

A PERSPECTIVE FROM
A TINY SOUTHEAST-
ASIAN NETWORK
TAN SHAO YI

The case for dropping RPKI Invalid prefixes

Disclaimer

- ▶ This presentation is not meant to shame/scold any economy/ASN
- ▶ Comments are welcome, please do not flame/cancel me 😊

Why this presentation?

- ▶ A significant number of Invalids are announced in our part of the world
- ▶ Our customers/end-users also live/do business in this part of the world
- ▶ How you deal with these Invalid prefixes has potential to affect your (and your customers'/end-users') utility and well-being

“

Should we drop RPKI
invalid prefixes?

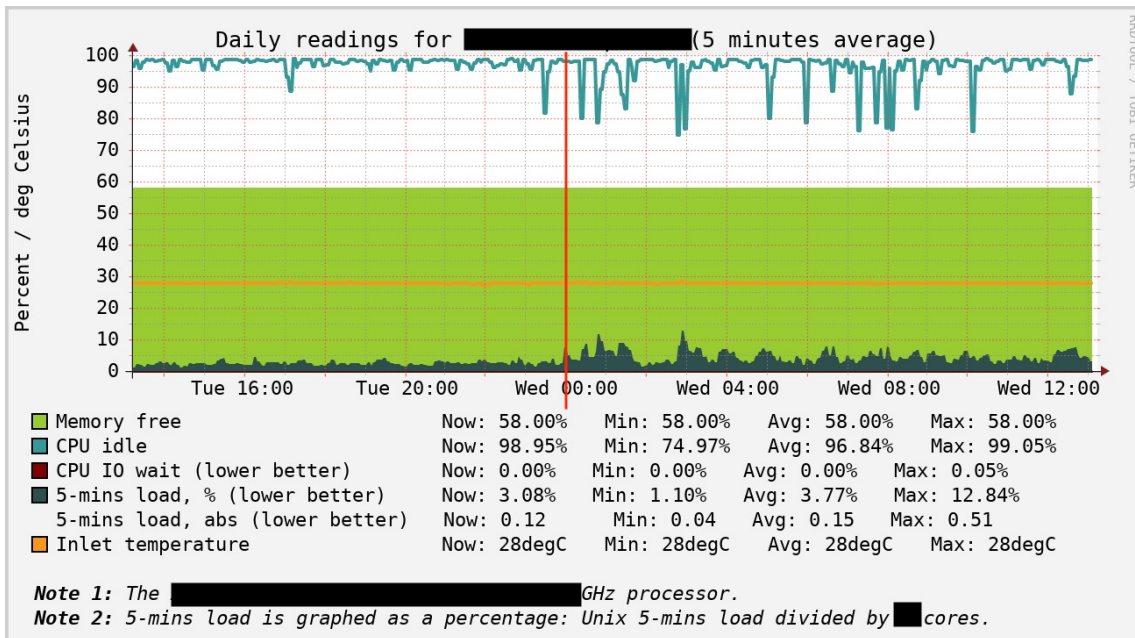
”

Methodology

- ▶ We are a smallish/tiny Southeast-Asian service provider in Singapore
- ▶ Running RPKI route origin validation on our transit providers and peers
- ▶ Parsed the received-routes from our transit providers
 - ▶ To determine the country/economy, we looked-up MaxMind's GeoLite2 Country database (updated 8 Jun 2021)
 - ▶ ASNs used as-is from received-routes

No significant impact to router load

6



- ▶ Implemented ROV around midnight
- ▶ Observed a slight increase in CPU utilization and load, but no change in memory used
- ▶ Maybe we are just a tiny, smallish service provider

IPv4

WHAT WILL WE (AND AND OUR CUSTOMERS) MISS?

Top 30 IPv4 Invalids (by economy, 13 Jun 2021)

12

No.	Economy	Invalids
1	IN	952
2	US	459
3	ID	161
4	BD	142
5	CN	87
6	SG	75
7	PK	67
8	GB	63
9	RU	62
10	CO	62

No.	Economy	Invalids
11	TH	60
12	PH	57
13	PE	57
14	TW	55
15	HK	43
16	BR	40
17	JP	37
18	AR	34
19	PS	25
20	MY	24

No.	Economy	Invalids
21	UA	21
22	TR	21
23	ZA	21
24	DE	21
25	AU	17
26	LK	15
27	IR	13
28	CL	13
29	VE	13
30	ES	12

SGNOG8 - 30 July 2021

Top 20 IPv4 Invalids (by ASNs, 13 Jun 2021)

13

No.	Econ.	ASN	AS-Name	Invalids
1	IN	18101	RELIANCE-COMMUNICATIONS-IN	390
2	IN	9498	BBIL-AP	152
3	US	54004	OPTIMUM-WIFI2	140
4	BD	58715	EARTHTELECOMMUNICATION-AS	124
5	IN	24560	AIRTELBROADBAND-AS-AP	117
6	ID	17995	SOLUSINET-AS-ID	97
7	TW	17408	ABOVE-AS-AP	70
8	PE	21575	ENTEL PERU S.A.	55
9	GB	1273	CW	53
10	IN	134540	TTML-AS-AP	48

No.	Econ.	ASN	AS-Name	Invalids
11	IN	4755	TATACOMM-AS	41
12	PK	45814	FARIYA-PK	40
13	CO	22368	TELEBUCARAMANGA	36
14	CN	45090	CNNIC-TENCENT-NET-AP	35
15	IN	17803	RELIANCE-AS-IN	35
16	CN	24429	Taobao	29
17	PS	47253	AS-BNETSET	25
18	RU	12389	ROSTELECOM-AS	23
19	CN	4808	CHINA169-BJ	23
20	PH	132199	GLOBE-MOBILE-5TH-GEN-AS	21

IPv6

WHAT WILL WE (AND OUR CUSTOMERS) MISS?

Top 30 IPv6 Invalids (by economy, 13 Jun 2021)

19

No.	Economy	Invalids
1	US	186
2	BD	97
3	JP	63
4	PE	38
5	IN	29
6	BR	28
7	TW	27
8	NP	17
9	VN	15
10	TH	12

No.	Economy	Invalids
11	ID	10
12	SG	9
13	CO	9
14	HK	7
15	RU	7
16	ZA	6
17	LK	5
18	EC	5
19	GB	5
20	IL	5

No.	Economy	Invalids
21	AU	4
22	MY	4
23	CL	4
24	IE	4
25	NL	3
26	AR	3
27	IT	3
28	PK	3
29	CH	3
30	FR	3

Top 20 IPv6 Invalids (by ASNs, 13 Jun 2021)

20

No.	Econ.	ASN	AS-Name	Invalids
1	GB	62240	Clouvider	101
2	HK	4637	ASN-TELSTRA-GLOBAL	68
3	BD	58715	EARTHTELECOMMUNICATION-AS	40
4	TW	9924	TFN-TW	27
5	PE	264684	PE-TPSA-LACNIC	26
6	US	6453	TCA-51	16
7	BD	134204	BUSINESSNETWORK-AS-AP	16
8	US	54004	OPTIMUM-WIFI2	15
9	VN	131429	MOBIFONE-AS-VN	14
10	PE	6147	PE-TPSA-LACNIC	12

No.	Econ.	ASN	AS-Name	Invalids
11	BR	264422	DIGITAL WAVE	11
12	NP	136477	PSNPL-AS-AP	9
13	(IN)	64947	(AS45609) BHARTI-MOBILITY-AS-AP	9
14	BD	136516	UNIQUENET-AS-AP	8
15	US	11796	AIRSTREAMCOMM-NET	8
16	US	19681	DIGGIO	8
17	(US)	65000	(AS11251) DSTL-2-11251	8
18	TH	59238	INOX-TH	5
19	NP	136530	ULTRANET-AS-AP	5
20	BD	38071	AFTABIT-BD-AS-AP	5

If we dropped these IPv4/6 prefixes

- ▶ May not be a good idea if we have many customers accessing services in South Asia and in China
- ▶ Your ability to explain to customers vs ability of customers to accept that these offending networks must fix their ROAs
 - ▶ "Why X network can access but not yours?"
 - ▶ How about using ROV status to just increase the preference for Validas to "protect" customers against Invalids?
 - ▶ How about permitting by exceptions?
 - ▶ Consider using SLURM for ROA/ROV exceptions
- ▶ Enhance the information with flow data to ascertain impact on customers before implementation?
- ▶ We haven't considered the size of the prefixes in our analysis

Questions?

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