



RIPE NCC

RIPE NETWORK COORDINATION CENTRE

KNOW YOUR NETWORK

Why Every Network Operator Should Host RIPE Atlas

Lia Hestina | SANOG 41 | Mumbai

11 things Network Operators Do



Network Infrastructure Management	Security Management	Configuration & Optimisation
Capacity Planning	Network Monitoring	Troubleshooting
Software Updates and Patch Management		8 to 11

No News is Good News

What's Known

Your infrastructure

System & Software

Your People

Monitoring Tools

Security Measures

The Unknown

Threats/ Unpredictability

What our competitor do

Everchanging Technology

Hijacks/ Natural Disaster

Opportunity

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

RIPE Atlas

Accessible via

GUI

API

CLI TOOL

Type of measurements

PING

TRACEROUTE

DNS

NTP

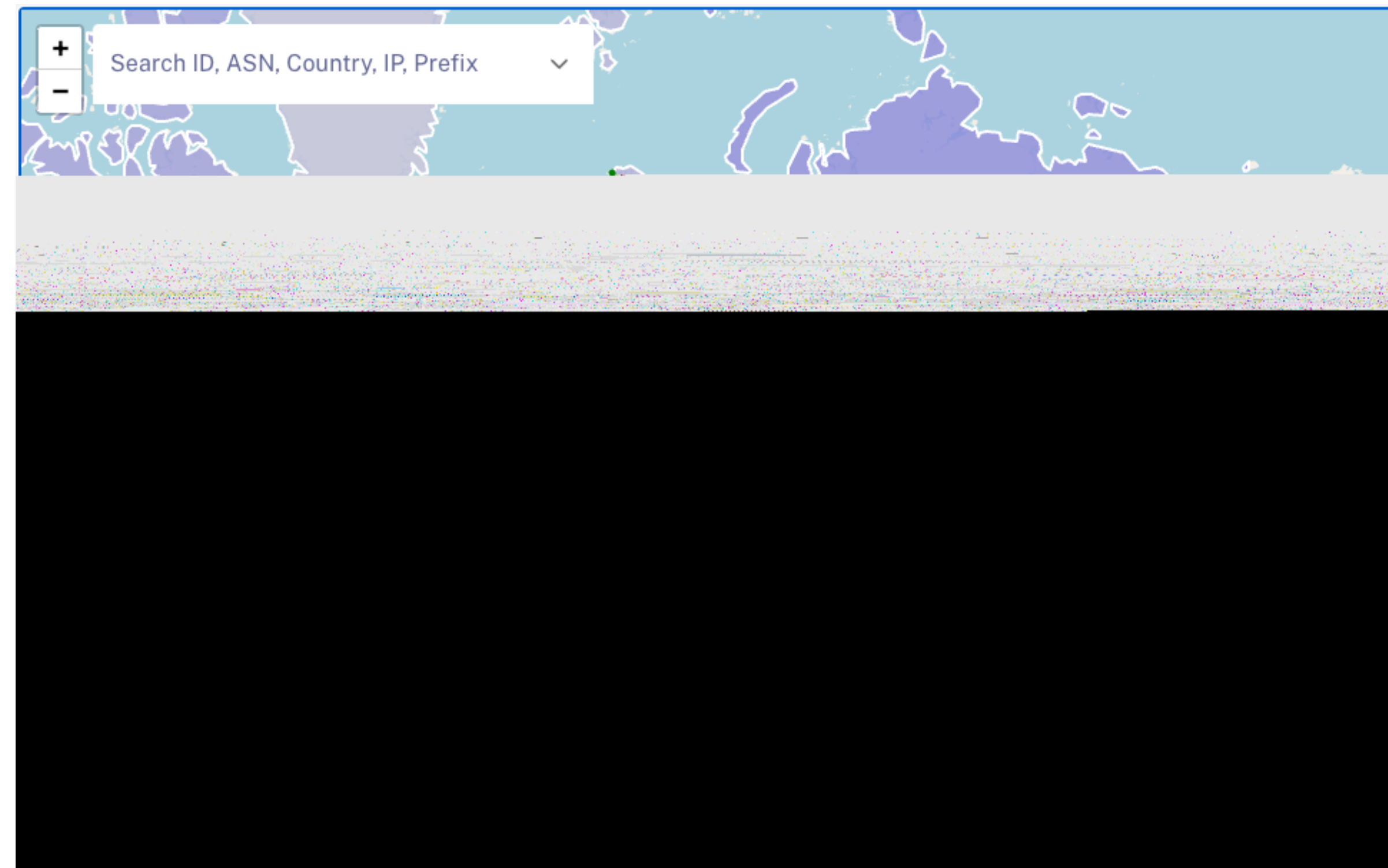
SSL/TLS

HTTP (anchors)

Run RIPE Atlas tests

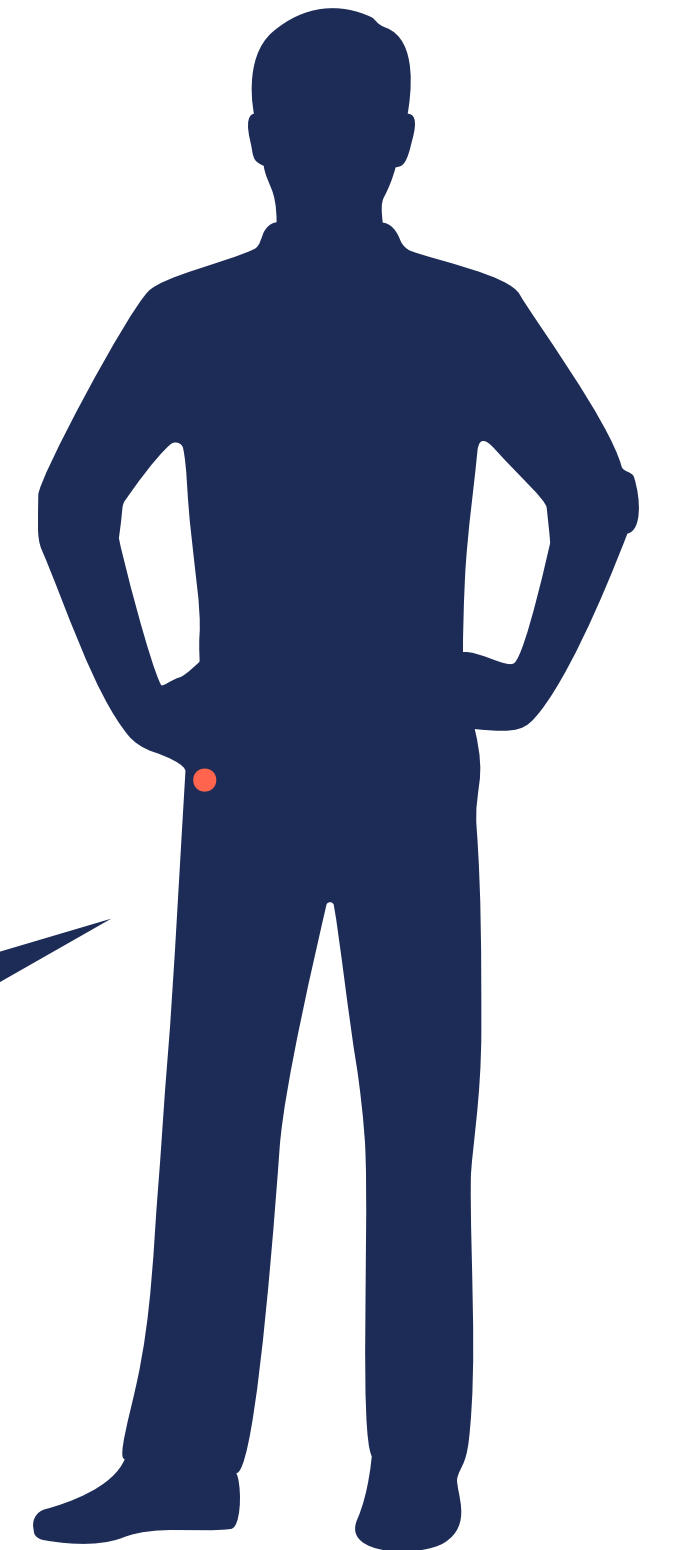


- More than 12,000 probes connected
- More than 3,000 ASNs globally
- 195 in South Asia



Some Problems

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



Mbappe

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

Issues Spotted!



High latency
Identified

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	✗	📘

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	✓	📘

Latest Traceroute Result for Measurement #59170999

2023-09-01 16:17 UTC

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

- 192.168.0.1 0.457ms 0.368ms 0.346ms
- 100.91.127.254 5.424ms 4.347ms 4.594ms
- 10.233.97.55 4.777ms 4.537ms 4.473ms
- 10.55.192.63 193.346ms 194.974ms 194.312ms
- 213.248.79.106 lax-b3-link.ip.twelve99.net AS1299 182.594ms 182.382ms 182.325ms
- 62.115.126.250 lax-b23-link.ip.twelve99.net AS1299 202.572ms 203.672ms 203.016ms
- * 62.115.123.136 dls-bb2-link.ip.twelve99.net AS1299 232.324ms *
- 62.115.116.213 atl-b24-link.ip.twelve99.net AS1299 255.674ms 250.639ms 250.838ms
- 62.115.119.201 ipls-b2-link.ip.twelve99.net AS1299 255.624ms 255.207ms 255.525ms
- 62.115.139.235 clb-b1-link.ip.twelve99.net AS1299 260.81ms 260.133ms 259.797ms
- ***
- ***
- ***
- ***
- ***
- 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



Hooray Moments!

Improve Performance

Shorter path is selected, better latency, reliability &

Control & Flexibility

Repeat tests as much as you need!

Service desks RIPE Atlas ❤️ GUI

To validate findings

What it's Not



Traffic Volume



Bandwidth



WIFI



Making your Coffee



Dare to Take a Risk?



Try it Wisely

- Who uses the platform?
- What do people say?
- Search for BAD review/BAD experience in Google
- What's the source? Trusted?
- Is it NEW?

Convinced?

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



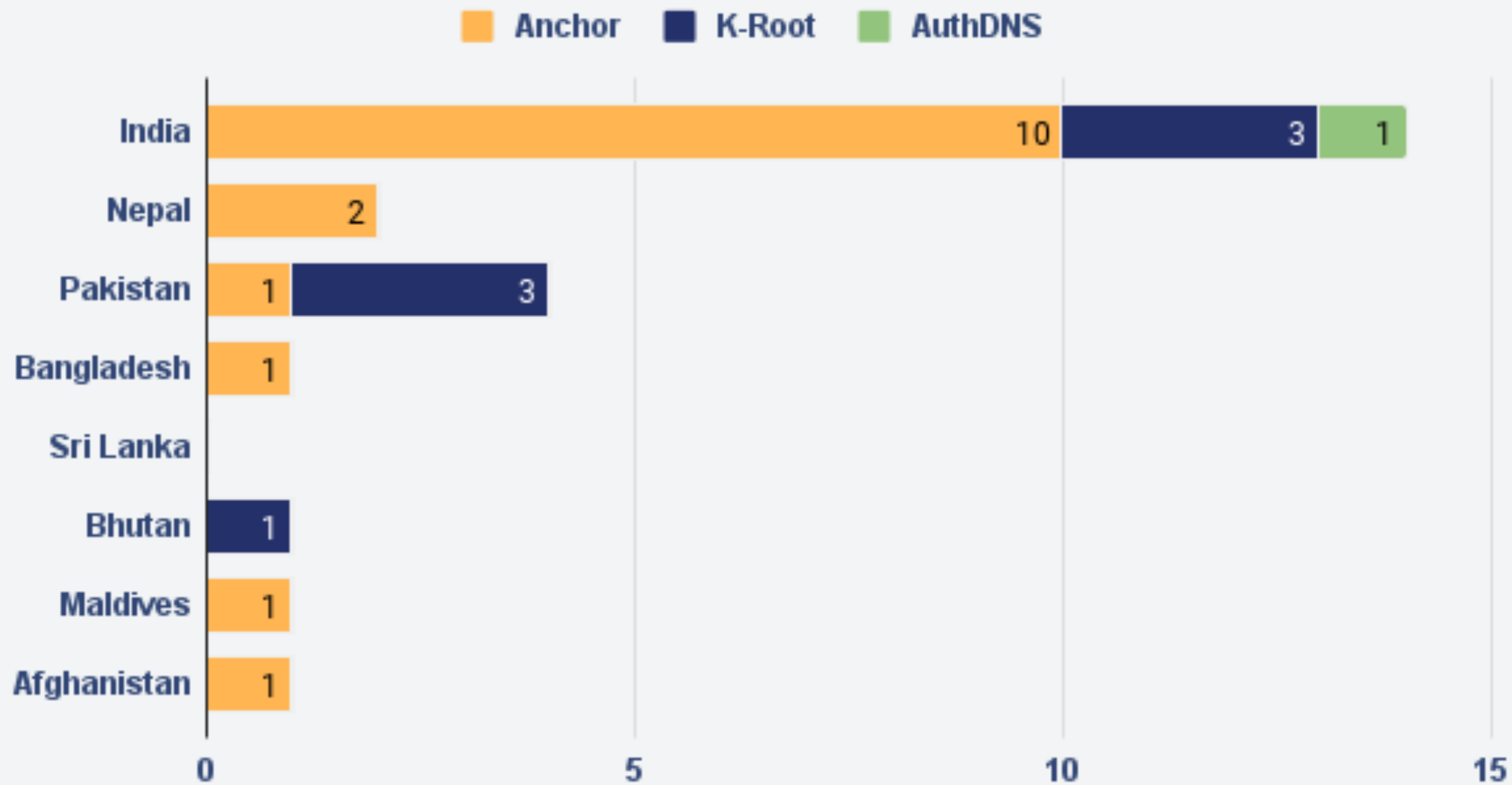


A view into
South Asian Economies

RIPE NCC tools & Services



South Asian Economies



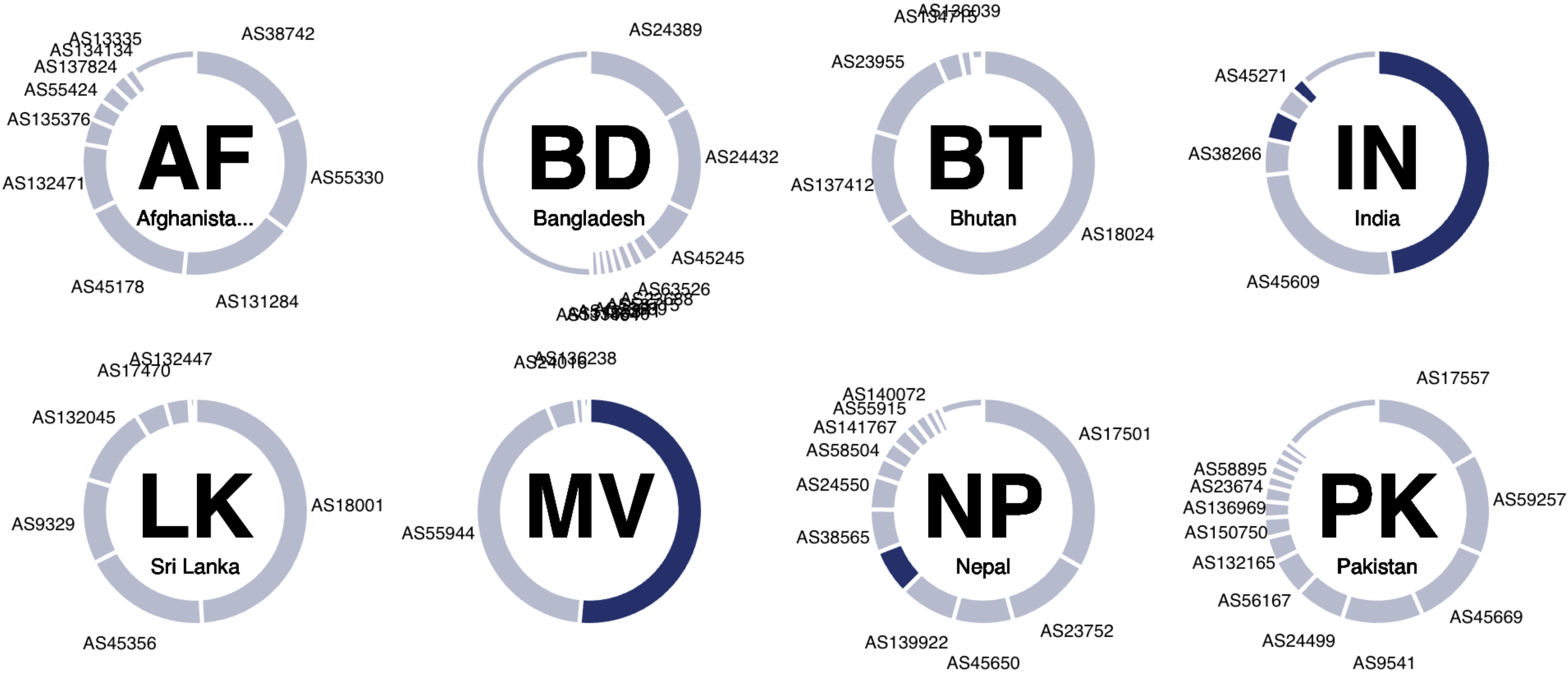
Top 10 Eyeball Network in South Asia with no coverage



RIPE Atlas probe coverage

Showing ASNs covering at least 1% of the country's population (2024-03-19)

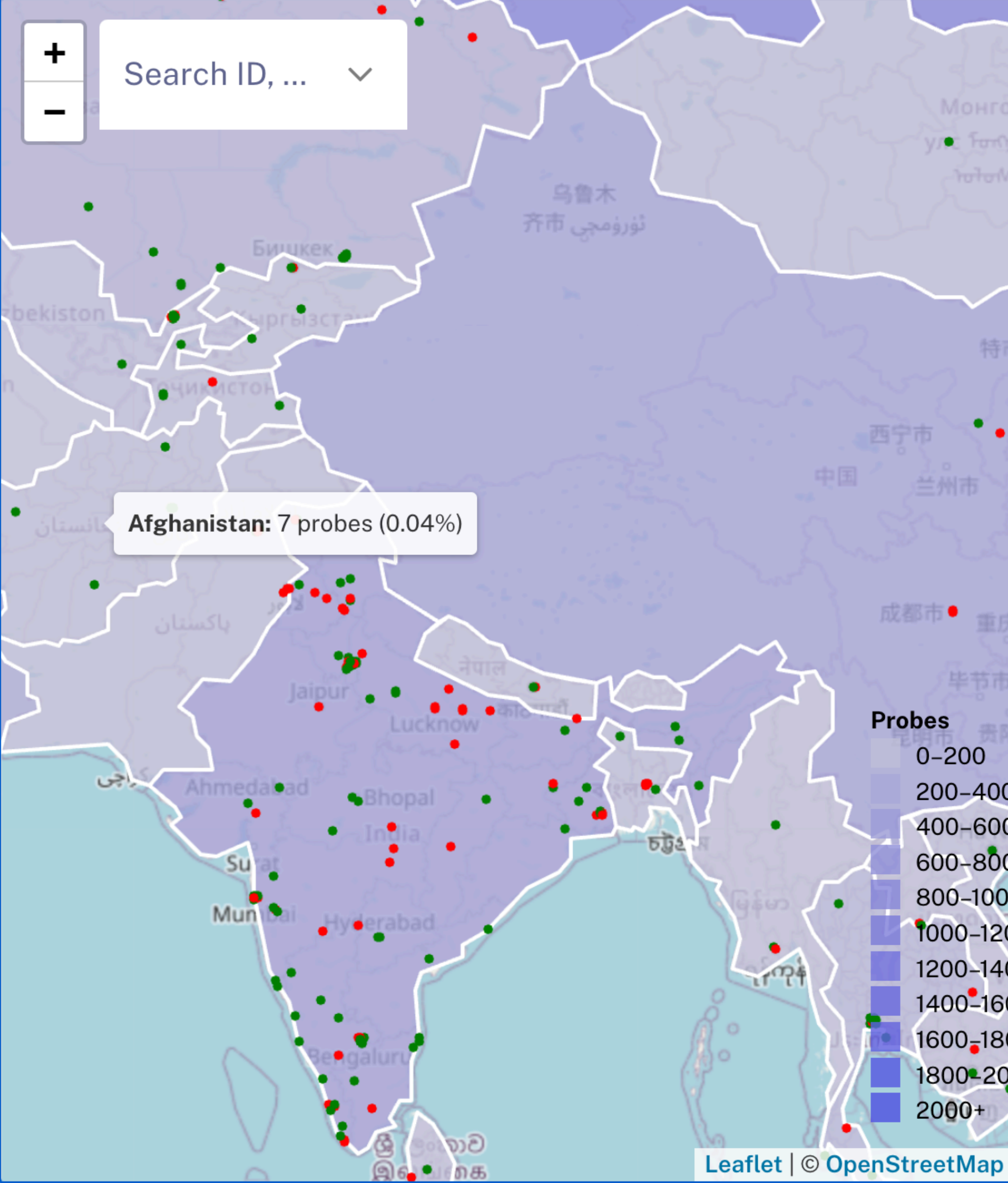
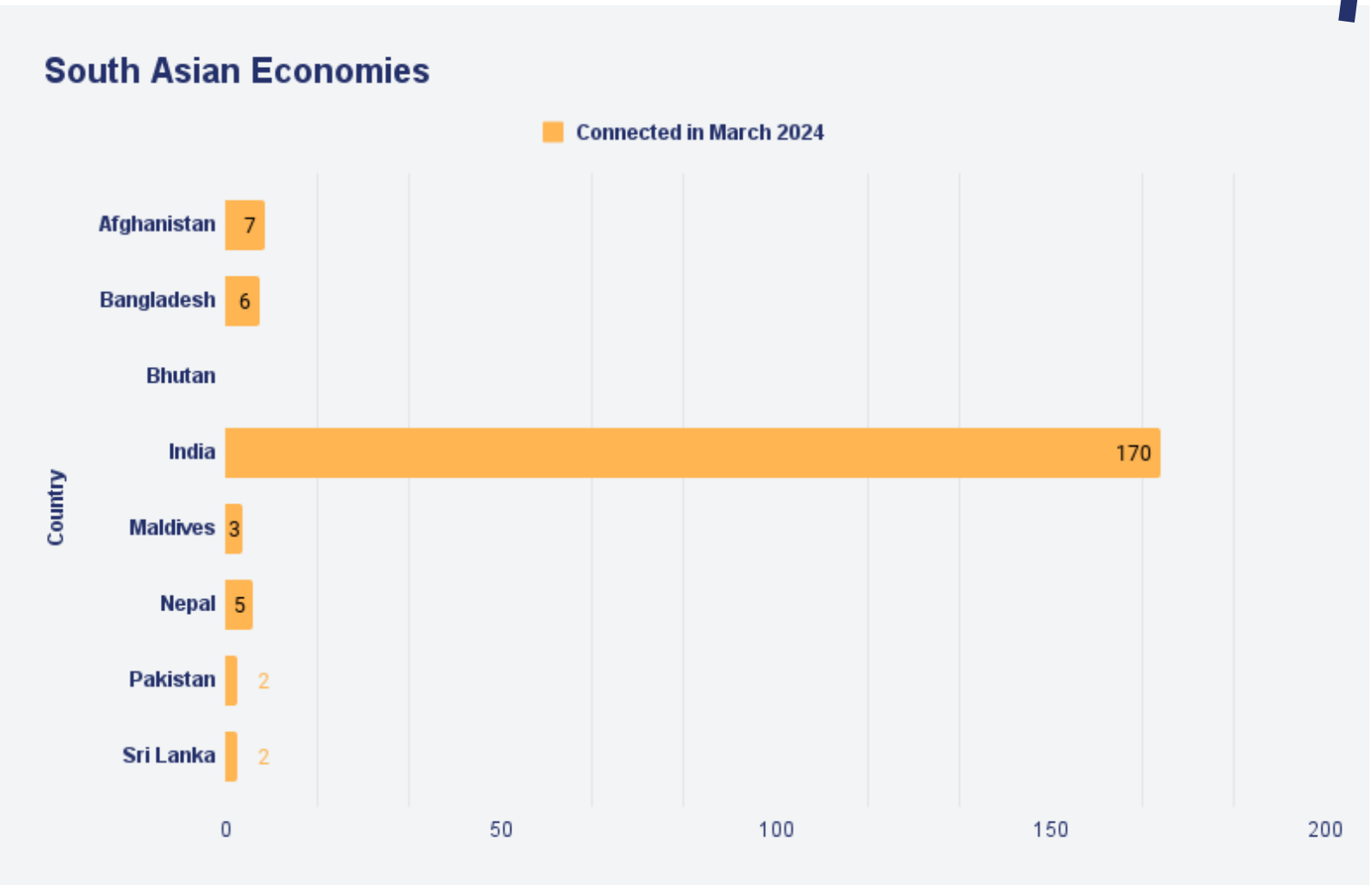
- ASN is not covered
- ASN has at least 3 probes



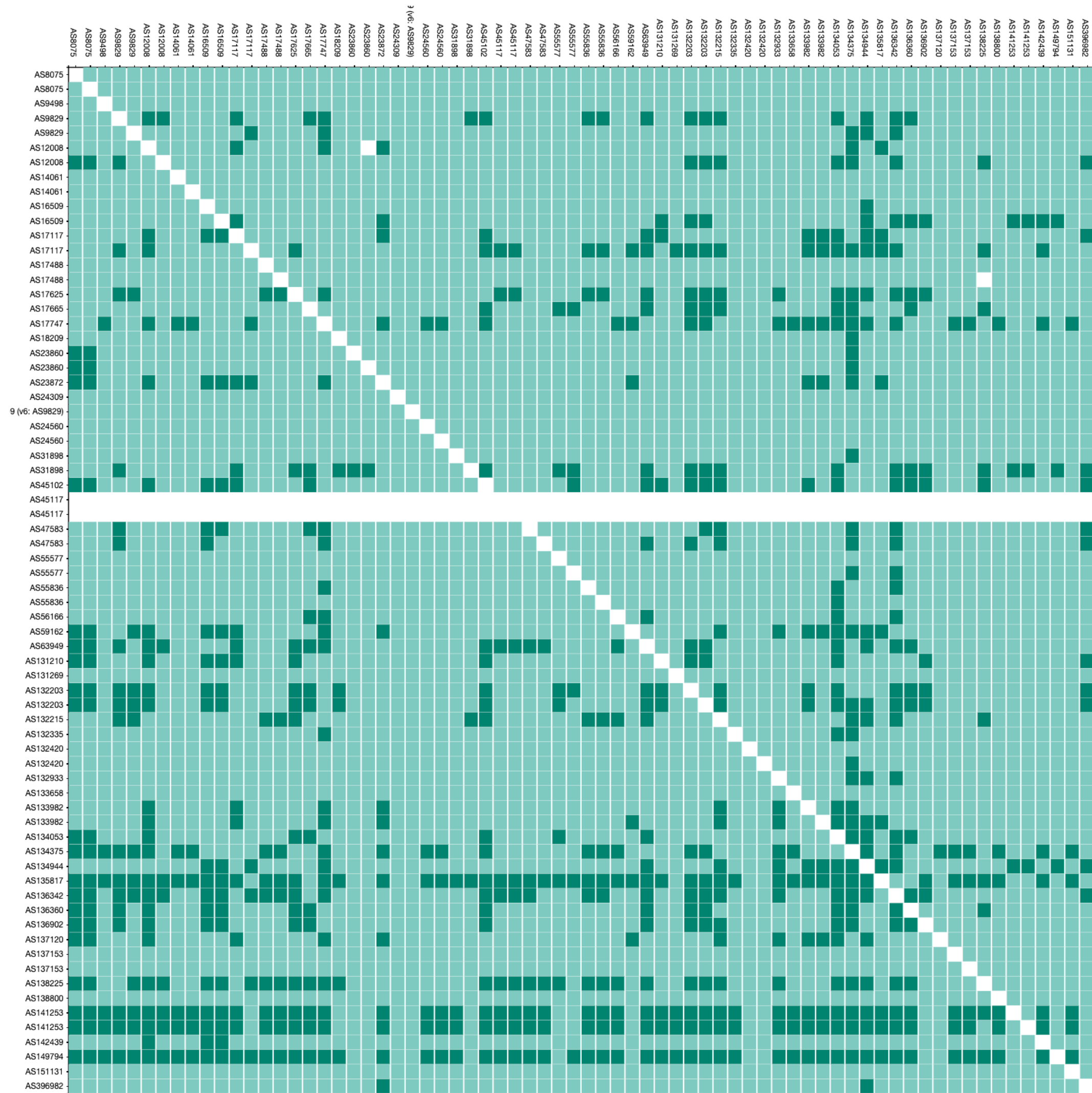
Prototype Tool

Probes in South Asia

Region	Country Code	Country	Anchor	K-Root	AuthDNS	RIPE Atlas
South Asian	IN	India	10	3	1	170
South Asian	NP	Nepal	2			5
South Asian	PL	Pakistan	1	3		2
South Asian	BD	Bangladesh	1			6
South Asian	LK	Sri Lanka				2
South Asian	BT	Bhutan		1		
South Asian	MV	Maldives	1			3
South Asian	AF	Afghanistan	1			7

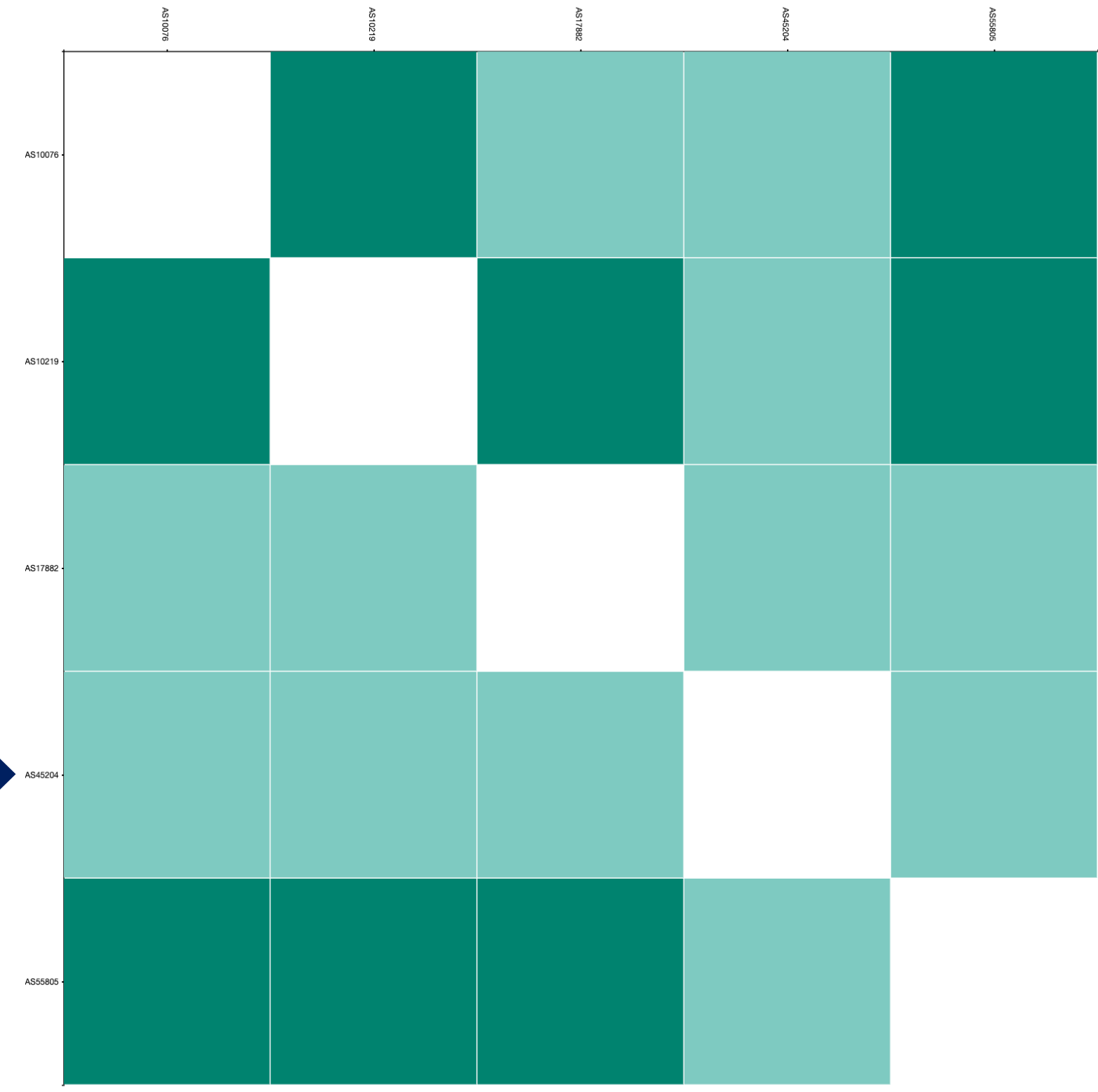


3. Finding Anomalies in Country IXP JEDI

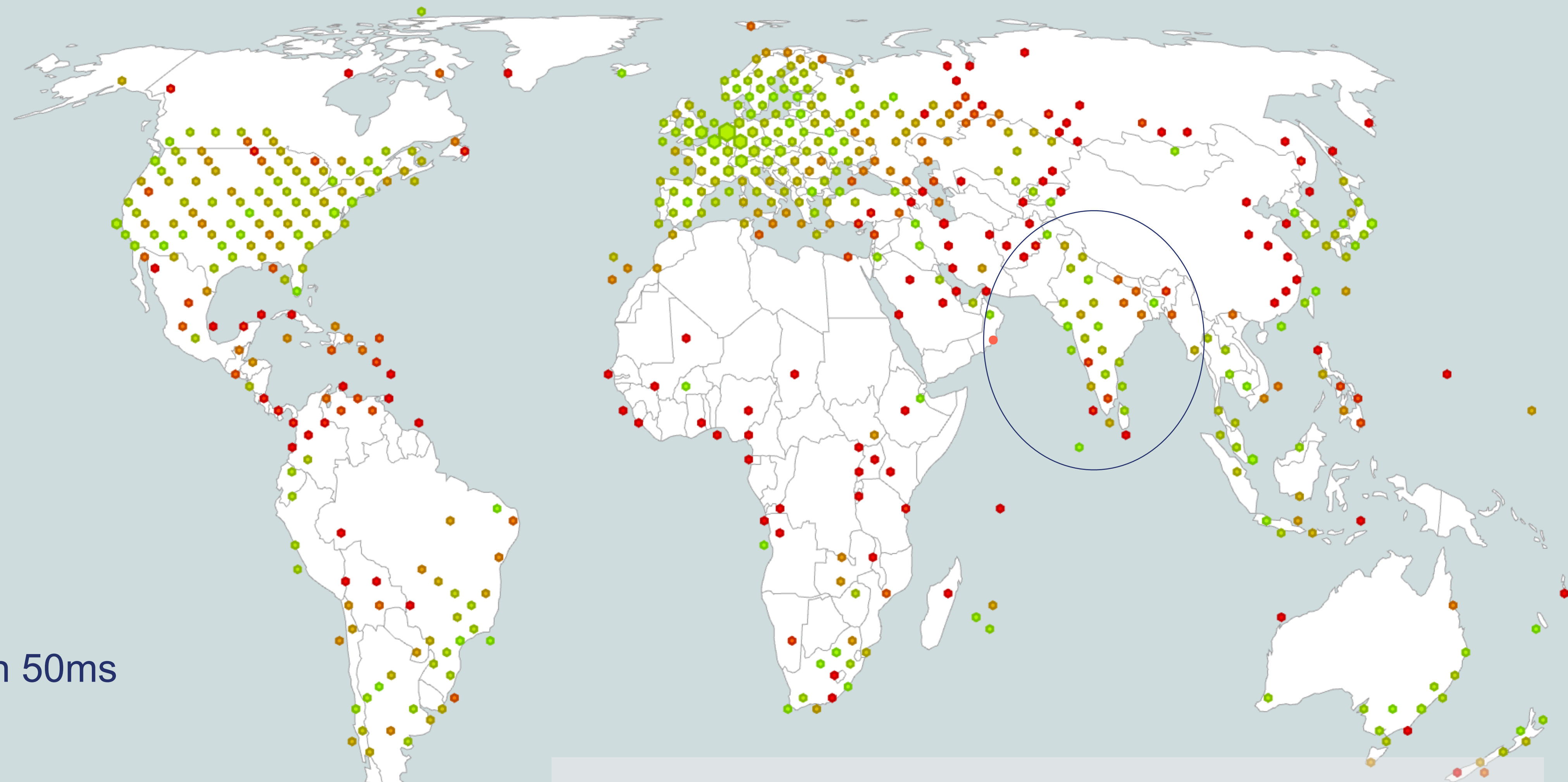
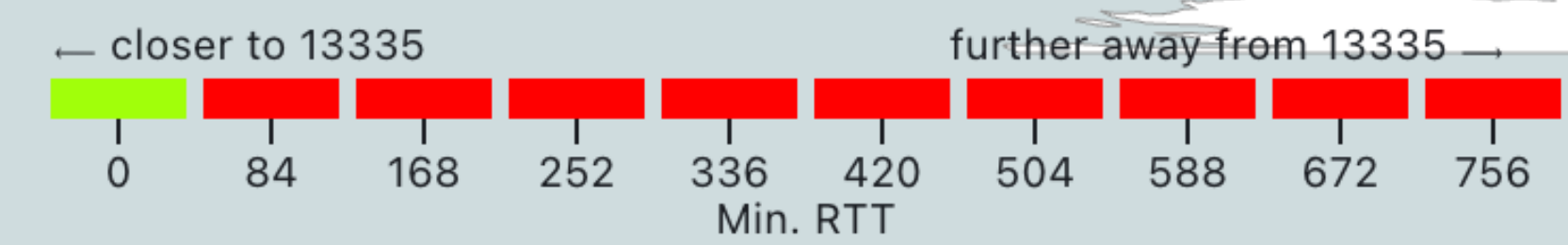
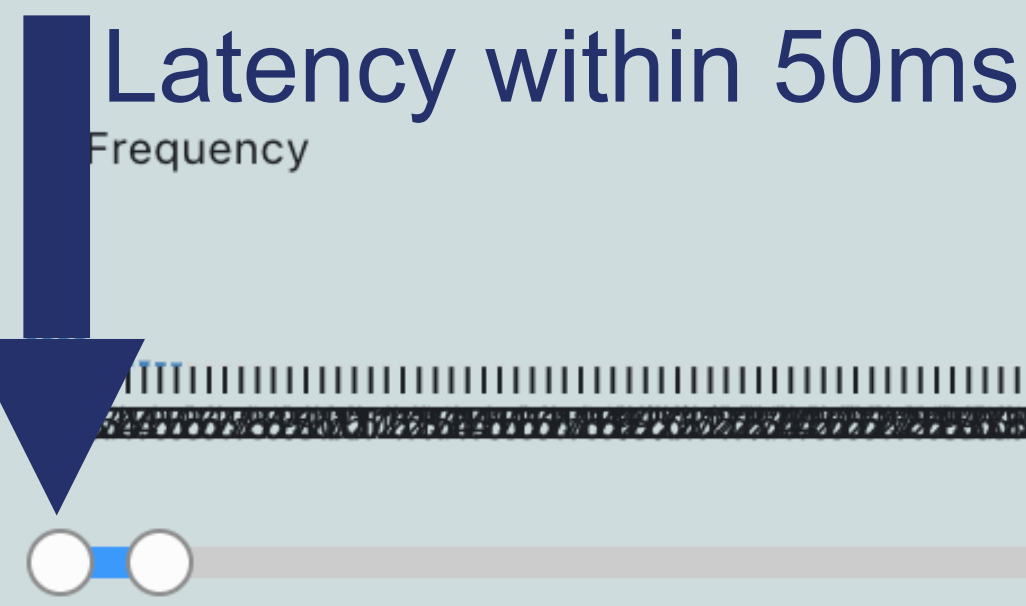


- Local IXP found: YES, out-of-country IPs: NO
- Local IXP found: YES, out-of-country IPs: YES

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



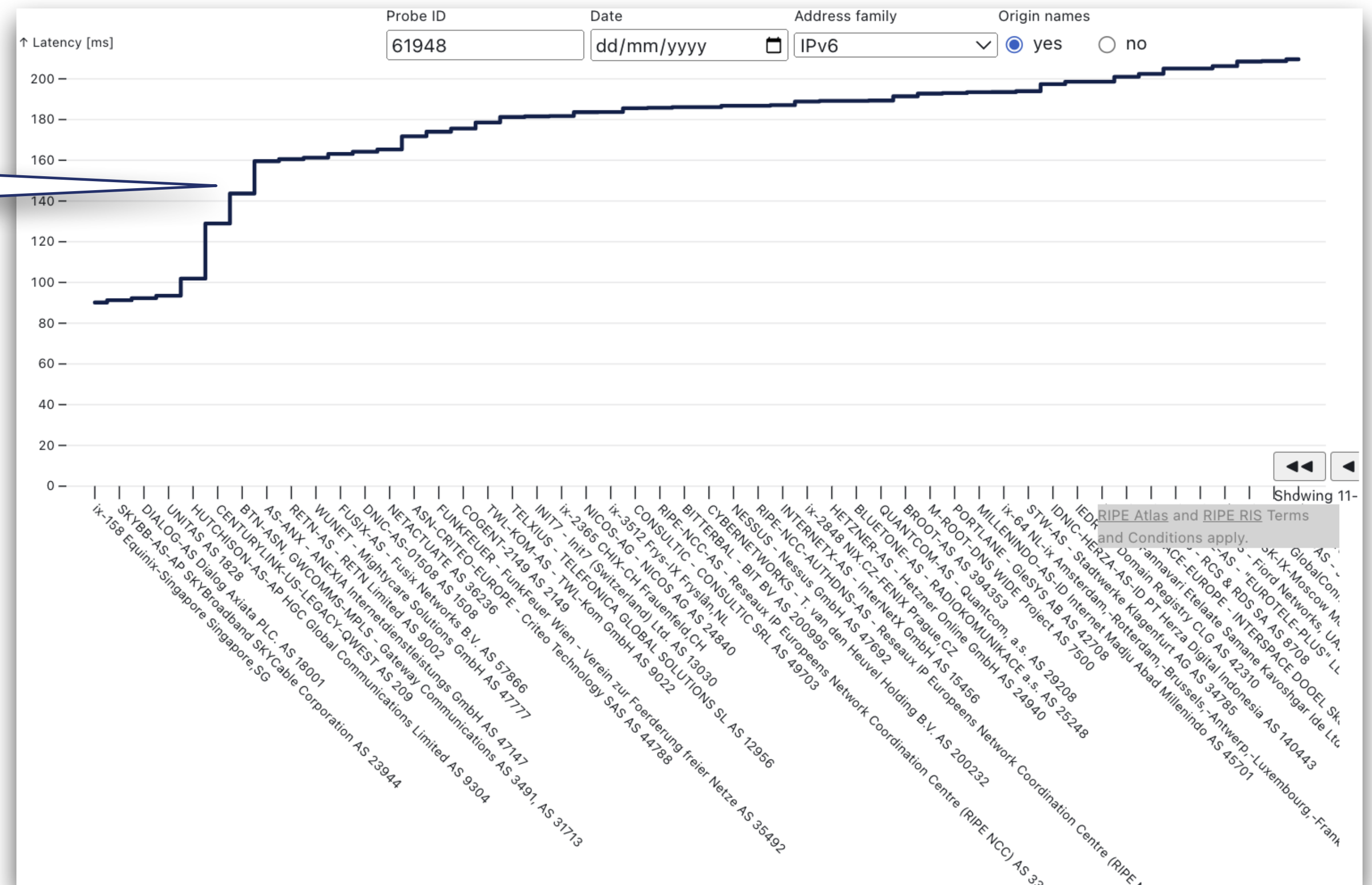
There's not enough probes to show other economies in South Asia, per Jan '24



MinRTT **Latency AS13335**
Cloudflare CDN

<https://observablehq.com/@ripenc/atlas-latency-worldmap>

Are these networks with **high latency** important to you?



SpeedLinks

General Network Built-ins

IPv4

Internet Address

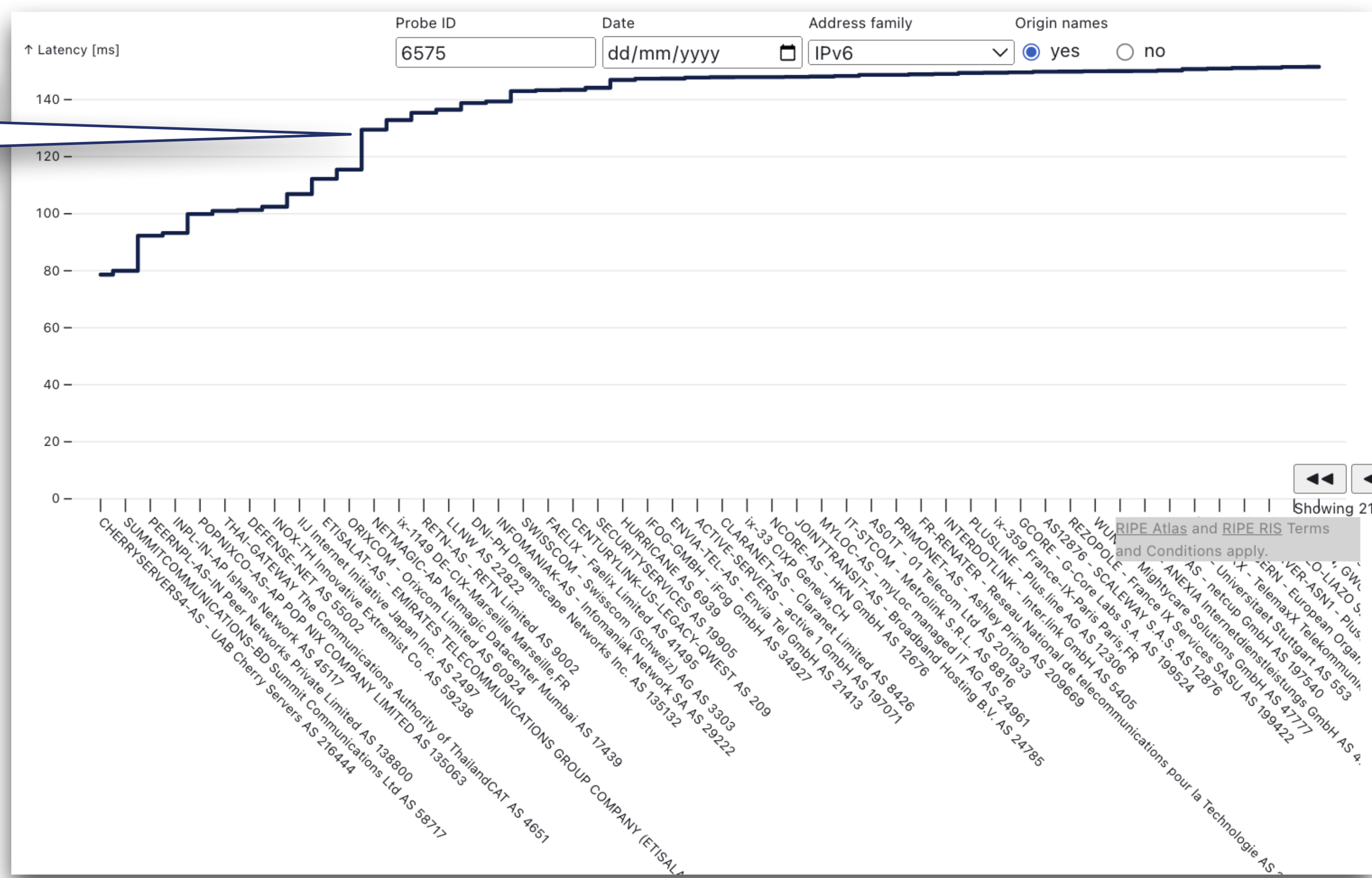
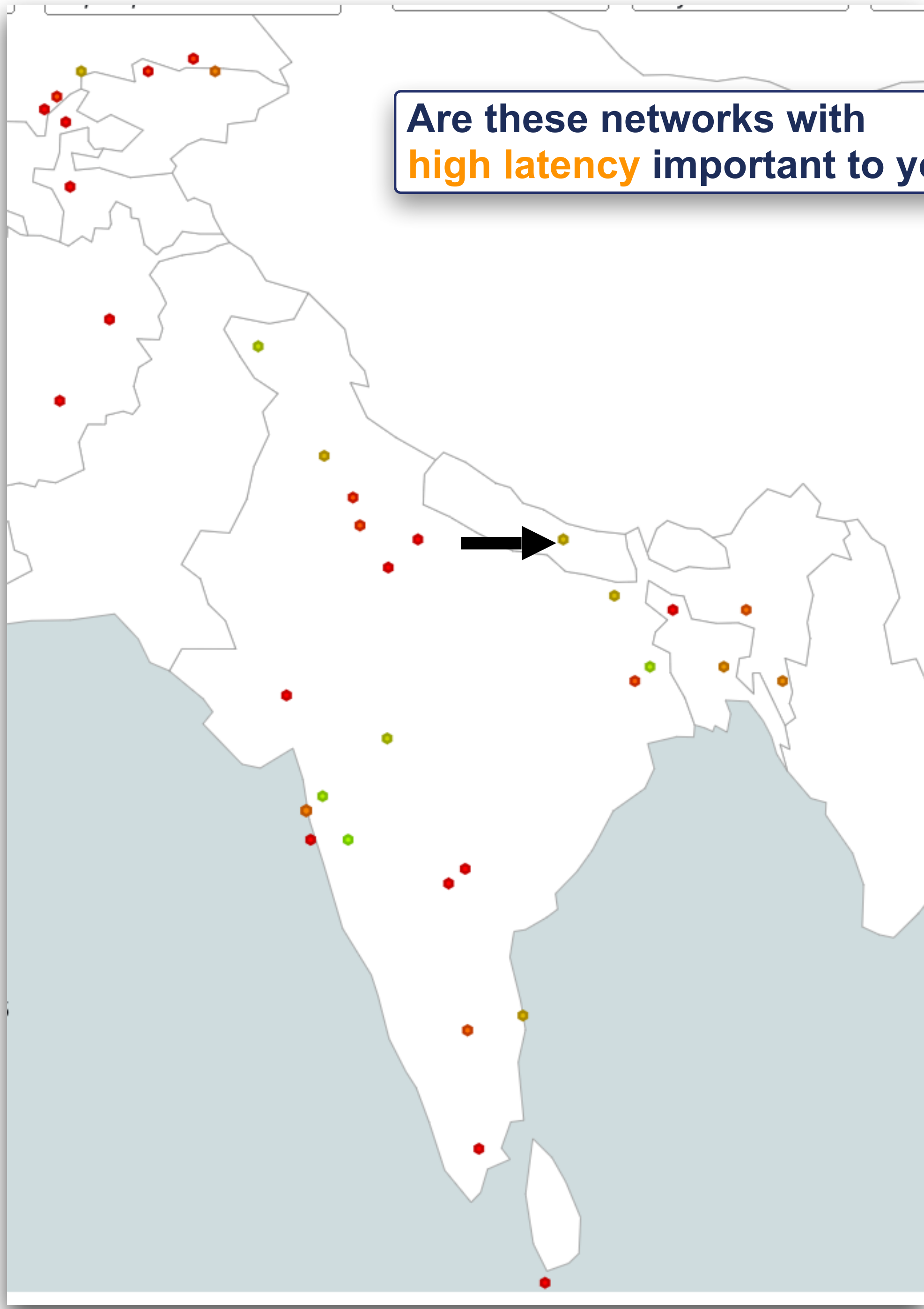
Prefix 103.138.147.0/24

ASN 149058 (SPEEDLINKS-AS-AP Speed Links)

ProbeID 61948 Bangladesh

<https://atlas.ripe.net/probes/61948/>

Are these networks with **high latency** important to you?



NPIX

General Network Built-ins

IPv4

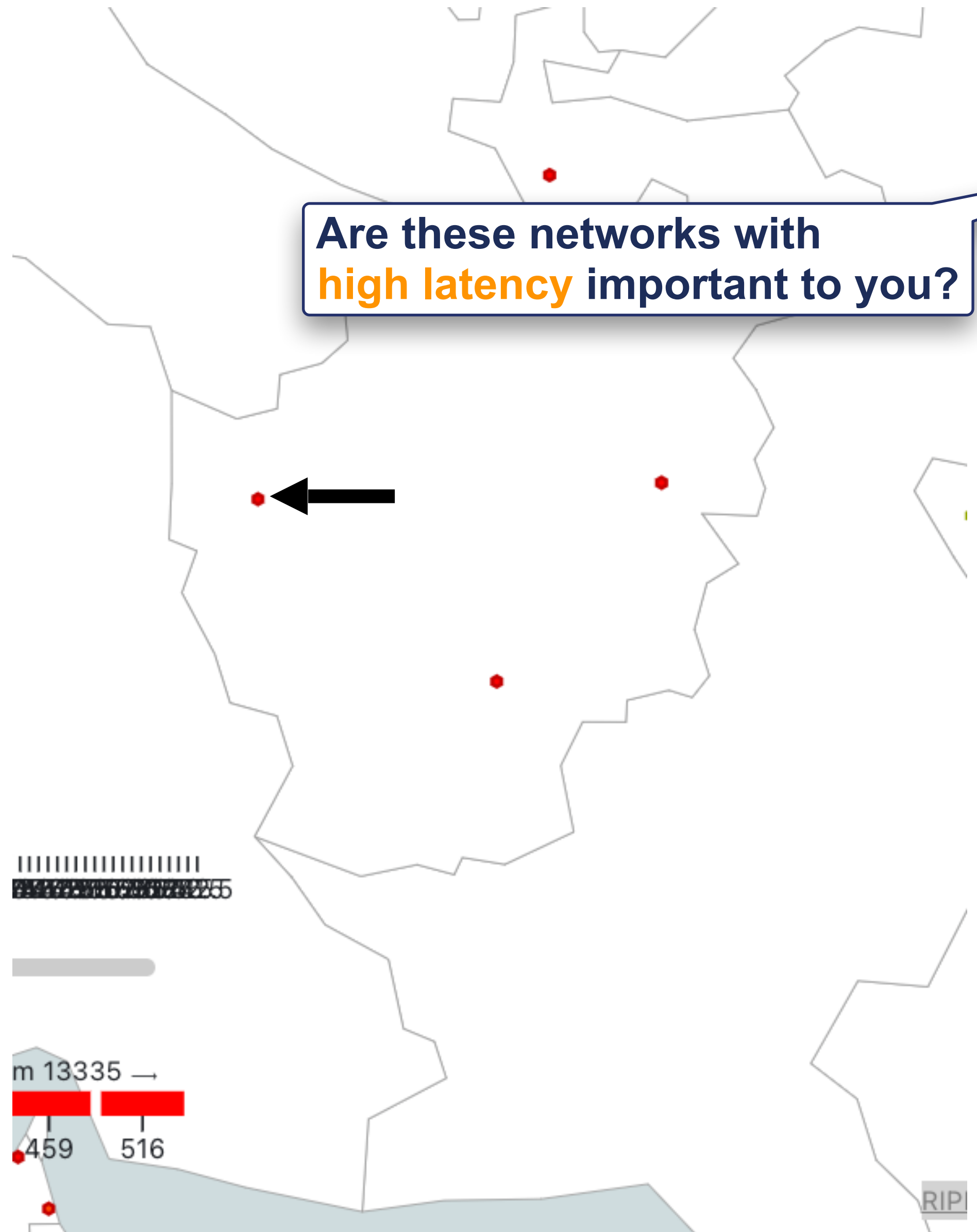
Internet Address 2

Prefix

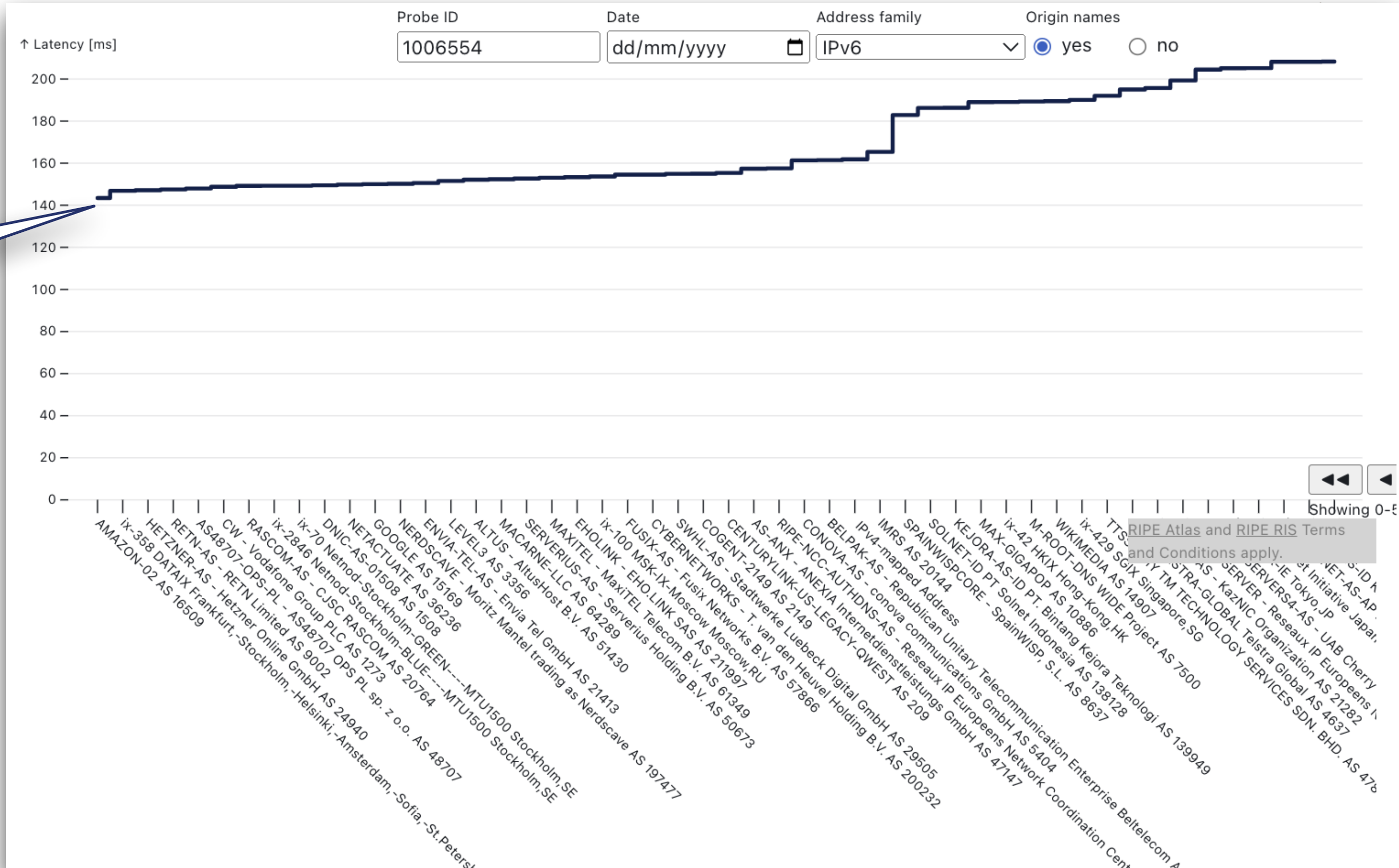
ASN 45170 (NREN-AS-NP Nepal Research and Education Network)

**AnchorID 6575
Nepal**

<https://atlas.ripe.net/probes/6575/>



Are these networks with **high latency** important to you?



ripe-atlas-hrt

General Network Built-ins

IPv4

Internet Address 152.36.198.58

Prefix

ASN 438222 (AMCC AS AD)

SW ProbeID 1006554
Afghanistan

<https://atlas.ripe.net/probes/1006554/>

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MinRTT

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



Try your probe here



[https://observablehq.com/
@ripenc/atlas-probe-
neighbourhood?](https://observablehq.com/@ripenc/atlas-probe-neighbourhood?)

NOTE: As MinRTT tool, AS13335 is not seen in Pakistan and Bhutan
Maybe due to not having enough probe within the economies and/or other reasons

****This is a prototype****

Instal SW probe now and see the difference

We'd like to install probes in these ASNs



Target ASN per country that has < 3 probes			Target ASN per country that has < 3 probes			Target ASN per country that has < 3 probes		
ASN	Network Name	Country	ASN	Network Name	Country	ASN	Network Name	Country
45609	BHARTI-MOBILITY-AS-AP	India	9541	CYBERNET-AP	Pakistan	23955	TASHICELL-DOMESTIC-AS	Bhutan
38266	VIL-AS-AP	India	24499	TPP-AS-PK	Pakistan	137412	TASHICELL-MOBILE-AS	Bhutan
45271	ICLNET-AS-AP	India	56167	PTML-PK	Pakistan	134715	GTA-AS-AP	Bhutan
138754	KVBPL-AS-IN	India	132165	CONNECT-AS-AP	Pakistan	136039	NANO-AS-AP	Bhutan
24309	CABLELITE-AS-AP	India	136969	KKNETWROK-AS-AP	Pakistan	138529	DATANET-AS-AP	Bhutan
24186	RAILTEL-AS-IN	India	23674	NAYATEL-PK	Pakistan	18001	DIALOG-AS	Sri Lanka
4755	M-AS TATA Communications forr	India	150750	ICIL-AS-AP	Pakistan	45356	MOBITEL-LK	Sri Lanka
9498	BBIL-AP BHARTI Airtel Ltd.	India	17501	WLINK-NEPAL-AS-AP	Nepal	9329	SLTINT-AS-AP	Sri Lanka
24389	GRAMEENPHONE-AS-AP	Bangladesh	23752	NPTELECOM-NP-AS	Nepal	132045	AIRTEL-AS-ISP	Sri Lanka
24432	AXIATA-ROBI-AS-AP	Bangladesh	45650	VIANET-NP	Nepal	17470	HUTCHISON-LK	Sri Lanka
45245	banglalink-AS	Bangladesh	139922	DMNPL-AS-AP	Nepal	132447	HUTCHISON-LK	Sri Lanka
63526	SSDTL-BD	Bangladesh	4007	SUBISU-CABLENET-AS-AP	Nepal	7642	DHIRAAGU-MV-AP	Maldives
23688	LINK3-TECH-AS-BD-AP	Bangladesh	38565	NCELL-AS-NP	Nepal	55944	OOREDOO-MV	Maldives
58715	ARTHTELECOMMUNICATION-A	Bangladesh	24550	WEBSURFERNP-AS-NP	Nepal	24016	RaajjeOnline-AS	Maldives
58689	ICCNET-DHK-BD	Bangladesh	58504	TECHMINDS-NP	Nepal	136238	SATLINKPVTLTD-AS-AP	Maldives
131464	DJBL-AS-AP	Bangladesh	141767	CG-COMMUNICATION-AS-AP	Nepal	38742	AWCC-AS-AP	Afghanistan
23956	AMBERIT-BD-AS	Bangladesh	55915	CLASSIC-NP	Nepal	131284	ETISALATAFG-AS-AP	Afghanistan
138640	HELLOTECHLIMITED-AS-AP	Bangladesh	140072	FWCPL-AS-AP	Nepal	55330	GCN-DCN-AS	Afghanistan
58717	MUNICATIONS-BD Summit Comn	Bangladesh	55427	BROADLINK-AS-AP	Nepal	45178	ROSHAN-AF	Afghanistan
17557	PKTELECOM-AS-PK	Pakistan	13335	CLOUDFLARENET	Nepal	132471	MTNAFGHANISTAN-AS-AP	Afghanistan
59257	CMPAKLIMITED-AS-AP	Pakistan	18024	BTTELECOM-AS-AP	Bhutan	135376	RAHANET-ISP-AS-AP	Afghanistan
45669	Mobilink-AS-PK	Pakistan	23955	TASHICELL-DOMESTIC-AS	Bhutan	55424	INSTATELECOM-AS-AP	Afghanistan
						137824	VNT-ISP-AS-AP	Afghanistan
						134134	NORTHTELECOM-AF	Afghanistan
						13335	CLOUDFLARENET	Afghanistan

<https://observablehq.com/@ripenc/ripe-atlas-networkcoverage?country=BD,IN,MN,NP,PK&search=38742&labels=notCovered&columns=4&spacing=4&radius=90>

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



What is RIS?

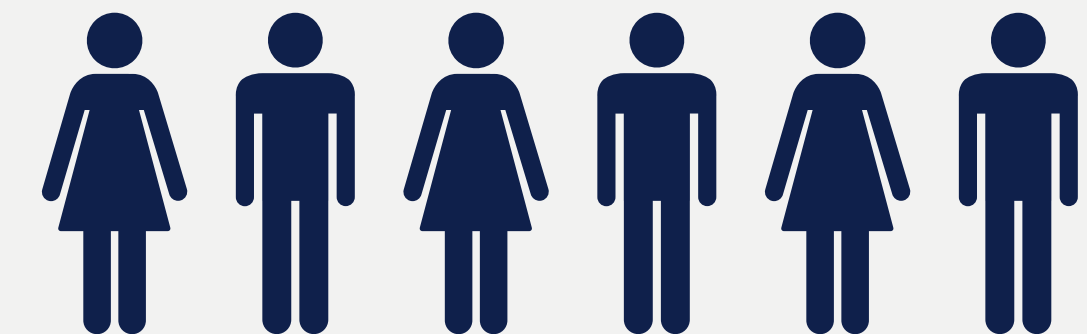


- RIS is a routing data collection platform
- Collecting BGP data since 1999
- Up-to-date routing information, as opposed to information in databases and routing registries, such as:
 - What is being announced
 - Which prefixes are seen and where
 - Which prefixes are not seen

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 (<https://stat.ripe.net/app/launchpad>)
- Tools developed by others allow you to set an alert
 - Try out **BGP Alerter** (powered by RIS Live)
 - PacketVis <https://packetvis.com/>



What's Next?

Create RIPE Access **ACCOUNT** ✓

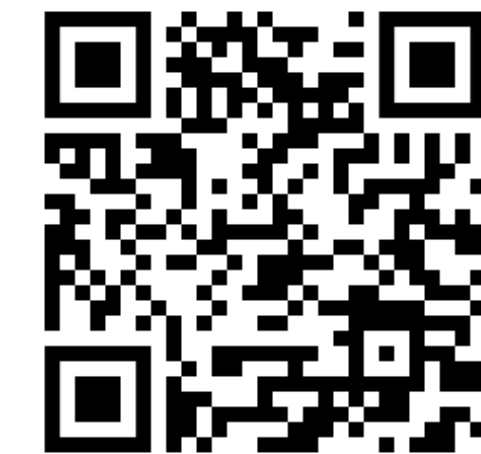
INSTALL RIPE Atlas strategically ✓

PEER with RIS* ✓

Start testing, **MONITOR** your network performance ✓

Got a disconnected probe? **Reconnect!** ✓

Redeem This Voucher
SANOG41





Questions



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Use Cases



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/