

**FAILURE**

Your ISP (BENJOJONET, AS206924) does not implement BGP safely. It should be using RPKI to protect the Internet from BGP hijacks. [Tweet this →](#)

▶ Details

# Twitter support reps hate them!

Learn this one weird trick to secure routing policy

*Ben Cartwright-Cox / @benjojo12*

www.youtube.com > watch

## Measuring RPKI Adoption via the data-plane - NLNOG 2018



Measuring **RPKI** Adoption via the data-plane - Ben Cartwright-Cox - **NLNOG** 2018.

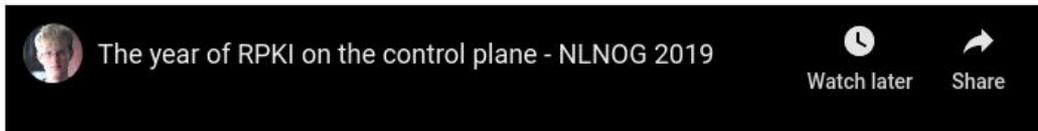
10 Sep 2018 - Uploaded by NLNOG

2019's: <https://blog.benjojo.co.uk/post/the-year-of-rpki-on-the-control-plane>

Sep 9 2019

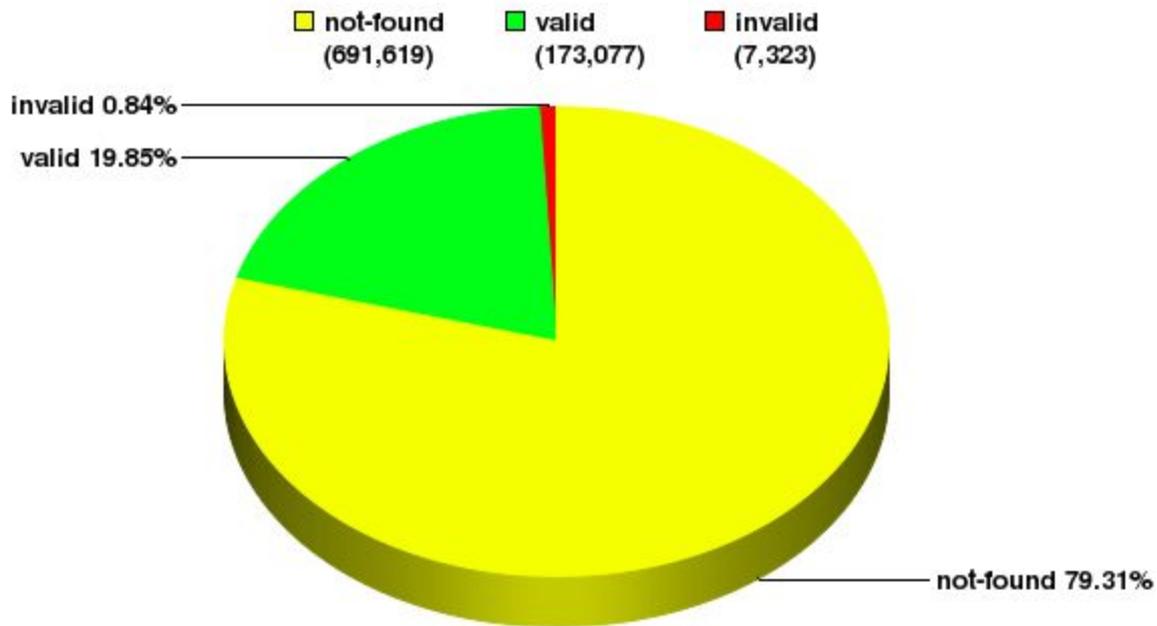
### The year of RPKI on the control plane

This post is a textual version of the talk I gave at NLNOG 2019, You can watch the recording of the talk on youtube below if that's your preferred medium:



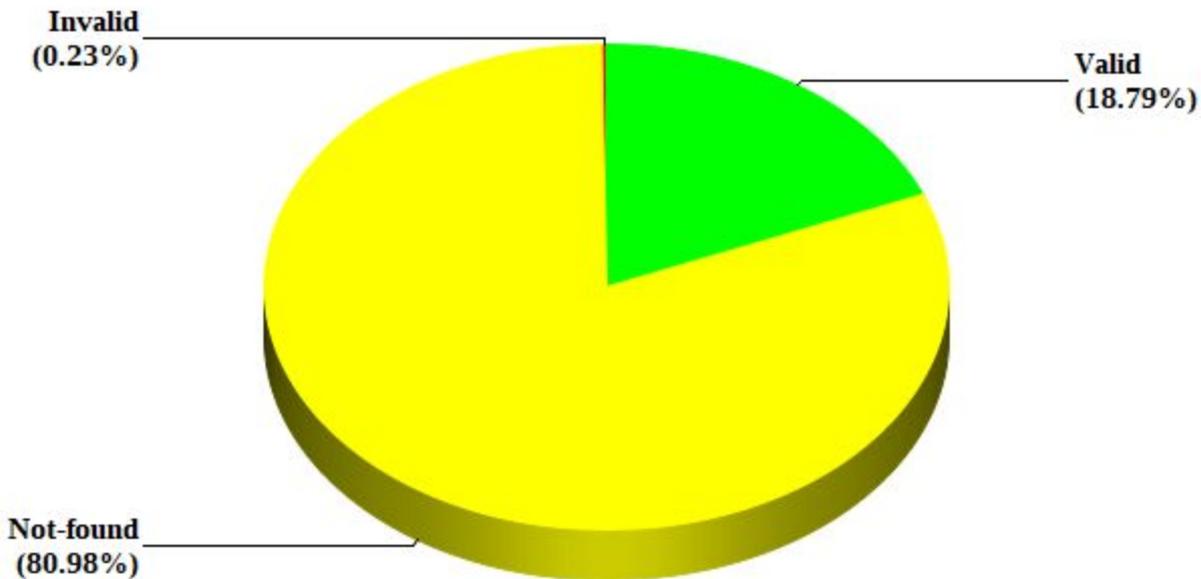
## Global: Validation Snapshot of Unique P/O pairs

872,019 Unique IPv4 Prefix/Origin Pairs



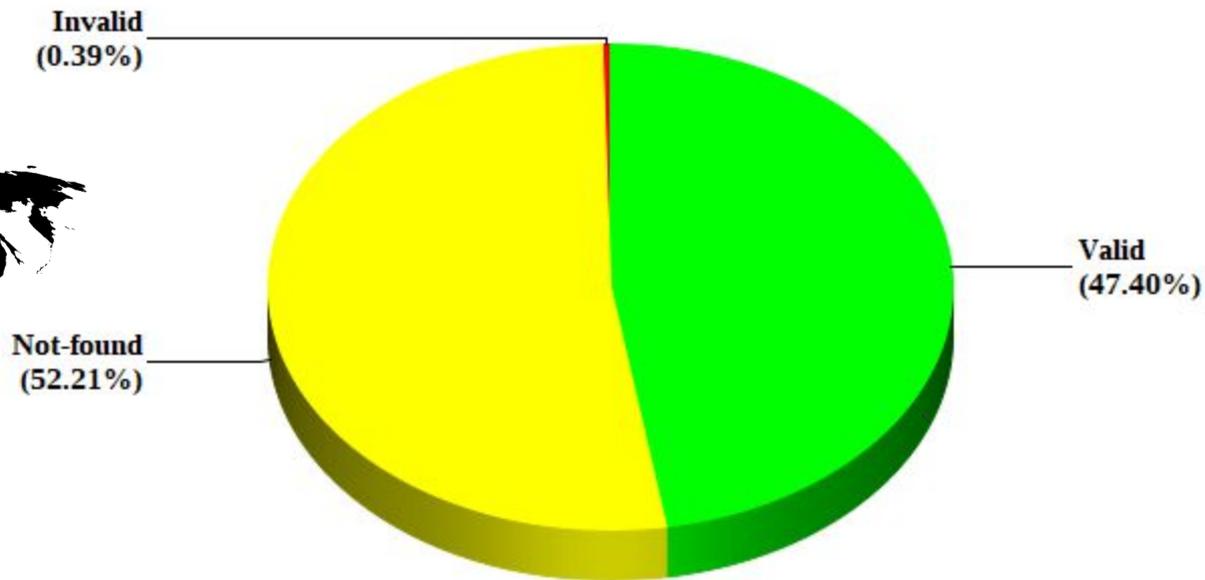
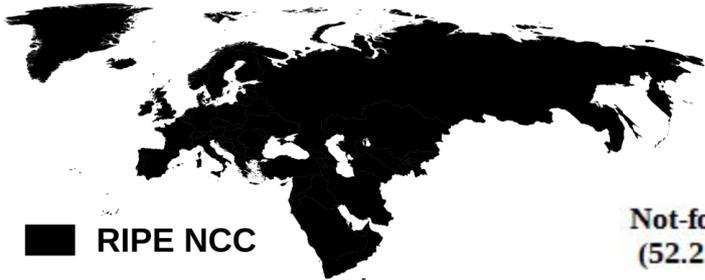
## Global: Validation Snapshot of Address Space (/24s) in Unique P/O Pairs

Valid (2,941,979)    Not-found (12,683,123)    Invalid (36,069)



## RIPE: Validation Snapshot of Address Space (/24s) in Unique P/O Pairs

Valid (1,641,410)    Not-found (1,807,804)    Invalid (13,595)



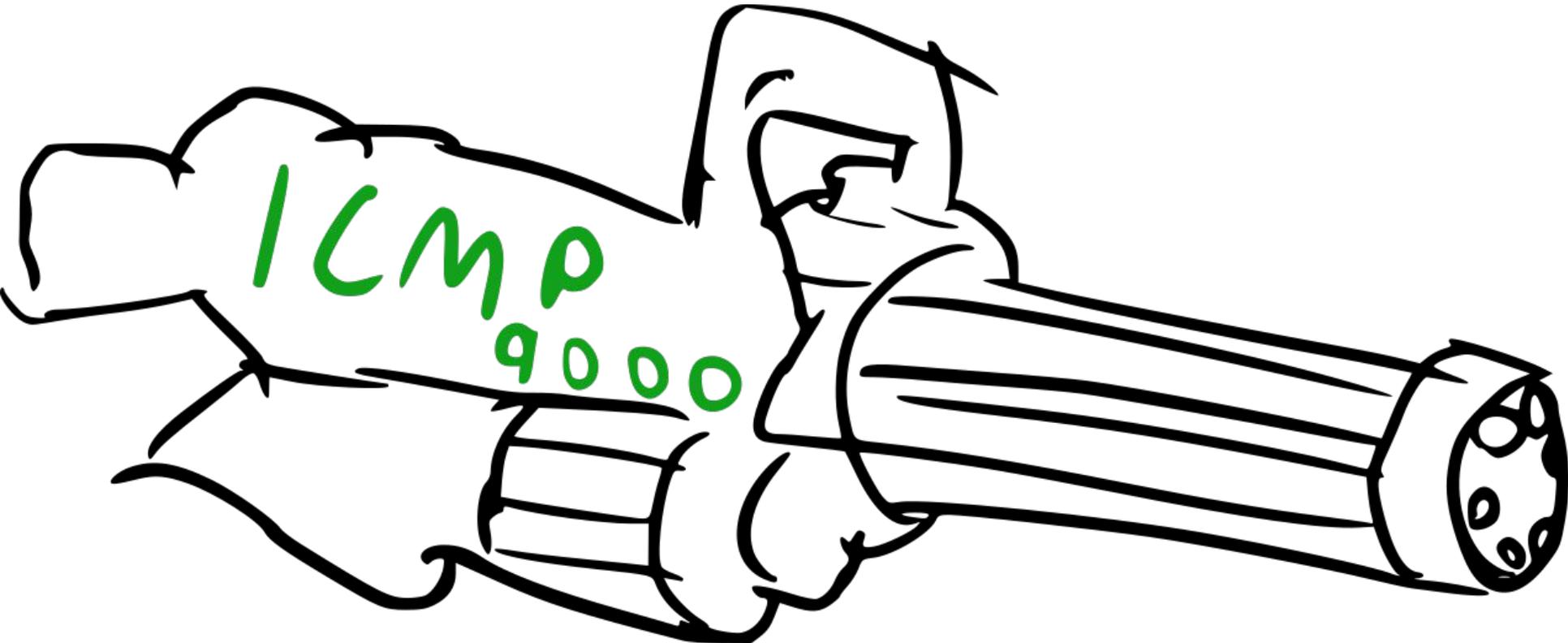
This is all well  
and good

How is validation  
adoption?

## Assumptions

- Lots of people have default routes
- Lots of people are signing but not validating

# Testing methodology



# Testing methodology

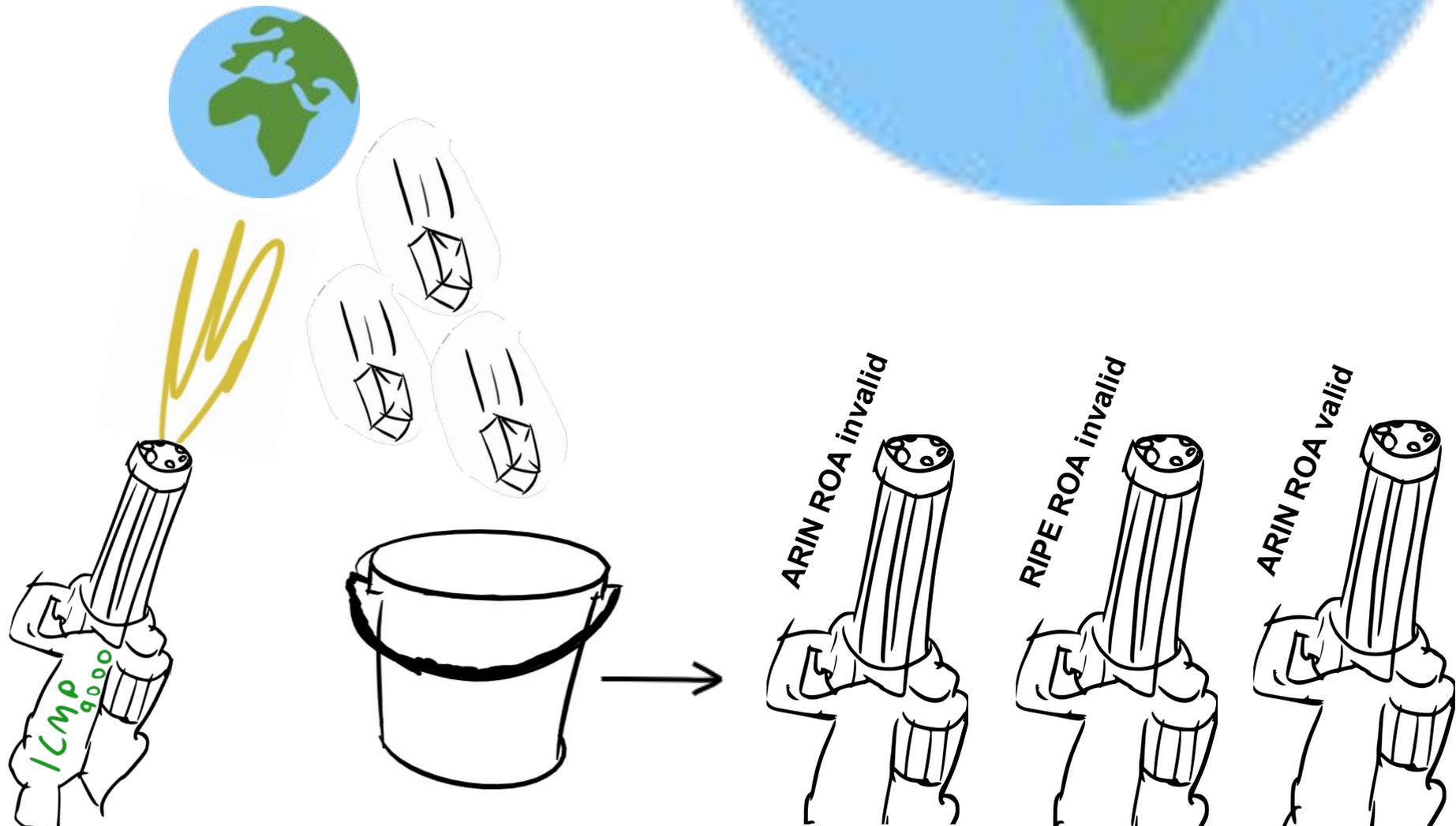
Prefix		Description	
<u>194.32.71.0/24</u>	 	NTT Europe Limited	
<u>209.24.0.0/24</u>	 	NTT America, Inc.	
<u>209.24.1.0/24</u>	 	NTT America, Inc.	

\* This testing setup assumes the networks don't have default routes. Or outsourcing their ROA filtering to a upstream that has total ROA validation, Like NTT.





All 0.0.0.0/0 responses collected





RPKI Deployment Stats May-2020

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive



100% £ % .0 .00 123 Default (Ca... 10 B I S A

fx 3406

	A	B	C	D	E	F	G
1	ASN	ValidCount	RIPEDrop	ARINDrop	RIPE Drop P	ARIN Drop P	Drop Vari
2	7922	21602854	13423	10858	0.06%	0.05%	0.01%
3	4837	16145151	325251	326105	2.01%	2.02%	0.01%
4	4134	9767043	188564	189498	1.93%	1.94%	0.01%
5	4766	9632094	301843	301332	3.13%	3.13%	0.01%
6	701	6122952	3533	2863	0.06%	0.05%	0.01%
7	16625	6086003	2483039	2523816	40.80%	41.47%	0.67%
8	5607	4748892	3141	3127	0.07%	0.07%	0.00%
9	9318	4583505	3493	3406	0.08%	0.07%	0.00%
10	8151	4371989	7049	6886	0.16%	0.16%	0.00%
11	3352	4224605	2295	2281	0.05%	0.05%	0.00%
12	3320	4126695	2805	2734	0.07%	0.07%	0.00%
13	3269	3917732	84342	77390	2.15%	1.98%	0.18%
14	3209	3838184	2599	2575	0.07%	0.07%	0.00%
15	209	3383028	5167	3367	0.15%	0.10%	0.05%
16	12322	2924915	1625	1646	0.06%	0.06%	0.00%
17	17858	2685092	1253	1201	0.05%	0.04%	0.00%
18	5089	2664252	1360	1354	0.05%	0.05%	0.00%
19	22773	2637369	3306	2418	0.13%	0.09%	0.03%
20	7713	2527838	2377	2341	0.09%	0.09%	0.00%
21	20115	2510070	2509731	2509718	99.99%	99.99%	0.00%
22	12389	2459039	2367	2272	0.10%	0.09%	0.00%
23	15557	2409820	1632	1630	0.07%	0.07%	0.00%
24	20001	2304796	2304796	2304796	100.00%	100.00%	0.00%
25	10796	2251026	2251026	2251026	100.00%	100.00%	0.00%
26	6830	2227870	1536	1462	0.07%	0.07%	0.00%
27	16509	2180630	266075	265520	12.20%	12.18%	0.03%
28	15169	2083516	1337	1178	0.06%	0.06%	0.01%
29	33363	2069557	2069530	2069529	100.00%	100.00%	0.00%



Bigger than 200 hosts

Everything

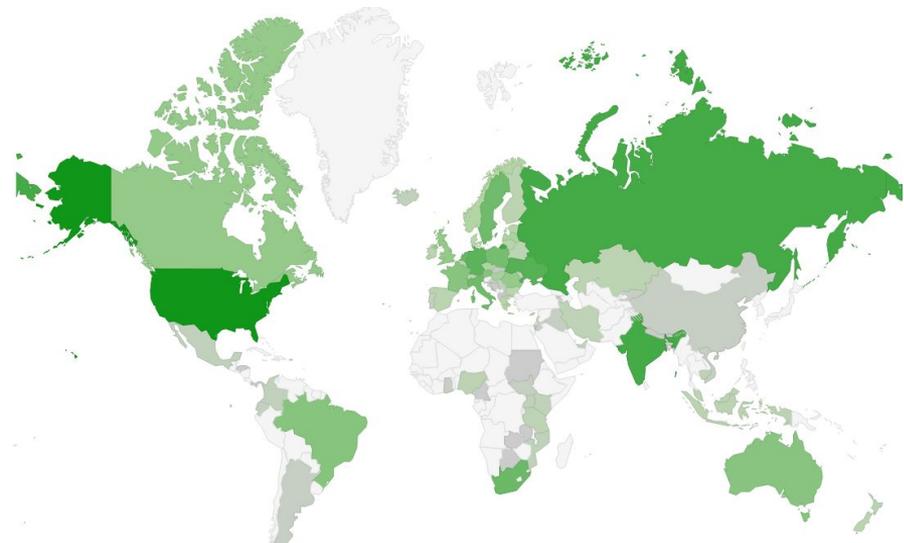




# Graphs for decision makers

# 2598 ROA

# Validating ASNs

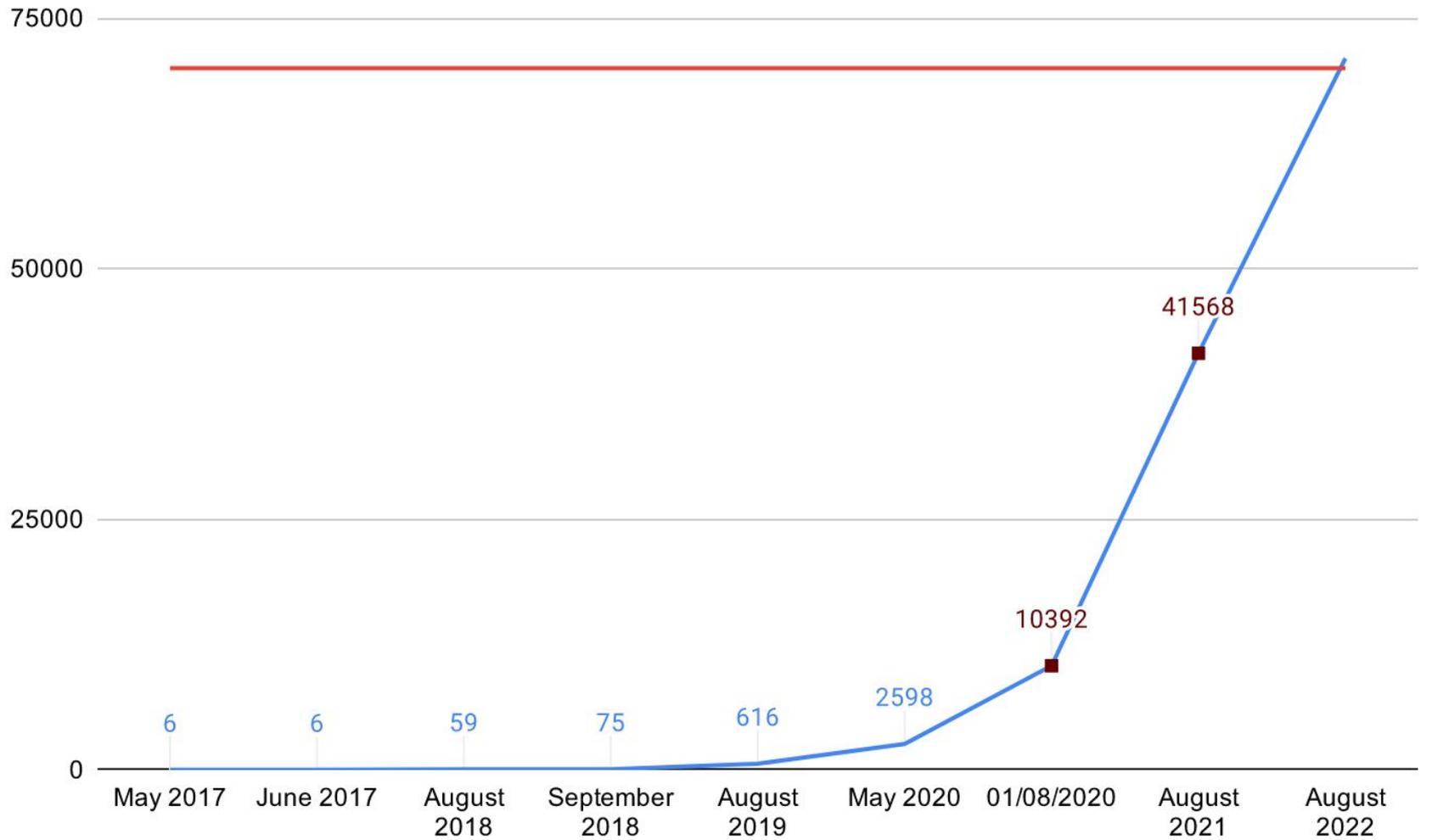


Top 10 ASN ROA Validating Countries

573	US
210	RU
210	IN
149	UA
132	DE
102	NL
99	ZA
91	IT
90	SE
81	PL

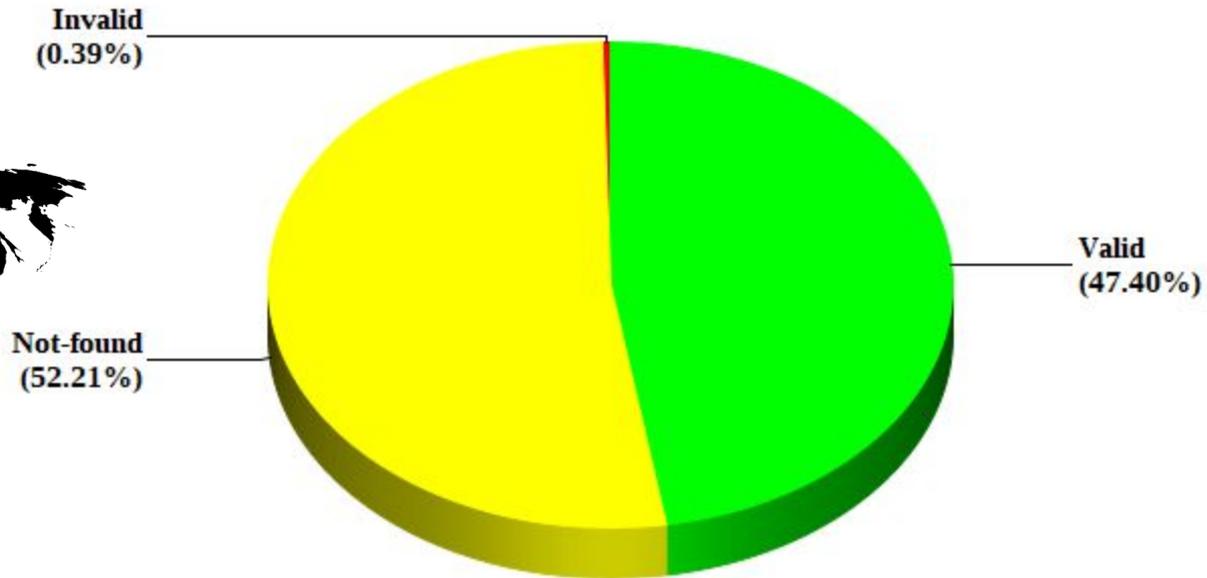
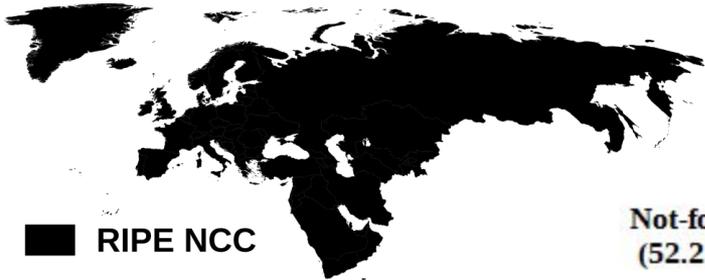


^ Link to full dataset

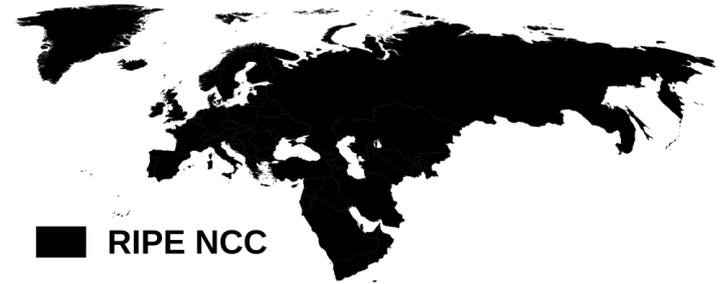
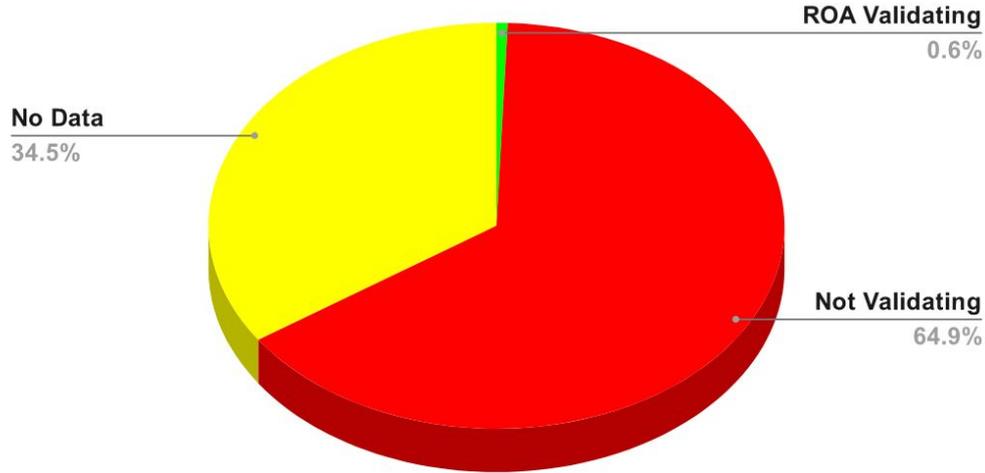


# RIPE: Validation Snapshot of Address Space (/24s) in Unique P/O Pairs

Valid (1,641,410)    Not-found (1,807,804)    Invalid (13,595)



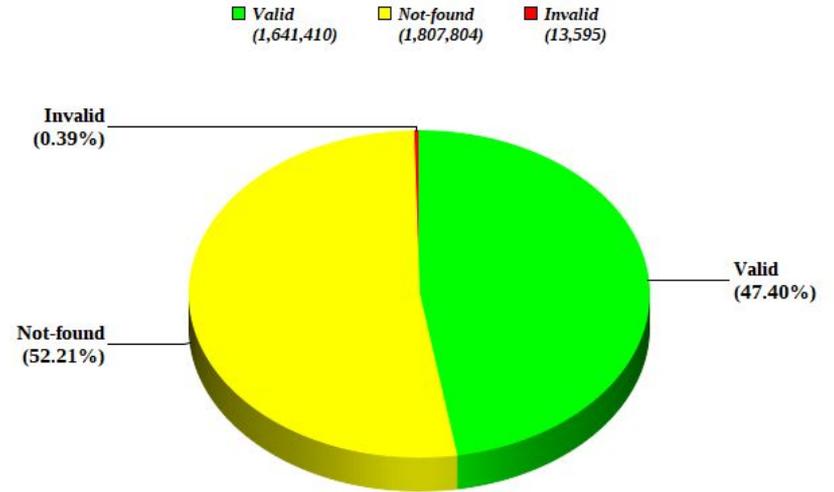
# RIPE: ROA Validation of address space (/24s)



\* No data means less than 4 IPs in the block responded to ICMP, So data is inconclusive

\*\* This testing setup assumes the networks don't have default routes, or outsourcing their ROA filtering to a upstream (Like NTT) that has total ROA validation.

## RIPE: Validation Snapshot of Address Space (/24s) in Unique P/O Pairs



@Benjojo12 / ben@benjojo.co.uk / \$whois as206924

## Shout outs

- Huge thanks to Job for the 10GBE server and the helping with prefixes
- NTT Communications
  - For the ARIN and RIPE prefix

# Questions to:

ripe80 @ benjojo.co.uk

Missed something? You can re-watch this on my twitter: <https://twitter.com/benjojo12>