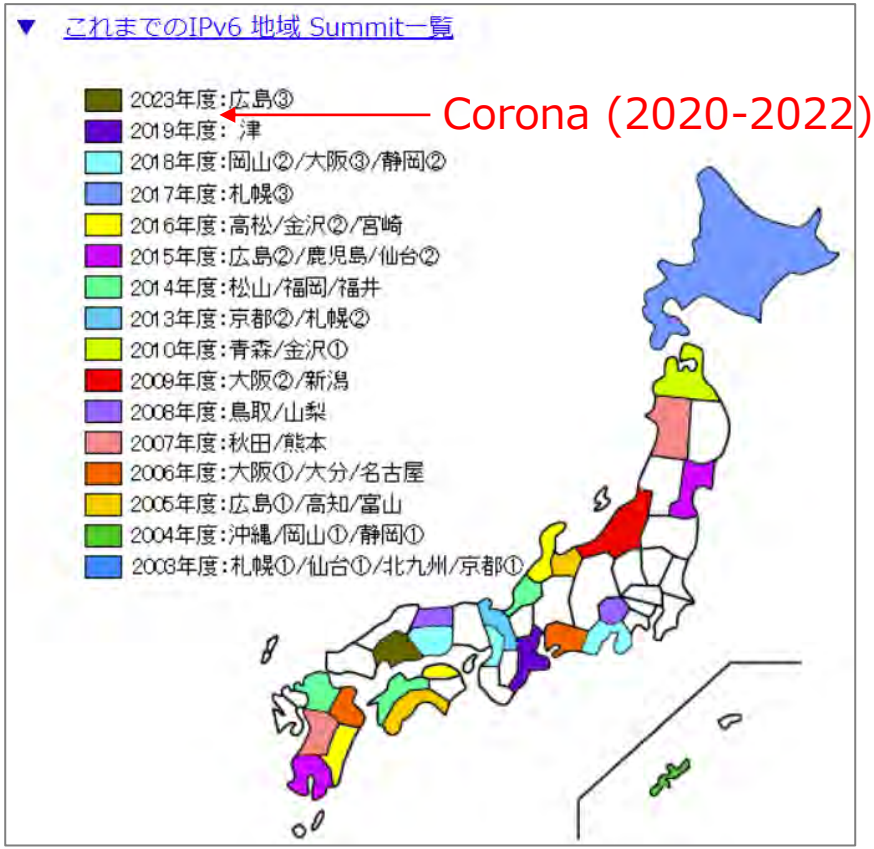
https://jpopf.net/

for 20 Years, since 2003 !!

- **Tokyo Summit** :
  - Once every year.
  - Big event
- **Local Summit** :
  - Some cities every year.
  - Small events and emphasizing F2F !!

※ Report of TOKYO 2022 is here.

Past Local Summit



https://www.iajapan.org/ipv6/summit/index.html

Guidelines for Enterprise etc. (by MIC: Ministry of Internal Affairs and Communications)

Government published in 2022.
for small medium enterprise and academic NW.

1 Introduction
2 IPv6 now (Trends of overseas and domestic, problems if you don't use IPv6, issues when you adopt IPv6)
3 Categolizing of NW
4 IPv6 transition scenario
5 IPv6 use case (Small/Medium Enterprise)
6 IPv6 use case (University)
7 Cost Calculation (System development)
8 How to use the check sheet
9 Other considerations
10 References
11 Appendix (Task management table, Cost check table, IPv6 adoption check sheet)

https://www.soumu.go.jp/menu_seisaku/ictseisaku/ipv6/index.html

IPv6 Programs, every year…

- 2021
  - IPv6 for Enterprise, SASE over IPv6
- 2022
  - IPv6 Content (LINE, SNS Operator)
  - IPv6 CDN !!
- 2023 (Nov.)
  - IPv6 Guidelines for Enterprise and Academy NW.
  - IPv6 Cloud (AWS Hands-on)

Internet Week 2023 https://internetweek.jp/2023/
Past Internet Week https://www.nic.ad.jp/ja/materials/iw/

Twice a year for 18 Years !!
invites speakers from Tokyo

Led by Academic !!

Well balanced by

- Academic Teachers and Students.
- Commercial Companies.
- Local Governments.

Former site : http://www.supercsi.jp/ipv6deploy/
Present site : https://www.ipv6hiroshima.jp/

Going to publish ver. 3.0, soon !!

Minimum Requirements of “Home Router”
defined from user’s view.

Major update

- Adding recent new issues.
- Removing “IPv6 over IPv4” and enhancing “IPv4 over IPv6”
- Making consistent with other standards like RFC7084 and TR124
- Re-classification of requirements “GEN / WAN / LAN / SEC”

Guideline 2.0 (not 3.0)
English https://www.v6pc.jp/pdf/v6hgw_Guideline_20.pdf
Japanese https://www.v6pc.jp/jp/upload/pdf/v6hgw_Guideline_2.0.pdf

IPv6 Game (by JAIPA : Japan Internet Providers Association)

QoE for gamers improved by IPv6 UPnP and QoS !!

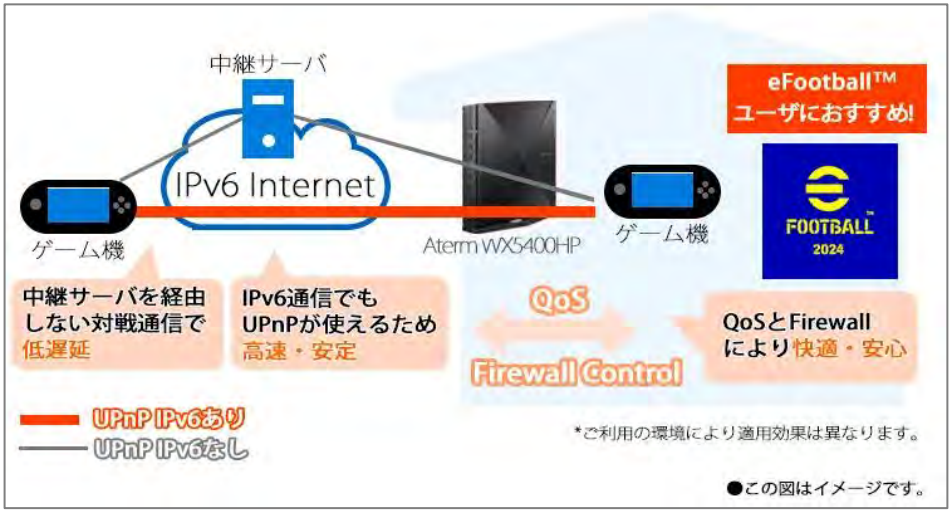
Two News: Last Week

- Konami made games compatible with IPv6 UPnP.
- NEC Platforms implemented IPv6 UPnP and QoS in Home Routers.

This is one of the outputs of discussions in JAIPA Game WG

With IPv6 UPnP,
game traffic bypasses relay servers.

With QoS,
IPv6 UPnP traffic is treated with high priority in home routers.



Konami eFootball 2024:
https://www.konami.com/efootball/ja/
NEC Platforms Release :
https://prtimes.jp/main/html/rd/p/000000002.000127290.html

IPv6 Certification Started !!

- Target
  - Beginner of NW engineers and operators who have basic network skills.
- Learning time using materials : 40 hours
- Number of questions : 40
- Exam time : 60 minutes
- Passing criteria : 70% correct
- Exam period : all year
- Fee : 10,000JPY+tax (70USD+tax)
- Venue : Test Center (350 in Japan)

https://network-engineer.jp/ipv6basic

Questions ?