

Peering Asia 4.0 @ Bangkok, Thailand

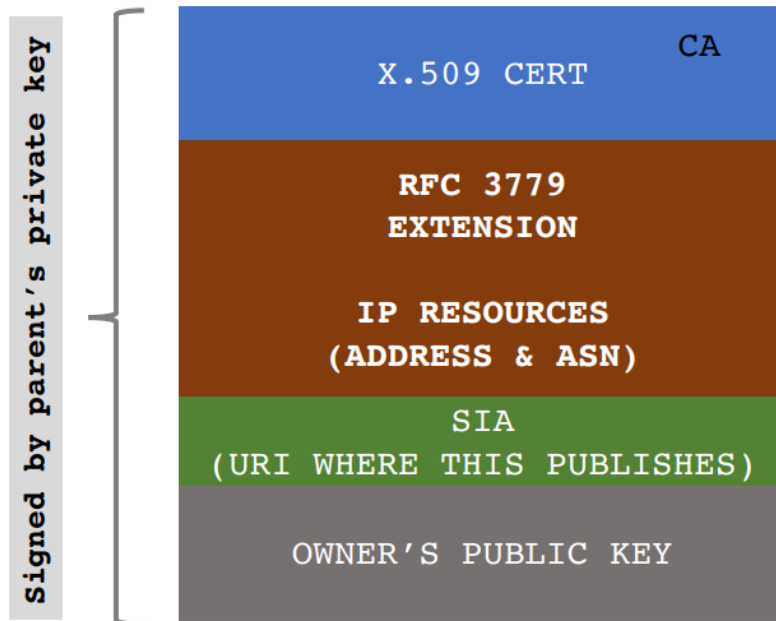


RPKI ROA for IP Address of IX Segment ~ Survey and Suggestion ~

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Introduction of RPKI

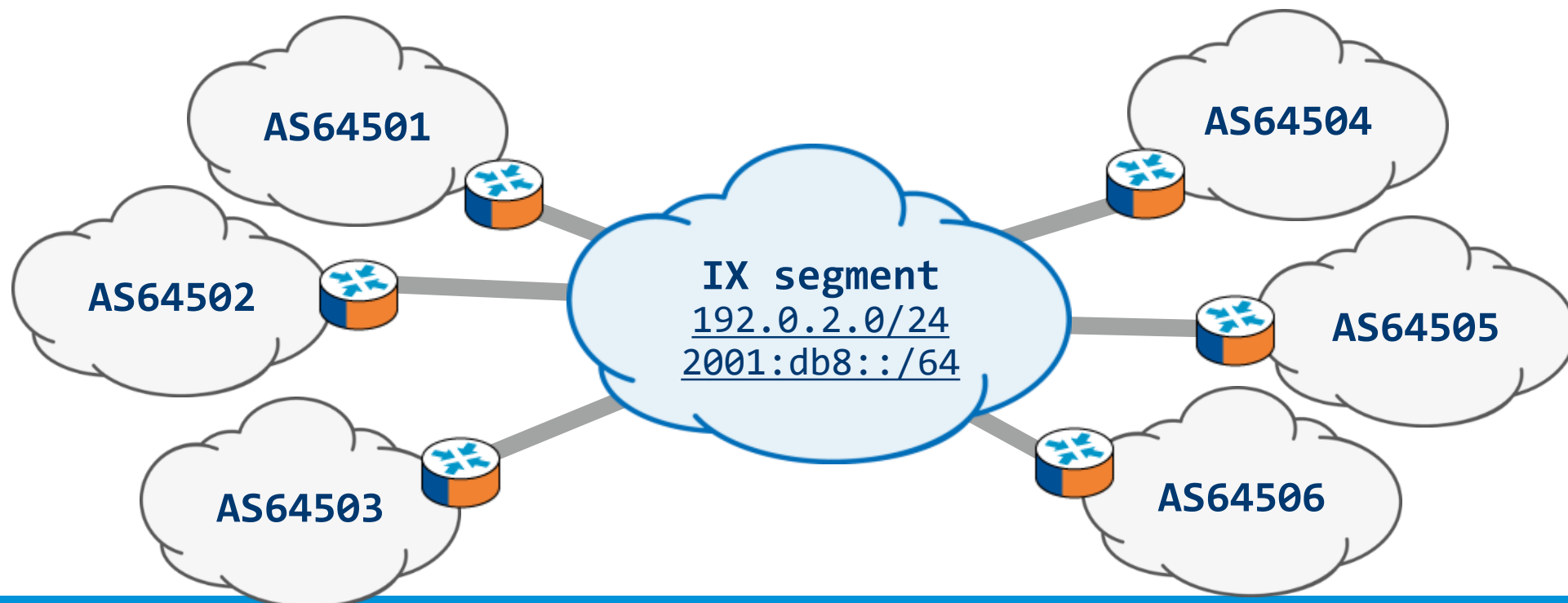
RPKI profile ~ Resource Certificates



- RFC 3779 extensions – binds a list of resources (**IPv4/v6, ASN**) to the subject of the certificate (private key holder)
- SIA (subject information access) contains a URI that identifies the publication point of the objects signed by the subject of the cert.

We (IXPs) have IP prefix for IX segment

- IX segment is an important network as a peering platform
- How about ROA for IX segment...?



RPKI ROA Survey (IPv4)

as of 27 Oct. 2022

IX name	IP Prefix for IX Segment	ROA
BBIX Tokyo	218.100.6.0/23 101.203.88.0/22	None
BKNIX	203.159.68.0/23	203.159.68.0/23, maximum prefix length = /23, AS0 203.159.68.0/23, maximum prefix length = /23, AS63529
Equinix Singapore	27.111.228.0/22	27.111.228.0/22, maximum prefix length = /24, AS0
GetaFIX Manila	103.104.19.0/24	103.104.16.0/22, maximum prefix length = /24, AS137074
HKIX	123.255.88.0/21	123.255.88.0/21, maximum prefix length = /21, AS0
IIX-Jakarta	103.28.74.0/23	None
IX Australia (Sydney NSW)	218.100.52.0/23	218.100.52.0/23, maximum prefix length = /23, AS0
JPNAP Tokyo	210.173.176.0/23	210.173.160.0/19, Maximum prefix length = /32, AS7521
KINX	192.145.251.0/24	None
MegaIX Sydney	103.26.68.0/23	103.26.68.0/23, maximum prefix length = /23, AS0
MyIX	218.100.44.0/24	218.100.44.0/24, maximum prefix length = /24, AS55822
NIXI Mumbai	103.156.182.0/23	None
SGIX	103.16.102.0/23	None
TPIX-TW	203.163.222.0/24	203.163.222.0/23, maximum prefix length = /24, AS10133
LINX LON1	195.66.224.0/21	None
AMS-IX	80.249.208.0/21	80.249.208.0/21, maximum prefix length = /21, AS1200
DE-CIX Frankfurt	80.81.192.0/21	80.81.192.0/21, maximum prefix length = /21, AS0
JPIX TOKYO	210.171.224.0/23	None

RPKI ROA Survey (IPv6)

as of 27 Oct. 2022

IX name	IP Prefix for IX Segment	ROA
BBIX Tokyo	2001:de8:c::/64	None
BKNIX	2001:deb:0:68::/64	2001:deb::/48, maximum prefix length = /48, AS63528
Equinix Singapore	2001:de8:4::/64	2001:de8:4::/64, maximum prefix length = /64, AS0
GetaFIX Manila	2401:fdc0::/64	None
HKIX	2001:7fa:0:1::/64	2001:7fa:0:1::/64, maximum prefix length = /64, AS0
IIX-Jakarta	2001:7fa:2::/64	None
IX Australia (Sydney NSW)	2001:7fa:11:4::/64	None
JPNAP Tokyo	2001:7fa:7:1::/64	2001:7fa:7::/48, Maximum prefix length = /128, AS0
KINX	2001:7fa:8::/64	None
MegaIX Sydney	2001:dea:0:10::/64	2001:dea:0:10::/64, Maximum prefix length = /64, AS0
MyIX	2001:de8:10::/48	2001:de8:10::/48, maximum prefix length = /48, AS55822
NIXI Mumbai	2001:de8:1:1::/64	None
SGIX	2001:de8:12:100::/64	None
TPIX-TW	2406:d400:1:133:203:163:222:0/112	None
LINX LON1	2001:7f8:4::/64	None
AMS-IX	2001:7f8:1::/64	None
DE-CIX Frankfurt	2001:7f8::/64	None
JPIX TOKYO	2001:de8:8::/64	2001:de8:8::/64, maximum prefix length = /128, AS0

Wide variety types of ROA registration

- **About Prefix Size of ROA**

- Registering exact prefix size (e.g. They operate /24 IX network, and /24 prefix is registered)
- Registering larger prefix size (e.g. They operate /24 IX network, and /23 prefix is registered)

- **About Maximum Prefix Length of ROA**

- Prefix Size = Maximum Prefix Length (e.g. Prefix Size = /23 and Maximum Prefix Length = /23)
- Prefix Size > Maximum Prefix Length (e.g. Prefix Size = /23 and Maximum Prefix Length = /24 or longer)

- **About AS Number of ROA**

- Using AS 0
- Using your own ASN

Description of AS 0 ROA on RFC 6483

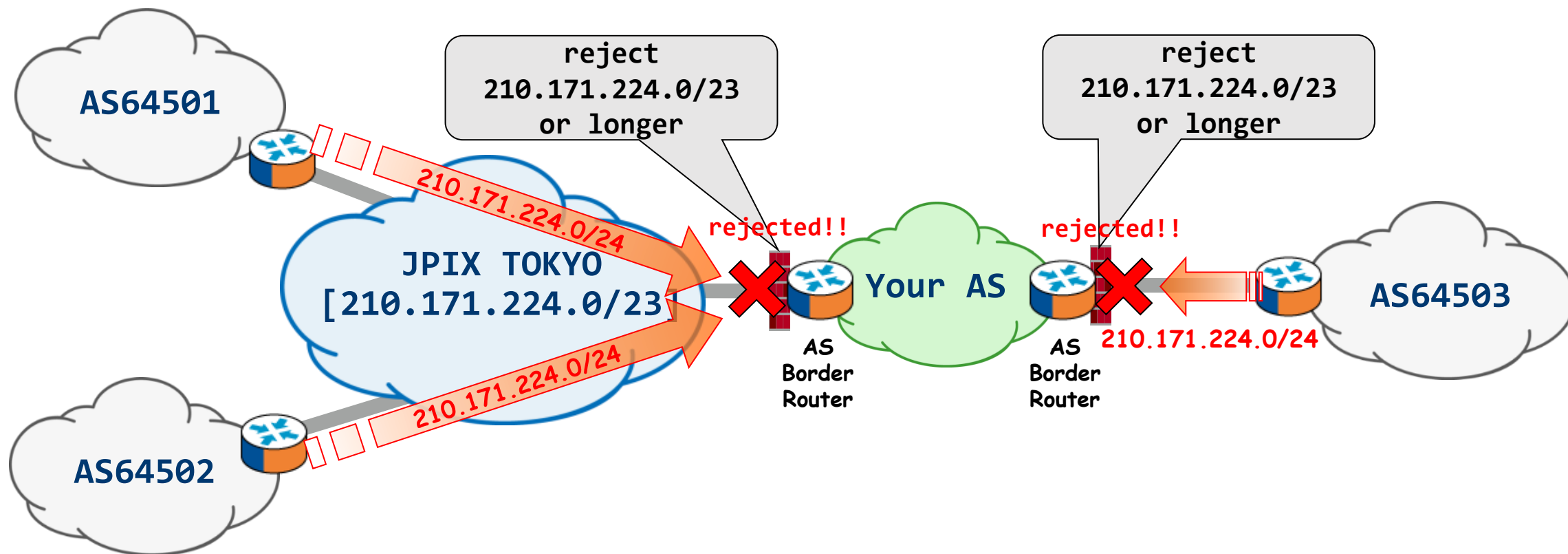
- In the Section 4. Disavowal of Routing Origination...

A ROA with a subject of AS 0 (AS 0 ROA) is an attestation by the holder of a prefix that the prefix described in the ROA, and any more specific prefix, should not be used in a routing context.

By convention, an AS 0 ROA should have a maxLength value of 32 for IPv4 addresses and a maxLength value of 128 for IPv6 addresses; although, in terms of route validation, the same outcome would be achieved with any valid maxLength value, or even if the maxLength element were to be omitted from the ROA.

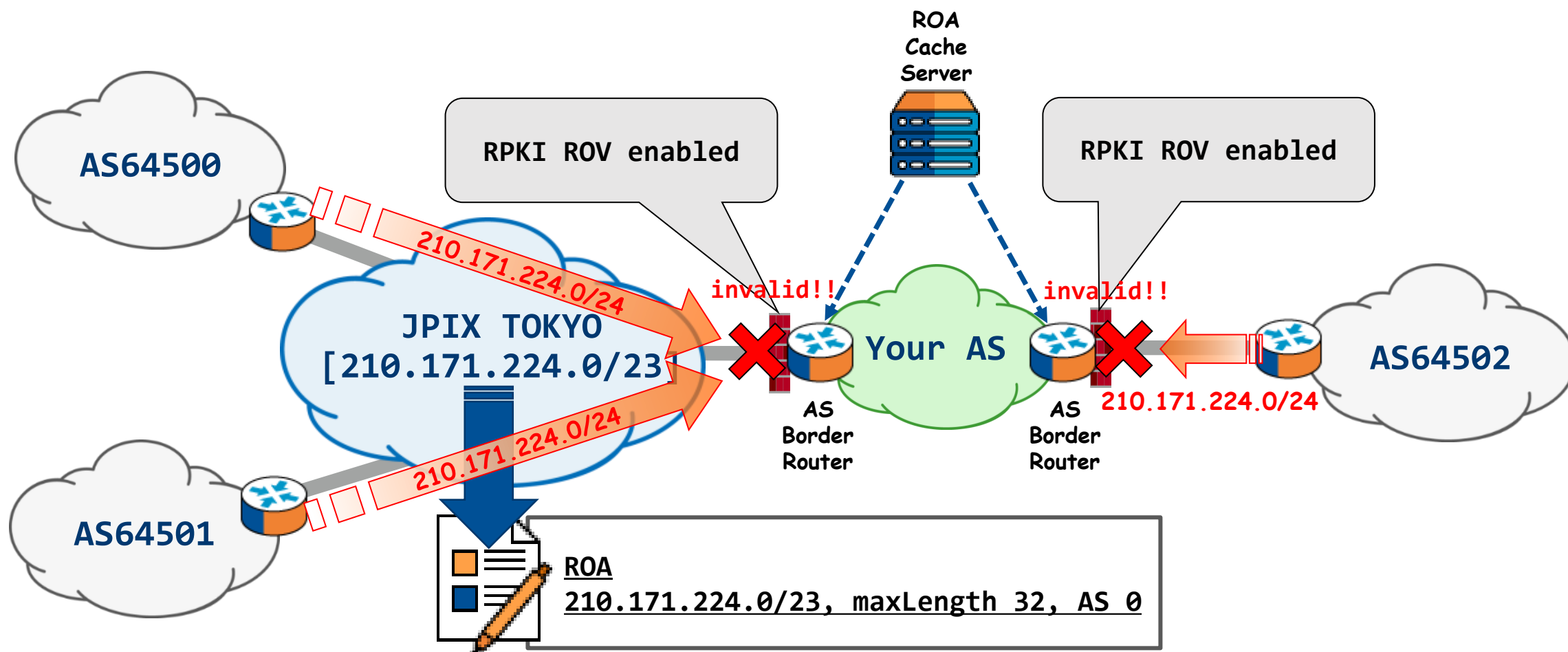
<https://www.rfc-editor.org/rfc/rfc6483.html>

Preventing trouble by mis-origination of IX segment by Route Filter Configuration



This is still basic configuration for securing internet routing but maybe relatively legacy...?

Preventing trouble by mis-origination of IX segment by RPKI ROV



Correctly issuing ROA for IX segment also helps prevent troubles caused by IX segment mis-origination

Conclusion

Correctly issuing ROA for IX segment is recommended

- A wide varied type of ROA for IX segment has been issued now...
- If you (IXP) didn't issue, let's issue ROA with AS 0 and correct value of maxLength, it's for not only IPv4 but also IPv6
- If you (IXP) already issued, please check AS number and maxLength on your ROA
 - It will not work as expected, if you didn't issue ROA correctly
- **Correctly issuing ROA helps to secure our internet routing**
 - We hope RPKI ROV will become more deployed as well.

25th
Anniversary



Japan Internet Exchange Co., Ltd.