RIPE NCC
RIPE NETWORK COORDINATION CENTRE

RIPE Atlas

Christopher Amin | 14 November 2017 | WTIS-17

Overview

- What is RIPE Atlas?
- Growing RIPE Atlas
- Challenges
- Example applications

What is RIPE Atlas?

RIPE NCC

- A not-for-profit membership association
- Founded in 1992
- Offices in Amsterdam and Dubai
- More than 16,000 members
- Regional Internet Registry (RIR) for Europe, the Middle East and parts of Central Asia

What We Do

- Distribute IPv4, IPv6 addresses and AS Numbers
- Secretariat for the RIPE community
- Manage K-root, one of the 13 Internet root name servers
- Training courses, capacity building and support
- Measurement and analytical tools (RIPE Atlas, RIPEstat, Routing Information Service)

Why RIPE Atlas? (1)

Lack of Internet wide measurements

Measurements

- **Monitor**
- **Troubleshoot**
- **Improve**
- **Security**

Why RIPE Atlas? (2)

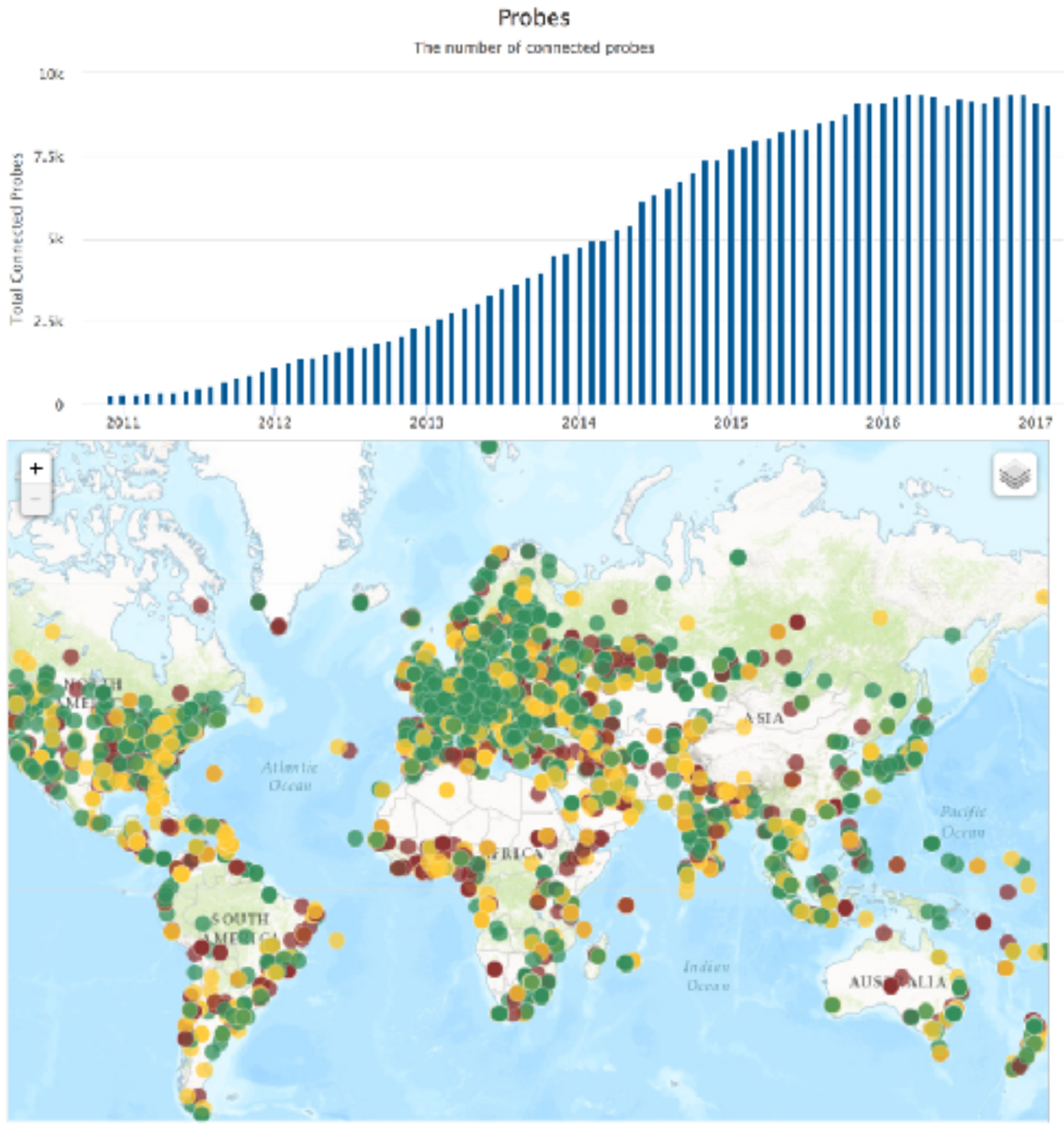
Goals:

- Internet wide measurement system
  - Internet infrastructure, not all applications
- Real time and historical info
- Outbound and inbound measurements
- Collaborative effort
- Open and free
- IPv4 and IPv6 capable

What is RIPE Atlas (1)

- RIPE Atlas video
- 10k+ active probes
  - 1,543 disconnected
  - 8,781 abandoned
- Countries: 179
- Originating ASNs:

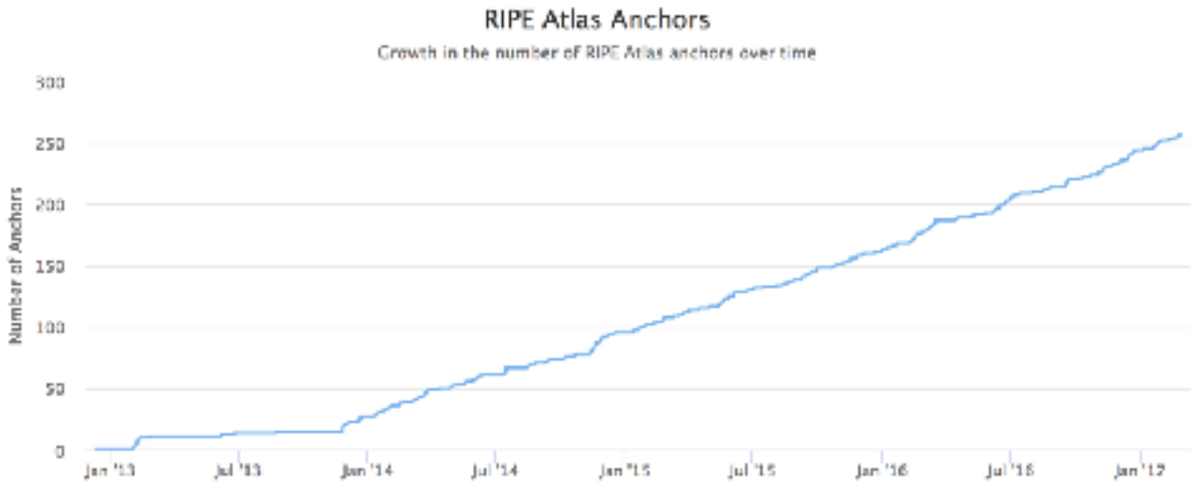
  3,613 (IPv4) = 6,1%
  1,377 (IPv6) = 9,7%

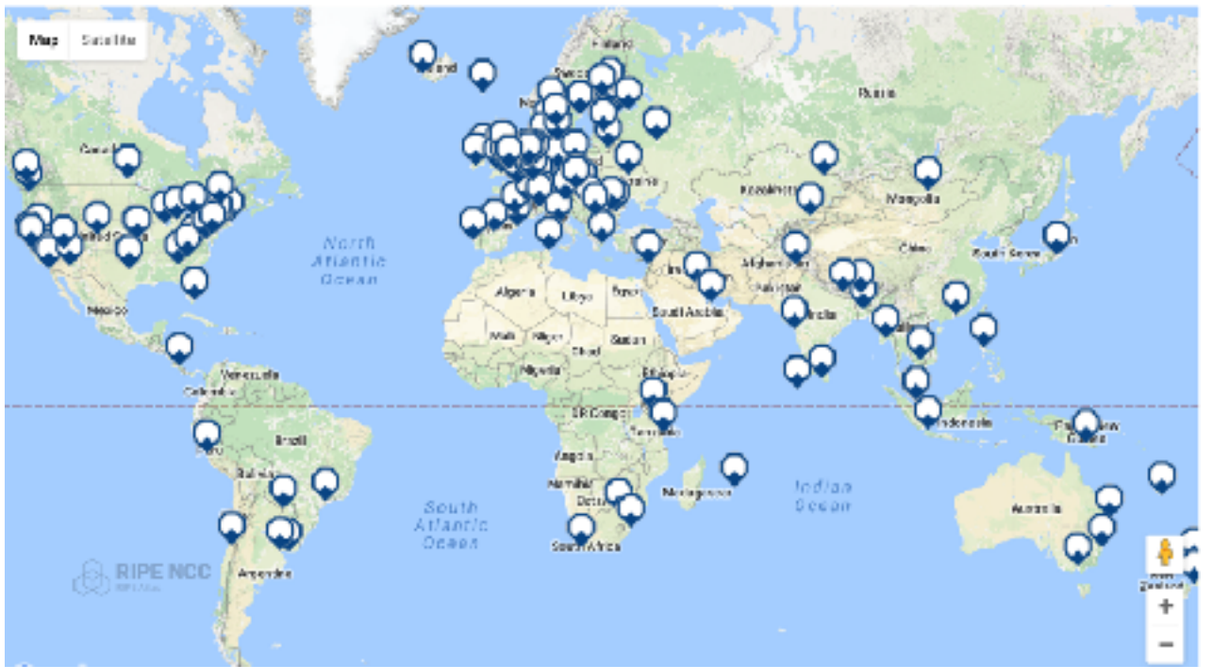


What is RIPE Atlas (2)

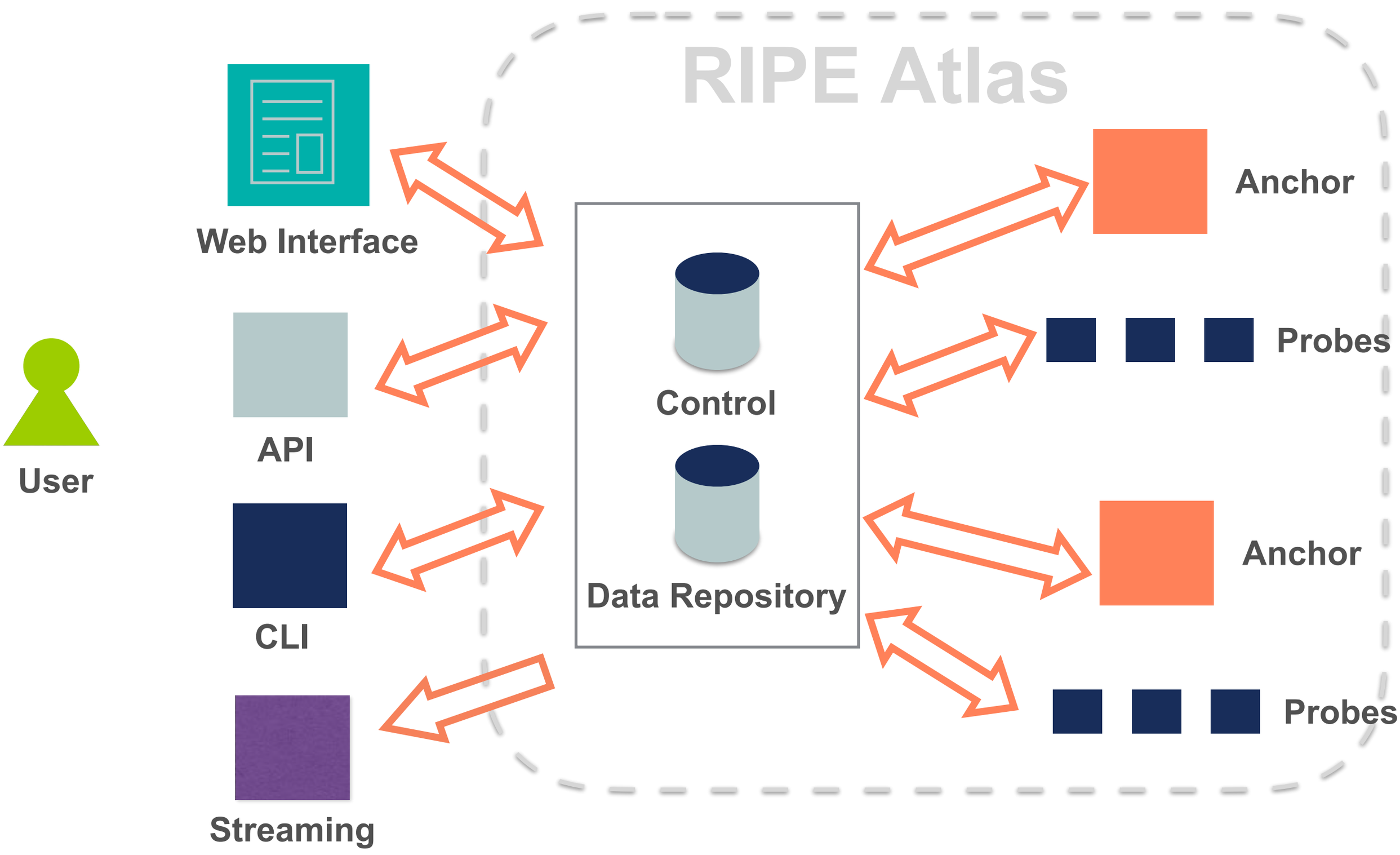
Anchors

- 293 active
- Around the world coverage improving thanks to the other RIRs and ISOC cooperation





What is RIPE Atlas (3)



RIPE Atlas Measurements

- **Built-in** global measurements towards root nameservers
  - Visualised as Internet traffic maps
- **Built-in** regional measurements towards “anchors”
- **Users** can run customised measurements

Measurements

- 35,000+ user-defined measurements weekly
- 5,000+ **results** collected per second

Measurements currently running

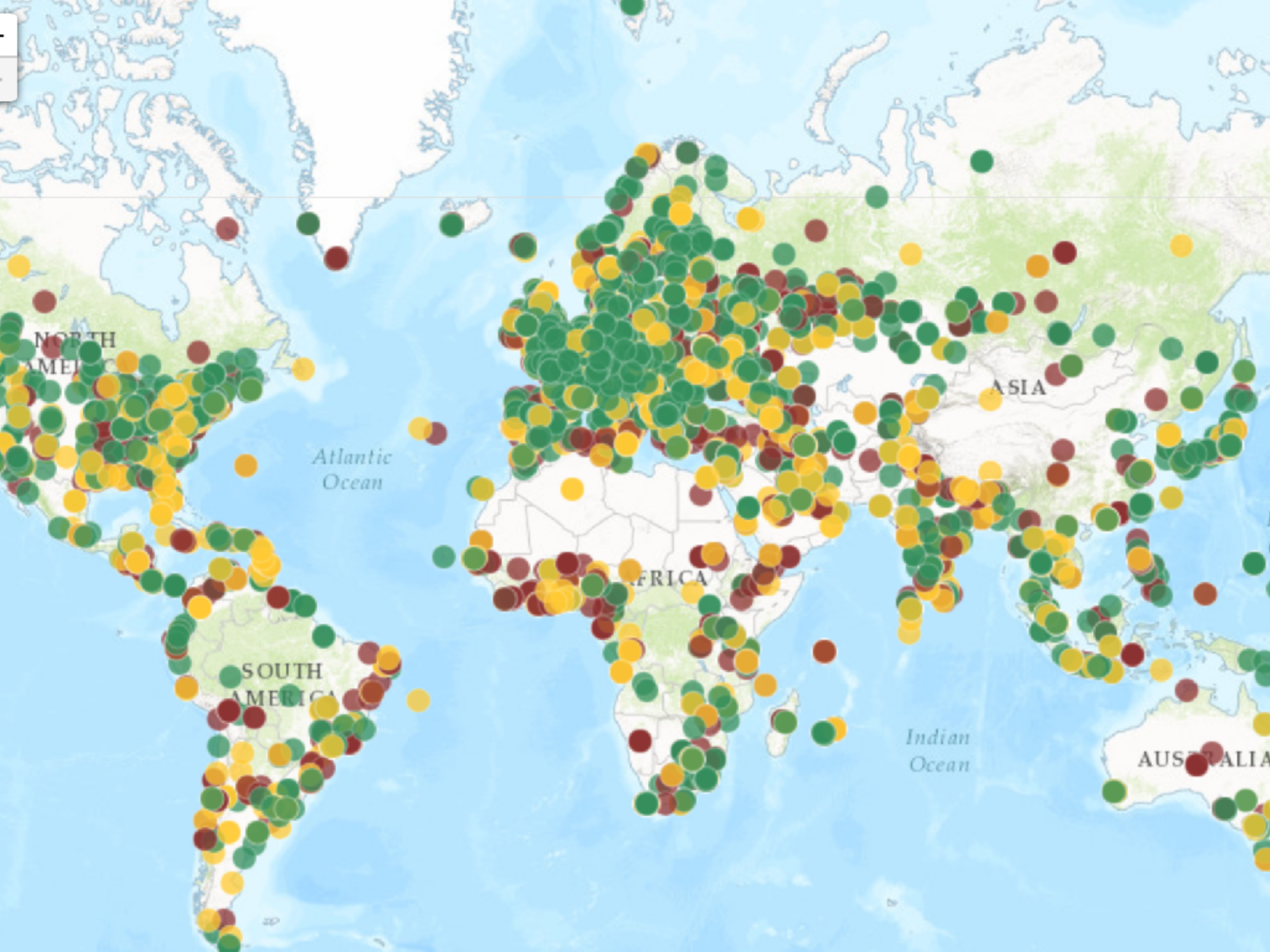
	Built-in	User-defined			
		Total UDM	Anchoring	DNSMON	Other
Ping	41	5514	1161	0	4353
Traceroute	45	4974	1163	848	2963
DNS	158	5247	0	3392	1855
SSL/TLS Certificate	4	244	0	0	244
NTP	0	67	0	0	67
HTTP	4	1216	1162	0	54
WiFi	0	15	0	0	15

Credits

- Every measurement has a cost in credits
- Why? Fairness and to avoid overload
- How to earn credits?

1. Hosting a probe / anchor
2. Being an RIPE NCC member (LIR)
3. Being RIPE Atlas sponsor
4. Being a RIPE Atlas Ambassador
5. Transfer
6. Cooperate as a researcher or academic

Growing RIPE Atlas

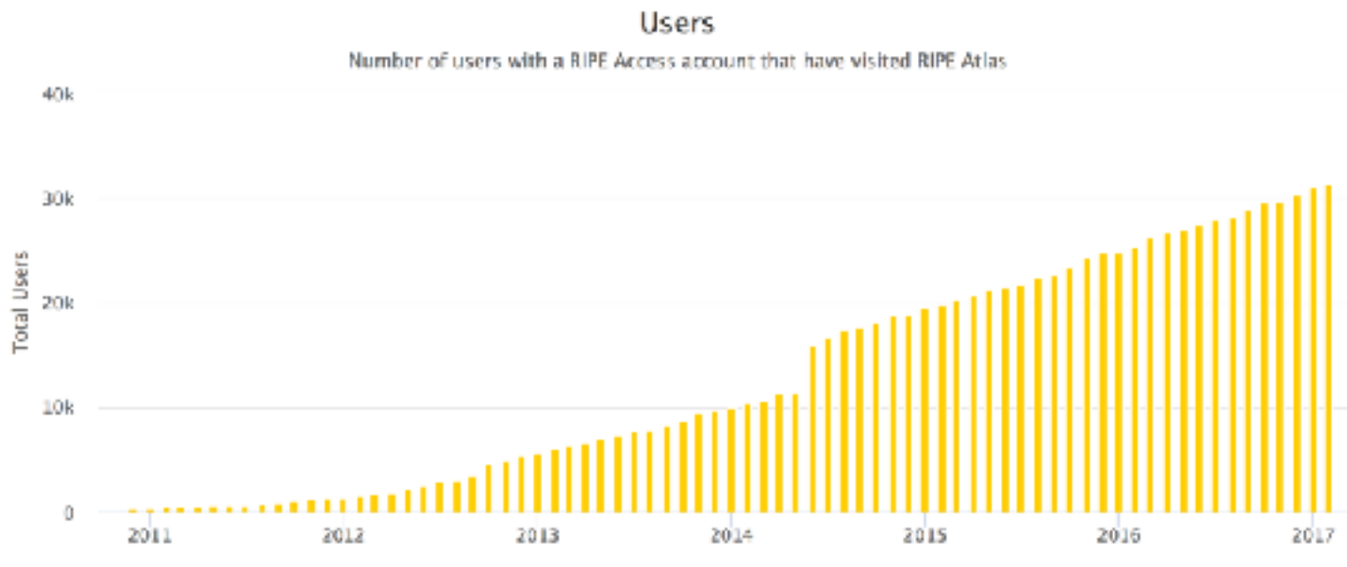

NORTH
AMERICA
Atlantic
Ocean
ASIA
AFRICA
SOUTH
AMERICA
Indian
Ocean
AUSTRALIA

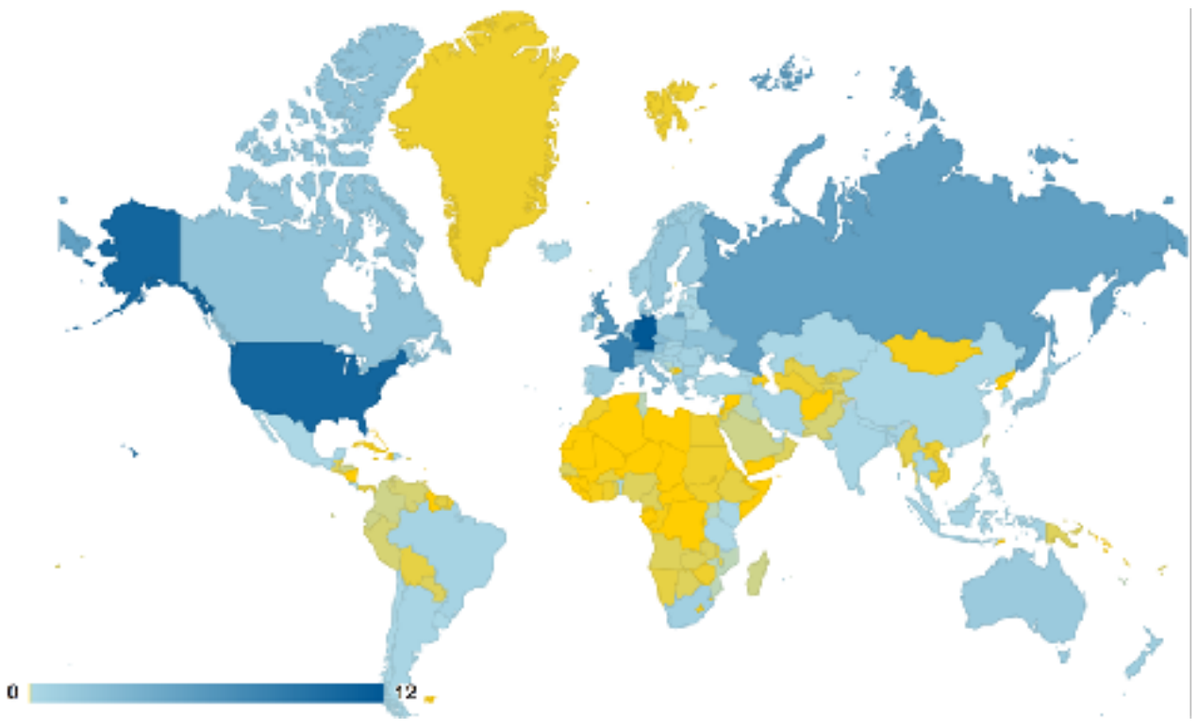
RIPE Atlas Community

- Users

- Sponsors
  - 5 sponsors in 2016
  - 2 already for 2017

- 300 +Ambassadors at many conferences





Trust and Good Will

- No passive measurements (no “snooping”)
- Set of measurements is limited
- All data is open and available to anyone
- Barrier to entry is low/cheap
- Open APIs
- Open source code on GitHub

Challenges

Data quality

- Good metadata
  - Probe tags
- Aggregates
- Probe diagnostics
- Baselines
  - Anchoring measurements
  - Stability metrics/tags

Security

- Probes:
  - No open ports; initiate connection; NAT is okay
  - Automatic FW updates
- Measurements triggered by “command servers”
  - Inverse ssh tunnels
- Security reviews

Examples

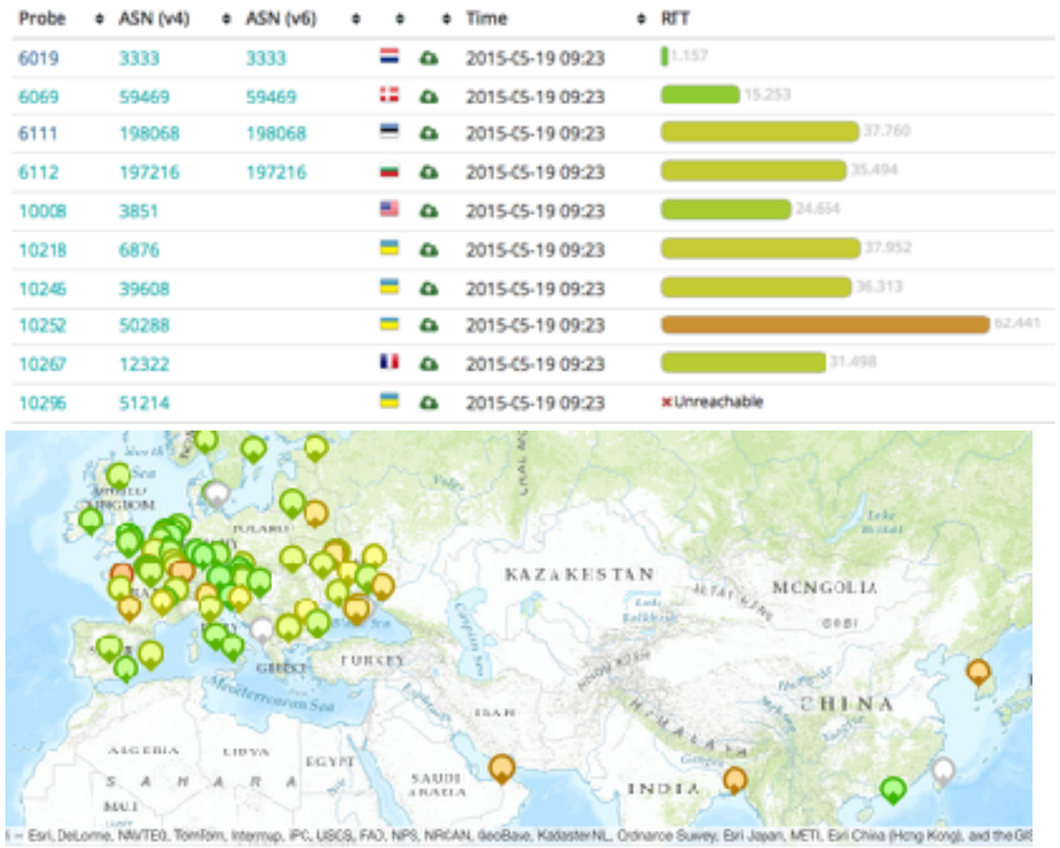
Examples of RIPE Atlas use

Visualisations

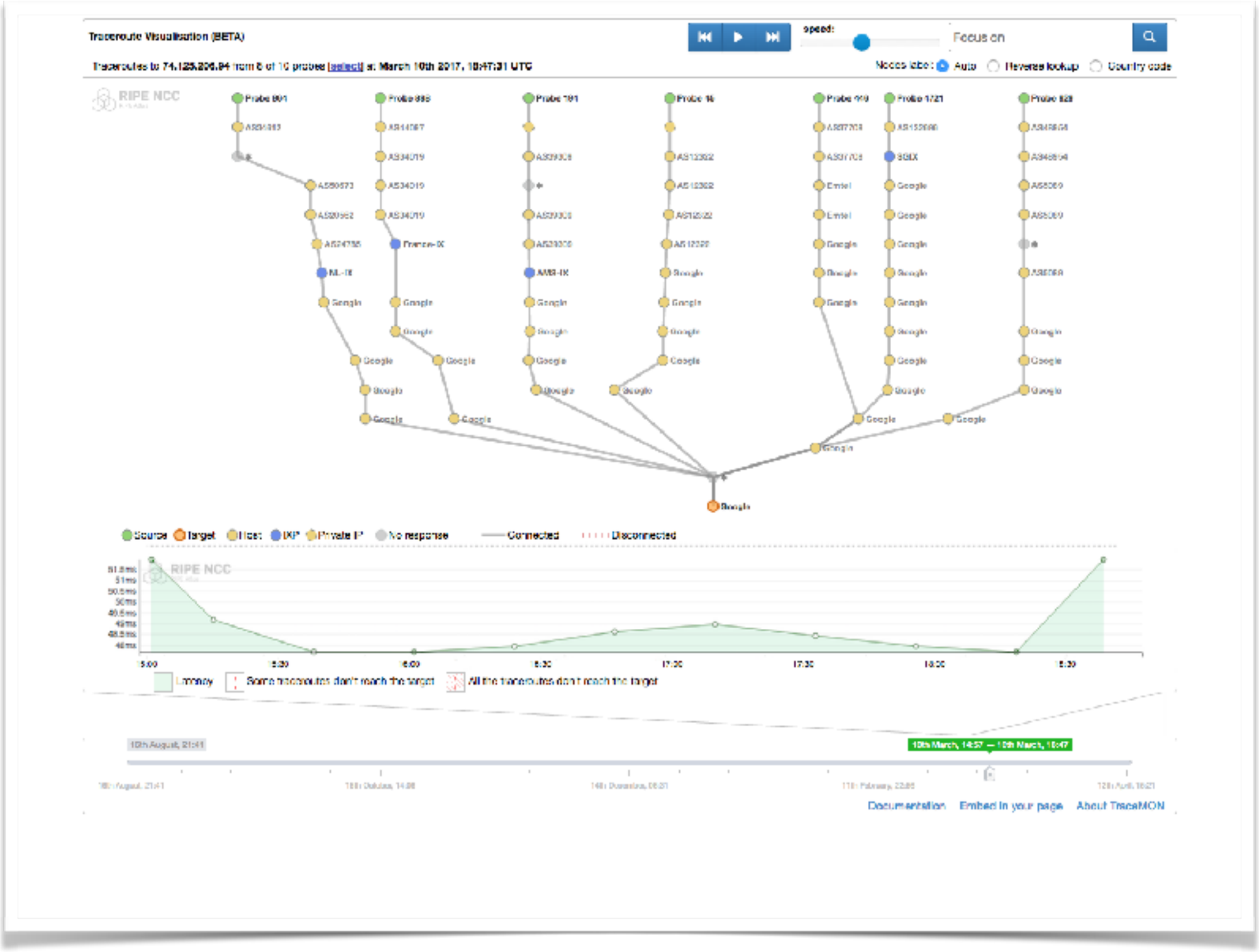
- List of probes: Sortable by RTT

- Map: Colour-coded by RTT

- LatencyMON: Compare multiple latency trends



Traceroute view: TraceMon



IXP Country Jedi

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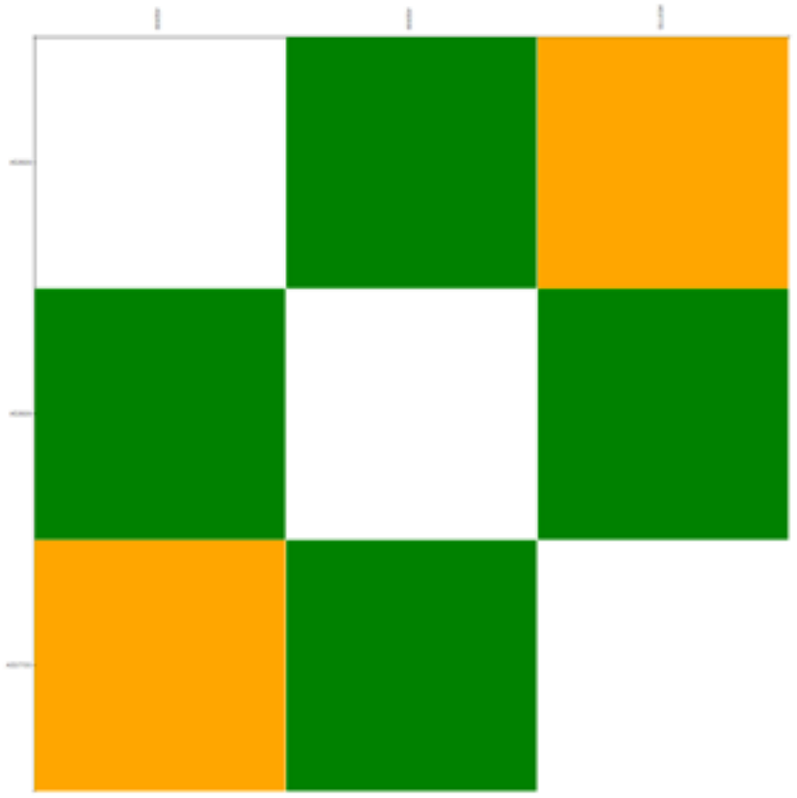
IXP IPs: NO, out-of-country IPs: YES

Tunisia

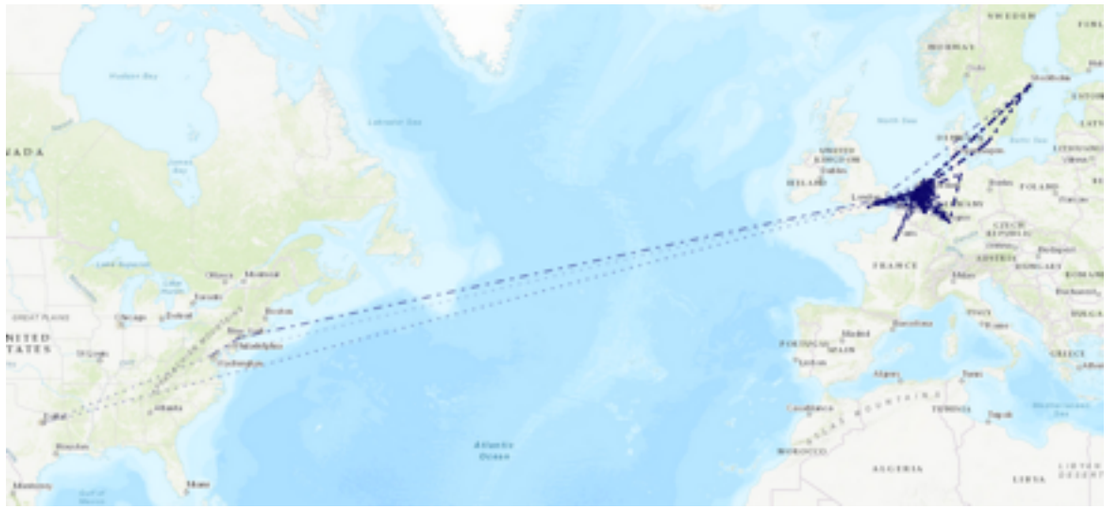


Netherlands

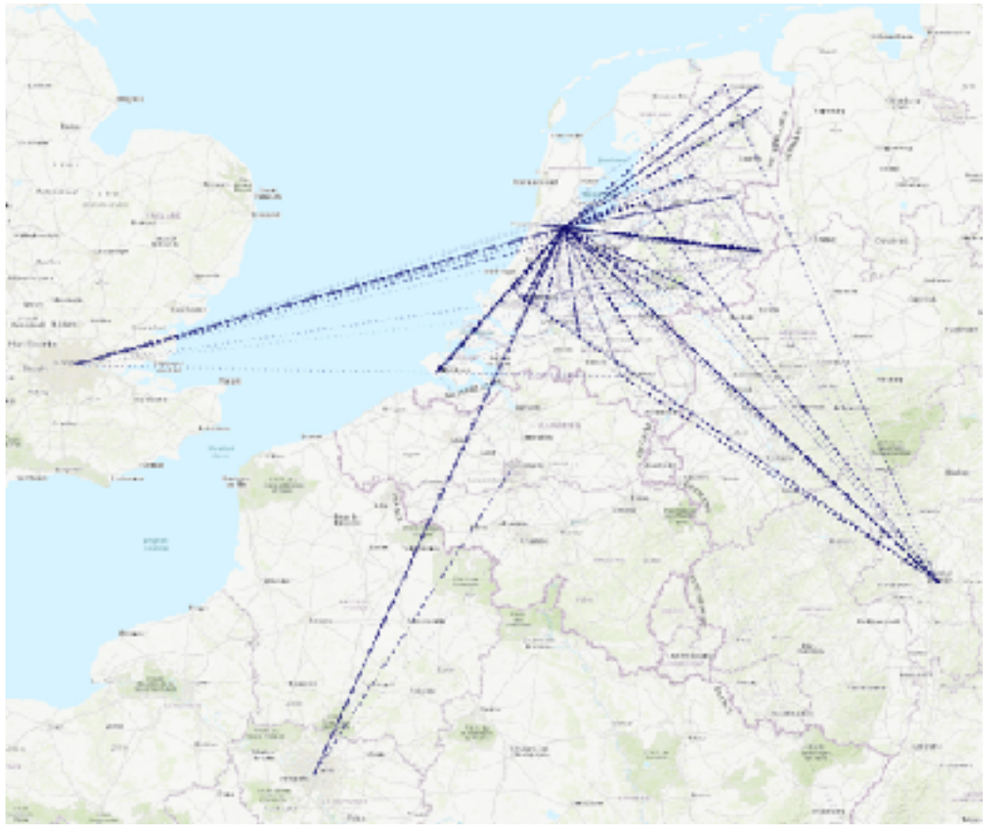
- https://github.com/emileaben/ixp-country-jedi

Paths for the Netherlands

IPv4

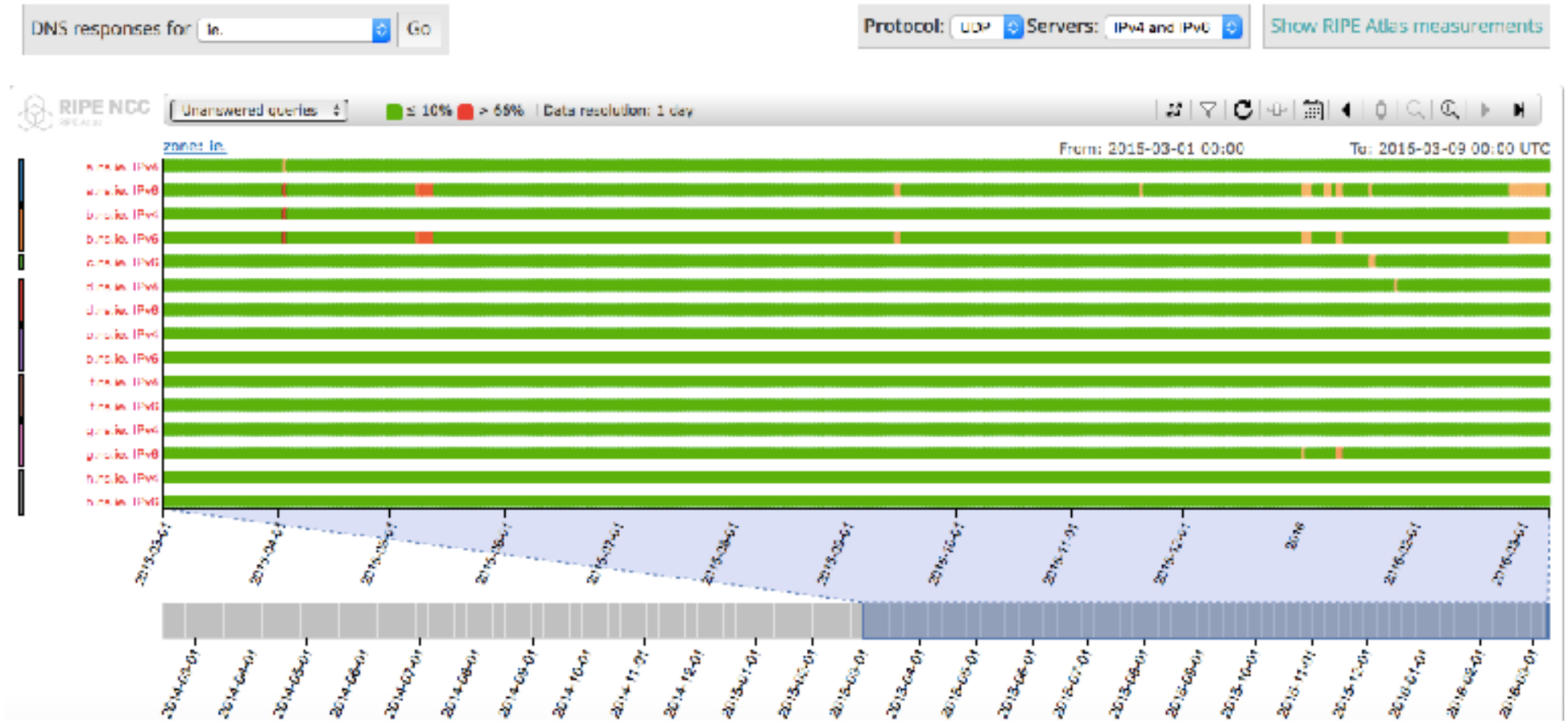


IPv6



DNSMON: dnsmon.ripe.net

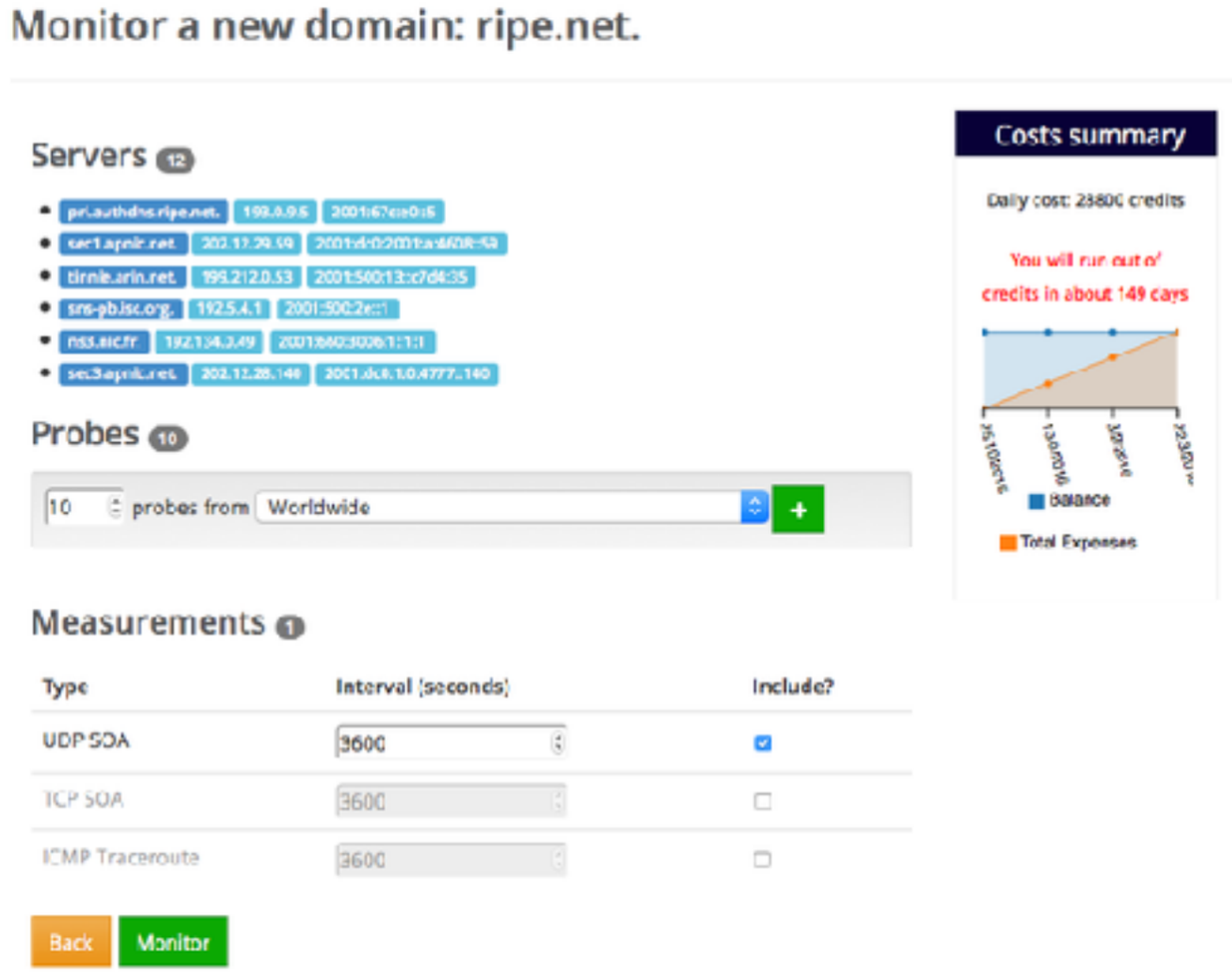
- From anchors to ccTLDs



- https://labs.ripe.net/Members/fatemah_mafi/an-updated-dns-monitoring-service

DomainMon

- Like “DNSMON”, but
  - from probes
  - to second-level domains



- https://labs.ripe.net/Members/su/domainmon-is-here

RIPE Atlas Contact Info

- https://atlas.ripe.net
- http://roadmap.ripe.net/ripe-atlas/

- Users' mailing list: ripe-atlas@ripe.net
- Articles and updates: https://labs.ripe.net/atlas
- Questions and bugs: atlas@ripe.net
- Twitter: @RIPE_Atlas and #RIPEAtlas