ROAs (Route Origin Authorizations)

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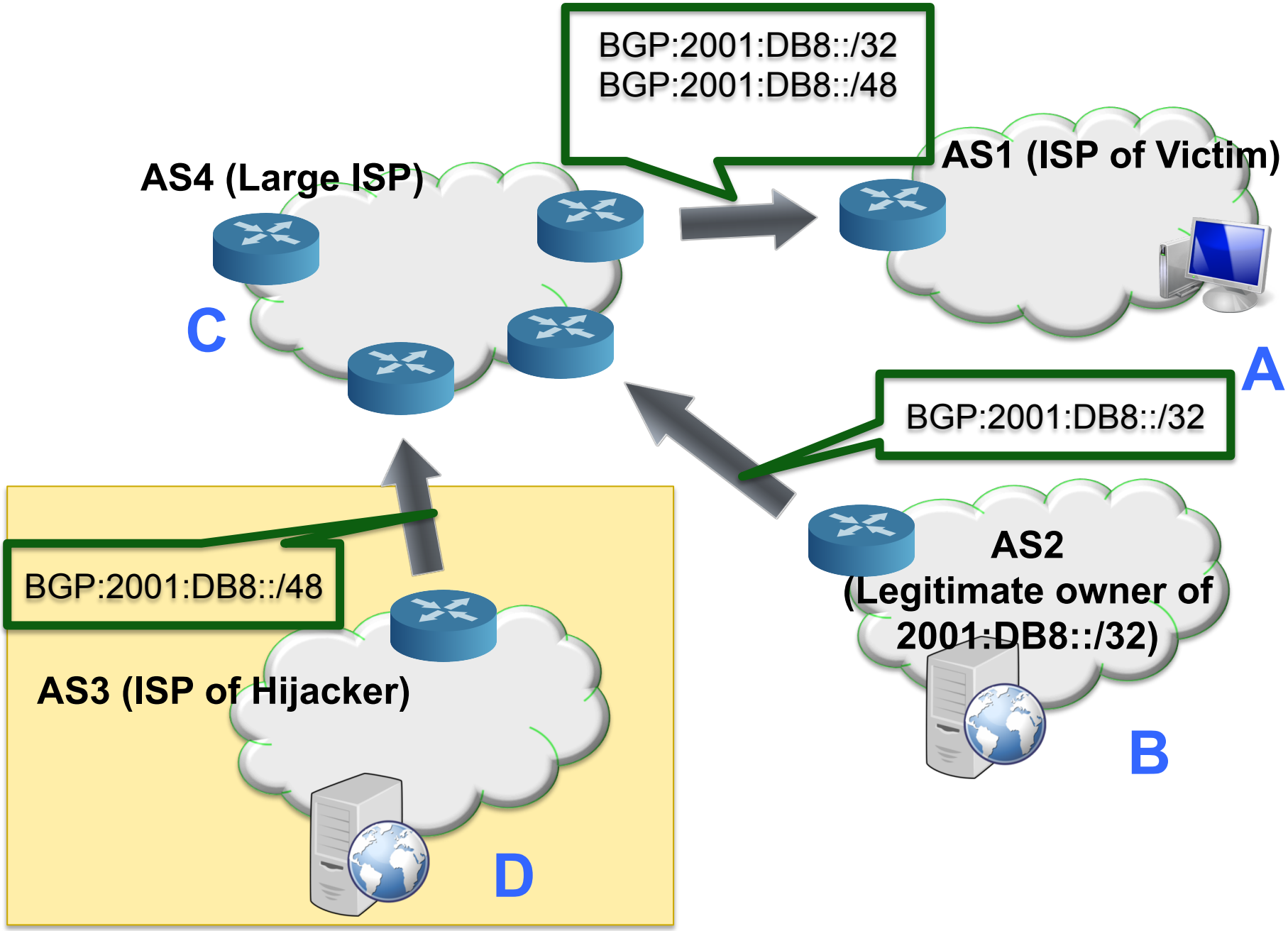
Issue Date:

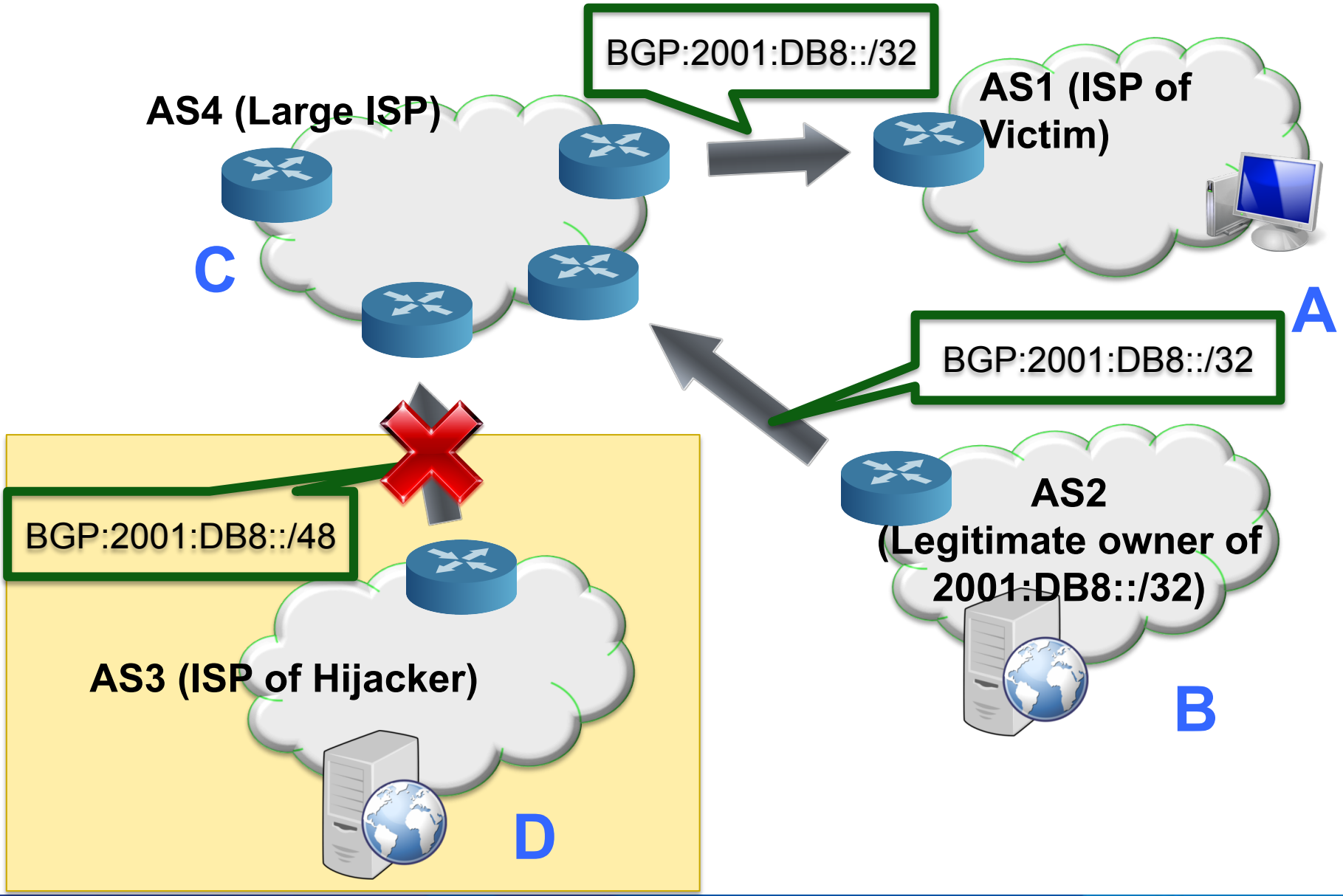
Revision:

APNIC

Motivation

- Stops route hijacking
  - Only the rightful custodian can originate the prefix announcement
  - ISPs filter prefixes they propagate
- Mitigates erroneous route entries
  - Limits human errors
  - Prioritize routes with certificates


BGP:2001:DB8::/32
BGP:2001:DB8::/48
AS4 (Large ISP)
AS1 (ISP of Victim)
C
A
BGP:2001:DB8::/32
BGP:2001:DB8::/48
AS2
(Legitimate owner of
2001:DB8::/32)
AS3 (ISP of Hijacker)
B
D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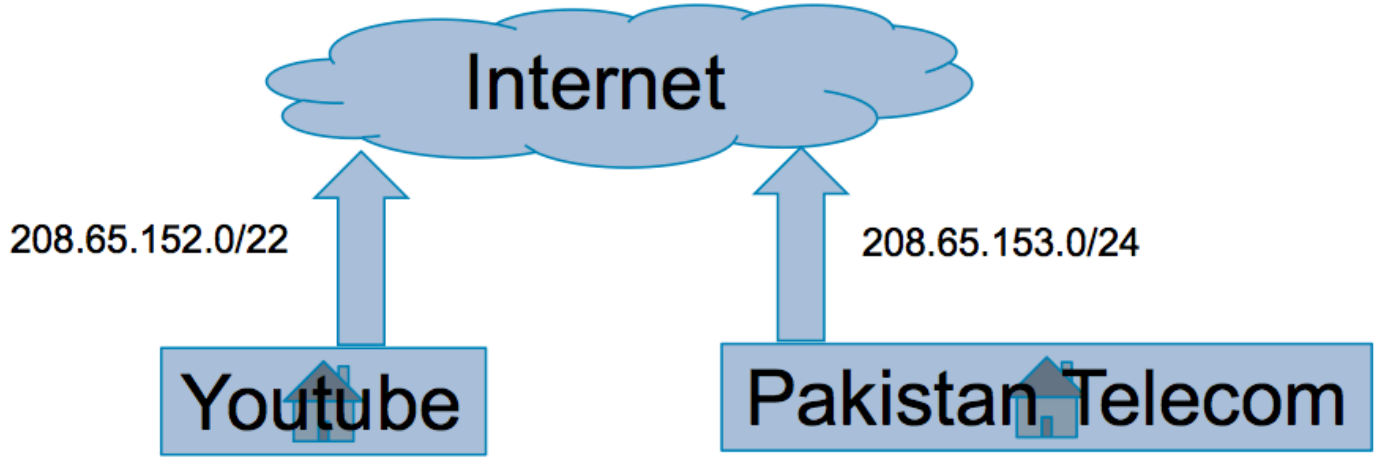
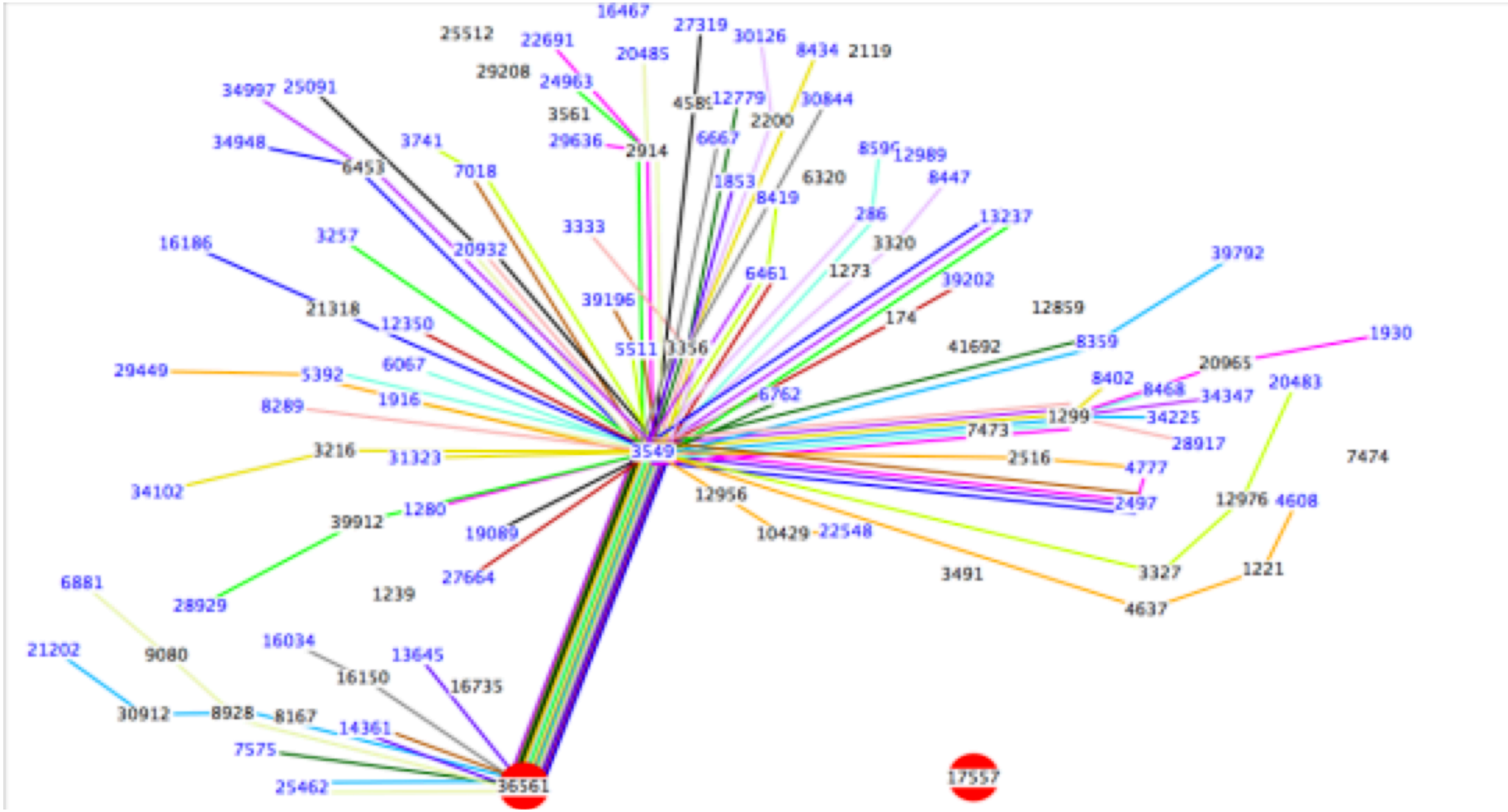
Real Life Example: YouTube Hijacking

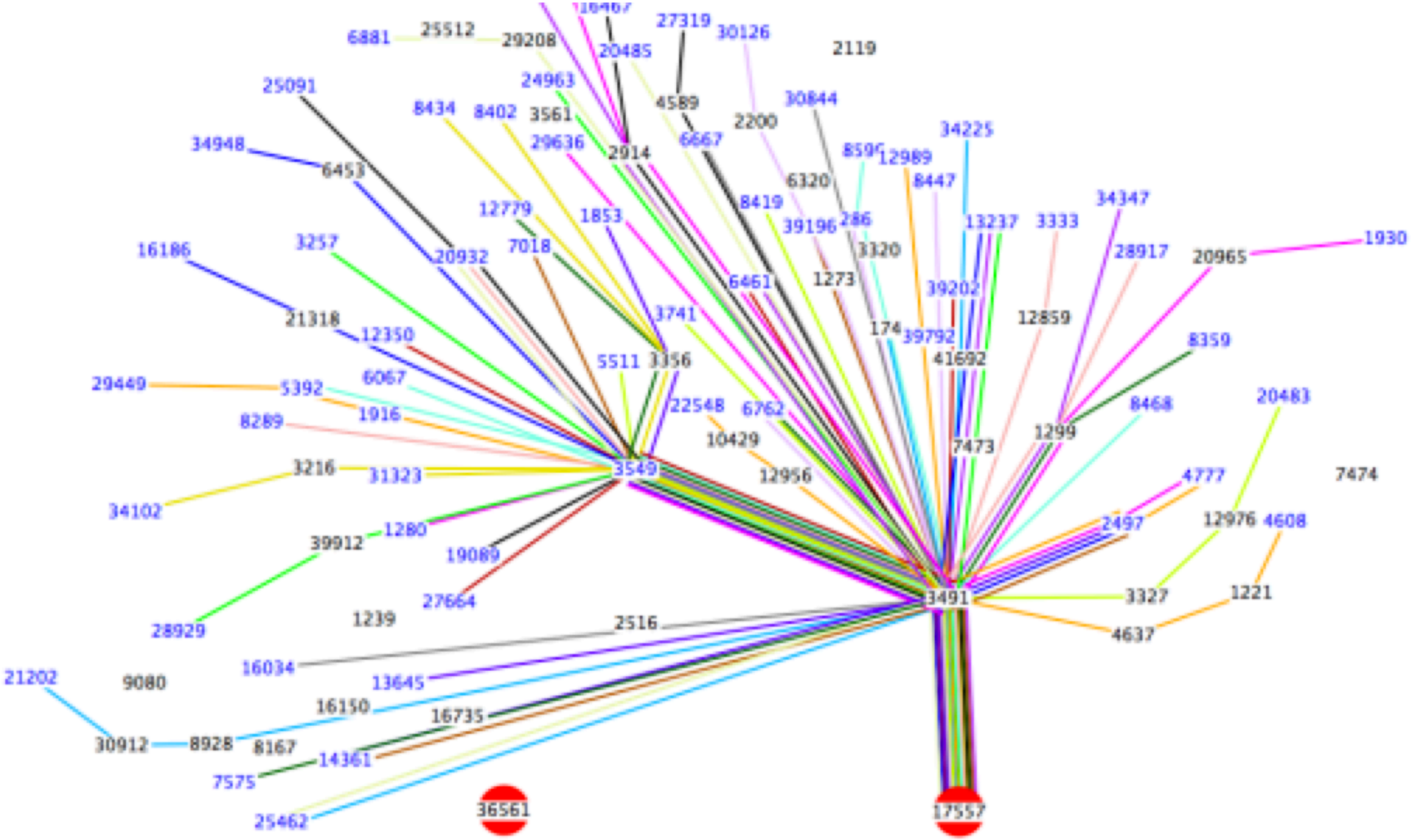
- Took place in 2008
- AS17557 (Pakistan Telecom) started announcing 208.65.153.0/24 (YouTube)
  - https://www.ripe.net/publications/news/industry-developments/youtube-hijacking-a-ripe-ncc-ris-case-study



YouTube – Life as normal



After misconfiguration



Resource Certification, ROA, RPKI

- APNIC offers Resource Certification as a tool to Members to create Route Origin Authorizations (ROAs) in MyAPNIC
- A ROA is a digitally signed, cryptographic object generated by the Resource Certification service
- The Resource Public Key Infrastructure (RPKI) is the framework that enables users of public networks to verify the authenticity of data that has been digitally signed by the originator of the data

What is a ROA object?

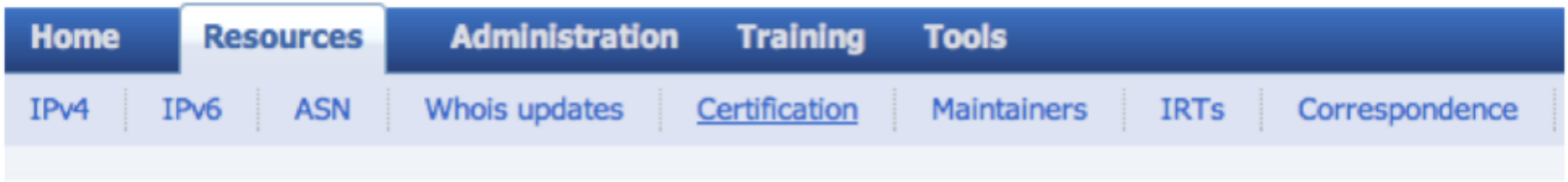
- What's contained in a ROA
  - The AS number you have authorized
  - The prefix that is being originated from it
  - The most specific prefix (maximum length) that the AS may announce

For example: *"ISP 4 permits AS 65000 to originate a route for the prefix 192.2.200.0/24"*

ROA and MyAPNIC

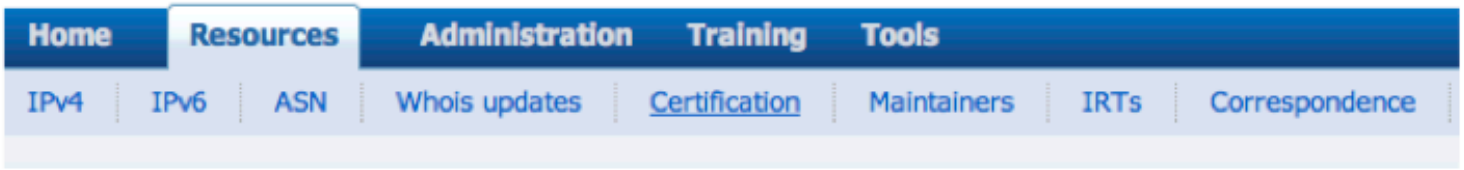
- What you need to have before creating a ROA
  - Must be an APNIC Member
  - Have access to MyAPNIC
  - Digital Certificate installed
- Takes only 5 minutes to create, and 10 minutes to be visible to the public

Activate Resource Certification

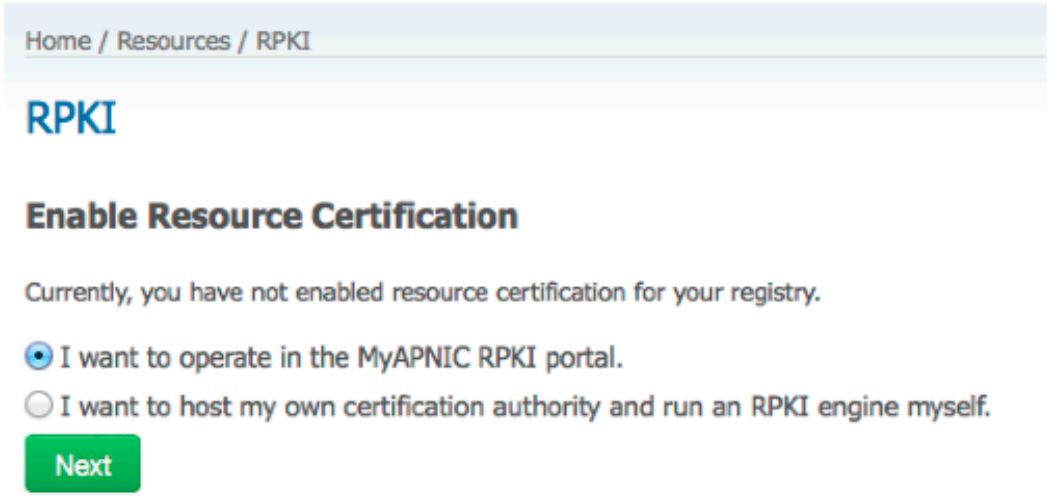


To start using the Resource Certification feature, click on the Certification menu under Resources

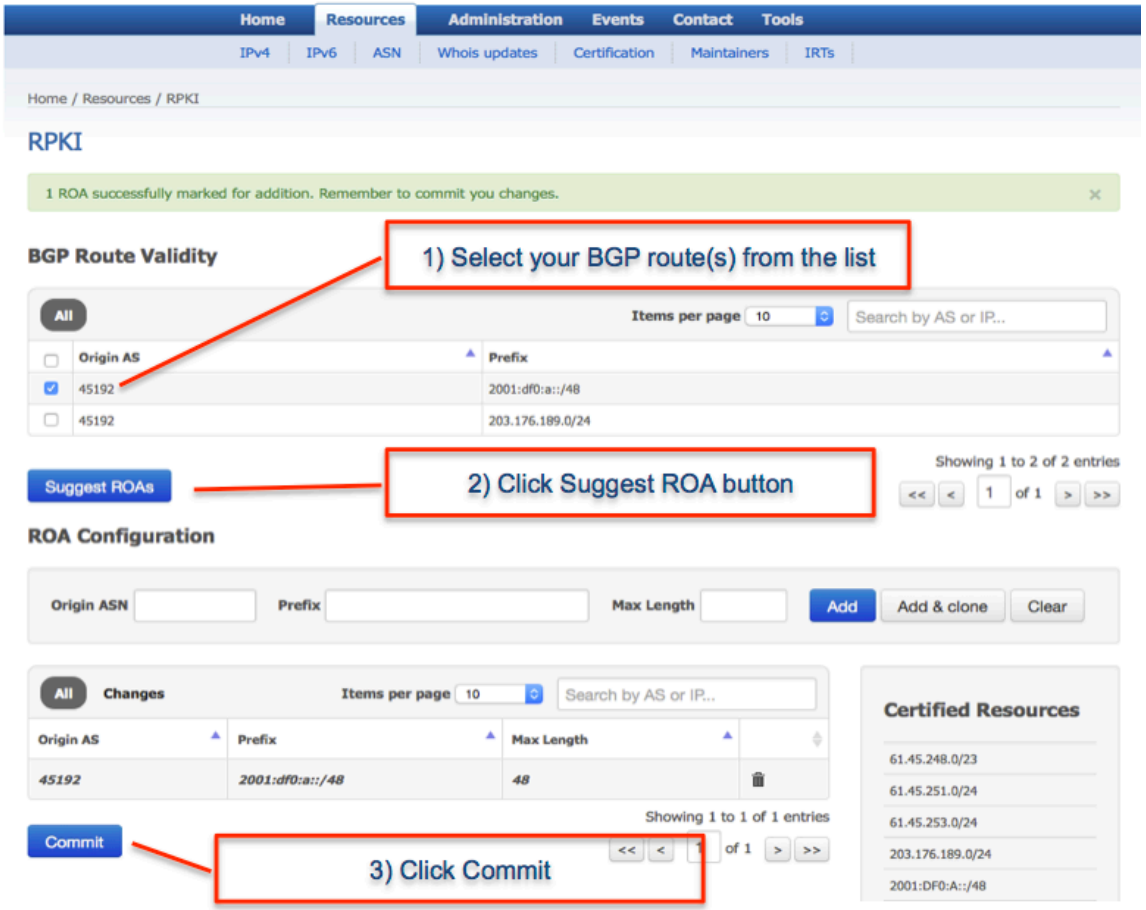
Activate RPKI Engine



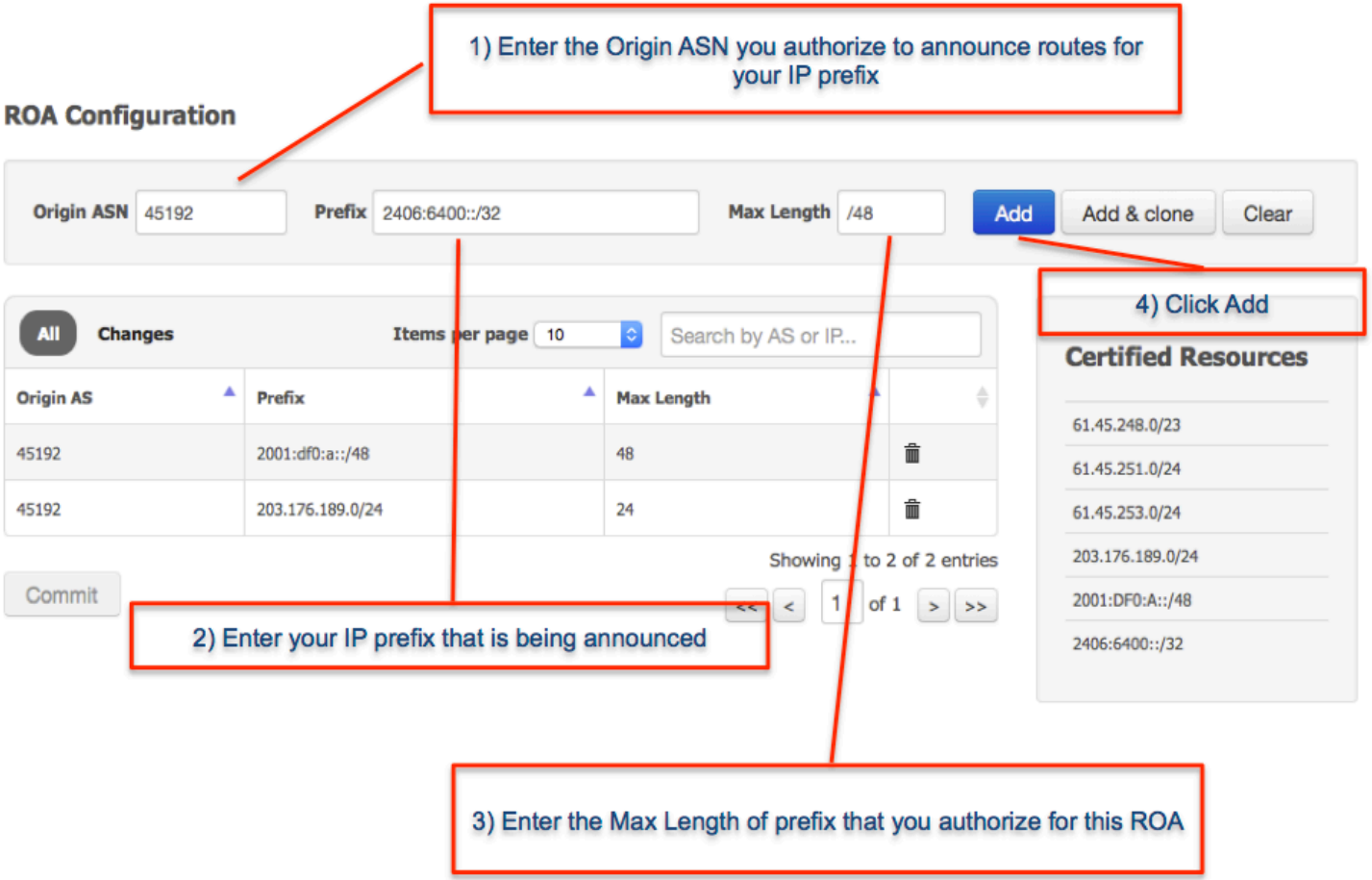
Select if you want to operate in the MyAPNIC RPKI portal or if you want to host your own certificate authority.



Creating your ROA



Creating your ROA



Created your ROA, what's next?

- **Maintain your ROAs**

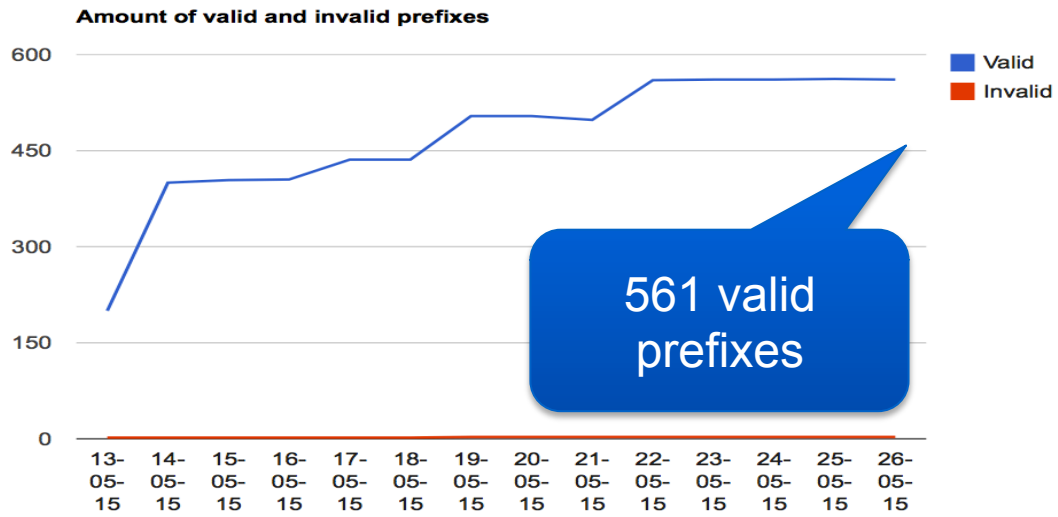
  - Changed BGP announcement
  - New delegation
  - Transferred resources

- **RPKI validator**

  - https://trac.rpki.net/wiki/doc/RPKI

Success Story

- May 2015: APNIC Outreach in Bangladesh
  - 13 organizations visited
  - Onsite support to create ROA objects



http://rpki.surfnet.nl/bd.html

World Leaderboard

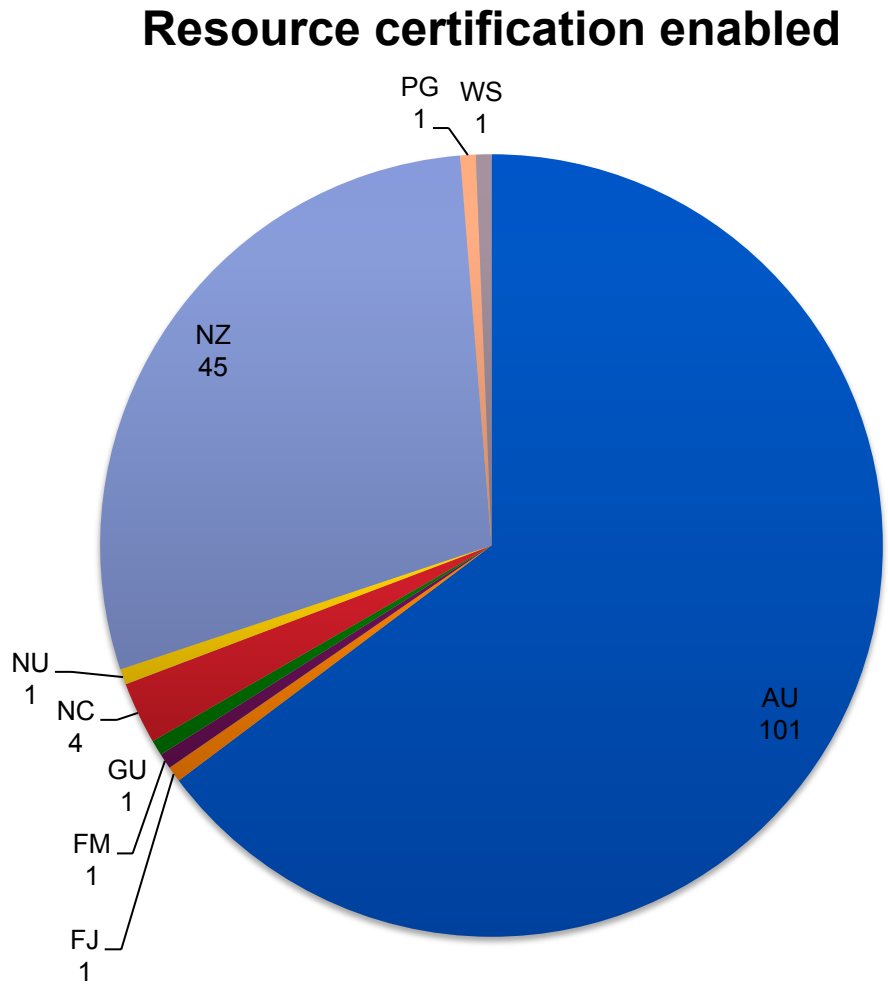
Breakdown per Country

10 records per page Search:

Country	Total	Valid	Invalid	Unknown	Accuracy	RPKI Adoption Rate
BD	2336 (100%)	617 (26.41%)	5 (0.21%)	1714 (73.37%)	99.2%	26.63%
NL	5028 (100%)	656 (13.05%)	25 (0.5%)	4347 (86.46%)	96.33%	13.54%
FR	5834 (100%)	1154 (19.78%)	105 (1.8%)	4575 (78.42%)	91.66%	21.58%
US	174637 (100%)	1084 (0.62%)	331 (0.19%)	173222 (99.19%)	76.61%	0.81%

http://rpki.surfnet.nl/country.html

Story in Oceania



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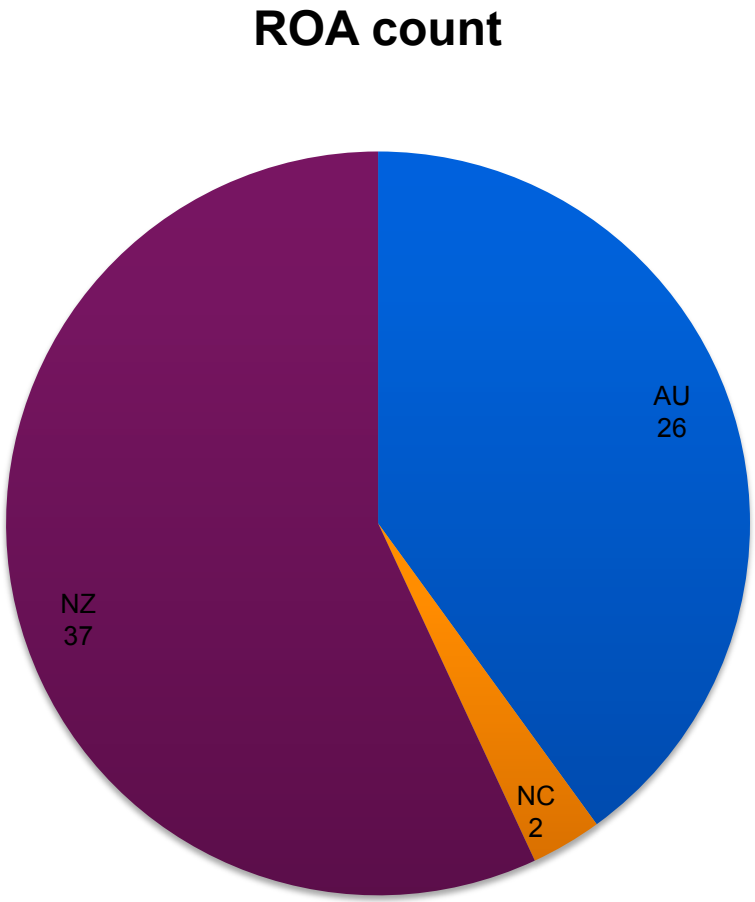

RPKI Initiatives

10 face-to-face and elearning RPKI training courses delivered

RPKI presentations to NOGs and conferences

Development of the 'Ready to ROA' Campaign – hands on sessions to help Members create ROAs

New shirts, stickers, web content to promote campaign

Ready to ROA launched in 2015

Questions?

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APNIC