

RPKI Deployment Status in South Asia

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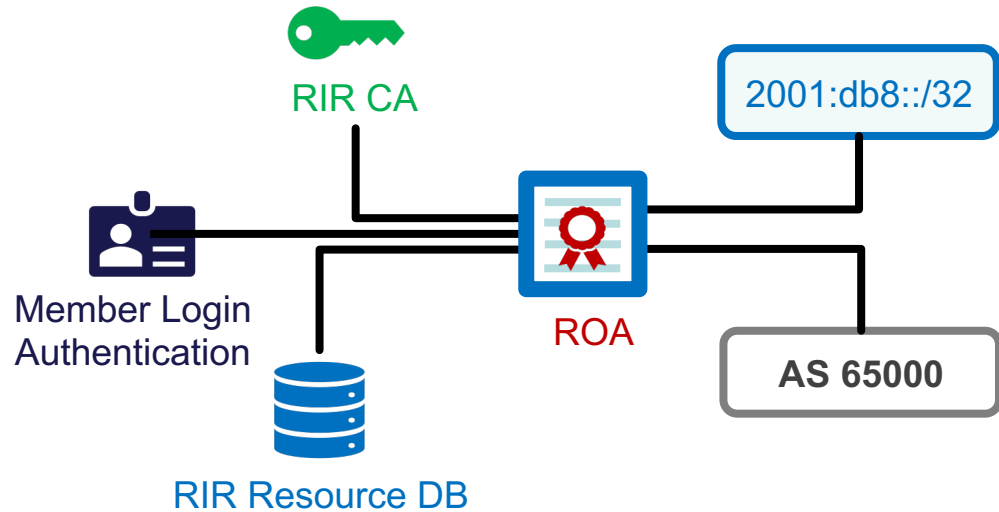


A route is not bad unless proven guilty

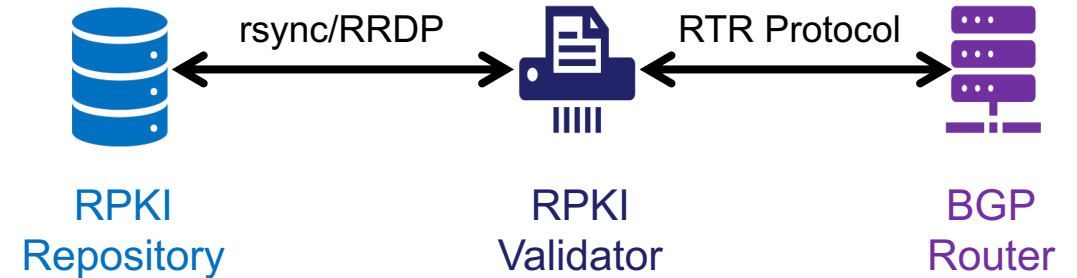
- How to prove it? – By validating
- How can we validate? – Cross-match with VRPs
- What makes the VRPs? – ROAs
- How to collect all the ROAs? – Resource PKI (RPKI)
- Who does what?
 - Resource holders create ROA
 - Network operators do ROV

RPKI is about 2 things: ROA and ROV

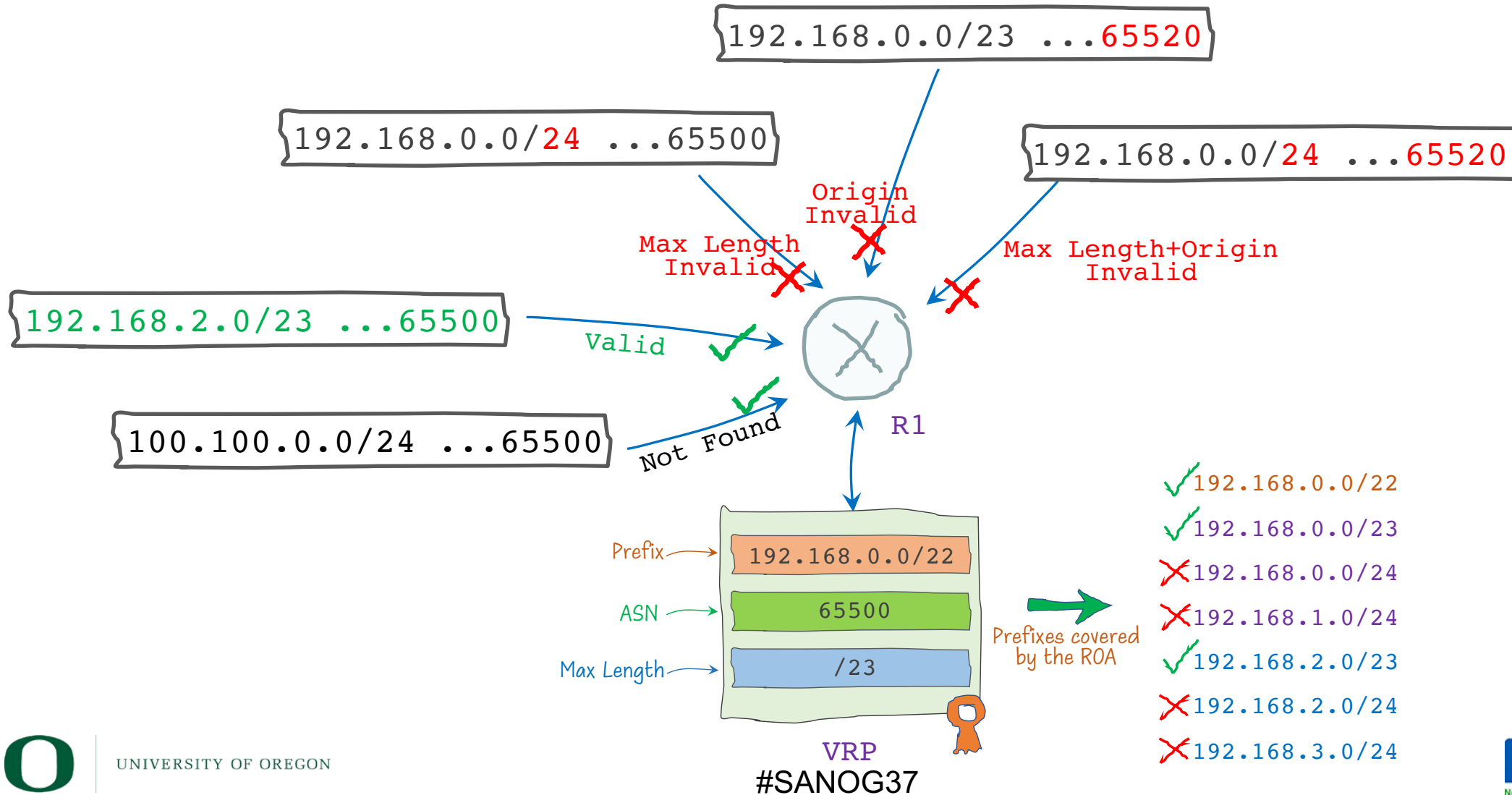
- 1 Signing prefixes
a.k.a. creating **ROAs**



- 2 Validating ROAs
a.k.a doing **ROV**



What Makes a Route RPKI Invalid?

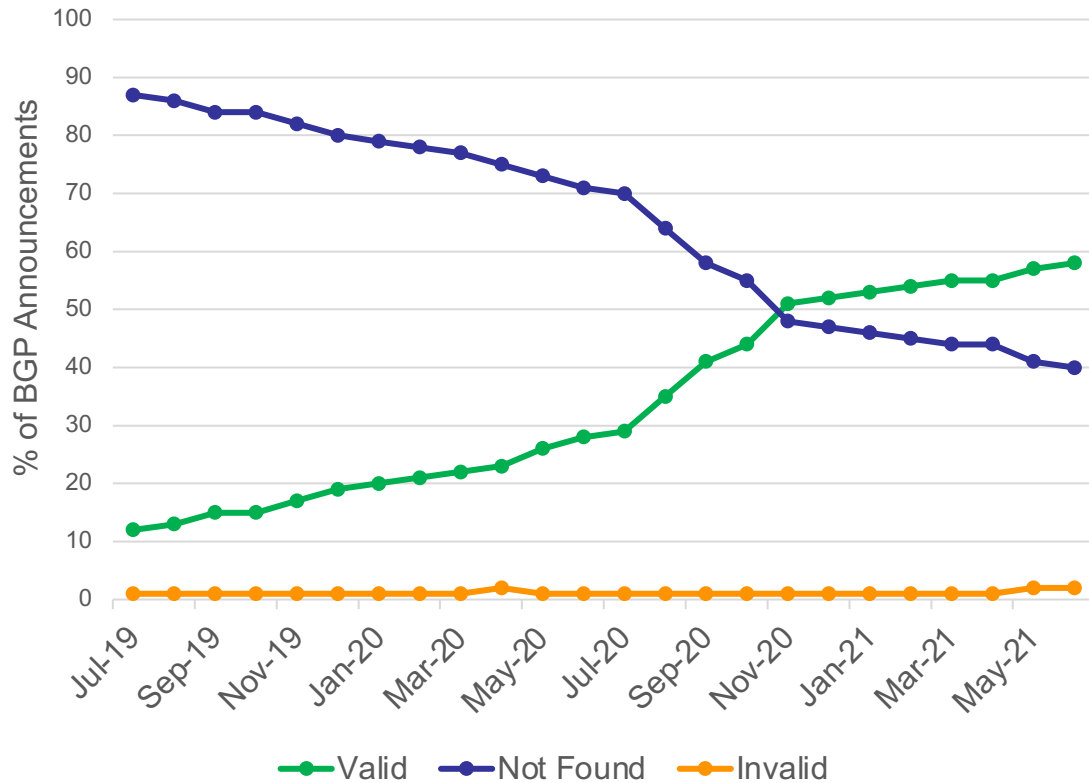


RPKI Deployment Status

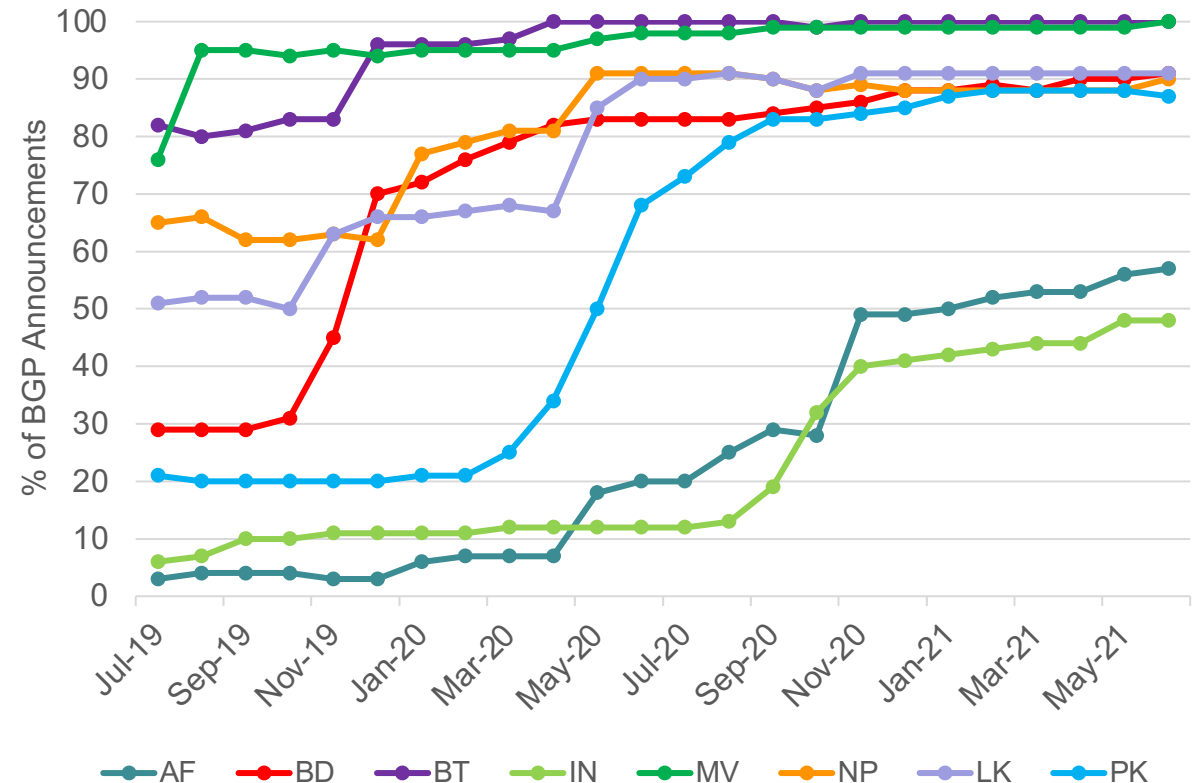


RPKI ROA Adoption

RPKI Status of South Asian BGP Prefixes



RPKI valid BGP Prefixes per Country

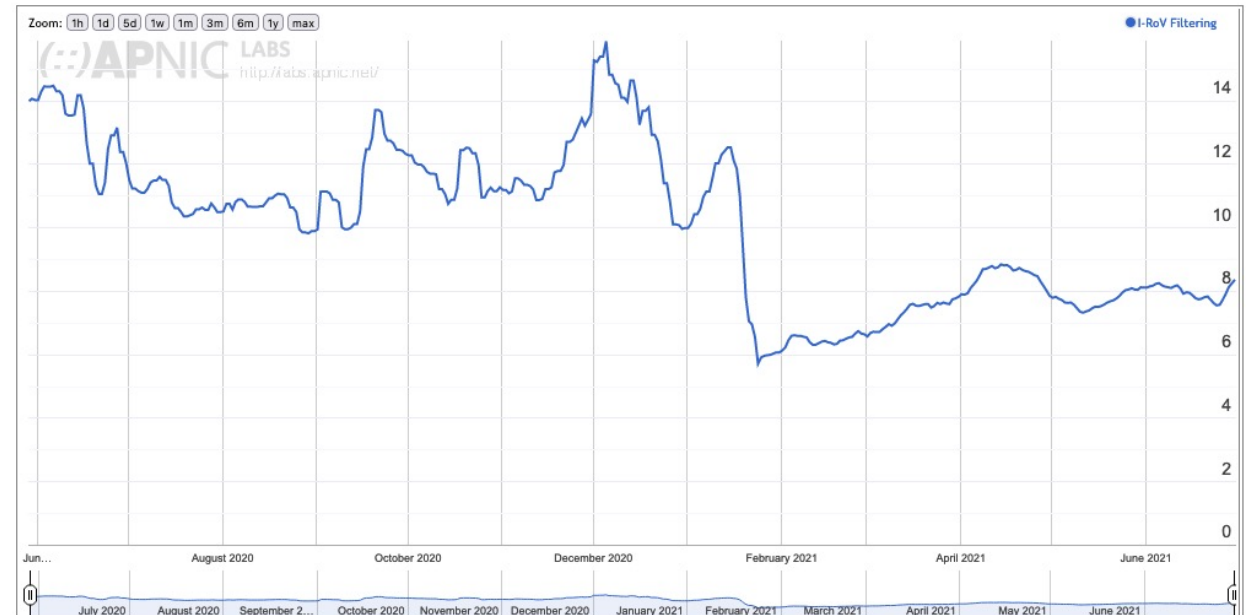


Source: <https://observatory.manrs.org/>

RPKI Validation

CC	Country	RPKI Validates	Samples
MV	Maldives, Southern Asia, Asia	49.94%	21,576
BT	Bhutan, Southern Asia, Asia	32.81%	9,882
IR	Iran (Islamic Republic of), Southern Asia, Asia	30.04%	201,358
AF	Afghanistan, Southern Asia, Asia	22.53%	19,726
LK	Sri Lanka, Southern Asia, Asia	9.15%	351,415
IN	India, Southern Asia, Asia	8.80%	6,735,350
PK	Pakistan, Southern Asia, Asia	8.49%	959,316
BD	Bangladesh, Southern Asia, Asia	5.25%	1,618,558
NP	Nepal, Southern Asia, Asia	5.01%	353,585

Use of RPKI Validation for Southern Asia (XT)

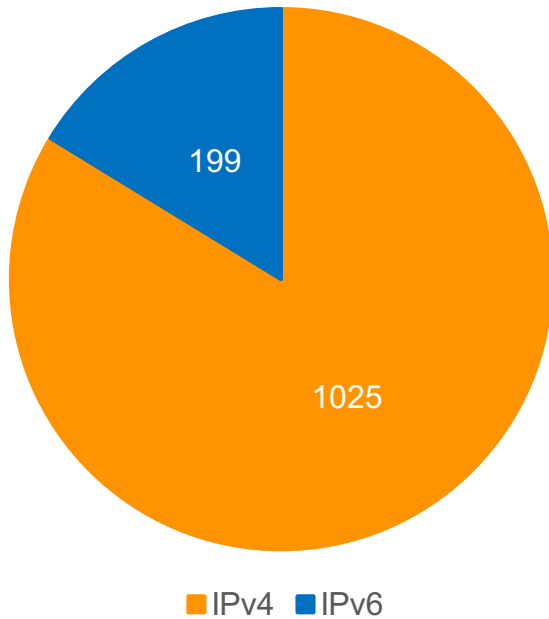


<https://stats.labs.apnic.net/rpki/XT>



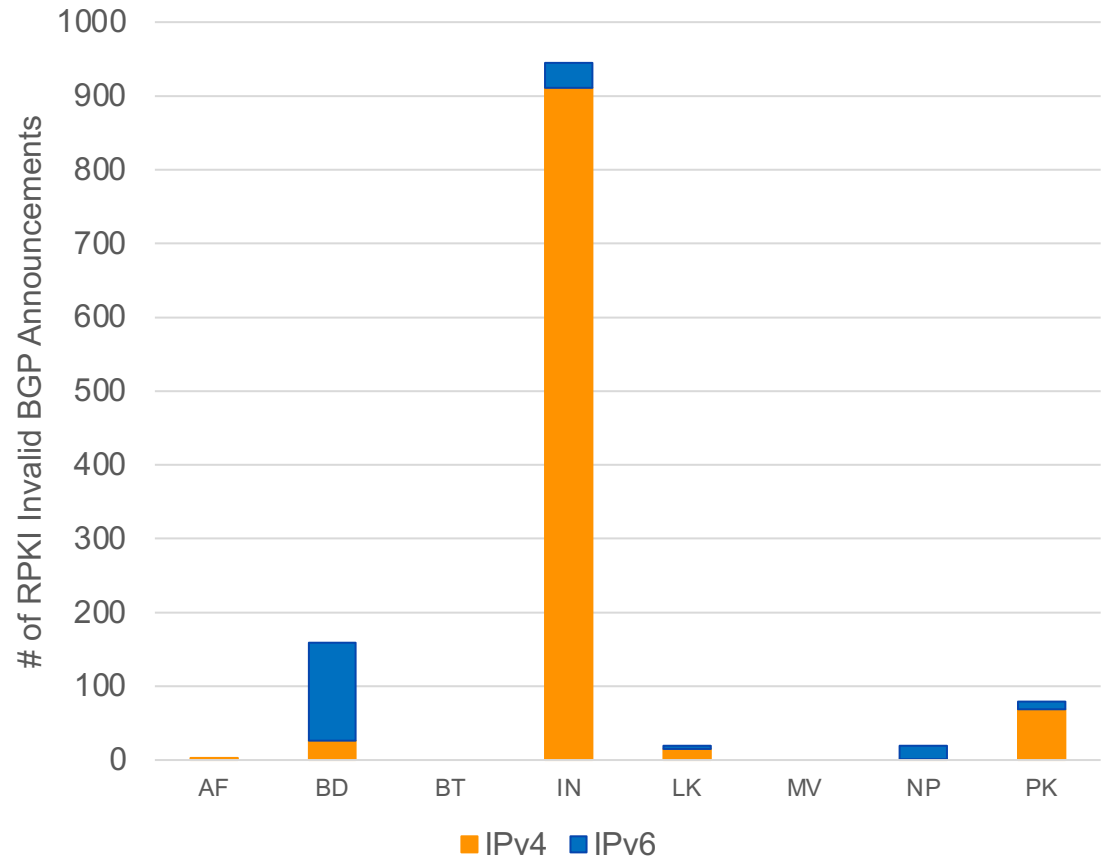
RPKI Invalid Types

Invalids per address family

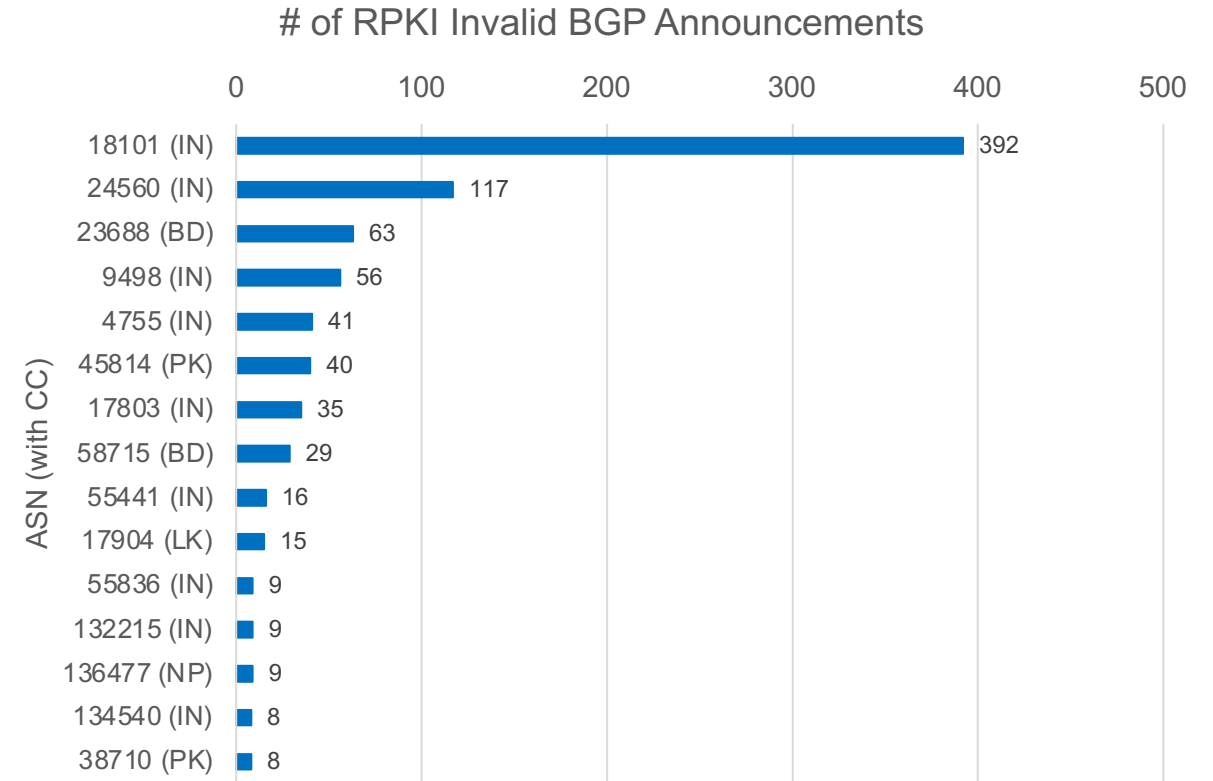
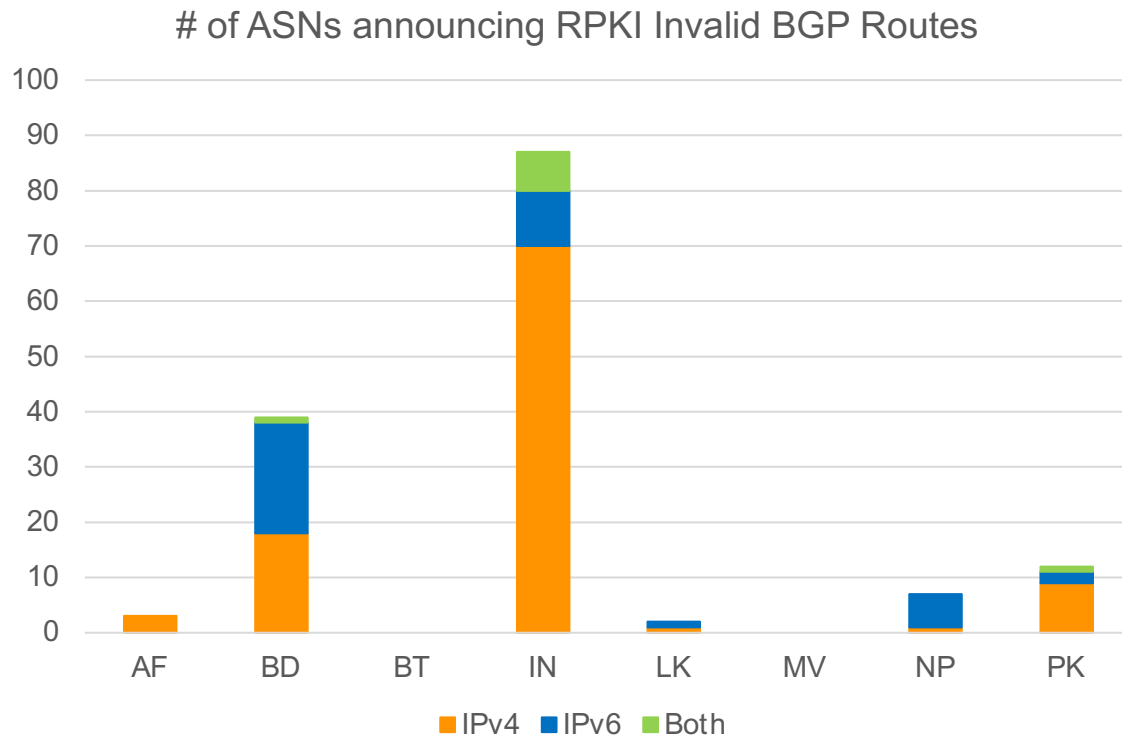


Source: <https://rpki.anuragbhatia.com/> (last updated on 30-Jun-2021)

RPKI Invalid Types Per Country



Top Contributors of RPKI Invalids



Source: <https://rpki.anuragbhatia.com/> (last updated on 30-Jun-2021)



What Goes Wrong?

Prefix		
<u>2403:140::/32</u>		
<u>2403:140:0:3::/64</u>		
<u>2403:140:0:10::/64</u>		

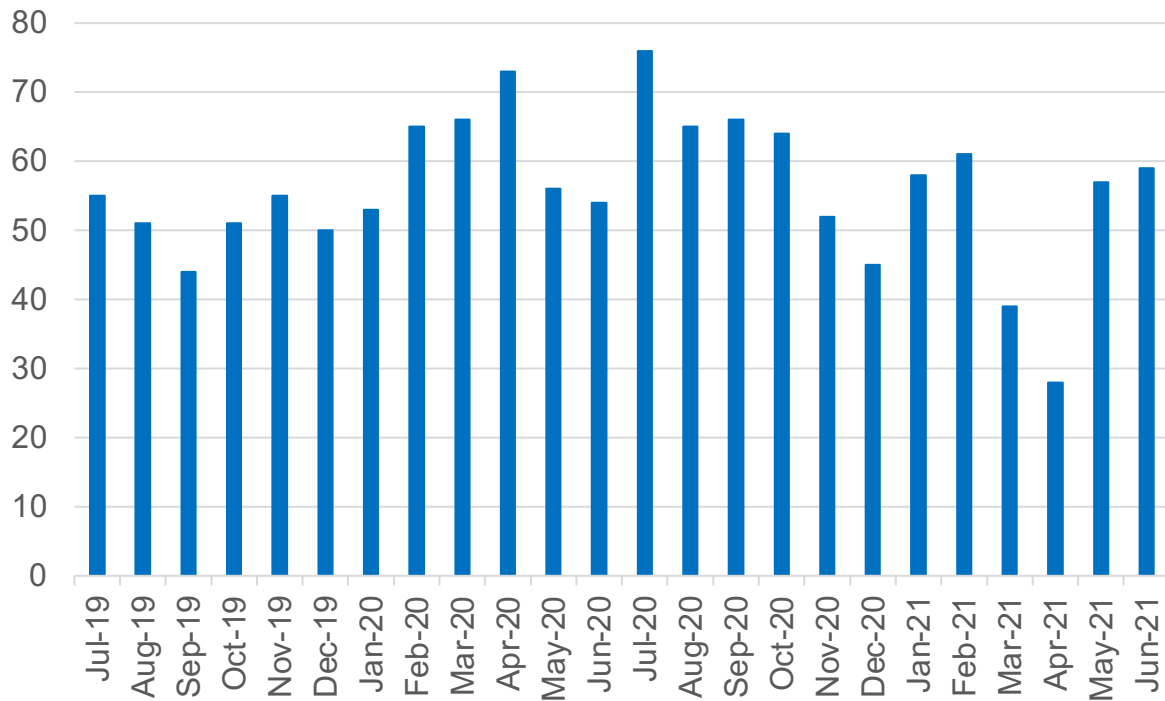
Prefix		
<u>103.115.72.0/22</u>		
<u>103.115.72.0/23</u>		
<u>103.115.72.0/24</u>		
<u>103.115.73.0/24</u>		
<u>103.115.74.0/23</u>		
<u>103.115.74.0/24</u>		
<u>103.115.75.0/24</u>		

Prefix		
<u>103.100.234.0/23</u>		
<u>103.126.216.0/24</u>		
<u>103.126.217.0/24</u>		
<u>103.126.218.0/24</u>		
<u>103.126.219.0/24</u>		
<u>103.143.88.0/23</u>		
<u>103.200.36.0/23</u>		
<u>103.200.36.0/24</u>		
<u>103.200.37.0/24</u>		
<u>103.200.38.0/24</u>		
<u>103.200.39.0/24</u>		

<u>2405:f280:c000::/36</u>		
<u>2405:f280:d000::/36</u>		
<u>2405:f280:e000::/36</u>		
<u>2405:f280:e000::/40</u>		
<u>2405:f280:e100::/40</u>		
<u>2405:f280:e200::/40</u>		
<u>2405:f280:e300::/40</u>		
<u>2405:f280:e400::/40</u>		
<u>2405:f280:e500::/40</u>		
<u>2405:f280:e600::/40</u>		
<u>2405:f280:e700::/40</u>		
<u>2405:f280:e800::/40</u>		
<u>2405:f280:e900::/40</u>		
<u>2405:f280:ea00::/40</u>		
<u>2405:f280:eb00::/40</u>		
<u>2405:f280:ec00::/40</u>		
<u>2405:f280:ed00::/40</u>		
<u>2405:f280:ee00::/40</u>		
<u>2405:f280:ef00::/40</u>		
<u>2405:f280:f000::/36</u>		
<u>2405:f280:f000::/40</u>		
<u>2405:f280:f100::/40</u>		

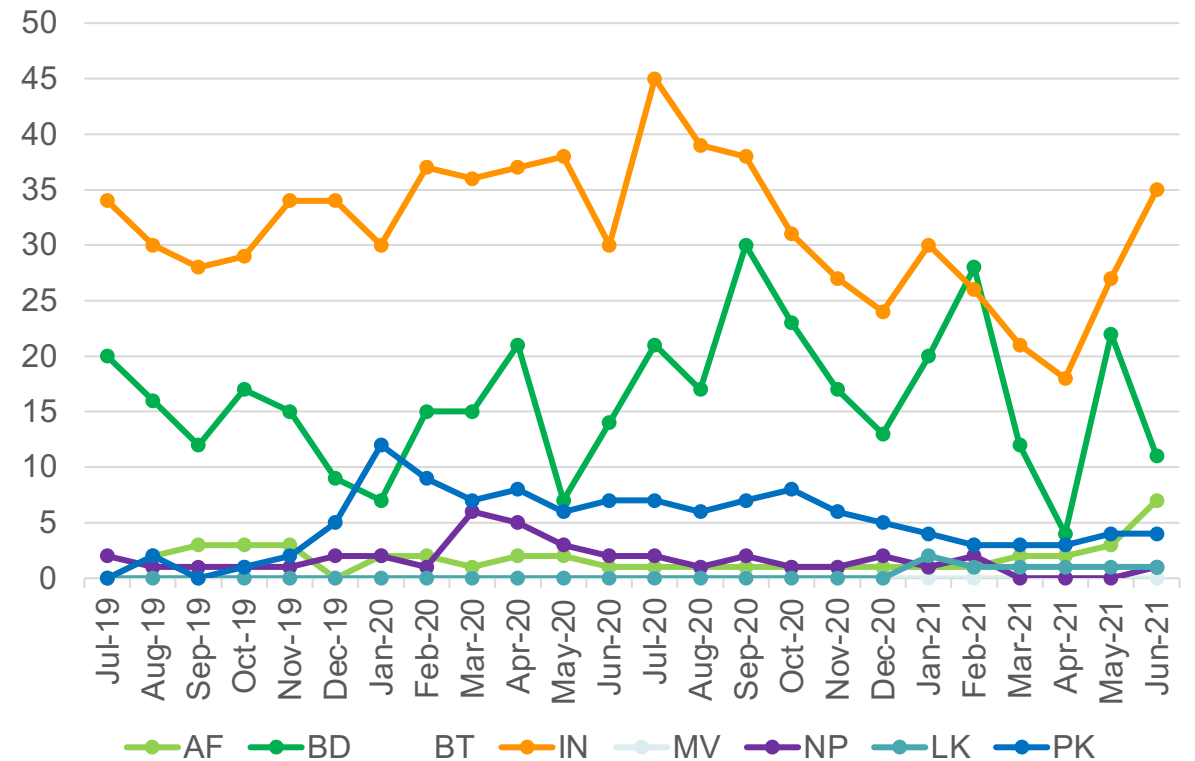
Routing Incidents

Total # of Routing Incidents



Source: <https://observatory.manrs.org/>

of Routing Incidents per Country



Remember, Many Operators Drop Invalids

- Telia
- NTT
- Cogent
- HE
- Cloudflare
- Netflix
- AMS-IX
- DE-CIX
- and many more

Caution:

Your RPKI invalid routes won't pass these networks i.e. many contents may not be accessible with RPKI invalid source IPs.



Acknowledgement

- National Science Foundation (NSF)
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Thanks

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