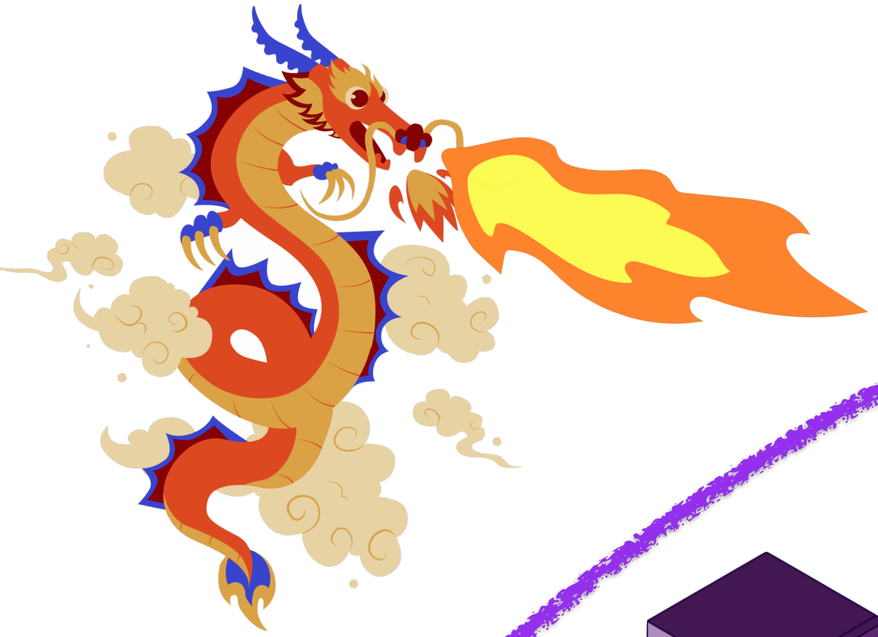
RIPE NCC
RIPE NETWORK COORDINATION CENTRE

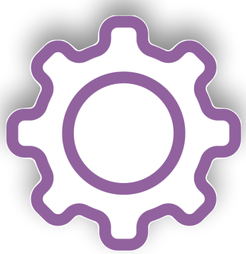
Minimising Impact Before Incidents Occur

Xin chào!

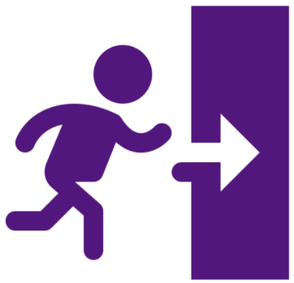
Lia Hestina | VNNIC 2024 | Ha Noi

The World Outside is Pretty Dark...





How Do You Minimise the Impact?



Escape

Gear up

Action

How Do You Minimise the Impact?

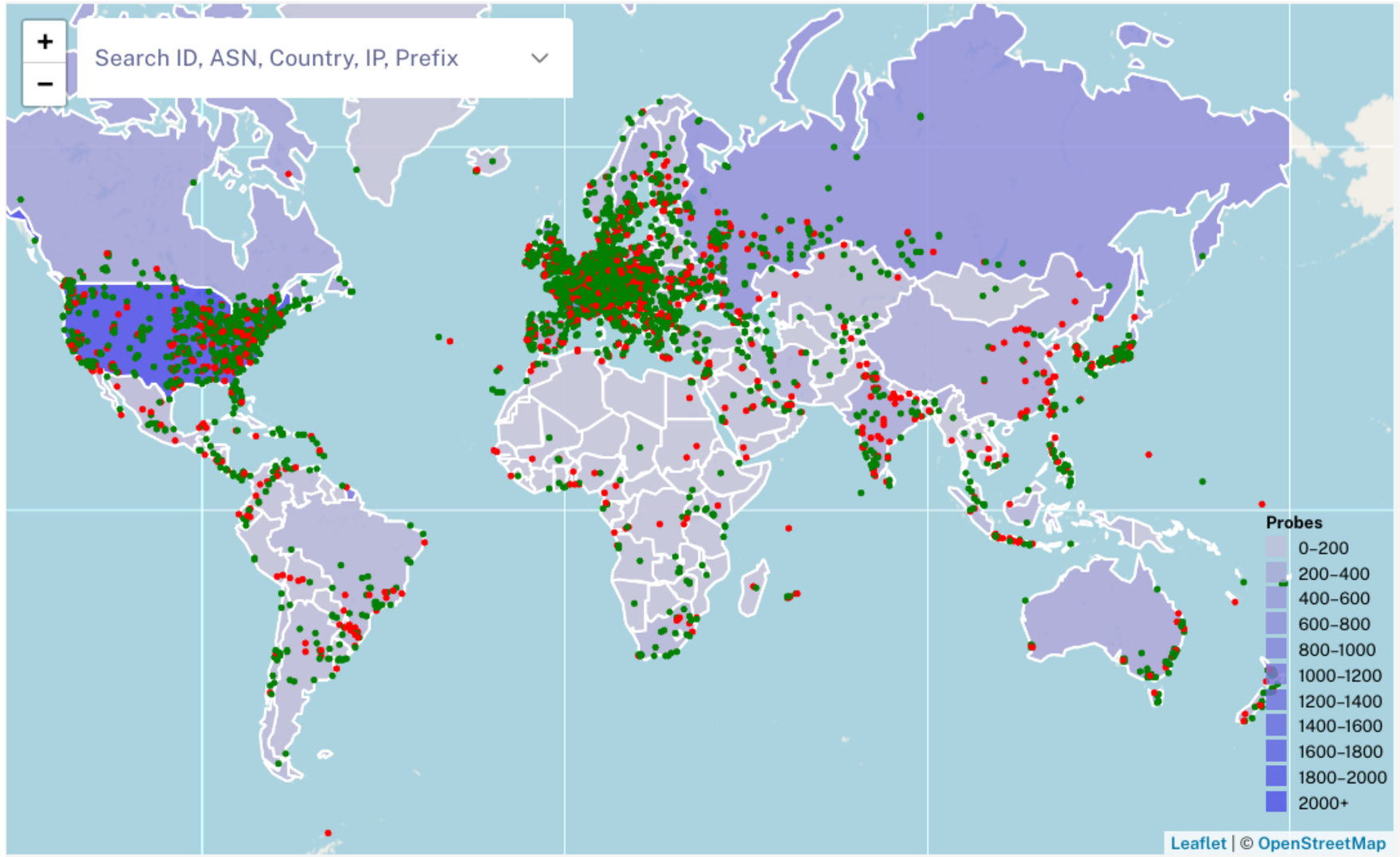
 Gear up	 Action
1. **Strategic Deployment**: • Install **RIPE Atlas** probes and anchor strategically	• **Continuous Monitoring**: Conduct ongoing measurements
2. Peer with **RIS** for more visibility • Set up alerts for deviations from normal measurements	• Detect route hijacks, unauthorised/incorrect announcement with **RIS LIVE**
3. **Continuous Monitoring**: Conduct ongoing measurements	• **Latency Assurance**: Debug and maintain low latency
4. **Performance Showcase**: Impress customers with network performance	

RIPE Atlas

- RIPE Atlas is a global active measurements platform, funded by RIPE NCC members and sponsors
- Goal: view Internet reachability
- Probes hosted by volunteers, using a credits system
- Data is publicly available
- atlas.ripe.net
- www.ripe.net/ripe-atlas/

Run RIPE Atlas Tests

- More than **12,000** 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

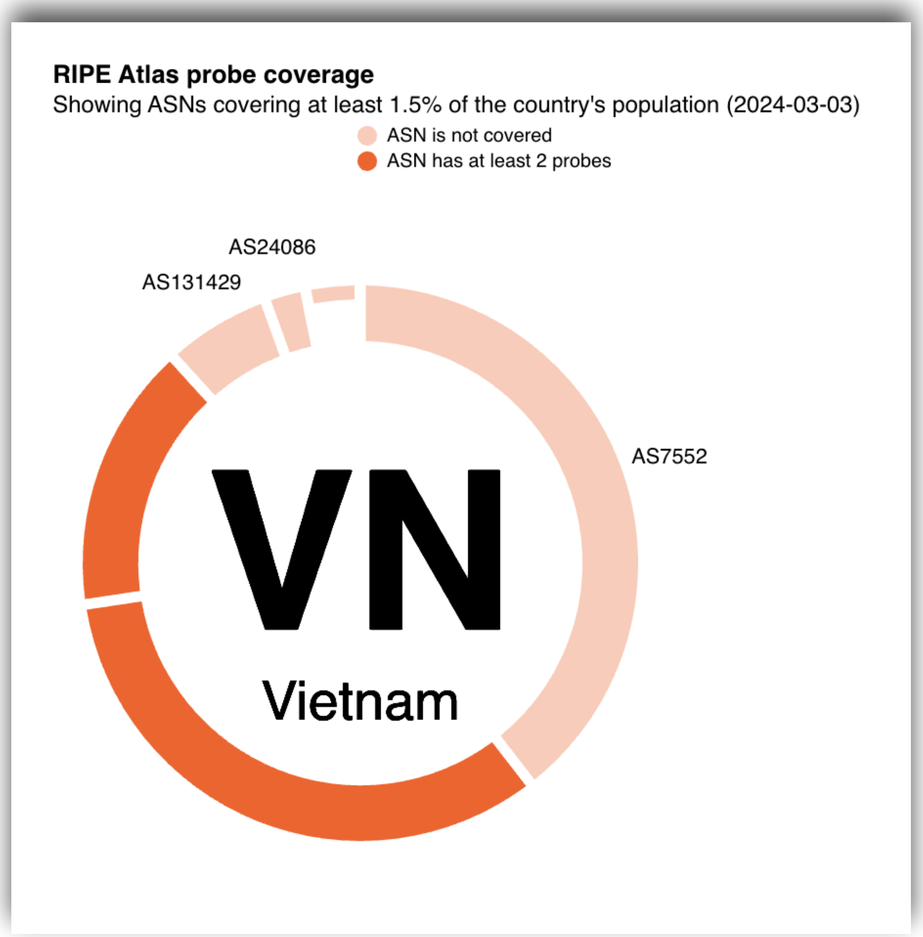
Probes

- ☑ Trusted 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
- ☑ Probe initiates SSH connections to server
- ☑ Code of measurements publicly available

1. Strategic Deployment: Install RIPE Atlas (software)



List of ASN per Economy that has < 2 probes		
ASN	Network Name	Yes please: Need one
7552	VIETEL-AS-AP	Vietnam
131429	MOBIFONE-AS-VN	Vietnam
24086	VIETTEL-AS-VN	Vietnam
45543	SCTV-AS-VN	Vietnam
38247	VIETNAMOBILE-AS-VN	Vietnam
13335	CLOUDFLARENET	Vietnam

Network Coverage

2. Peer with RIS for more Visibility

- 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
- Information includes:
  - What is being announced
  - Which prefixes are seen and where
  - Which prefixes are not seen

THANK YOU TO OUR COMMUNITY

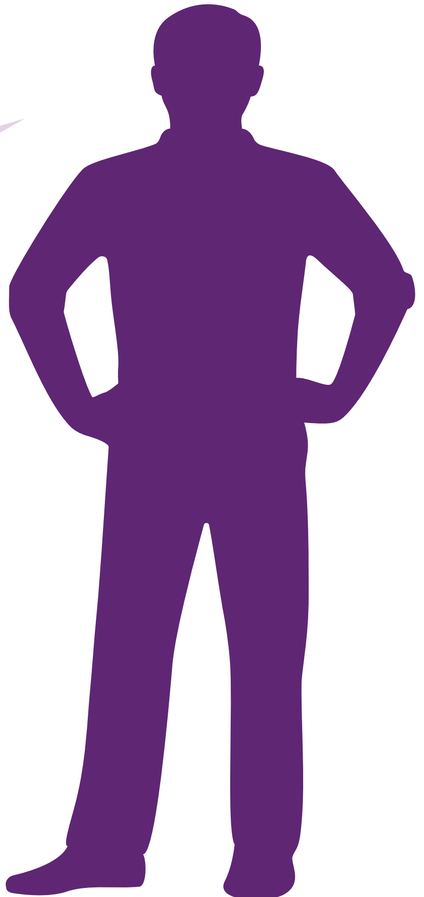
23 collectors

1,377 global peers

Problems

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

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



3. 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

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
```

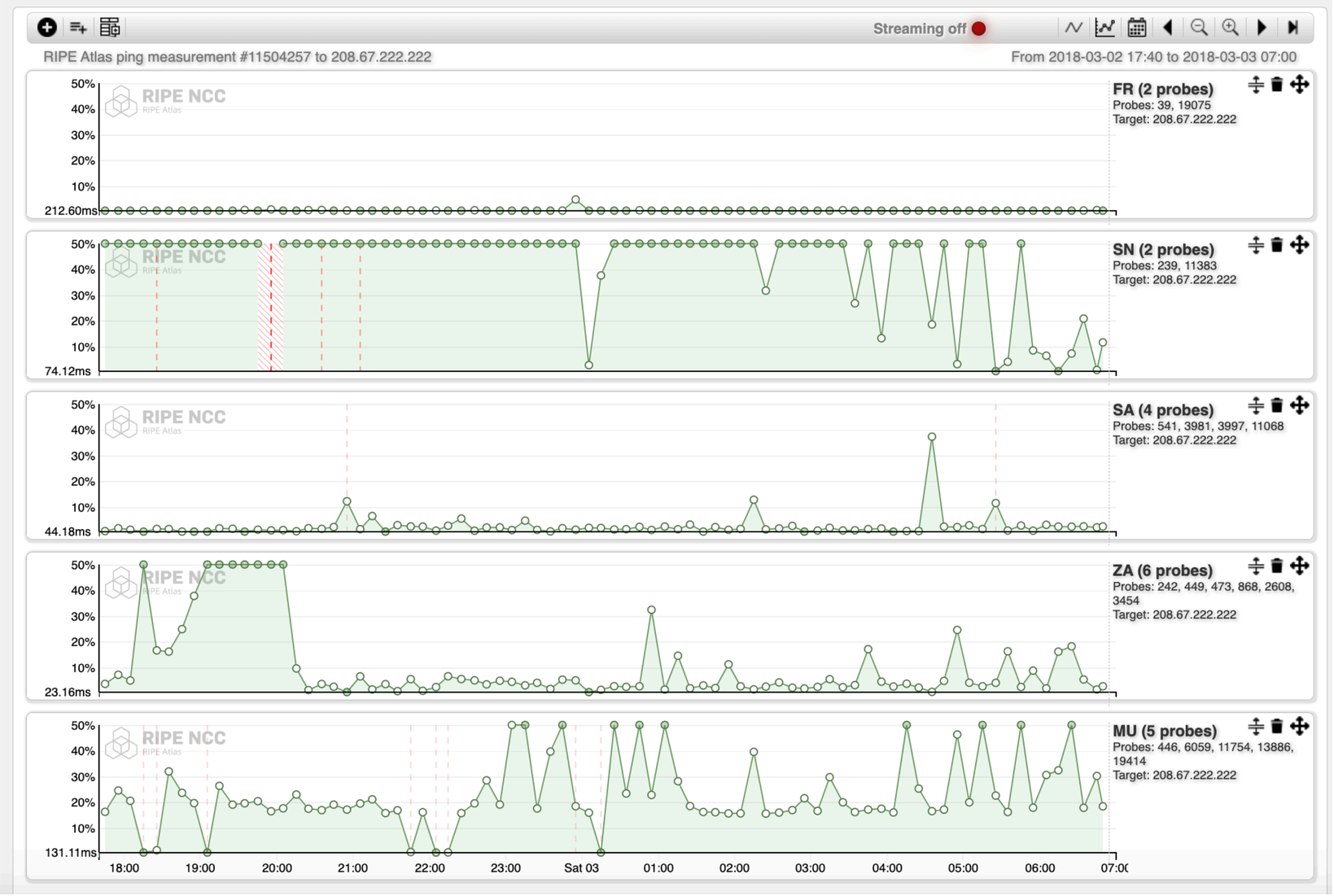
Talk to your peers, ISP or any that can help improve RTT

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	✓
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	✓

Lower latency after debugging

LatencyMON - Monitoring your Latency



4. Showcase Your Network Performance

Action

For your clients

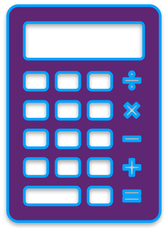
Improve Performance

Shorter path is selected, better latency, reliability and security.

For your staff

Service desks ❤️

RIPE Atlas GUI to validate findings.



For YOU

Control and Flexibility

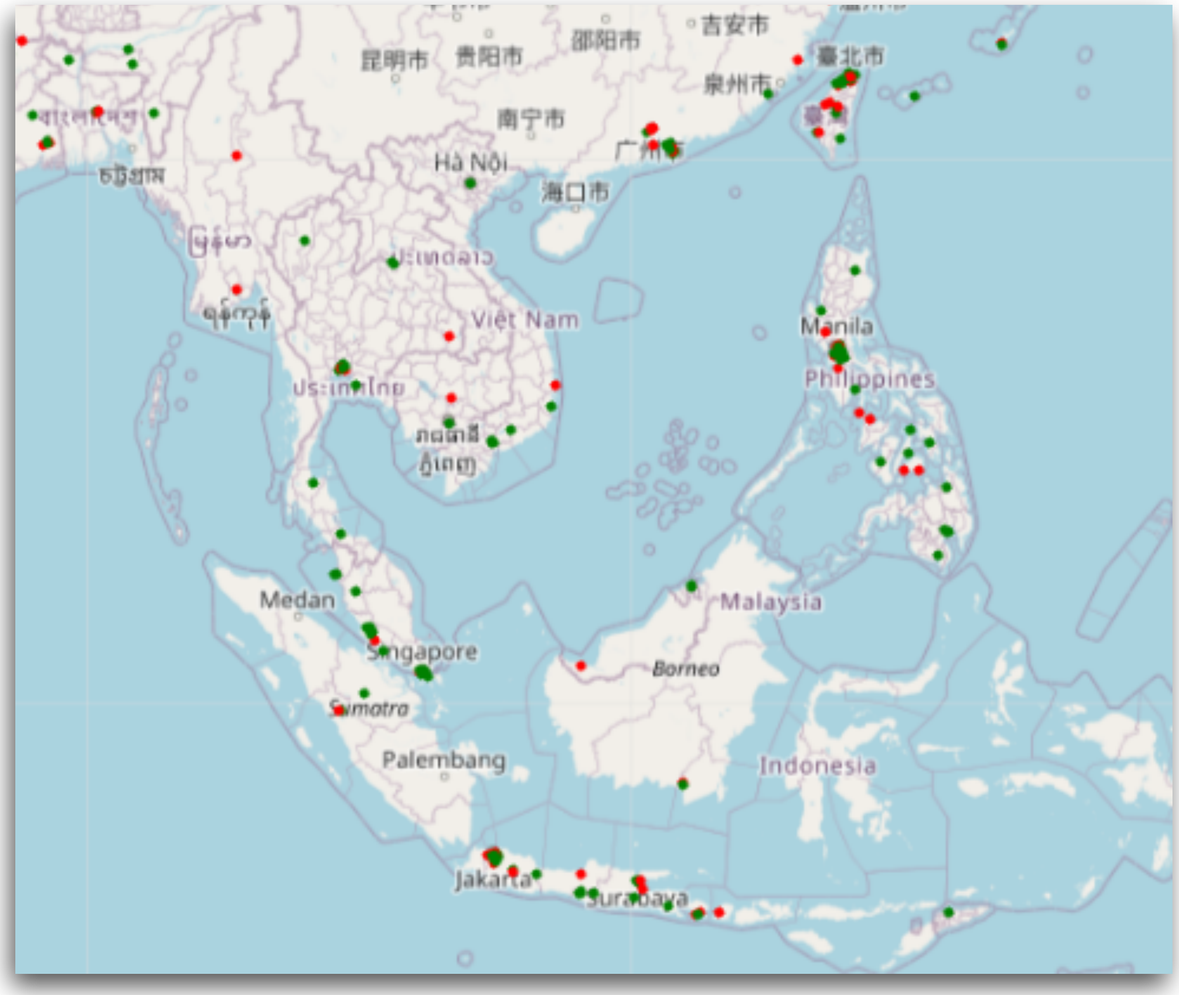
Repeat tests as much as you need!

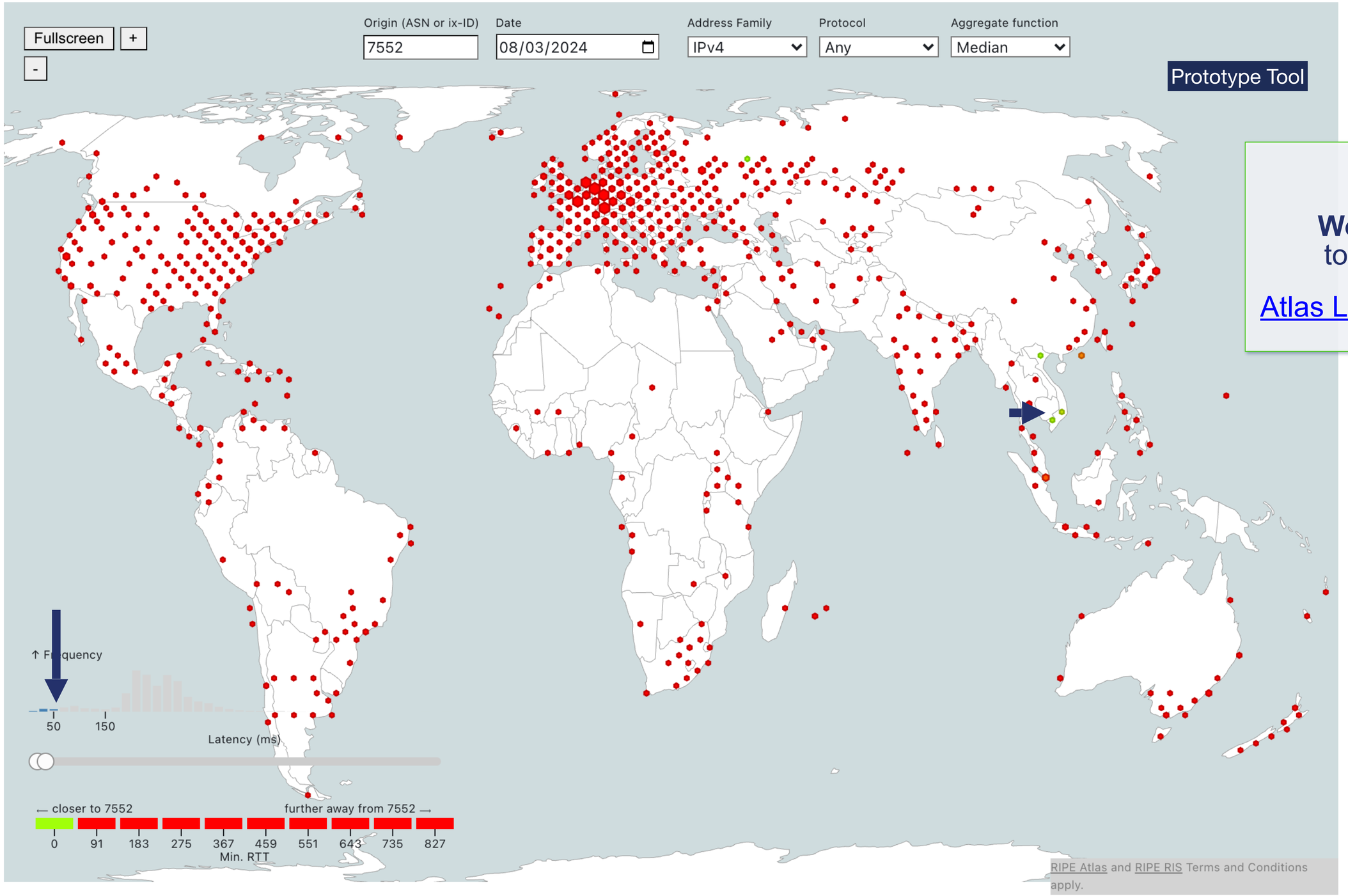
A view into Vietnam and South East Asia

Using RIPE NCC Tools for Network Operators

Probes in South East Asia

Country	RIPE Atlas
Vietnam	7
Timor Leste	1
Thailand	27
Singapore	117
Philippines	60
Myanmar	2
Malaysia	28
Laos	1
Indonesia	99
Cambodia	2
Brunei	3



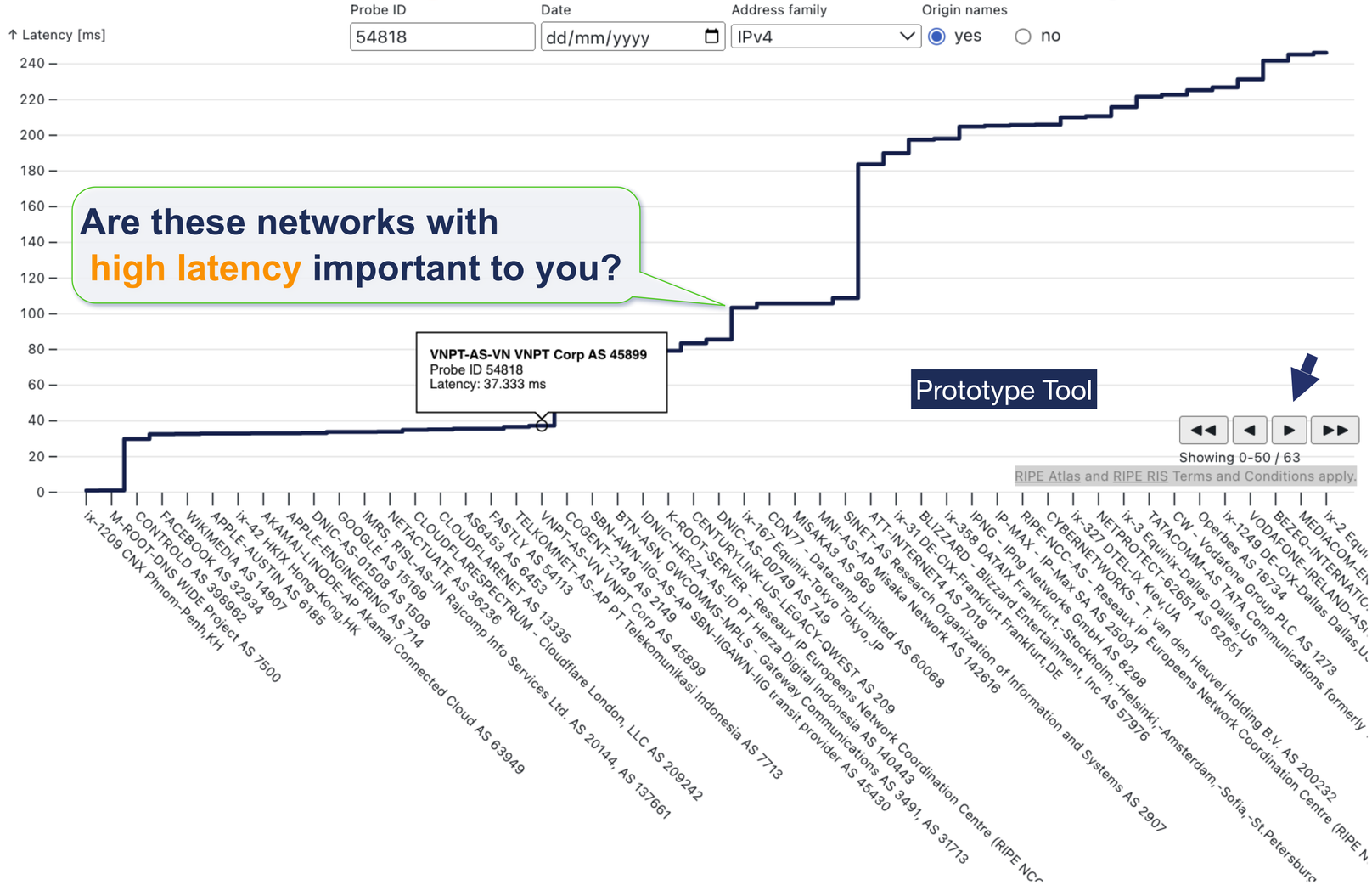


MinRTT

World Latency Map
to **AS7552 Vietnam**
Within 50 ms
Atlas Latency World Map

MinRTT

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



Try your probe here

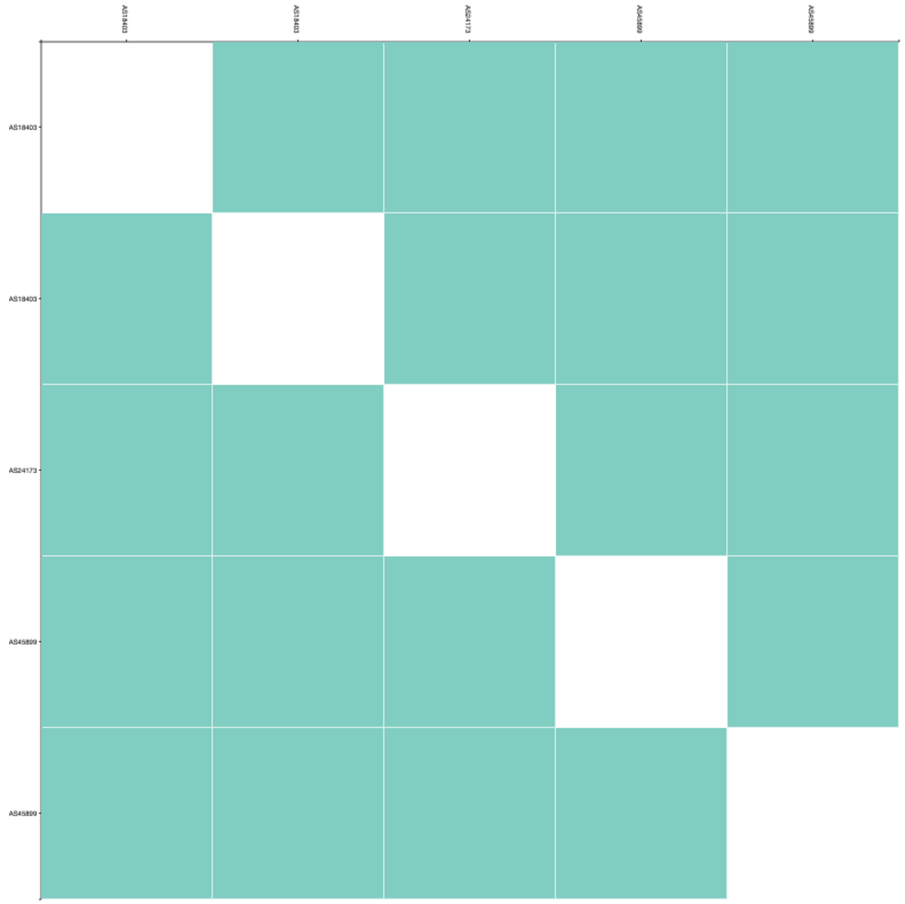
Atlas probe neighbourhood

Do the Paths Remain Local?

IXP Country JEDI shows whether your traffic stays LOCAL.

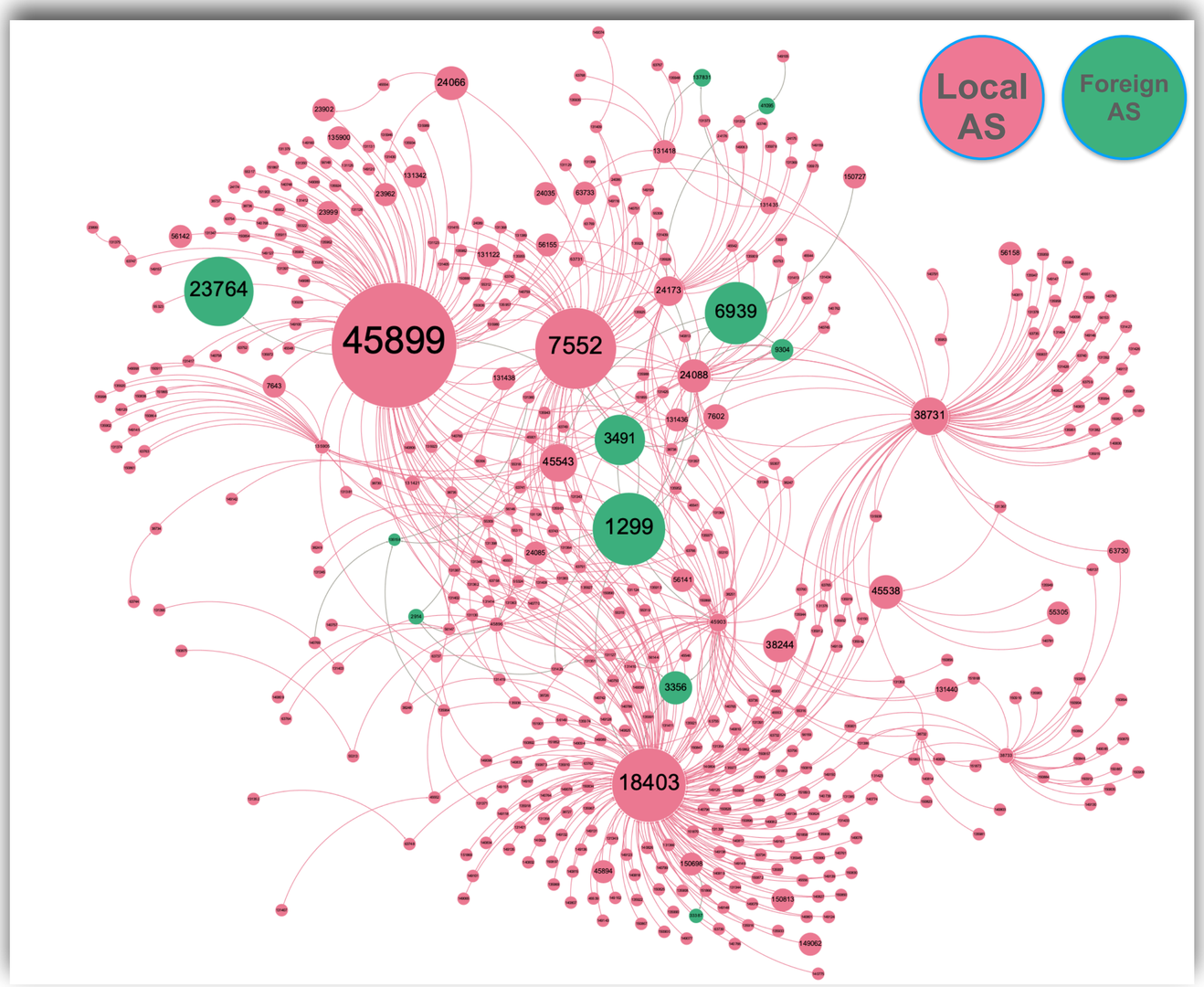
[IXP Country Jedi]

Data: 1 February 2024



Prototype Tool

AS Hegemony in Vietnam - RIS Data

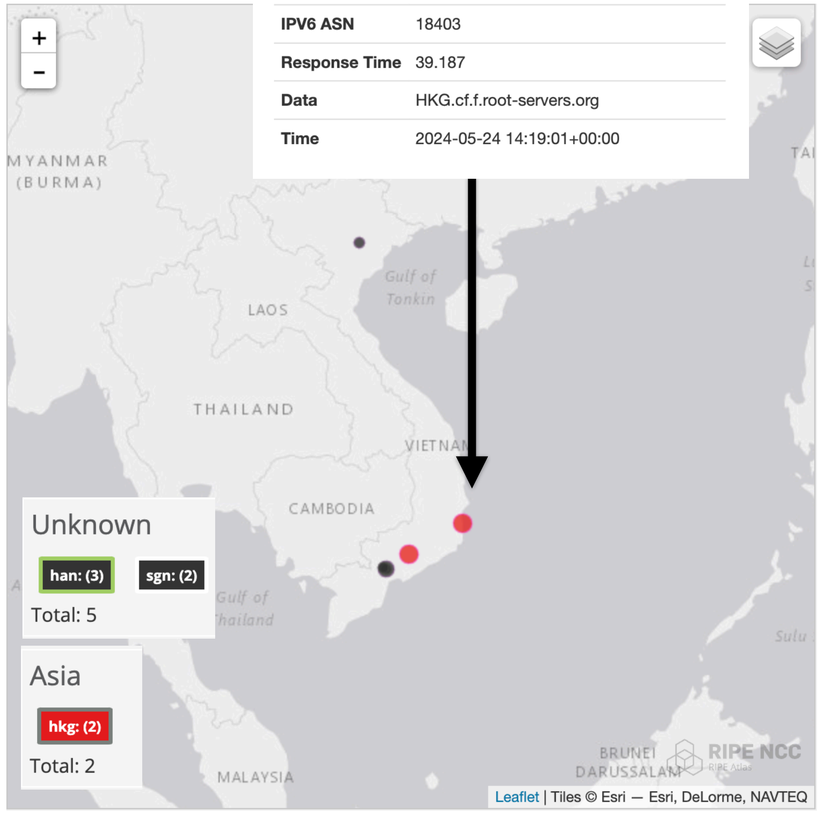


- As seen by BGP data
- Size shows the importance of the network
- Many networks in Vietnam are connected to AS45899
- Data based on the Hegemony method

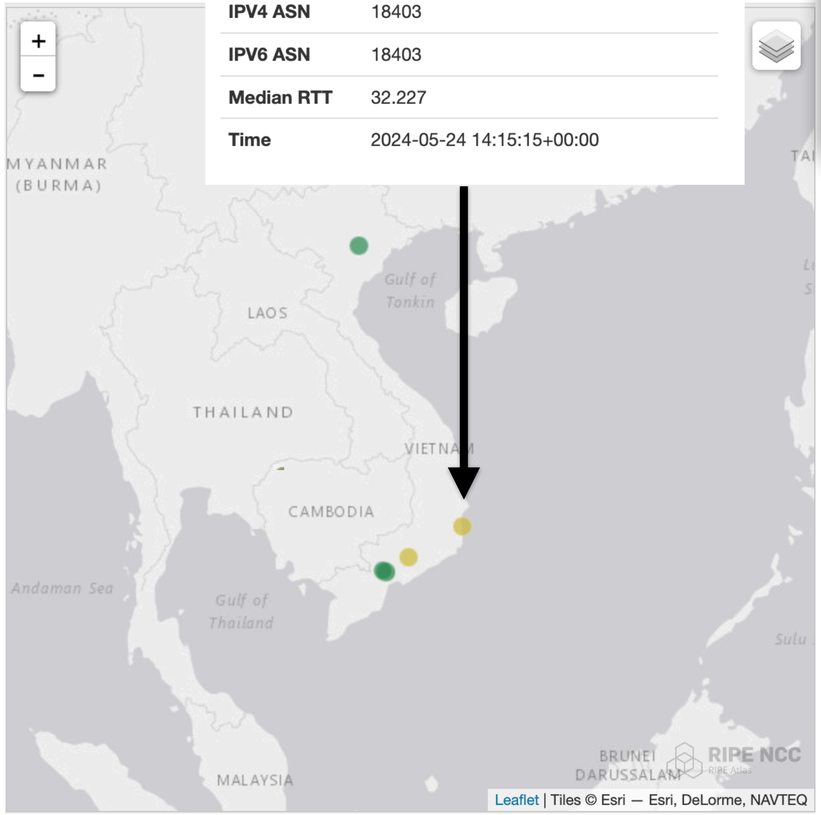
DNS Root Instances as Seen by RIPE Atlas and MRTT

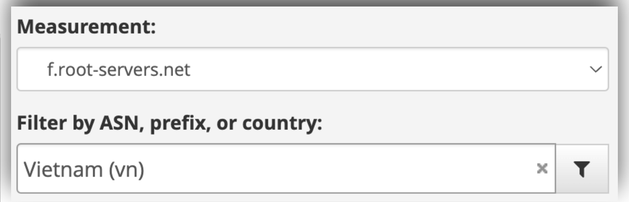
F-Root

ID	#1000388
Country	VN
Current Status	Connected (2024-05-23T20:39:40+02:00)
IPV4 ASN	18403
IPV6 ASN	18403
Response Time	39.187
Data	HKG.cf.f.root-servers.org
Time	2024-05-24 14:19:01+00:00



ID	#1000388
Country	VN
Current Status	Connected (2024-05-23T20:39:40+02:00)
IPV4 ASN	18403
IPV6 ASN	18403
Median RTT	32.227
Time	2024-05-24 14:15:15+00:00



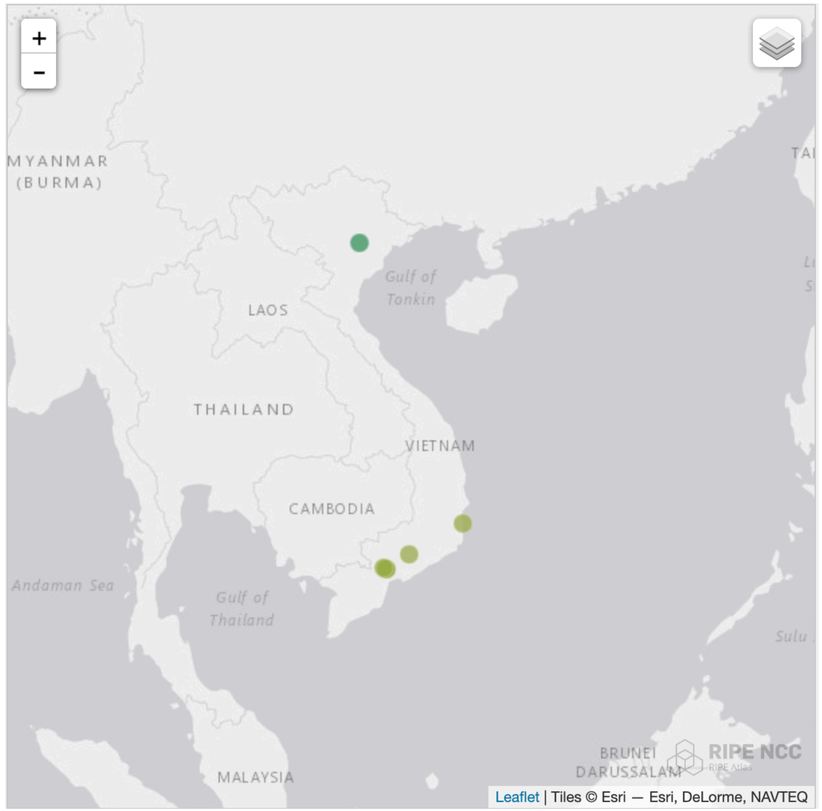


- 4 F-root instances in Vietnam
  - Thủ Đức (2), Da Nang (1) and Hanoi (1)
- 2 probes received an answer from Hong Kong, 2 from Singapore and 3 from Hanoi
- MRTT is below 40ms

< 10ms: 32 | < 20ms: 21 | < 30ms: 7 | < 40ms: 2 | < 50ms: 0 | < 100ms: 6 | < 200ms: 1 | < 300ms: 3 | > 300ms: 1 | No Data: 20 | Unreachable: 0 | Total: 93

DNS Root Instances as Seen by RIPE Atlas and MRTT

M-Root

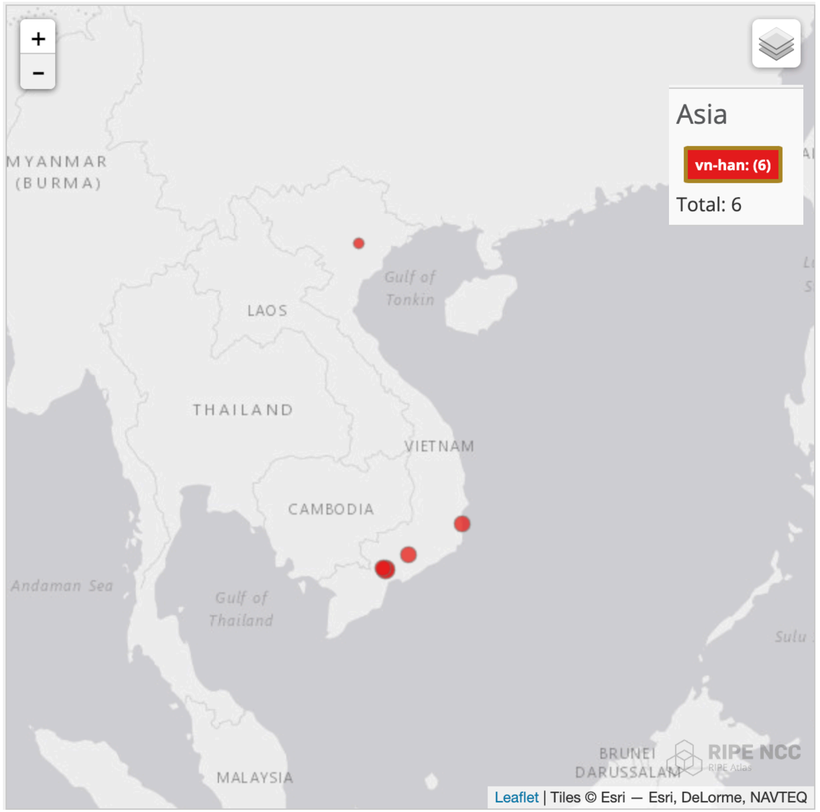


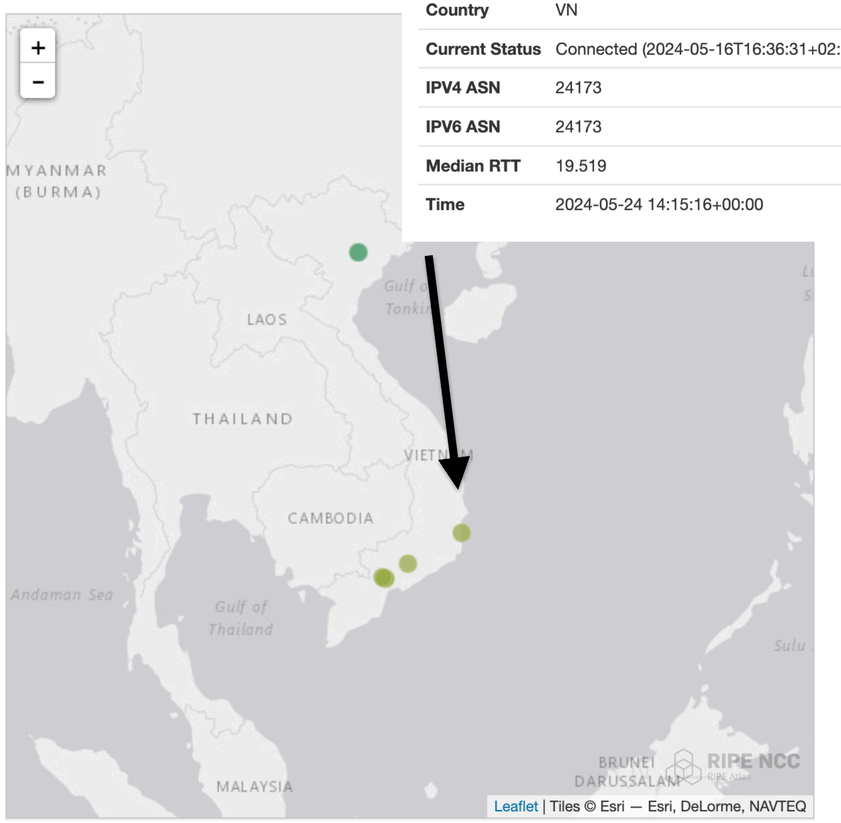
- 1 M-Root instance in Hanoi
- All 7 probes received an answer from an instance in Hanoi
- MRTT is below 50ms

< 10ms: 32 | < 20ms: 21 | < 30ms: 7 | < 40ms: 2 | < 50ms: 0 | < 100ms: 6 | < 200ms: 1 | < 300ms: 3 | > 300ms: 1 | No Data: 20 | Unreachable: 0 | Total: 93

DNS Root Instances as Seen by RIPE Atlas and MRTT

K-root





ID	#6718
Country	VN
Current Status	Connected (2024-05-16T16:36:31+02:00)
IPV4 ASN	24173
IPV6 ASN	24173
Median RTT	19.519
Time	2024-05-24 14:15:16+00:00

Measurement:

k.root-servers.net

Filter by ASN, prefix, or country:

Vietnam (vn)

- 1 K-root instance in Hanoi
- All 6 probes got answer from instance in Hanoi
- MRTT is below 30ms

< 10ms: 32 | < 20ms: 21 | < 30ms: 7 | < 40ms: 2 | < 50ms: 0 | < 100ms: 6 | < 200ms: 1 | < 300ms: 3 | > 300ms: 1 | No Data: 20 | Unreachable: 0 | Total: 93

RIPE Atlas Monitoring DNS .jp

https://atlas.ripe.net/dnsmon/

Authoritative DNS (AuthDNS)

- We’re seeking a partner to host AuthDNS in an ***interconnected*** location in Vietnam.
- Reduced dependency on external DNS Services
  - Minimises 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.

Want to host AuthDNS?

Network Name	Country
VIETTELTIMORLESTE	Timor Leste
AIS3G-2100-AS-AP	Thailand
CLOUDFLARENET	Myanmar
VIETEL-AS-AP	Vietnam

More Reasons to Love RIPE Atlas

12,000 Probes	Global coverage
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	For the community

Fair Use/
NON Monetary

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. Have a disconnected probe? **Reconnect**!

Redeem This Voucher

VNNIC24

Let’s Talk…

Tell us what’s important to you!

We can develop new **prototypes**!

Questions

lhestina @ ripe.net
atlas @ ripe.net

Use Cases

A distributed view of the Internet

The Kazakhstan outage as seen from RIPE Atlas

Detecting DNS root manipulation

DNS vulnerability, configuration errors that can cause DDoS