hierarchical vs non-hierarchical as-sets

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The Problem

Inaccurate or outdated data in Internet Routing Registries (IRRs) undermines the reliability of route filtering, which is fundamental for the integrity of the ever growing Internet.

While ROA adoption is still under 50% globally, addressing the problem of incorrect or stale data in IRR databases is imperative to ensure the integrity and resilience of the global Internet routing system.

Lets Investigate!

- Just like we parse data from RADb and ALTDB, we also parse RIR's allocation data.

- Again, there were just many ways to investigate the IRR data, we (Max Stucchi, Amreesh Phokeer, Aftab Siddiqui) decided to do the following

- Compare RIR delegation file with RIR IRR data

- Also add RADb matching objects

- All data is publicly available for further review

http://103.162.143.30/route-check
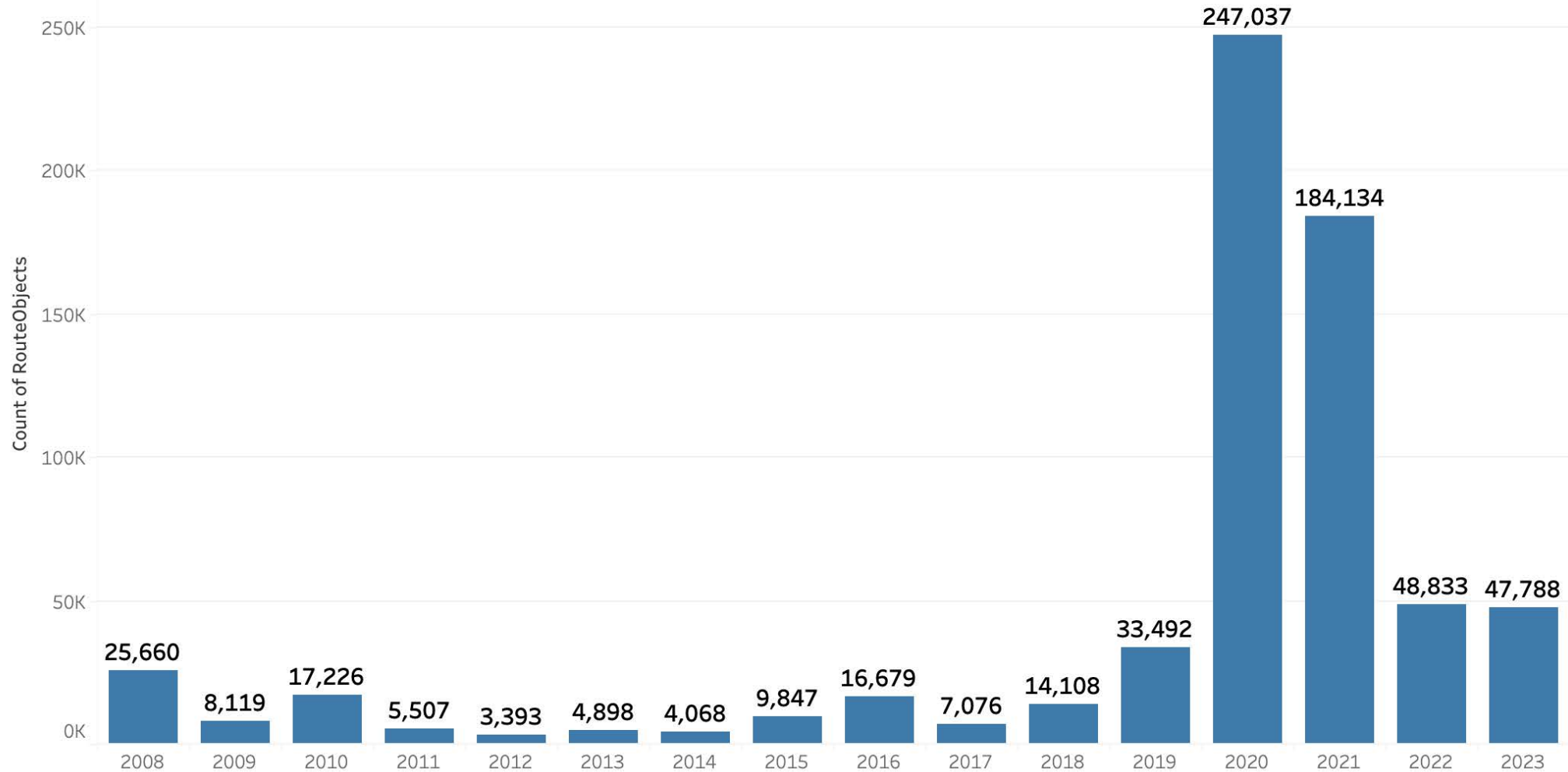
APNIC Resource Status

- There are 4 – Status types

  - Status 1 – There are objects for "**Exact**" allocation size and for "**More Specifics**"

  - Status 2 – There are objects only for "**Exact**" allocation size, no "**More Specifics**"

  - Status 3 – There are objects only for "**More Specifics**"

  - Status 4 – There are no objects (neither "**Exact**" match nor "**More Specifics**")

Distinct Prefixes	Distinct Origin ASN
529,445	10,457

APNIC IRR – Route Objects

apnic_whois_History

Year	Count of RouteObjects
2008	25,660
2009	8,119
2010	17,226
2011	5,507
2012	3,393
2013	4,898
2014	4,068
2015	9,847
2016	16,679
2017	7,076
2018	14,108
2019	33,492
2020	247,037
2021	184,134
2022	48,833
2023	47,788

First look at non-problematic data
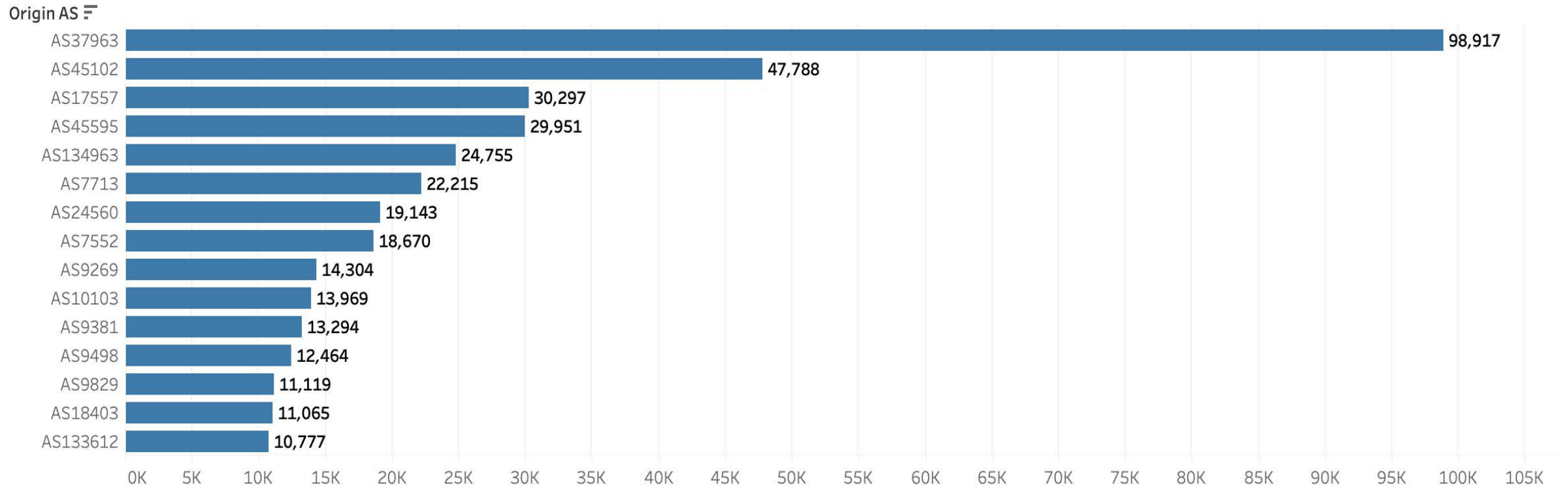
APNIC IRR – Route Objects

Creating route objects in authenticated Internet Routing Registries (IRRs) is important for several reasons, it provide a means to validate the legitimacy of route announcements. Network operators can cross-reference routing information with authorized route objects, enhancing the accuracy of BGP route validation and reducing the risk of route hijacking and misconfigurations.

- Route Validation

- Improved Routing Security
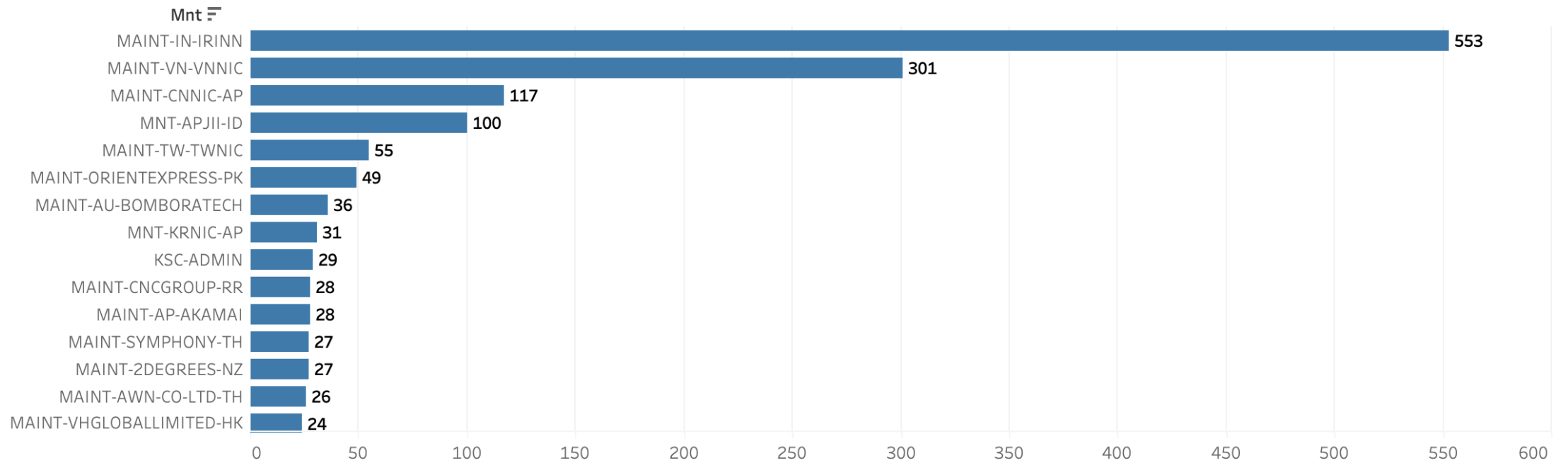
- Facilitating Collaboration

APNIC IRR – Route Objects

Top 15 Origin ASN

Origin AS	
AS37963	98,917
AS45102	47,788
AS17557	30,297
AS45595	29,951
AS134963	24,755
AS7713	22,215
AS24560	19,143
AS7552	18,670
AS9269	14,304
AS10103	13,969
AS9381	13,294
AS9498	12,464
AS9829	11,119
AS18403	11,065
AS133612	10,777

APNIC IRR – Route Objects

Top 15 Maintainer

APNIC IRR – Route Objects

Top 15 Prefixes

Prefix (Sheet1)

Prefix	Count
203.17.72.0/24	33
120.29.254.0/24	32
120.29.253.0/24	32
120.29.252.0/24	32
103.155.121.0/24	8
103.155.120.0/24	8
103.155.120.0/23	8
157.119.21.0/24	6
143.96.0.0/16	6
103.99.41.0/24	6
103.99.40.0/24	6
103.99.40.0/23	6
103.73.85.0/24	6
103.73.84.0/24	6
103.153.102.0/23	6
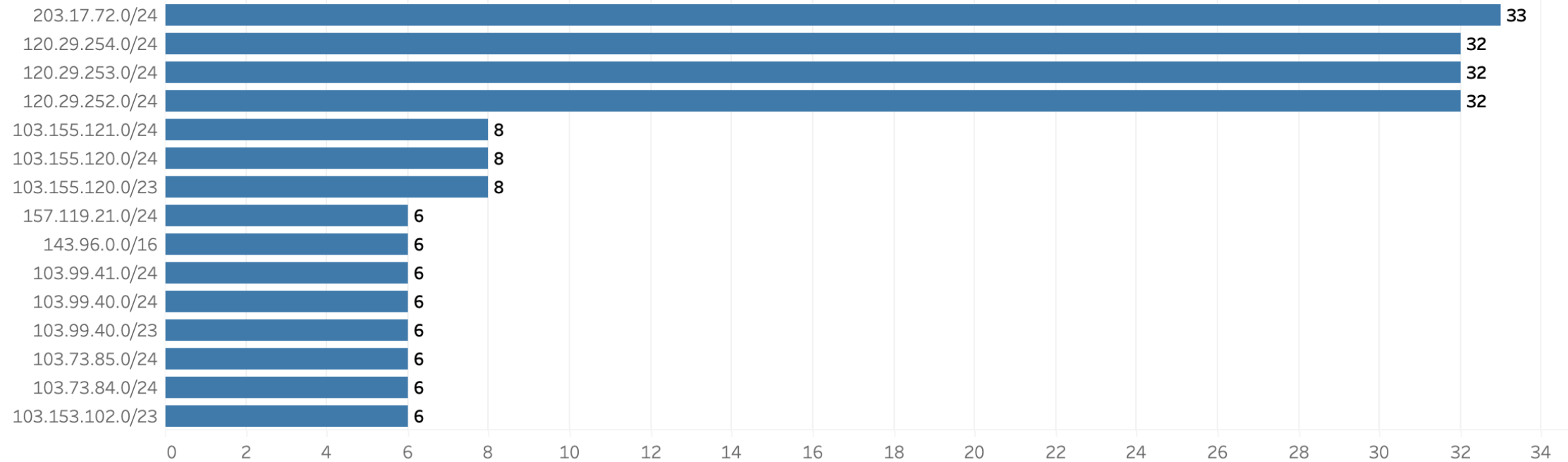
APNIC IRR – Route Objects

Private Origin ASN

Mnt	Prefix (Sheet1)	Origin AS	Year of Last Mod..	Description (Sheet1)
MAINT-AU-CBA	140.168.64.0/19	AS65510	2022	Commonwealth Bank of Australia
	140.168.78.0/24	AS65510	2022	Commonwealth Bank of Australia
	140.168.79.0/24	AS65510	2022	Commonwealth Bank of Australia
	140.168.87.0/24	AS65510	2022	Commonwealth Bank of Australia
	140.168.96.0/19	AS65510	2022	Commonwealth Bank of Australia
	140.168.128.0/19	AS65512	2022	Commonwealth Bank of Australia
	140.168.135.0/24	AS65512	2022	Commonwealth Bank of Australia
	140.168.160.0/19	AS65512	2022	Commonwealth Bank of Australia
	140.168.244.0/22	AS65501	2022	Commonwealth Bank of Australia
	140.168.244.0/24	AS65501	2022	Commonwealth Bank of Australia
	140.168.245.0/24	AS65501	2022	Commonwealth Bank of Australia
	140.168.246.0/24	AS65501	2022	Commonwealth Bank of Australia
MAINT-COCHLEAR-AU	203.19.234.0/24	AS64515	2022	COCHLEAR LIMITED

APNIC IRR – Route Objects

Available ASN

Mnt	Origin AS	Prefix (Sheet1)	Description (Sheet1)
MAINT-AU-NEXON	AS38055	210.215.78.0/24	Nexon Asia Pacific Pty Ltd
MAINT-BLINKLOAD-HK	AS9833	103.149.162.0/24	Blinkload
		103.149.163.0/24	Blinkload
MAINT-BNSPL-AU	AS140689	103.151.202.0/23	BMS Network Solutions Pty Ltd
MAINT-HPL-PK	AS136607	103.152.100.0/24	HOMENET PRIVATE LIMITED

Authentication and Data Integrity:

- Stale or outdated data can be a concern in IRR databases. How do operators mitigate the risk of using stale data in IRR services, and what best practices have they implemented to address this issue?

Future of IRR Services:

- In light of evolving internet security and routing challenges, how do operators envision the future of IRR services, and what improvements or developments would they like to see?

- What role does community collaboration play in the maintenance and improvement of IRR services? How can network operators contribute to the accuracy and utility of IRR data?

https://www.surveymonkey.com/r/IRRsurvey

Thankyou

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