Long chopsticks in heaven
- When packets dropped using ROA -
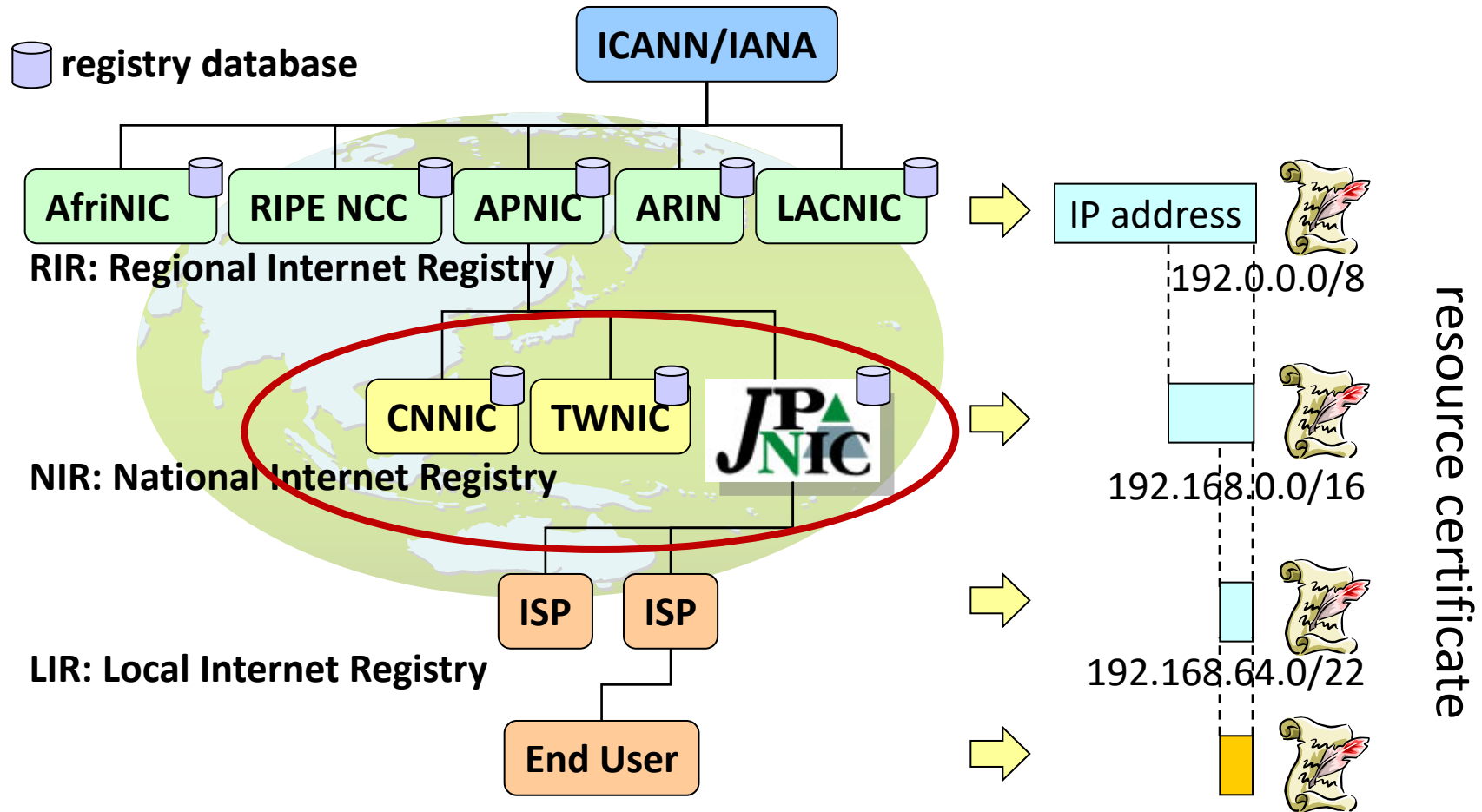
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Contents

- **RPKI in Asia and Japan**

- **One trouble shooting case in an ISP**

- **What will happen with dropping packets using ROA?**

- **What should be cared from now?**

RPKI in Asia-Pacific region

registry database

ICANN/IANA

AfriNIC RIPE NCC APNIC ARIN LACNIC

RIR: Regional Internet Registry

CNNIC TWNIC JPNIC

NIR: National Internet Registry

ISP ISP

LIR: Local Internet Registry

End User

IP address

192.0.0.0/8

192.168.0.0/16

192.168.64.0/22

resource certificate

National Internet Registry (NIR) has a role to serve RPKI service for their members.

RPKI/ROA in Japan

- **As a trial service for ISP's operational knowledge**

- **Numbers**
  - Publish 83 resource certificates and 295 ROAs
  - Coverage: 5.0%(IPv4) / 56.8%(IPv6)

- **Tutorial**
  - Hands-on for beginners
    - 2018: April, June and October
   - 2019: February, April ...
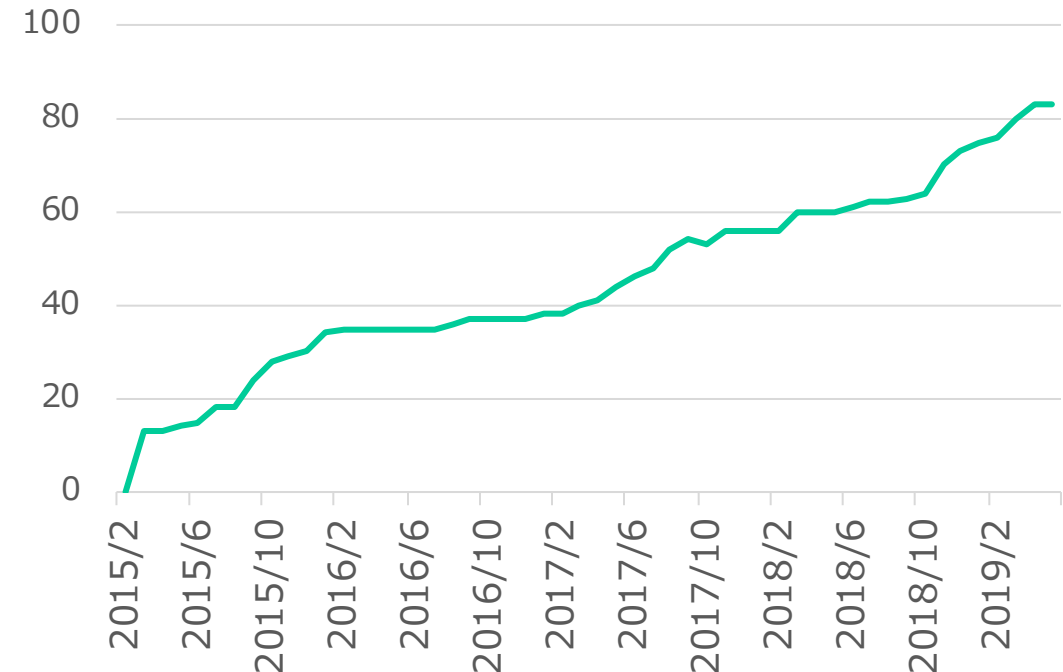
One trouble shooting case in an ISP

A customer experienced reachability problem

- **Customer reported to the ISP**
  - Unreachable for one web site in Europe
  - Using mobile router -> reachable
  - Using IPv6 -> reachable
  - Traceroute -> reachable until AS one front of destination
- **The ISP responded for the customer as**
  - guiding reboot customer's router as usual in help desk
  - asked on the web form for the web site about reachability

The ISP's action (continued)

- **The ISP:**
  - asked for the AS one front of destination (#5) but no good answer because no relationship with the ISP
  - asked AS#1-4 to help asking AS #5 but all they responded as "no action will be taken because no problem found for the prefix"
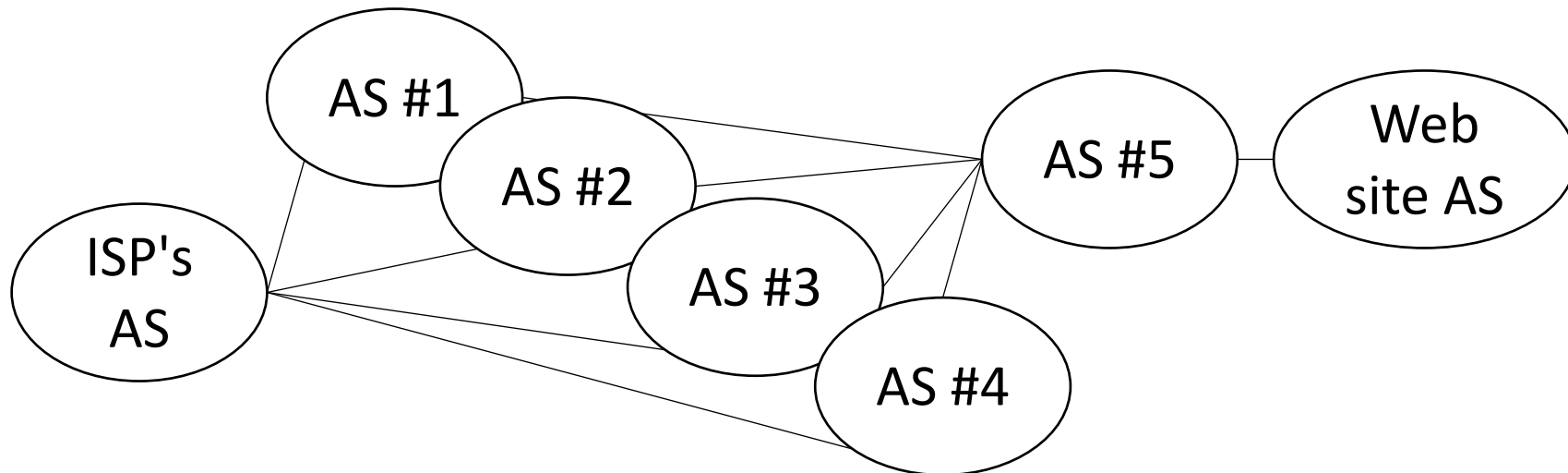
The cause of unreachability

- **The ISP got**
    - a response by e-mail contact found Peering DB
    - the reason is "invalid prefix length"
- **The cause and fixing**
    - Prefix length has been changed for operational reason after creating ROA for several years!
        - Human/organization cannot remember things over years
    - By fixing maximum prefix length in the ROA, reachability has been recovered.

> **This is not simple nor just technical issue but will be happen in worldwide when deploying ROV.**

8

What will happen with dropping packets using ROA?

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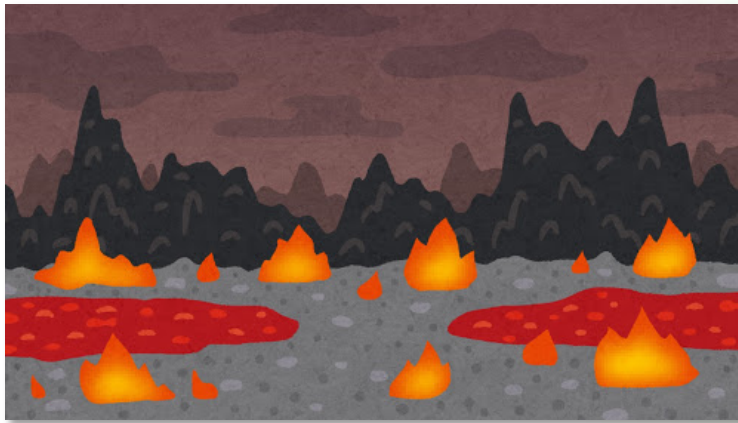
Three things will happen

- **IP address holder may leave ROA different from actual BGP route.**

- **End user will experience unreachability without any sign or alert.**

- **Only BGP operators can know the reason and only IP address holder can fix the problem. Different players need to react to solve the problem.**

What should be cared from now?

Spread ideas on using ROA

- **Try and know what will happen when using ROA/RPKI**

- **When unreachable for some specific routes, remember to investigate origin validation state**

- **Consider communication over different NOG**

What we can do

- **Be aware "adoption rate" is not only the indication of security**

- **Encourage communicating between engineers and between tech and non-tech persons (includes customer supporting staff)**

- **Spread culture of "mutual help" in BGP and Internet without making tie in the rule**

Conclusion

- **Dropping invalid routes using origin validation with ROA/RPKI can make unreachable IP networks**

- **To ease recovery from mis-configured routes or ROA, communication is important**
  - between tech and non-tech people
  - between operators beyond NOG

Encouraging "mutual help" is <u>essential</u> for global Internet

Allegory of the long spoons - Wikipedia
https://en.wikipedia.org/wiki/Allegory_of_the_long_spoons