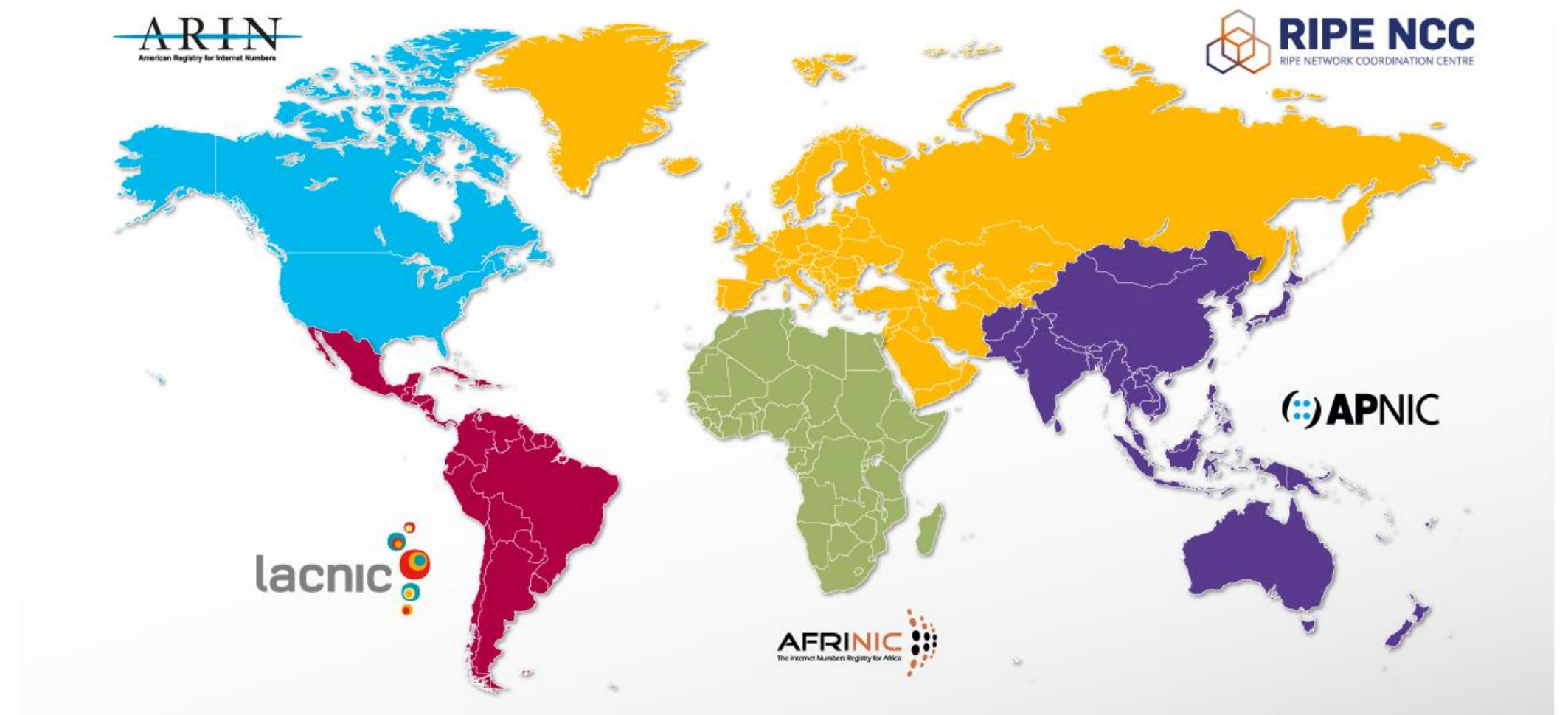# Taiwan's Digital Landscape

With RIPE NCC's Tools

Lia Hestina | TWNOG 5 | Taipei

About Us

- Regional Internet Registry for Europe, Middle East and parts of Central Asia

- Non-profit, established in1992

- Provide training and e-learning

- Share our research on RIPE Labs - you can also contribute!

- We develop Internet measurement tools

www.ripe.net

Supporting Local Infrastructure

With RIPE NCC Tools

RIPE NCC Tools Can Help

- RIPE Atlas:

  - Can help reduce impact of possible incidents

  - Provide a global network of probes to measure Internet connectivity and performance.

- RIPE Routing Information Service

  - Provides real-time routing information services(RIS)

  - Helps optimise Internet traffic, can be used to set up alerts

- AuthDNS

  - Hosting an AuthDNS node can provide faster and more reliable domain look ups

  - Reverse DNS for timely delivery of email and secure logins

Your Infrastructure

Install
RIPE Atlas

- The world's largest active Internet measurements platform
- A network global probes that measure Internet connectivity and performance.

Peer with
RIPE RIS

- Monitor a prefix for unexpected announcements.
- Is your prefix seen and where?
- Make informed decisions, detect and alleviate potential security threats, and enhance overall network resilience.

Host
AuthDNS

- Serve your local community by hosting Authoritative DNS servers for faster and more reliable domain lookups

RIPE Atlas

View your network from outside

More 12K probes, hosted by volunteers globally

Credit system for fairness/ Non Monetary

Run SIX types of measurements:
PING, Traceroute, DNS, SSL/TLS, NTP and HTTP (anchors only)

Accessible via:
GUI
API
CLI Tool

RIPE Atlas Security and Privacy

Probes

☑ Trust Material (regular server address, keys)

☑ NO open Ports; initiate connection; NAT is OK

☑ Don't listen to local traffic/ No snooping

Measurements

☑ No passive measurements

☑ Probes initiate SSH connections from probe to server

☑ Code of measurements publicly available

RIPE Atlas Impact
A Global Network of Internet Measurements

Probe	ASN (IPv4)	ASN (IPv6)			Time (UTC)		RTT			Hops	Success		
4429	55430		🇸🇬	☁	2020-05-13 19:02		270.039			17	✖		
14042	55430		🇸🇬	☁	2020-05-13 19:02		267.779			17	✖		ℹ
22798	55430	55430	🇸🇬	☁	2020-05-13 19:02		268.372			17	✖		ℹ
24422	55430	✖	🇸🇬	☁	2020-05-13 19:02		268.974			17	✖		ℹ
25828	4788		🇲🇾	☁	2020-05-13 19:02		364.127			15	✖		ℹ
28850	4844		🇸🇬	☁	2020-05-13 19:02		265.993			17	✖		ℹ
54623	4773	4773	🇸🇬	☁	2020-05-13 19:02		268.964			16	✖		ℹ
55415	55430	55430	🇸🇬	☁	2020-05-13 19:02		367.158			13	✖		ℹ

High latency Identified

> Talk to your peers, ISP or any that can help improve RTT

Settings & Status | **Latest Results** | Map | Tracemon | IPMap | Downloads

Probe	ASN (IPv4)	ASN (IPv6)			Time (UTC)		RTT			Hops	Success		
4429	55430		🇸🇬	☁	2020-05-13 20:17		4.394			14	✔		ℹ
14042	55430		🇸🇬	☁	2020-05-13 20:17		3.042			14	✔		ℹ
22798	55430	55430	🇸🇬	☁	2020-05-13 20:17		3.336			14	✔		ℹ
24422	55430		🇸🇬	☁	2020-05-13 20:17		3.993			15	✔		ℹ
25828	4788		🇲🇾	☁	2020-05-13 20:17		3.158			14	✔		ℹ
28850	4844		🇸🇬	☁	2020-05-13 20:17		3.127			14	✔		ℹ
31918	55430		🇸🇬	☁	2020-05-13 20:17		5.194			15	✔		ℹ
54623	4773	4773	🇸🇬	☁	2020-05-13 20:17		4.505			14	✔		ℹ
55415	55430	55430	🇸🇬	☁	2020-05-13 20:17		3.508			14	✔		ℹ

Lower latency after debugging

Latest Traceroute Result for Measurement #59170999 ✖

2023-09-01 16:17 UTC

Traceroute to tiktok.com (3.160.5.56), 48 byte packets

```
1   192.168.0.1     0.457ms  0.368ms  0.346ms
2   100.91.127.254  5.424ms  4.347ms  4.594ms
3   10.233.97.55    4.777ms  4.537ms  4.473ms
4   10.55.192.63    193.346ms  194.974ms  194.312ms
5   213.248.79.106  lax-b3-link.ip.twelve99.net   AS1299  182.594ms  182.382ms  182.325ms
6   62.115.126.250  lax-b23-link.ip.twelve99.net  AS1299  202.572ms  203.672ms  203.016ms
7 * 62.115.123.136  dls-bb2-link.ip.twelve99.net  AS1299  232.324ms  *
8   62.115.116.213  atl-b24-link.ip.twelve99.net  AS1299  255.674ms  250.639ms  250.838ms
9   62.115.119.201  ipls-b2-link.ip.twelve99.net  AS1299  255.624ms  255.207ms  255.525ms
10  62.115.139.235  clb-b1-link.ip.twelve99.net   AS1299  260.81ms   260.133ms  259.797ms
11 * * *
12 * * *
13 * * *
14 * * *
15 * * *
255 3.160.5.56  server-3-160-5-56.cmh68.r.cloudfront.net  AS16509  243.323ms  242.473ms  243.412ms
```

8

# Routing Information Service (RIS)

# Routing Information Services Impact

- RIS is a routing data collection platform

- Collecting BGP data since 1999

- Up-to-date routing information, as opposed to information in databases and routing registries, such as:

  - What is being announced

  - Which prefixes are seen and where

  - Which prefixes are not seen

**THANK YOU TO OUR COMMUNITY**

23 collectors
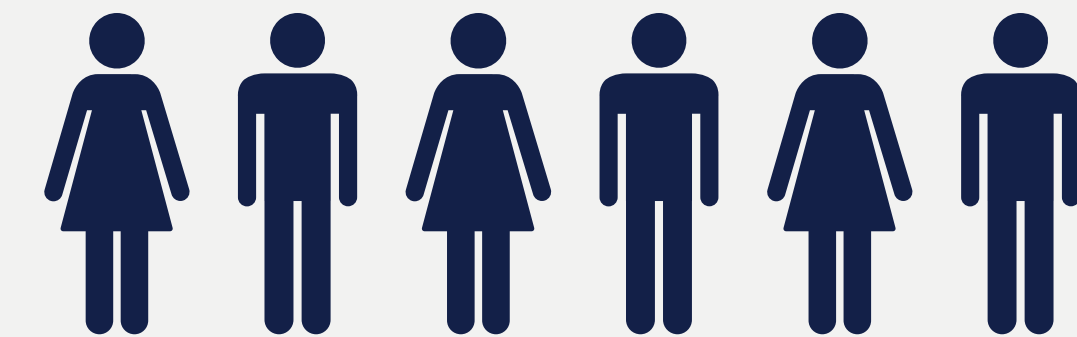
1377 global peers

# How can RIS help Network Operators?

- Is your prefix getting announced?

  - RIS Live (https://ris-live.ripe.net/)

  - NeTOX (https://netox.apnic.net/)


- Tools developed by others allow you to set an alert

  - Try out **BGP Alerter** (powered by RIS Live)

  - Packetvis (https://packetvis.com/) RPKI & BGP Monitoring

# Peering with RIS

- Provides real-time routing information

- Enhances network stability

- Enables proactive management of Internet traffic

**Live RIS BGP messages**

⏸  *Reconnecting*  |  5294 matching messages  ~0 kbit/s ⓘ

```
// Received at 16:31:27 (3.87 second delay)
{
    "timestamp": 1704382283.27,
    "peer": "198.32.160.242",
    "peer_asn": "24482",
    "id": "198.32.160.242-018cd519be060000",
    "host": "rrc11.ripe.net",
    "type": "UPDATE",
    "path": [24482, 16097, 35244],
    "community": [[24482, 2], [24482, 200], [24482, 12000],
[24482, 12020], [24482, 12022], [24482, 65203], [65101, 1082],
[65102, 1000], [65103, 276], [65104, 150]],
    "origin": "IGP",
    "med": 85222,
    "announcements": [
        {
            "next_hop": "198.32.160.242",
            "prefixes": [
                "83.243.112.0/21"
            ]
        }
    ],
    "withdrawals": []
}
```

Authoritative DNS

AuthDNS

Hosting AuthDNS

- Reduced dependency on external DNS Services

  - Minimise exposure to potential disruptions from international events

  - Greater control over Internet infrastructure

- Enhanced local Internet infrastructure

  - Hosting AuthDNS servers locally can improve the overall reliability and performance of DNS services for local users.

- Control over critical Internet infrastructure

  - Better control and oversight of Internet infrastructure, aligning with national policies and regulations.

  - This control can be useful for managing domain registrations, ensuring compliance, and responding to security or legal concerns.

A View into Taiwan and East Asia

Statistics

East Asia Deployment

Legend: Anchor (orange), K-Root (dark blue), AuthDNS (green)

Country	Anchor	K-Root	AuthDNS
China		4	
Mongolia	1		
Taiwan	5	1	
Japan	15	1	1
South Korea	5		
Macau			
North Korea			
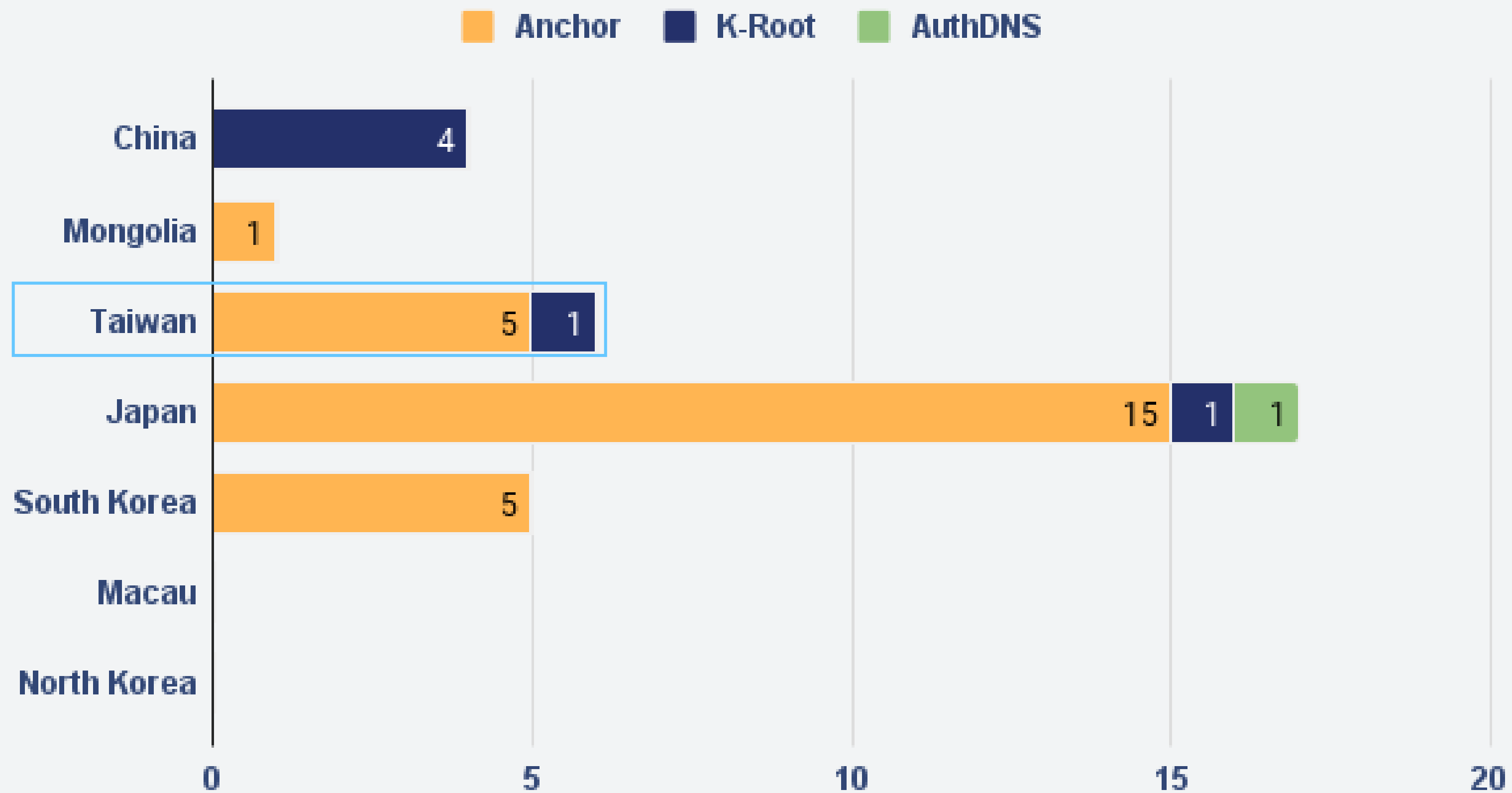
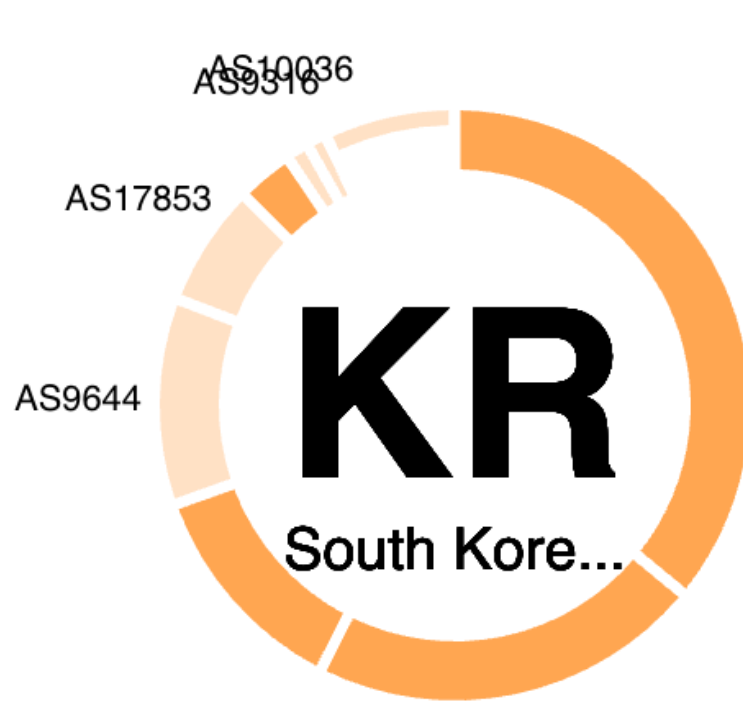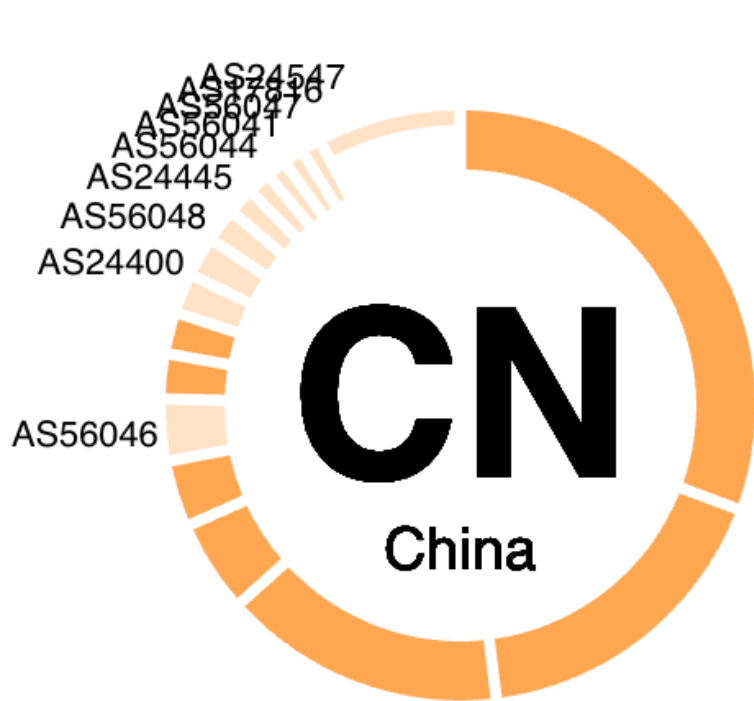| Country	RIPE Atlas
China	40
Mongolia	9
Taiwan	38
Japan	254
South Korea	28
Macau	
North Korea	

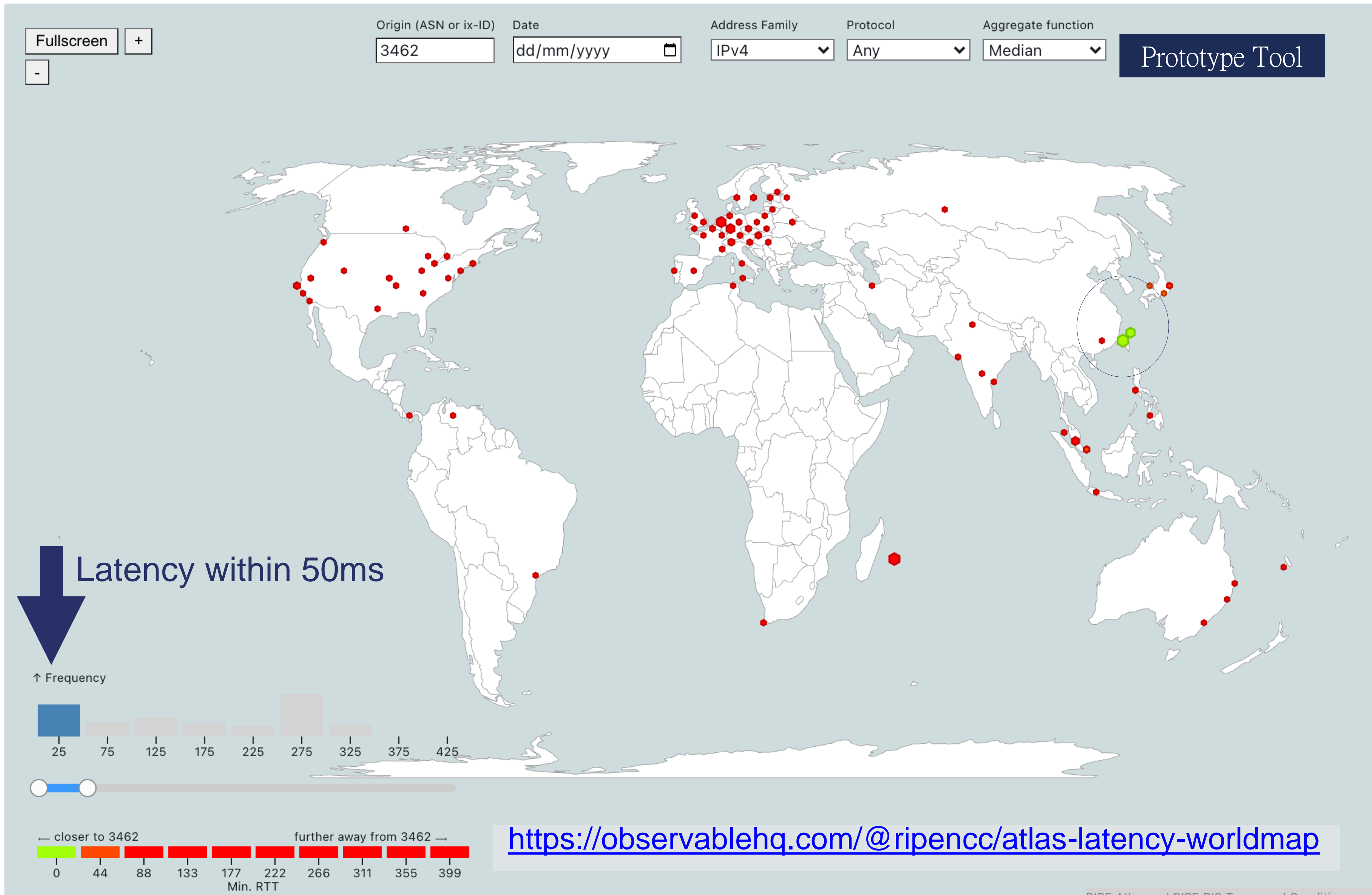Japan ✓

Target Eyeball Networks for RIPE Atlas Probes

RIPE Atlas probe coverage
Showing ASNs covering at least 1% of the country's population (2024-03-13)

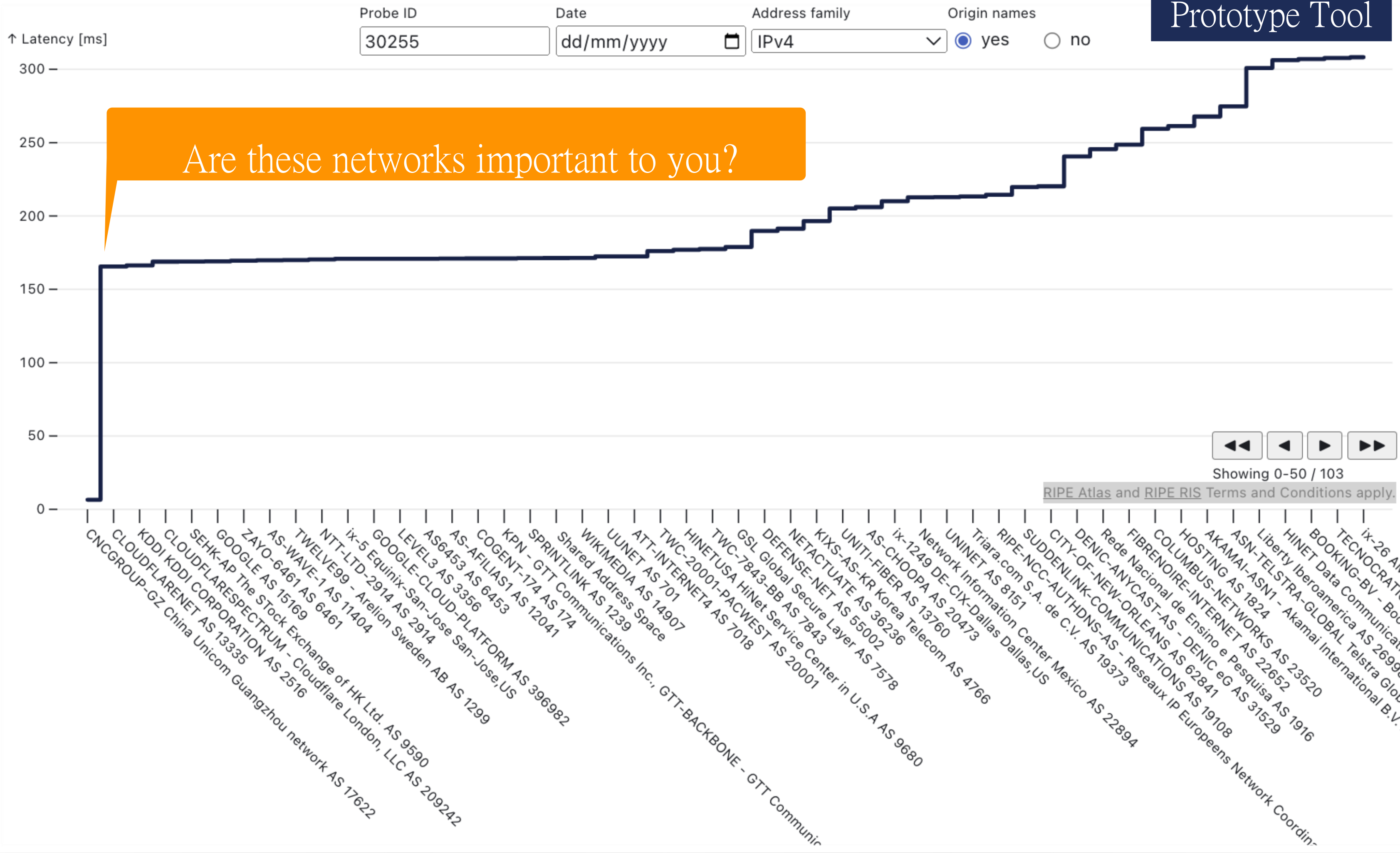- ASN is not covered
- ASN has at least 1 probe
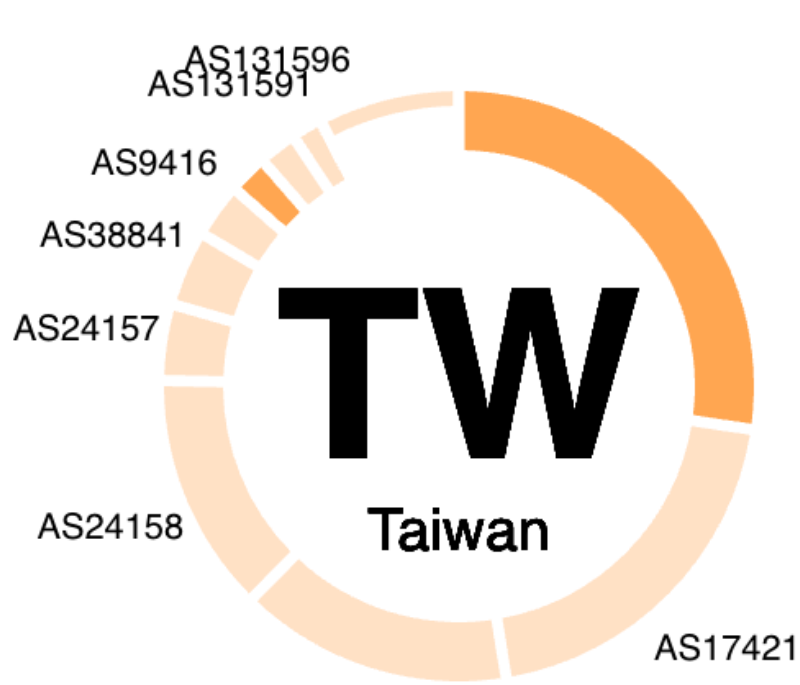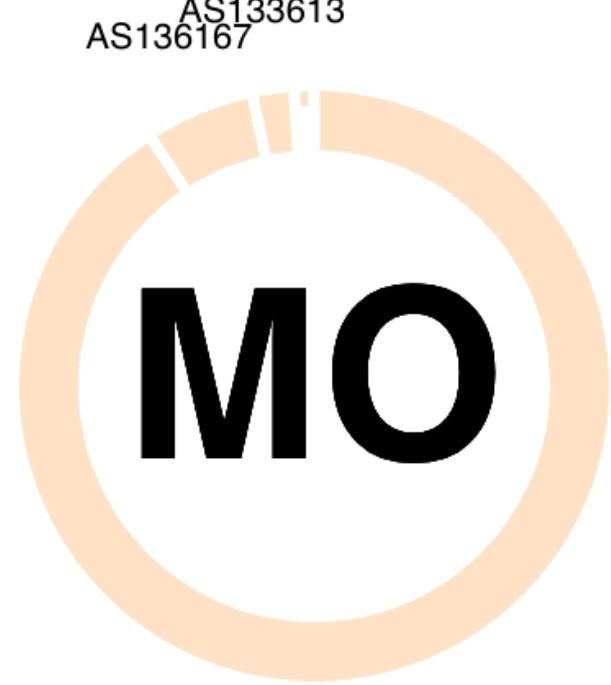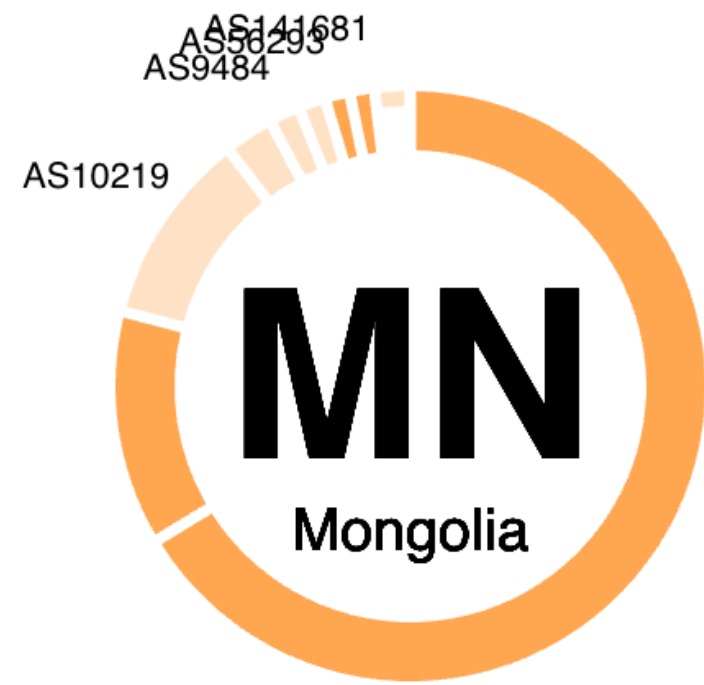
How RIPE Atlas sees your Network?

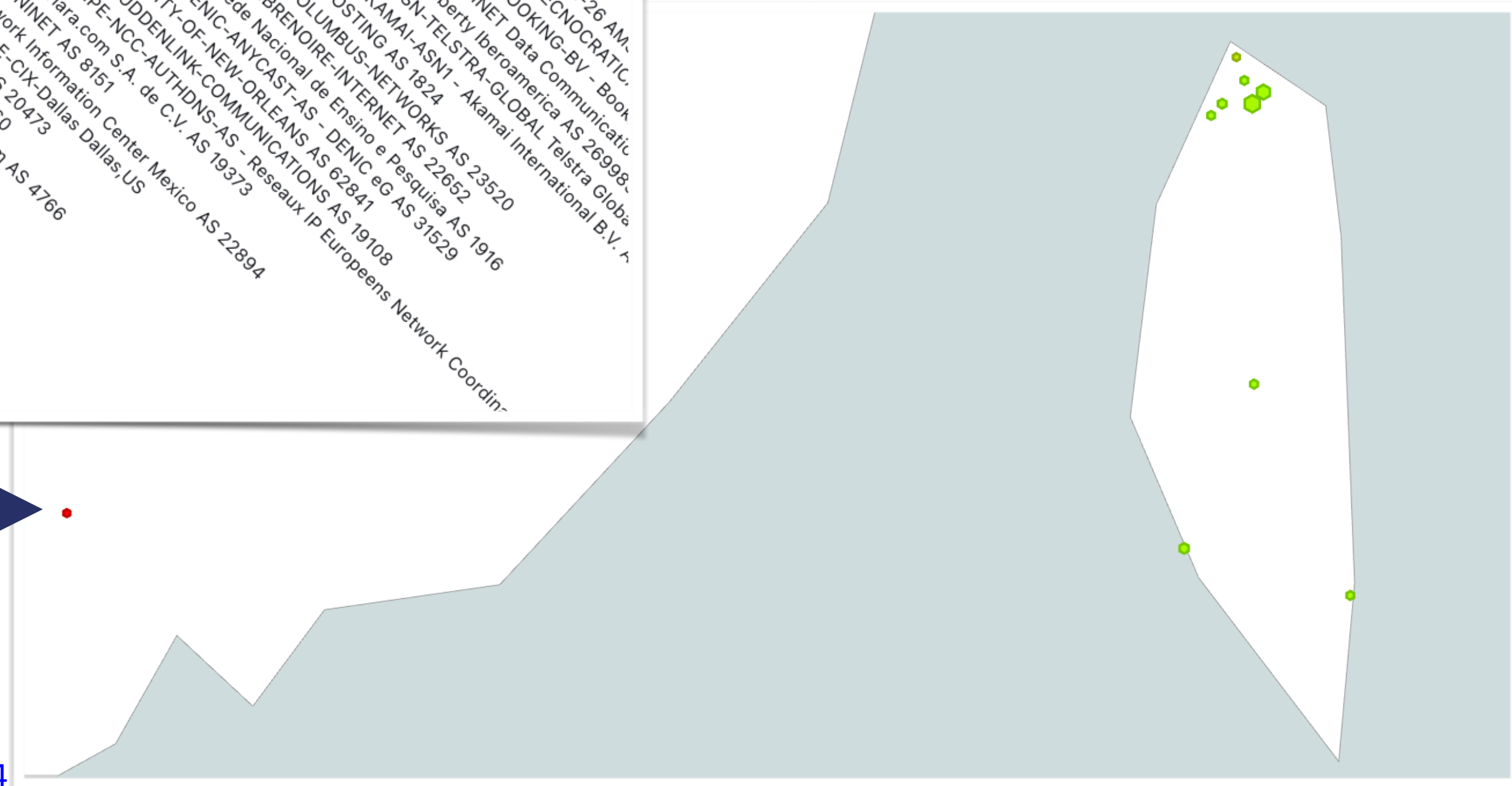**World Latency Map**

MinRTT
Latency AS3462
HINET

https://observablehq.com/@ripencc/atlas-latency-worldmap

Networks in the neighborhood of RIPE Atlas probe ID61078

https://observablehq.com/@ripencc/atlas-probe-neighbourhood?probe_id=61078&af=4

Networks in the neighbourhood of RIPE Atlas probe ID30255

Prototype Tool

Are these networks important to you?

Zooming in

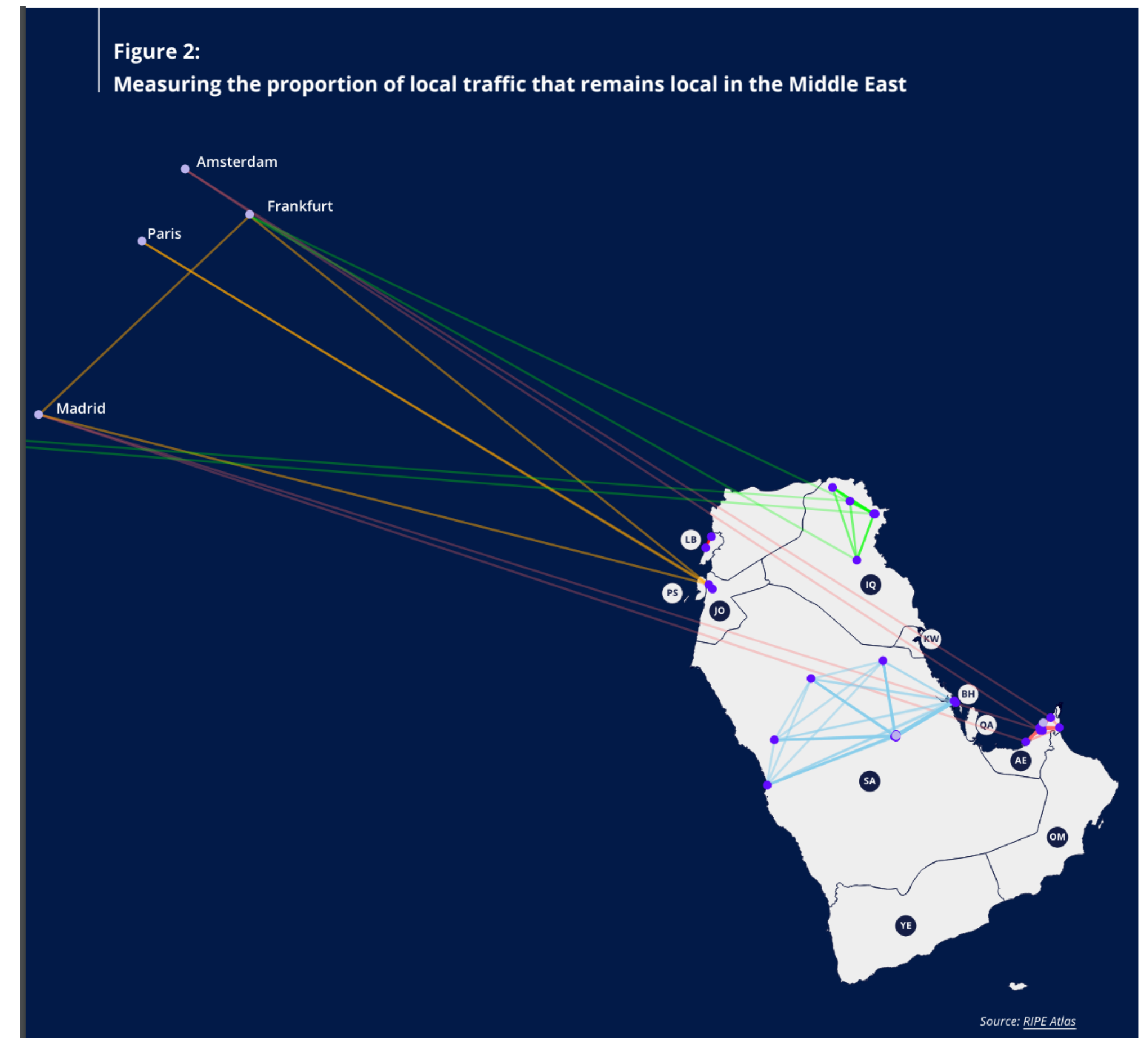https://observablehq.com/@ripencc/atlas-probe-neighbourhood?probe_id=61078&af=4

IXP Report Middle East

- Created using RIPE Atlas and RIS data

- Unlocking Digital Growth: The Role of Internet Exchange Points

- Can be downloaded on RIPE Labs:

  - https://labs.ripe.net/author/jadelcham/unlocking-digital-growth-the-role-of-ixps-in-the-middle-east/

Figure 2:
Measuring the proportion of local traffic that remains local in the Middle East

Source: RIPE Atlas

Some Reasons to Love RIPE Atlas

12,000 Probes — Global Coverage

Trusted Source — Non-profit organisation
Volunteers: End Users

Safe & Secure — Regular third-party security review

Open Data — Measurement results open to all

Community Driven — From the community for the community

Fair Use/ Non Monetary

Next Steps

Install RIPE Atlas

ASN	Name	Country Code	Probes
3462	HINET	TW	7
17421	EMOME-NET	TW	
9674	FET-TW	TW	
24158	taiwanmobile-as	TW	
24157	VIBO-NET-AS	TW	
38841	kbro-AS-TW	TW	
9416	MULTIMEDIA-AS-AP	TW	
131591	AMBIT-AS-TW	TW	
24164	UBBNET-AS-TW	TW	
131596	TBCOM-NET	TW	
4780	SEEDNET Digital United Inc.	TW	
9924	TFN-TW Taiwan Fixed Network	TW	

Peer with RIS

AS12654

0-20Mbps
Selective
as12654.peeringdb.com
ris-peering@ripe.net

Michela Galante:
mgalante@ripe.net

Marco Giuliani:
mgiuliani@ripe.net

Jelena Cosic:
jcosic@ripe.net

Host AuthDNS

Apply to host:
https://hosted-dns.ripe.net/applications/create/?service=K-root

Available in VM

Questions

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atlas@ripe.net
ris-peering@ripe.net