

Progress in DNSSEC Validation ~ Case of Japan ~

15 Apr 2021

2nd ICANN APAC-TWNIC Engagement Forum

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About Me / Self Introduction



- 2003 Joined JPRS
- 2003-2020 Worked as a researcher; topics were:
 - IDN, standardization of internationalized identifiers
 - DNSSEC technical evaluation and promotion work
 - Analysis of domain name security
- 2021- Working as a technical liaison; topics are:
 - Evaluation of emerging technologies and consideration of adoption for our services
 - Liaison work with other organizations/communities to accomplish them

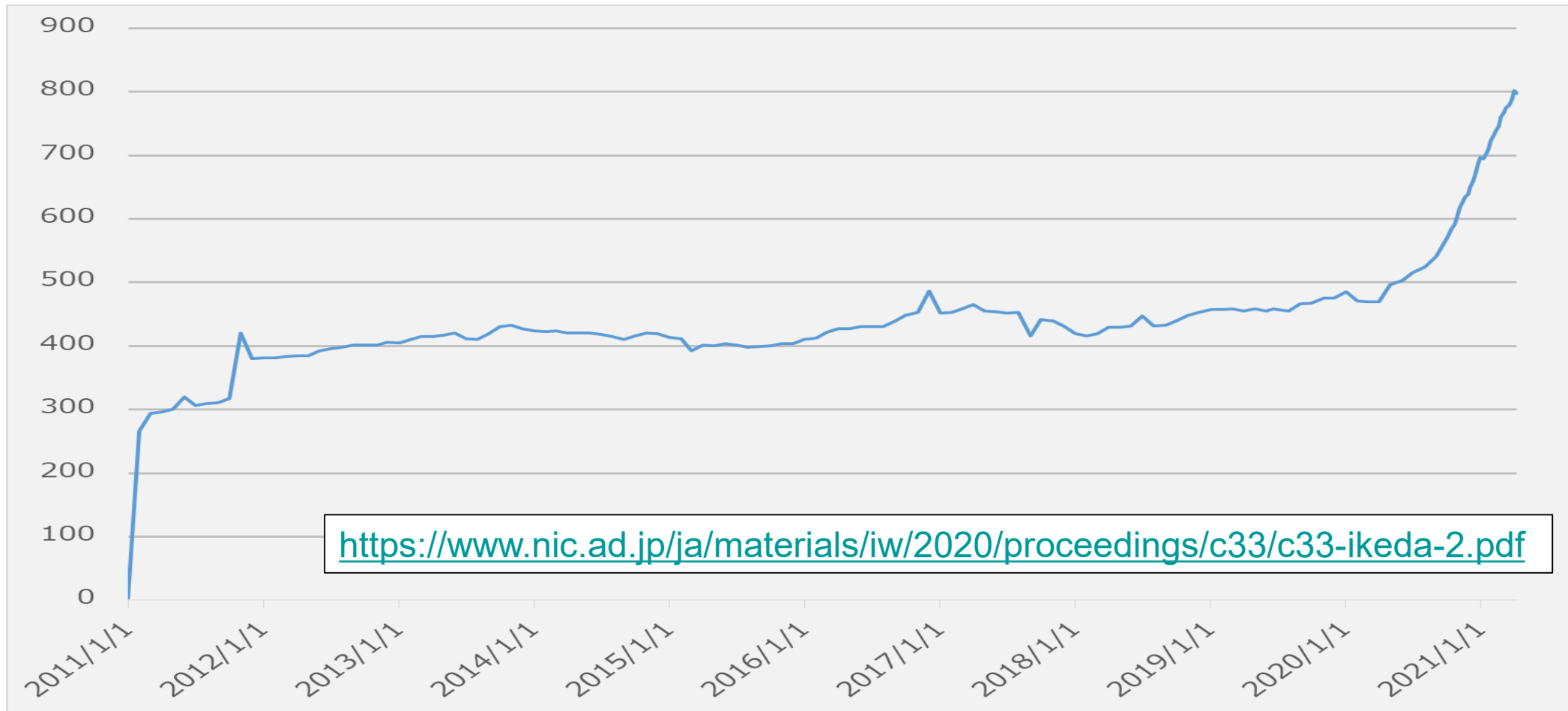
Hurdles preventing DNSSEC deployment^{JPRS}

(My personal opinion)

- Real DNSSEC deployment requires both wheels of DNSSEC signing and validation
 - It is a kind of chicken and egg problem, but DNSSEC validation deployment in advance might be better
- Two hurdles in DNSSEC signing
 1. Automation of Signing Key management
 2. Automation of Signing Key registration
 - Supporting technologies are already developed, but they are not boarding on business logic of Registrant-Registrar-Registry relation well yet
 - This is interesting topic, but out of scope today
- Two hurdles in DNSSEC validation
 1. Automation of Trust Anchor (TA) update
 2. Development of adoption policy for Negative Trust Anchor (NTA)
 - These hurdles are the matter of DNS full-resolver operators' decision

DNSSEC signing situation in Japan (as of JP domain names)

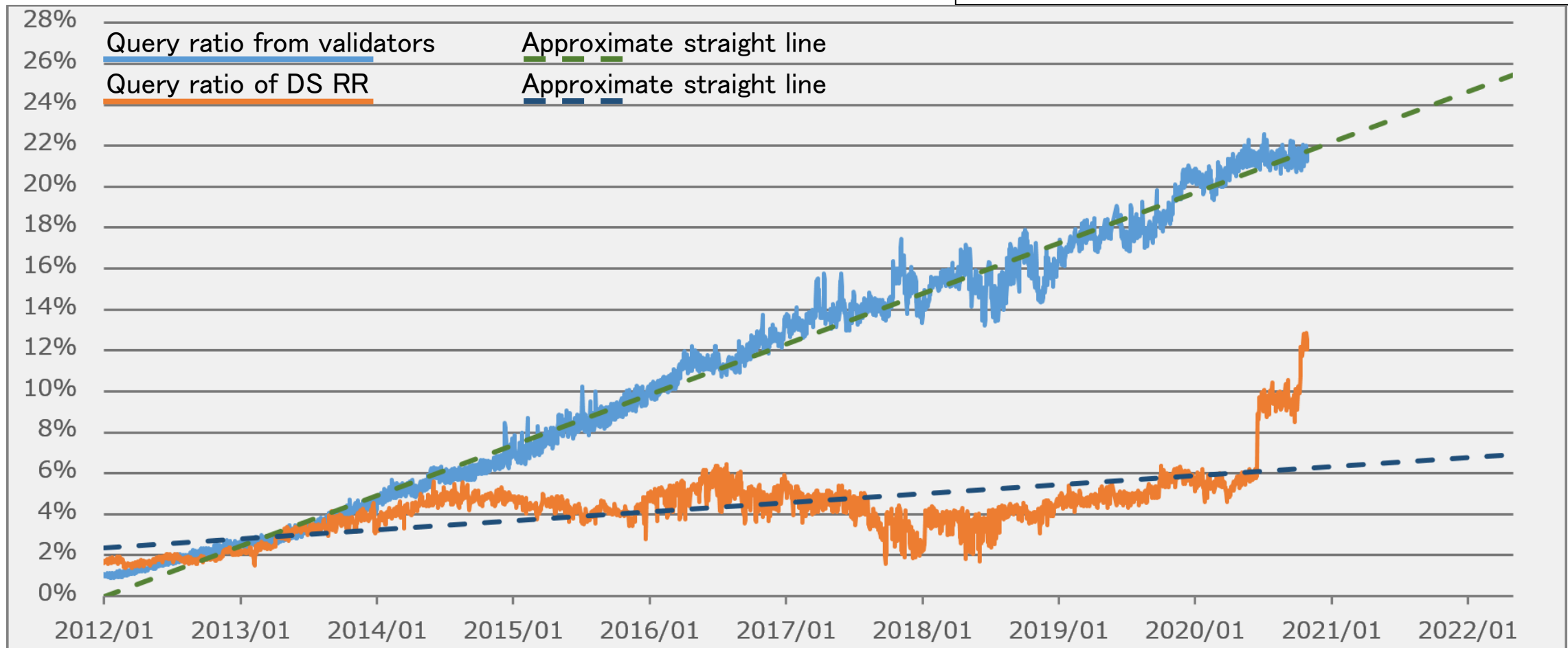
- DS registered domain names are around 800, 0.05% of total (~1.6M)



DNSSEC validators in Japan (Observed at JP DNS)

- Validator ratio is around 20%

<https://www.nic.ad.jp/ja/materials/iw/2020/proceedings/c33/c33-ikeda-2.pdf>



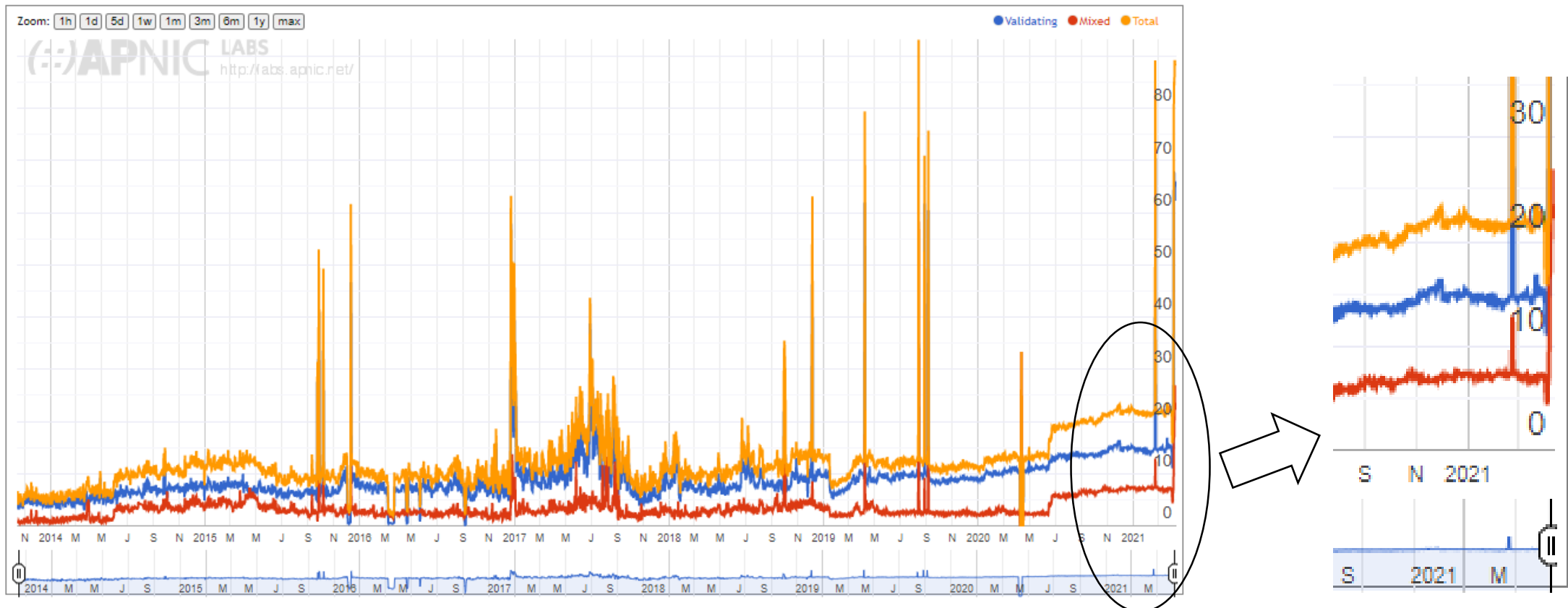
DNSSEC validation in Japan (Observed at APNIC)

- Validator ratio is around 15%

Use of DNSSEC Validation for Japan (JP)

Snapshot on 12 April 2021

<https://stats.labs.apnic.net/dnssec/JP>



DNSSEC validation in Japan

(Supplemental information)

- Those statistics are not representing end-users' coverage
 - It is hard to know how many end-users are behind full-resolvers
 - Mobile carriers are key players for the end-users' coverage
- Major Japanese IPv6 VNEs are already providing DNSSEC validator
 - Validation ratio on IPv4 and IPv6 seemed to be different, but there are no statistics

Considerations

- Most of Japanese major ISPs are still not deploying DNSSEC validators
 - Exceptional major ISP is IIJ
- Universal best practices that major ISPs can follow are needed
 - Especially adoption policy and operational procedure of NTA
 - Let's share knowledge among countries/regions
 - Recently established ICANN KINDNS project can be a home place
<https://community.icann.org/display/KINDNS>
- ISPs not deploying DNSSEC validators are suggested to put next Root KSK Rollover as the final turning target
 - It will be the last chance to check their configuration is conforming to Root KSK Rollover
 - Although, next Root KSK Rollover plan is not completed
- Medium/Small ISPs might consider to provide third-party full-resolver to users
 - E.g. offer Public DNS (full-resolver) service (such as [Quad101](#)) to end-users, as long as its privacy policy meets the ISP's policy
 - Collocating Public DNS instance(s) will be an additional option