Minimising Impact

Before Incidents Occur with RIPE Atlas and RIS

Lia Hestina | APRICOT 2024 | Bangkok

The world outside is pretty dark...
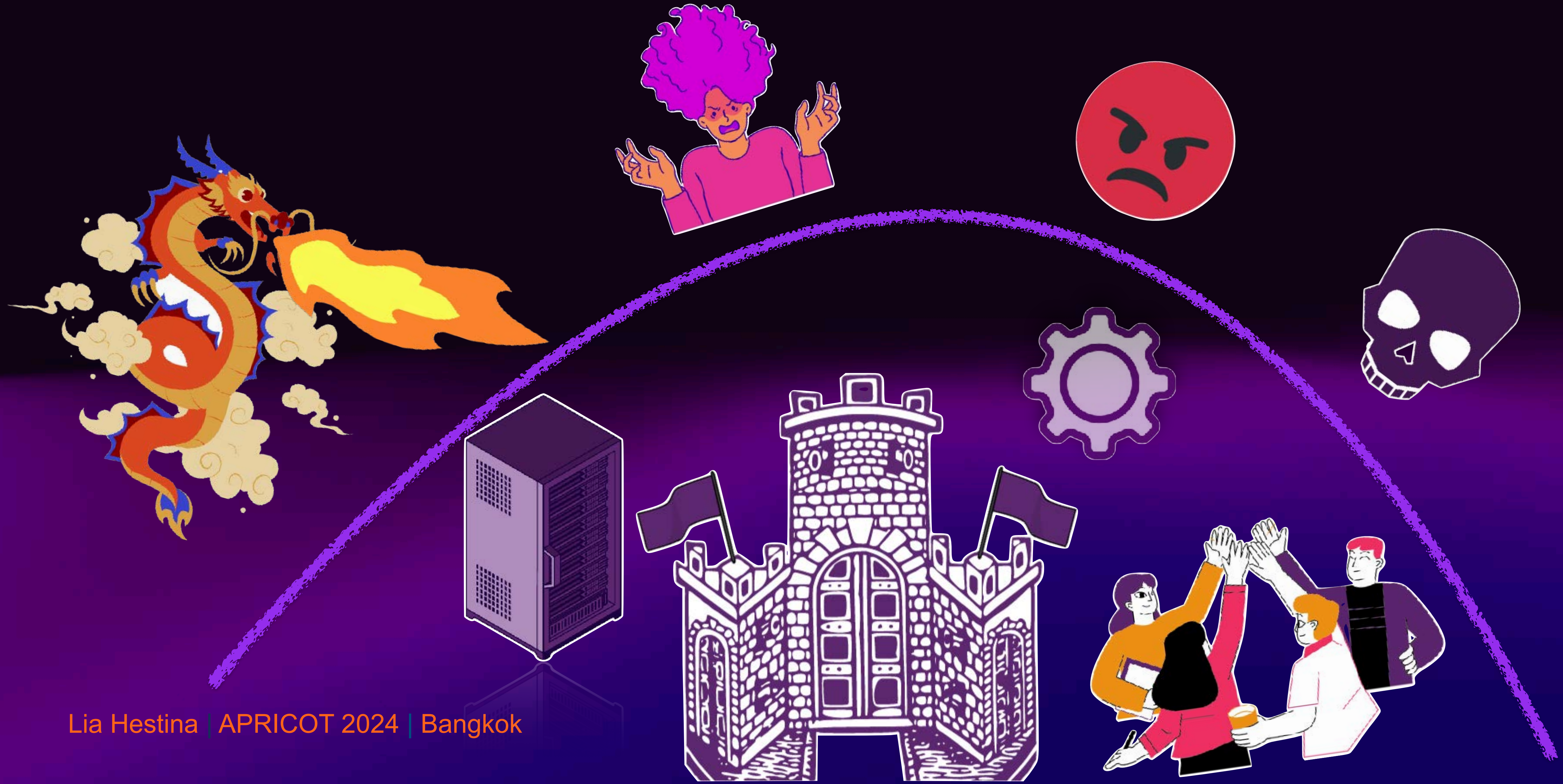
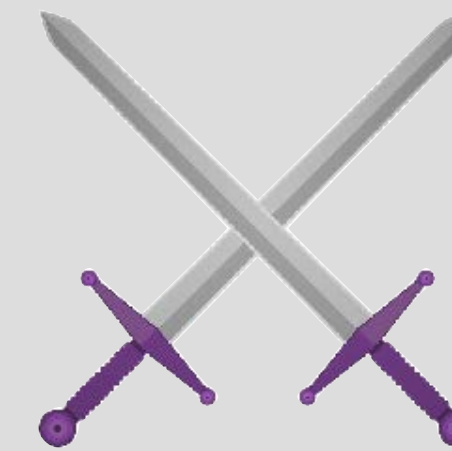# How do you minimise the impact?

Escape

Gear up

Action

How do you minimise impact?

Gear up

- **Strategic Deployment**:
  - Install **RIPE Atlas** probes & anchor strategically
  - Peer with **RIS** (Routing Information Services)
- **Continuous Monitoring**: Conduct ongoing measurements
- **Abnormality Alerts**:
  - Set up alerts for deviations from normal measurements
  - Detect route hijacks

Action

- **Anomaly Detection**: Identify network issues swiftly.
- **Latency Assurance**: Debug and maintain low latency.
- **Performance Showcase**: Impress customers with network performance
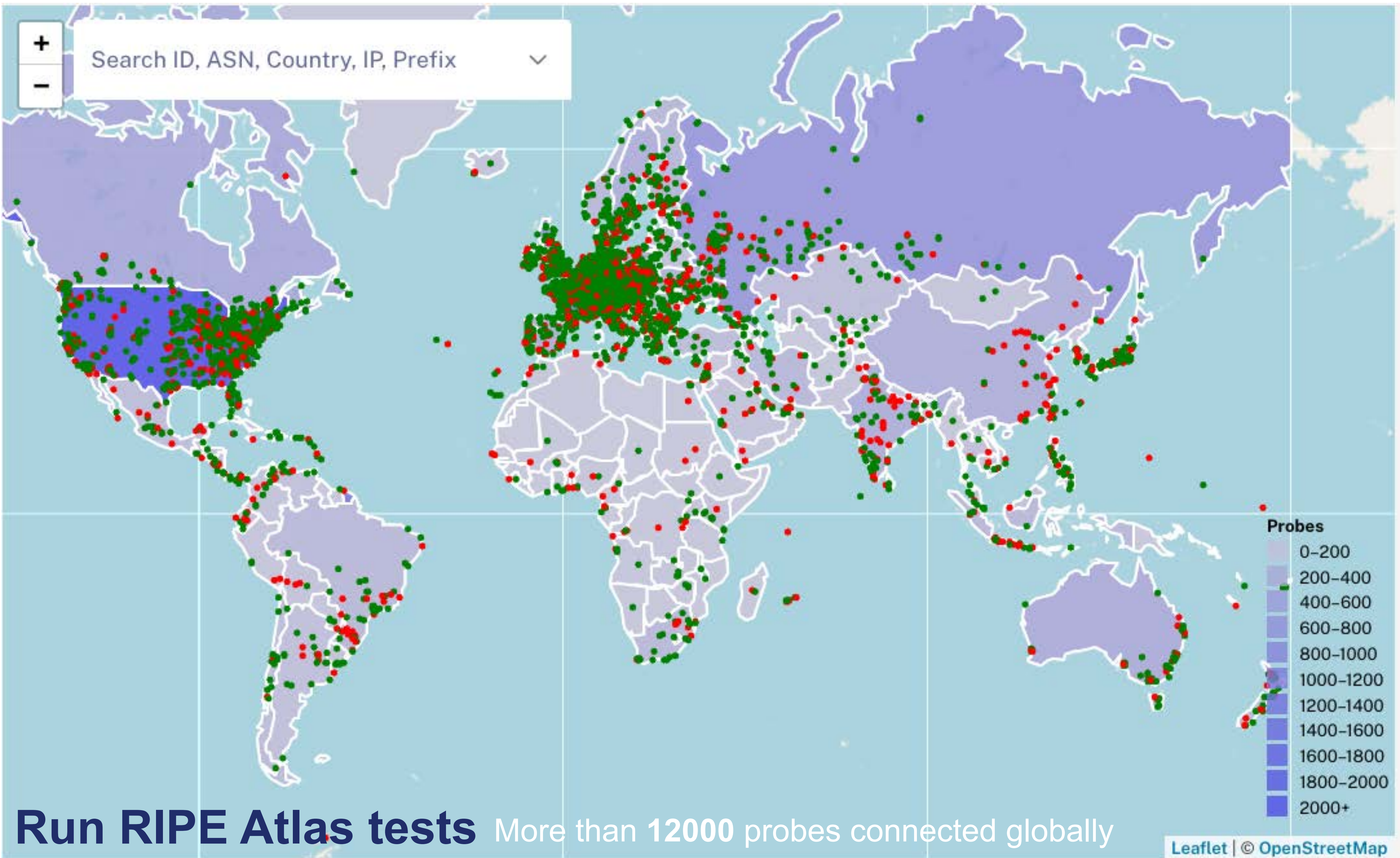
RIPE Atlas

- RIPE Atlas is a global active measurements platform, funded by RIPE NCC members and sponsors
- The goal: To view your Internet reachability from outside your network
- Probes hosted by volunteers, using a credits system
- Data is publicly available

atlas.ripe.net

Run RIPE Atlas tests More than **12000** probes connected globally

RIPE Atlas

Accessible via

- GUI
- API
- CLI TOOL

Types of measurements

- PING
- TRACEROUTE
- DNS
- NTP
- SSL/TLS
- HTTP (anchors)

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
- ☑ SSH connections from probe to server
- ☑ Initiated by Probes
- ☑ Code of measurements publicly available

Types of Probes

|	Hardware	Software
Installation	Physical Device	Software base, user machine or VMs
Uptime	24/7	Same as the device it's installed on
Measurements	Same	Same

What is RIS?

- 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
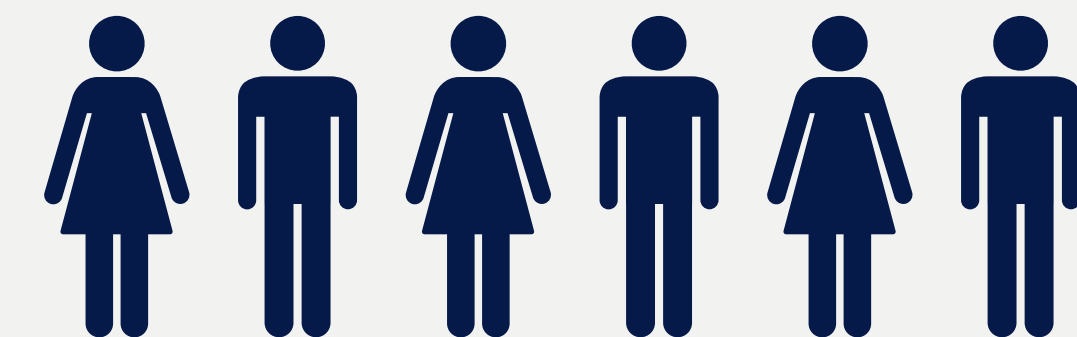
1377 global peers

How can RIS help network operators?

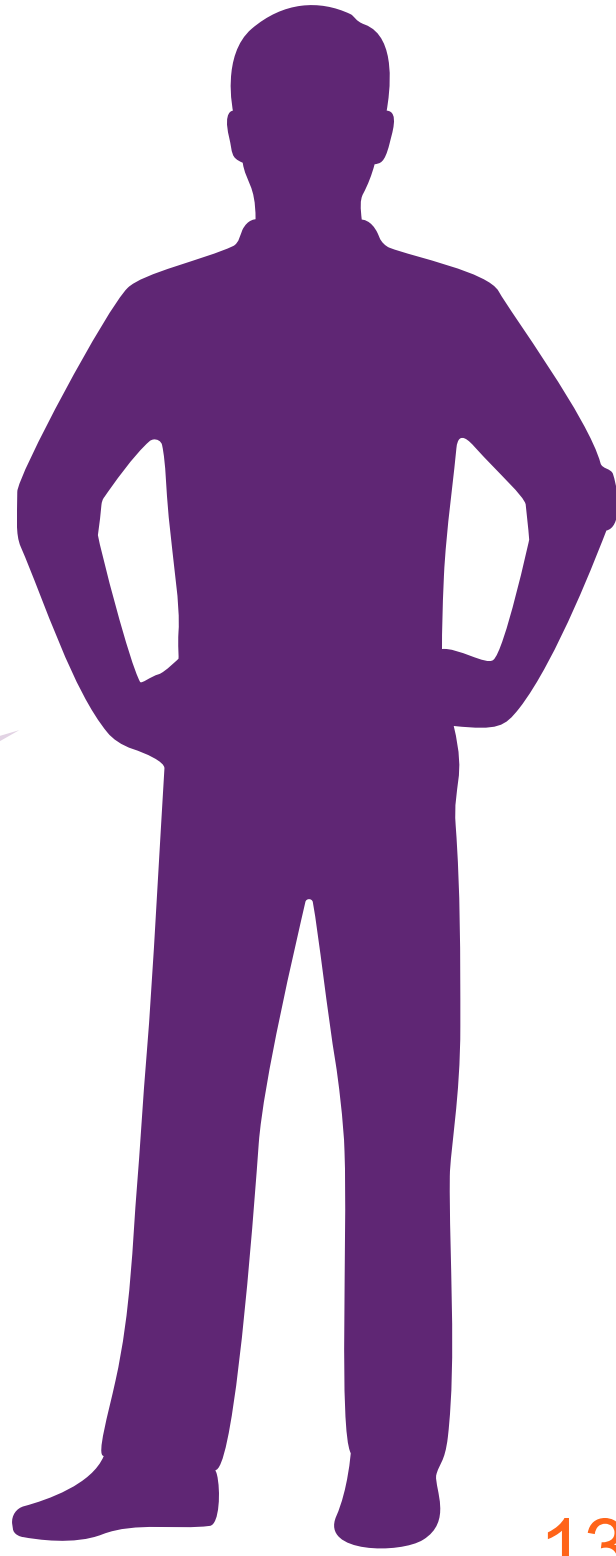- Is your prefix getting announced?

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

    - RIPEstat (Inforedes)

- Tools developed by others allow you to set an alert

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

    - PacketVis https://packetvis.com/

Some Problems

- High latency = impatient gamers
- Gamers from different networks
- Realtime application, unpredictable

Kunang
Online gaming company
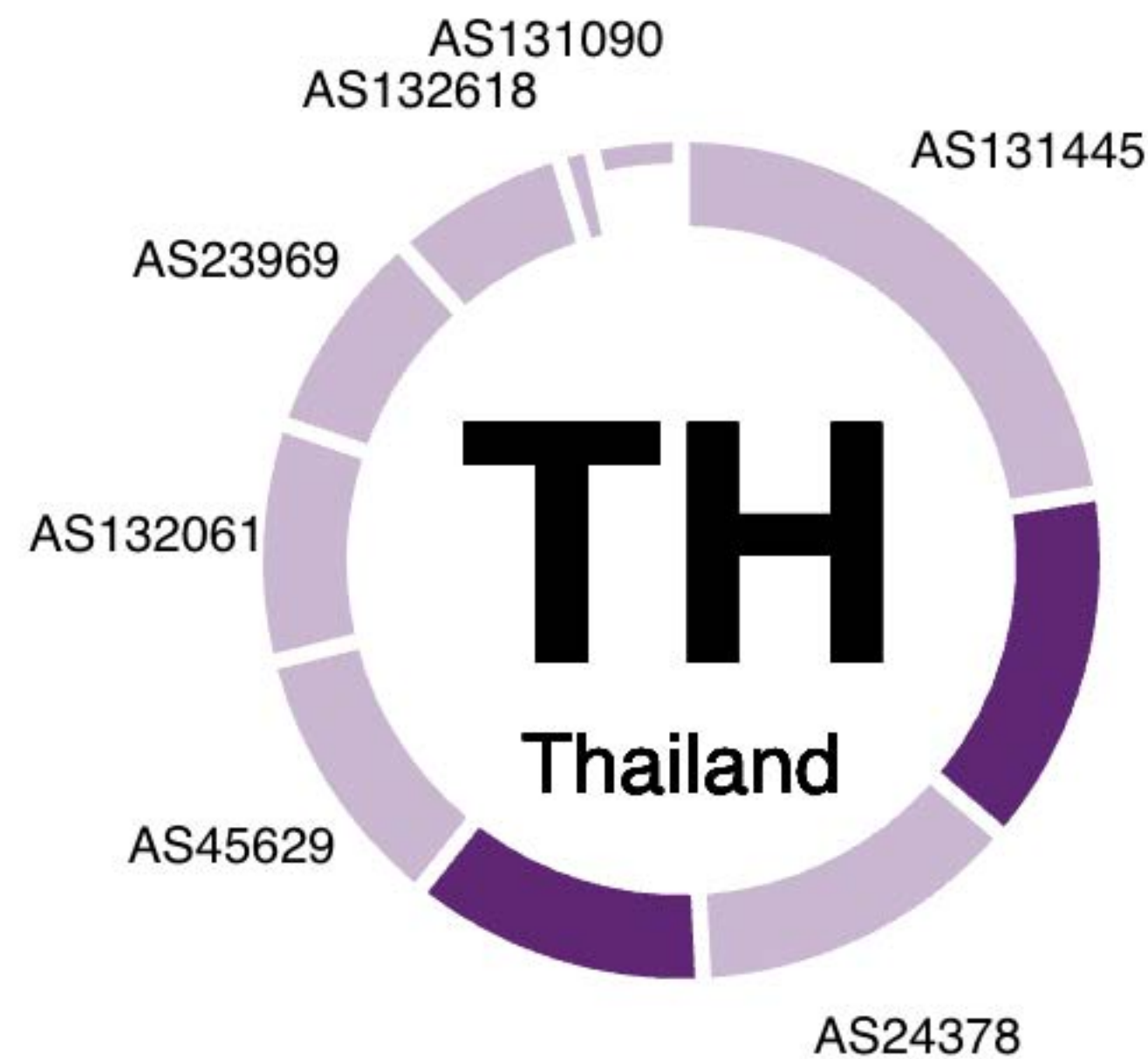Runs own LAN
Users from around the world

1. Strategic Deployment: Install RIPE Atlas (software)

RIPE Atlas probe coverage
Showing ASNs covering at least 1% of the country's population (2024-02-07)

- ● ASN is not covered
- ● ASN has at least 3 probes

| ASN	Name
131445	3AIS3G-2100-AS-AP
17552	TRUEONLINE-AS-AP
133481	AIS-Fibre-AS-AP
45629	JASTEL-NETWORK-TH-AP
24378	ENGTAC-AS-TH-AP
132061	Realmove-as-ap
23969	TOT-NET
132618	REALFUTURE-AS-AP

1. Strategic Deployment: Peer with RIS

ASN	12654
Traffic profile	mostly balanced
Traffic Volume	0-20Mbps
Peering Policy	Selective
Peering Locations (IX or POP)	RRCs at 23 locations globally: https://www.ripe.net/analyse/internet-measurements/routing-information-service-ris/ris-peering-policy
PeeringDB entry	as12654.peeringdb.com
Contact information	ris-peering@ripe.net Michela Galante: mgalante@ripe.net Marco Giuliani: mgiuliani@ripe.net Jelena Cosic: jcosic@ripe.net
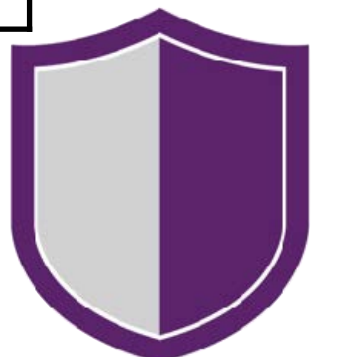
2. Monitor your network performance

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	✗		ⓘ
22798	55430	55430	🇸🇬 ☁		2020-05-13 19:02		268.372			17	✗		ⓘ
24422	55430		🇸🇬 ☁		2020-05-13 19:02		268.974			17	✗		ⓘ
25828	4788		🇺🇸 ☁		2020-05-13 19:02		364.127			15	✗		ⓘ
28850	4844		🇸🇬 ☁		2020-05-13 19:02		265.993			17	✗		ⓘ
54623	4773	4773	🇸🇬 ☁		2020-05-13 19:02		268.964			16	✗		ⓘ
55415	55430	55430	🇸🇬 ☁		2020-05-13 19:02		367.158			13	✗		ⓘ

High latency
Identified

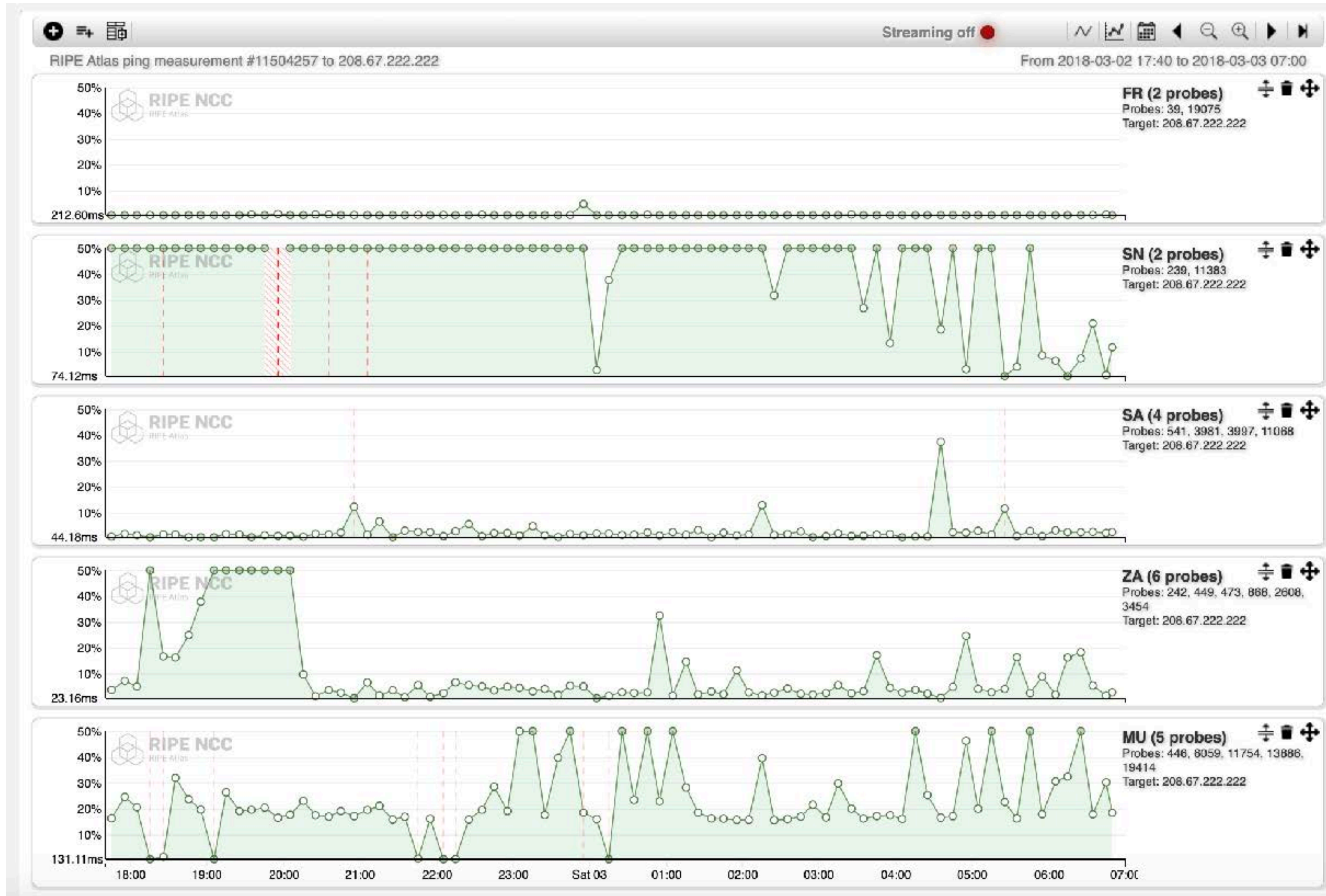**Talk to your peers, ISP or any that can help improve RTT**

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		4.994			14	✓		ⓘ
14042	55430		🇸🇬 ☁		2020-05-13 20:17		3.042			14	✓		ⓘ
22798	55430	55430	🇸🇬 ☁		2020-05-13 20:17		3.336			14	✓		ⓘ
24422	55430		🇸🇬 ☁		2020-05-13 20:17		3.993			15	✓		ⓘ
25828	4788		🇺🇸 ☁		2020-05-13 20:17		3.158			14	✓		ⓘ
28850	4844		🇸🇬 ☁		2020-05-13 20:17		3.127			14	✓		ⓘ
31918	55430		🇸🇬 ☁		2020-05-13 20:17		5.194			15	✓		ⓘ
54623	4773	4773	🇸🇬 ☁		2020-05-13 20:17		4.505			14	✓		ⓘ
55415	55430	55430	🇸🇬 ☁		2020-05-13 20:17		3.508			14	✓		ⓘ

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 lpls-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

Lower latency after debugging

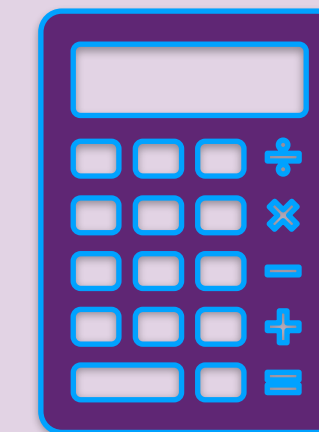# 3. Set up alerts for any abnormal results

Action

- **Anomaly Detection**: Identify network issues swiftly.
- **Latency Assurance**: Debug and maintain low latency.
- **Performance Showcase**: Impress customers with network performance

For your clients
Improve Performance
Shorter path is selected, better latency, reliability & security

For YOU
Control & Flexibility
Repeat tests as much as you need!

For your staff
Service desks ❤️
RIPE Atlas GUI
To validate findings

Probes in
South East Asia

Country Code	Probe	Anchor
BN	3	
MM	2	
KH	2	1
TL	1	
ID	92	12
LA	1	
MY	27	3
PH	54	4
SG	129	29
TH	29	2
VN	8	1

Measurements in 2023 with Thai probes

Search Measurements
thailand

All   Built-In   Anchoring

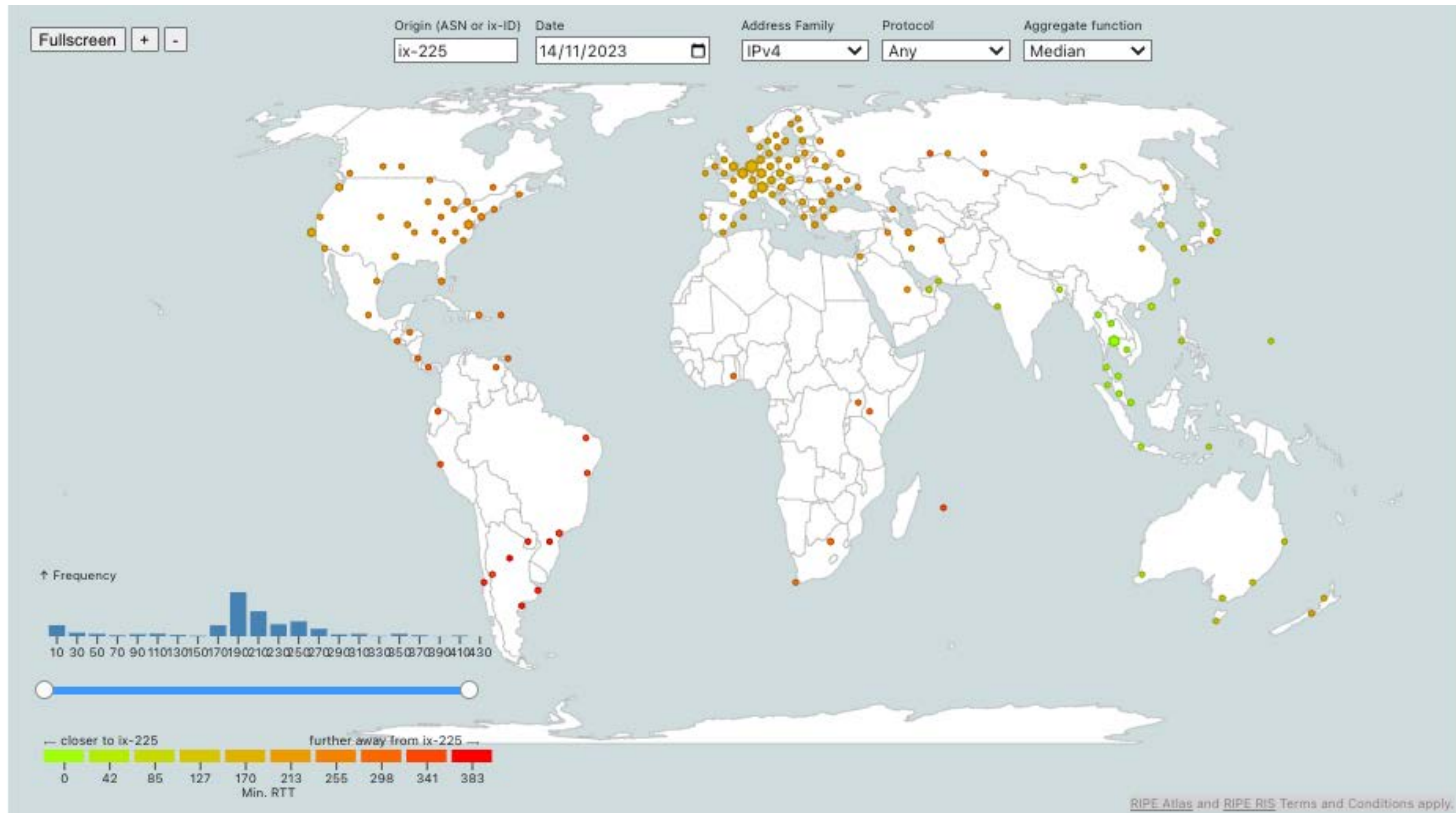| ID	Type All	IPv4/v6 All	Target	Description	Probes	Interval All	Time (UTC)	Status All
63898041	ping	4	pull-flv-l10-va01.tiktokcdn.com	Ping test from Thailand to pull-flv-l10-va01.tiktokcdn.com	6	one-off	▷ 2023-11-21 13:42	◉
63898035	ping	4	pull-f5-va01.tiktokcdn.com	Ping test from Thailand to pull-f5-va01.tiktokcdn.com	6	one-off	▷ 2023-11-21 13:41	◉
63898030	ping	4	pull-flv-l1-va01.tiktokcdn.com	Ping test from Thailand to pull-flv-l1-va01.tiktokcdn.com	6	one-off	▷ 2023-11-21 13:41	◉
63898026	ping	4	pull-flv-l11-va01.tiktokcdn.com	Ping test from Thailand to pull-flv-l11-va01.tiktokcdn.com	6	one-off	▷ 2023-11-21 13:41	◉
63898021	ping	4	43.132.86.2	Ping test from Thailand to 43.132.86.2	6	one-off	▷ 2023-11-21 13:41	◉
63896837	ping	4	pull-flv-l10-va01.tiktokcdn.com	Ping test from Thailand to pull-flv-l10-va01.tiktokcdn.com	6	one-off	▷ 2023-11-21 12:42	◉
63896833	ping	4	pull-f5-va01.tiktokcdn.com	Ping test from Thailand to pull-f5-va01.tiktokcdn.com	6	one-off	▷ 2023-11-21 12:41	◉
63896828	ping	4	pull-flv-l1-va01.tiktokcdn.com	Ping test from Thailand to pull-flv-l1-va01.tiktokcdn.com	6	one-off	▷ 2023-11-21 12:41	◉
63896822	ping	4	pull-flv-l11-va01.tiktokcdn.com	Ping test from Thailand to pull-flv-l11-va01.tiktokcdn.com	6	one-off	▷ 2023-11-21 12:41	◉
63896819	ping	4	43.132.86.2	Ping test from Thailand to 43.132.86.2	6	one-off	▷ 2023-11-21 12:40	◉
63895647	ping	4	pull-flv-l10-va01.tiktokcdn.com	Ping test from Thailand to pull-flv-l10-va01.tiktokcdn.com	6	one-off	▷ 2023-11-21 11:42	◉

638,089 UDMs
350,951 created by IPmap

Tools for **Network Operators**
(Prototype)

MinRTT
Latency IX-225
Thailand

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

MinRTT
Your network **neighbourhood** as seen through RIPE Atlas

Try your probe here
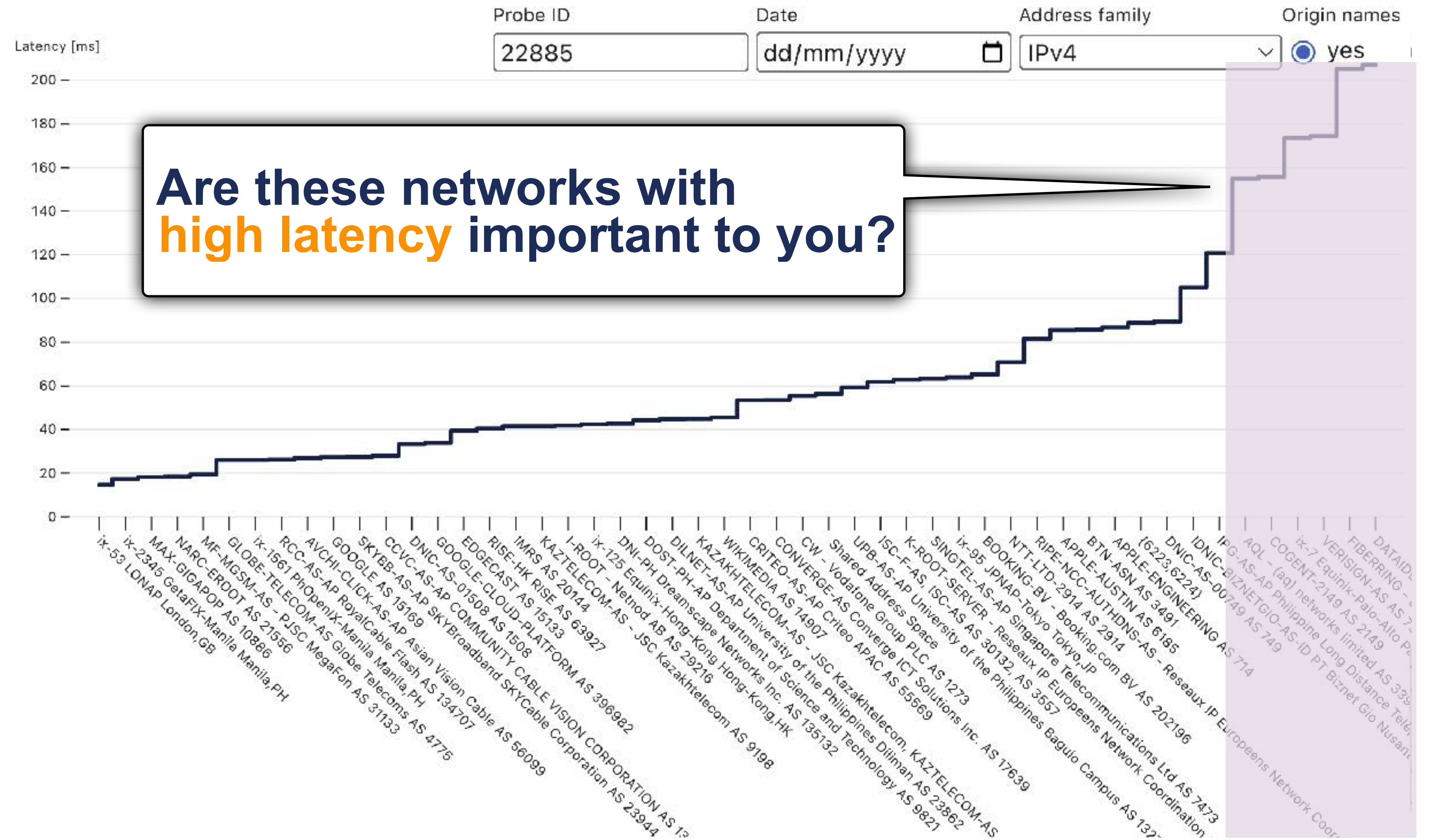
https://observablehq.com/
@ripencc/atlas-probe-
neighbourhood?

Are these networks with high latency important to you?

IXP Country JEDI
Keep your traffic
in Thailand **LOCAL**

■ Local IXP found: YES, out-of-country IPs: NO

■ Local IXP found: YES, out-of-country IPs: YES

■ Local IXP found: NO, out-of-country IPs: NO

■ Local IXP found: NO, out-of-country IPs: YES

https://jedi.ripe.net/latest/PH/ixpcountry/index.html?ASNS=all&ipv=v4

More reasons to love RIPE Atlas

12,000 Probes   Global Coverage

Fair Use/
NON Monetary

Trusted Source   Non-profit organisation
Volunteers: End Users

Safe and Secure   Regular third-party security review

Open Data   Measurement results open to all

Community Driven   From the community & RIPE NCC
for the community

What do you do now?

1. Create a RIPE NCC Access **ACCOUNT**
2. **INSTALL** RIPE Atlas probe strategically
3. **PEER** with **RIS**
4. Start testing, **MONITOR** your network performance
5. Got a disconnected probe? **Reconnect**!
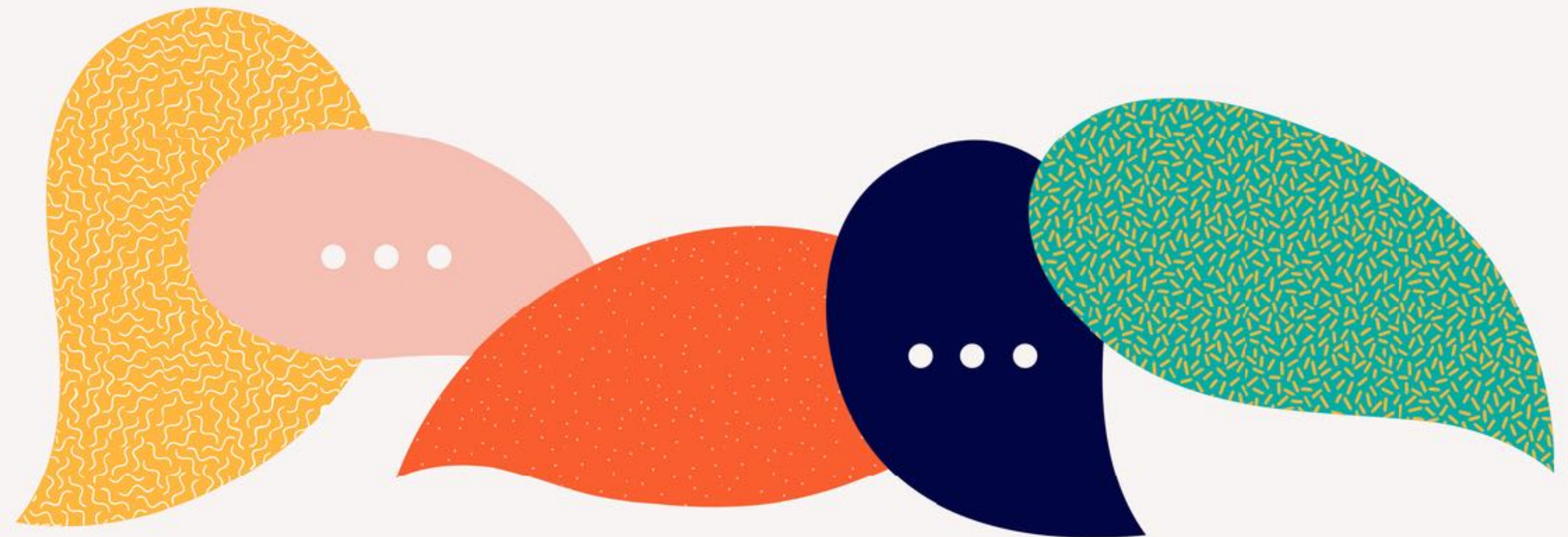
Redeem This Voucher
Sawasdee24

Let's talk…

Tell us what is important to you!

We can develop new **prototypes**!

Questions ?

lhestina@ripe.net

atlas@ripe.net

Use Cases on RIPE Labs

A distributed view of the Internet
https://labs.ripe.net/author/alun_davies/ripe-atlas-a-distributed-view-of-the-internet/

**The Kazakhstan outage
as seen from RIPE Atlas**
https://labs.ripe.net/author/emileaben/the-kazakhstan-outage-as-seen-from-ripe-atlas/

Detecting DNS root manipulation
https://labs.ripe.net/author/qasim-lone/detecting-dns-root-manipulation/

DNS vulnerability, configuration errors that can cause DDoS
https://labs.ripe.net/author/giovane_moura/dns-vulnerability-configuration-errors-that-can-cause-ddos/