RIPE NCC
RIPE NETWORK COORDINATION CENTRE

Network Visualisation Workshop

Focus: RIPE Atlas

Christian Teuschel | September 2016 | iWeek ZA

Workshop Requirements

- Please make sure you have a RIPE NCC Access account!

https://access.ripe.net

- Voucher for 5,000 Atlas credits

Network Visualisation

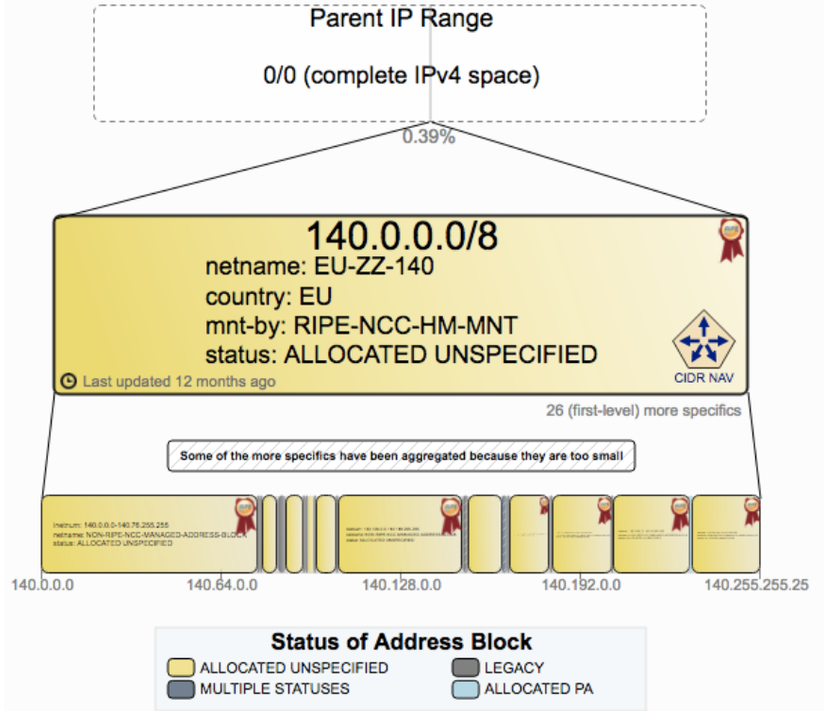
Overview

Network Visualisation

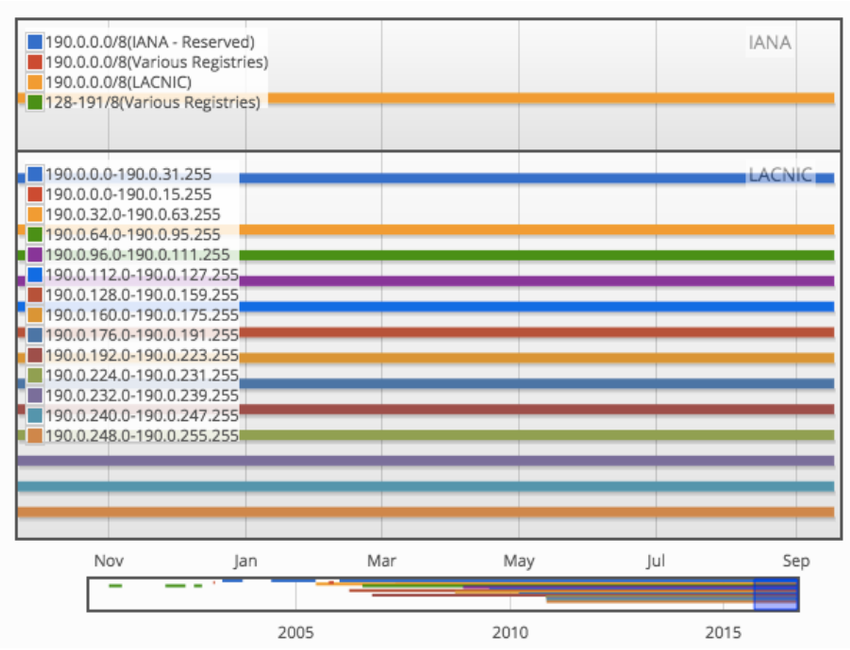
- Bringing raw data to life, help with interpretation and understanding
- Three main types of data:
  - Registry data
  - Routing data (BGP)
  - Active measurement data (RIPE Atlas, MLab, etc.)

Registry Data

- Source: RIR databases
  - AFRINIC, ARIN, APNIC, LACNIC and RIPE NCC
- Useful as supporting data set



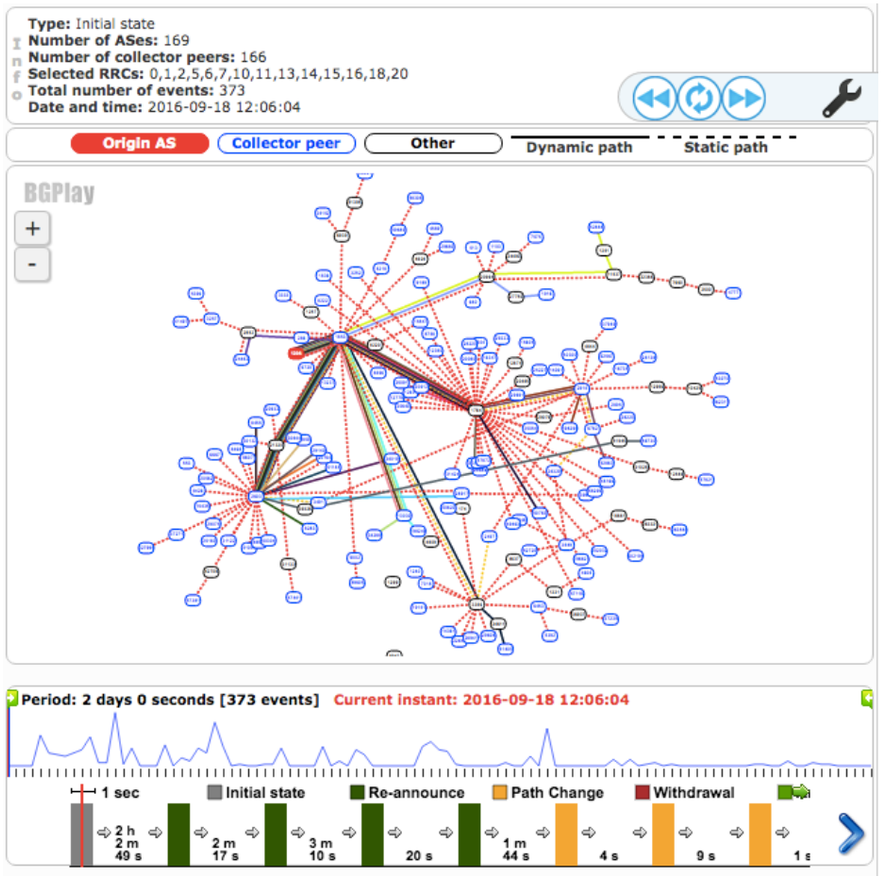
https://stat.ripe.net/widget/address-space-hierarchy



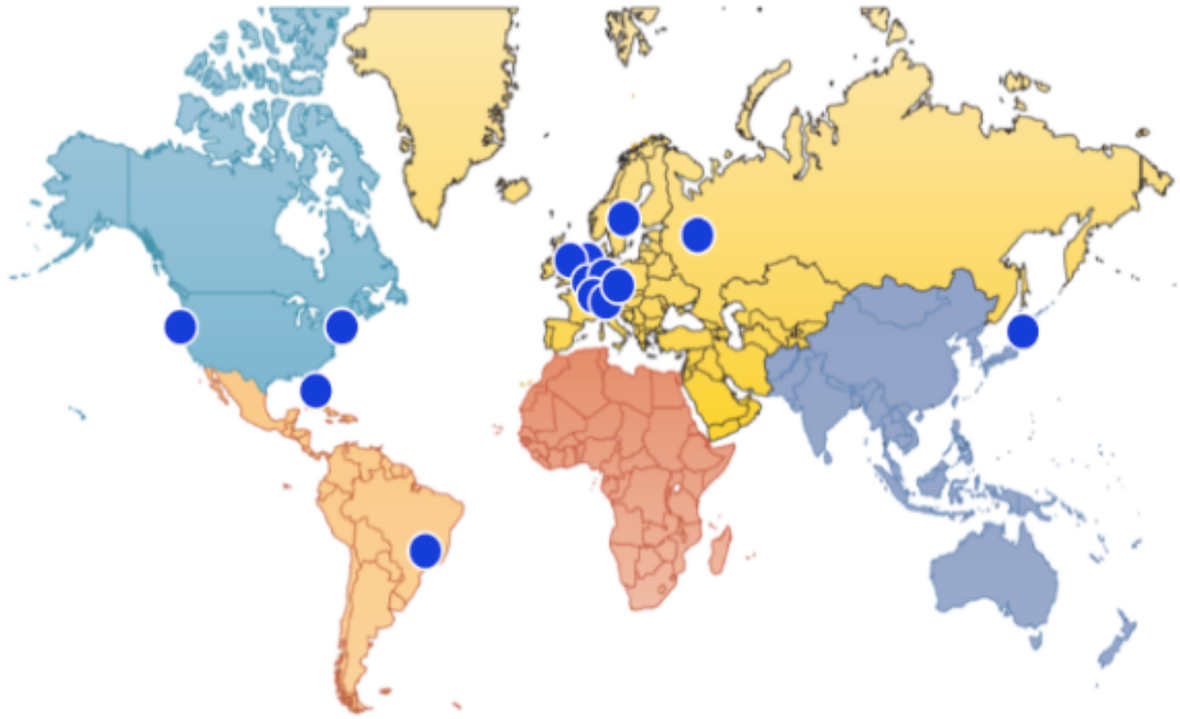
https://stat.ripe.net/widget/allocation-history

Routing Data

- RIPE NCC's RIS
  - http://ris.ripe.net



https://stat.ripe.net/widget/bgplay



Routing Data

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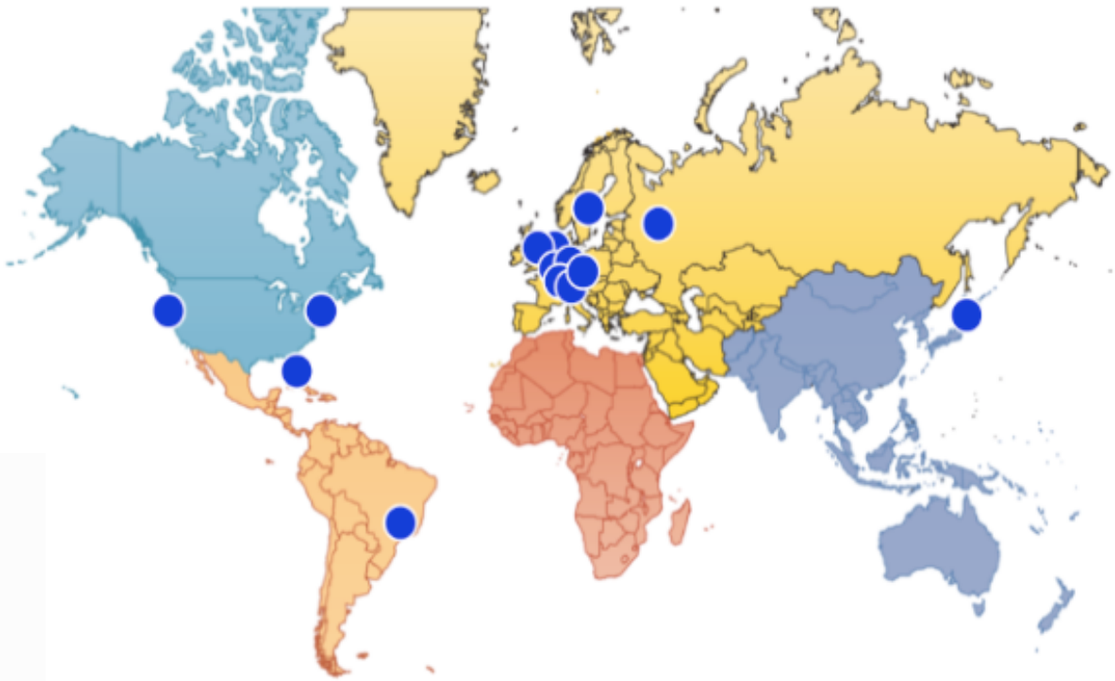
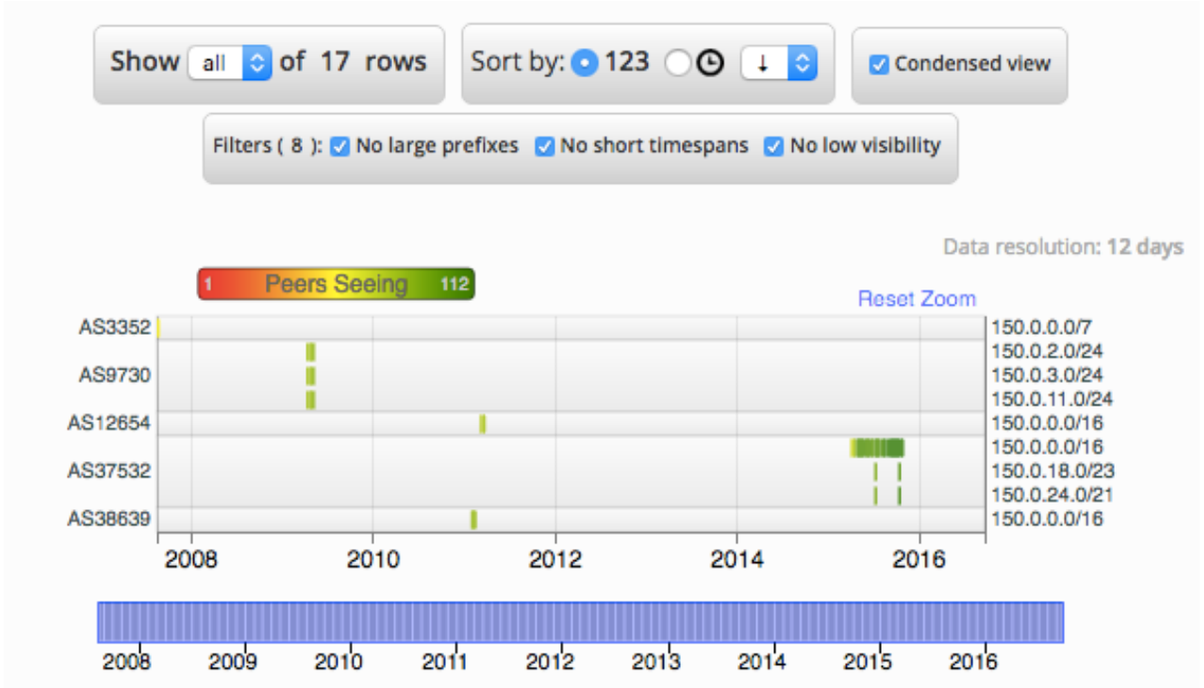
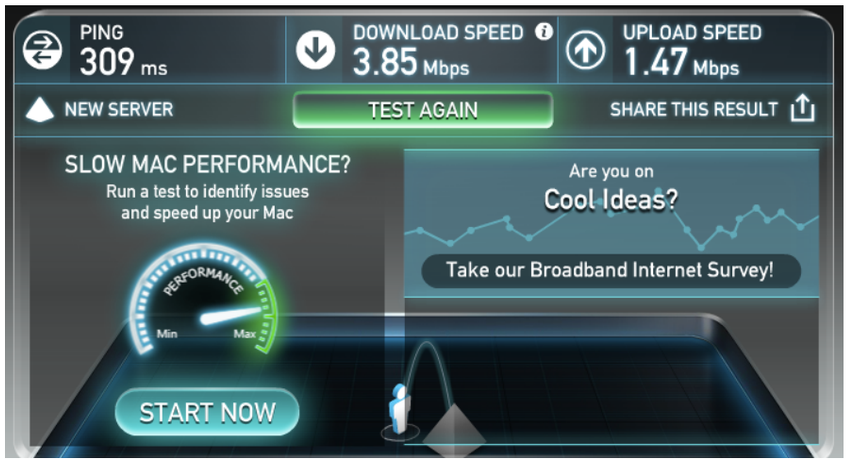




https://stat.ripe.net/widget/routing-history

Active Measurement Data

- RIPE Atlas
- MLab by Google
- Bandwidth measurements
  - Speedchecker, Ookla, …



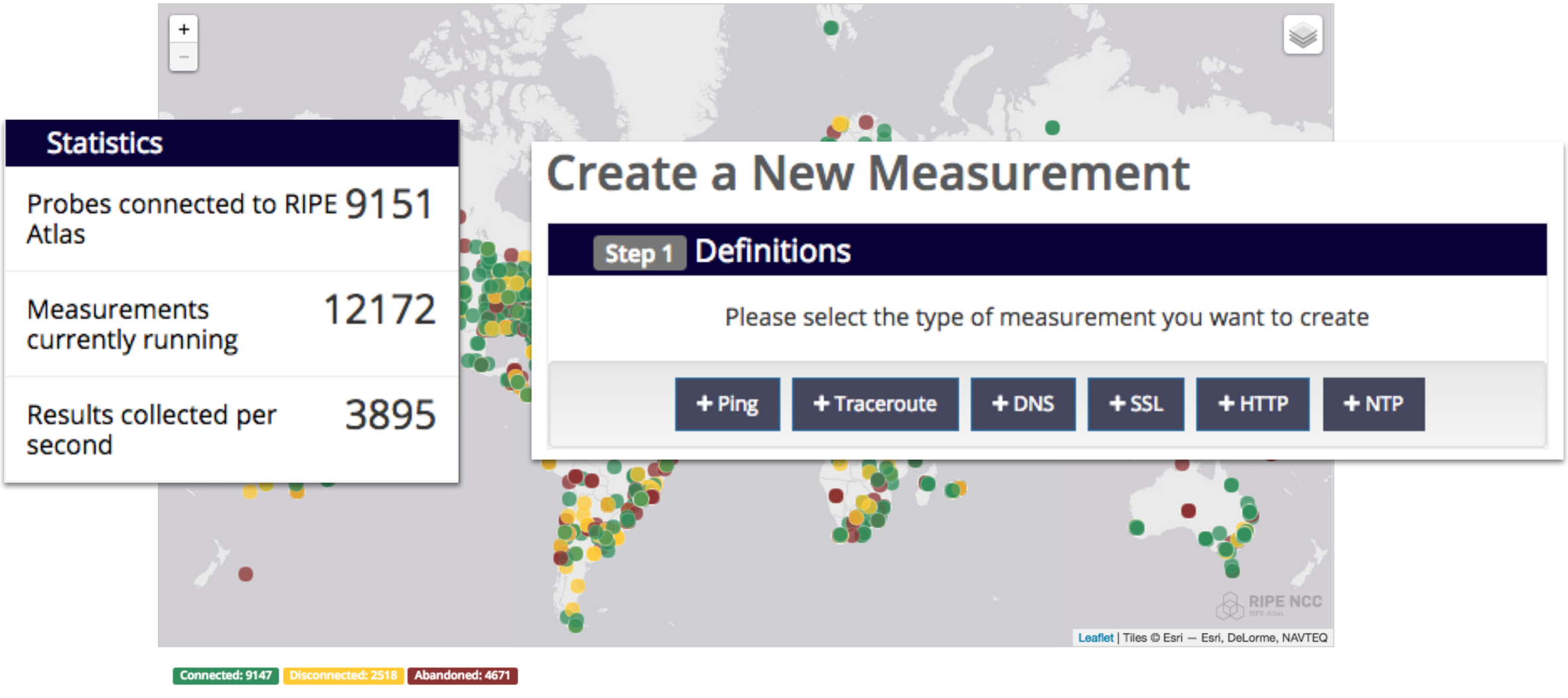
- Google ad measurements done by APNIC

RIPE Atlas

Introduction

RIPE Atlas

- A brief introduction
  - Global network for Internet measurements

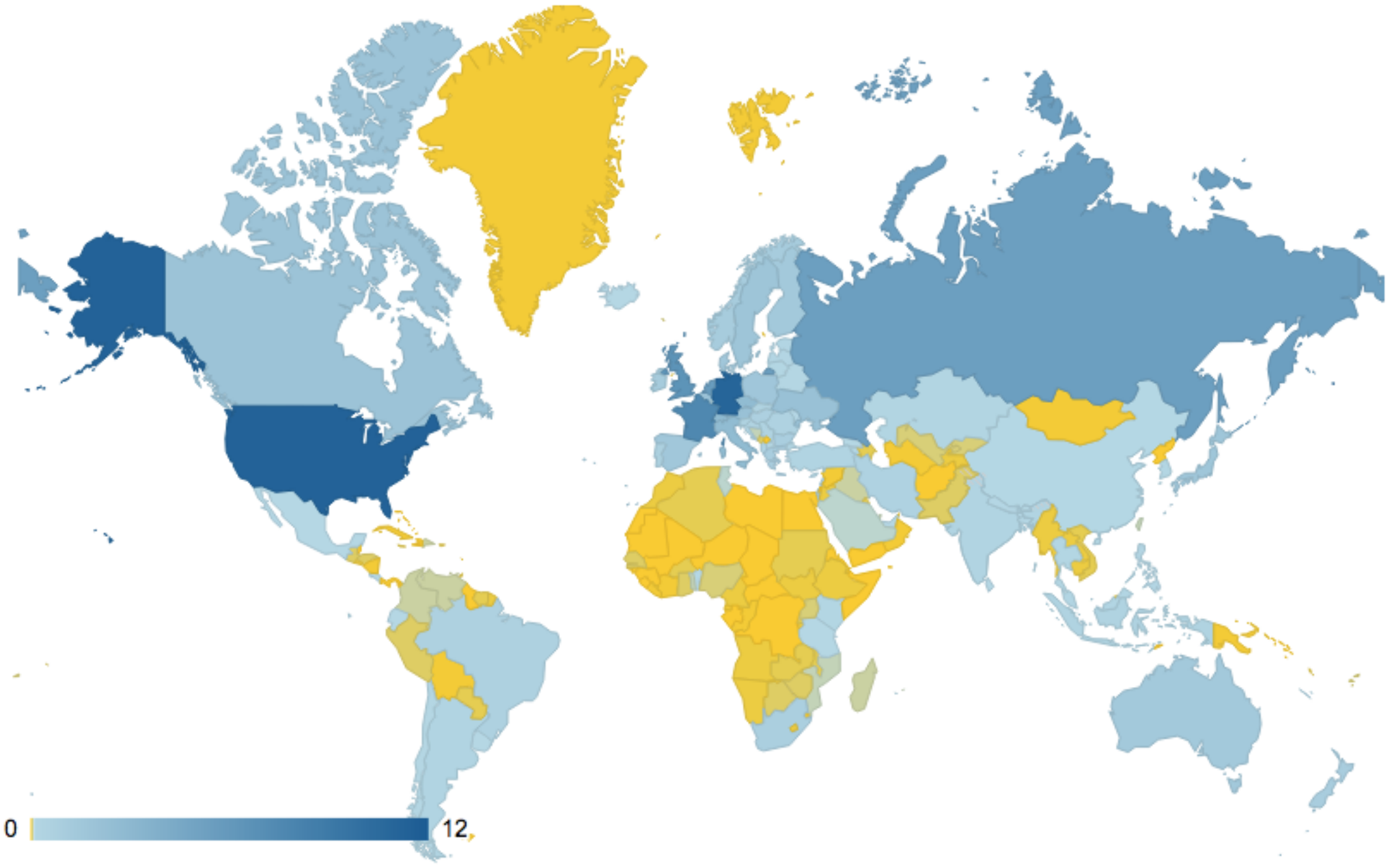


RIPE Atlas

- Standard Probe
  - TP-Link MR3020
  - Version 3

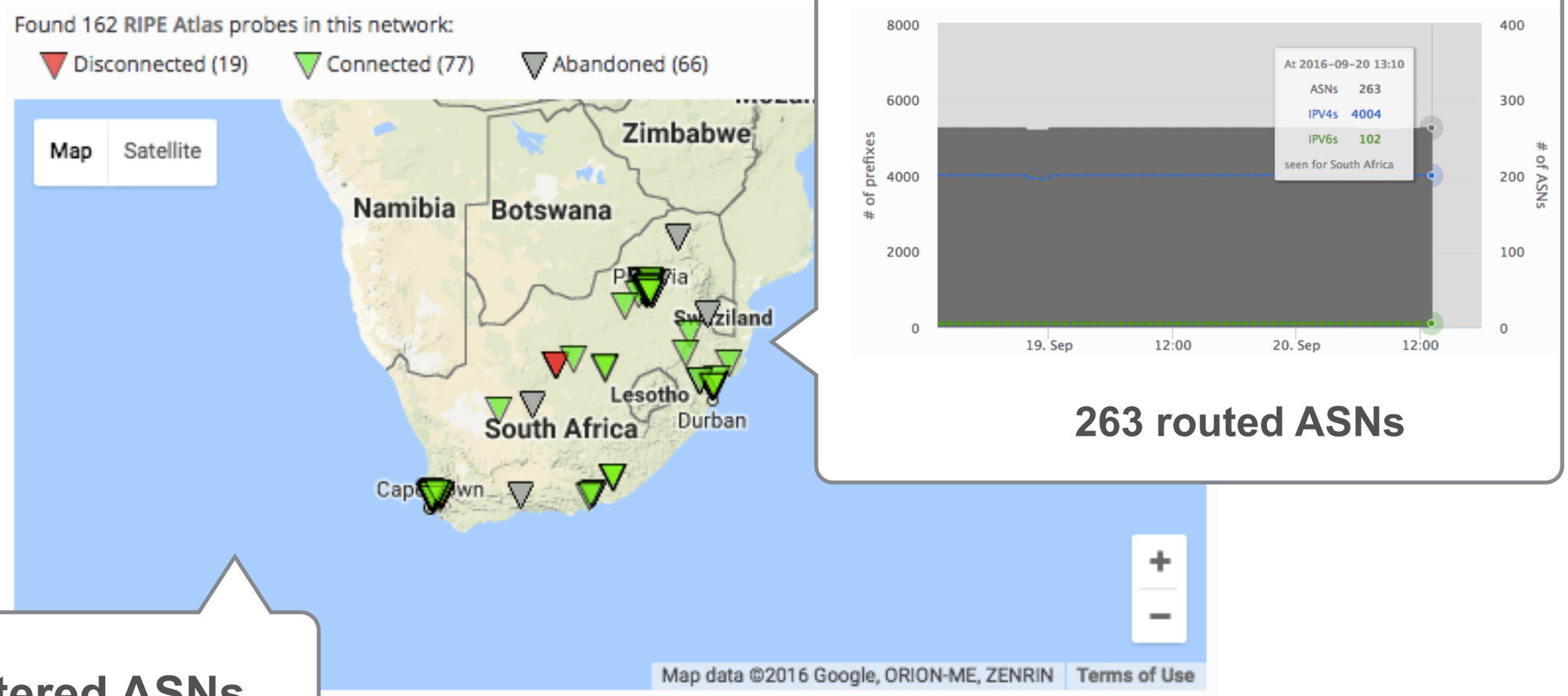
- Atlas Anchor
  - Higher capacity
  - Currently 216 nodes
  - Soekris Net6501-70
  - https://atlas.ripe.net/anchors/

RIPE Atlas



RIPE Atlas

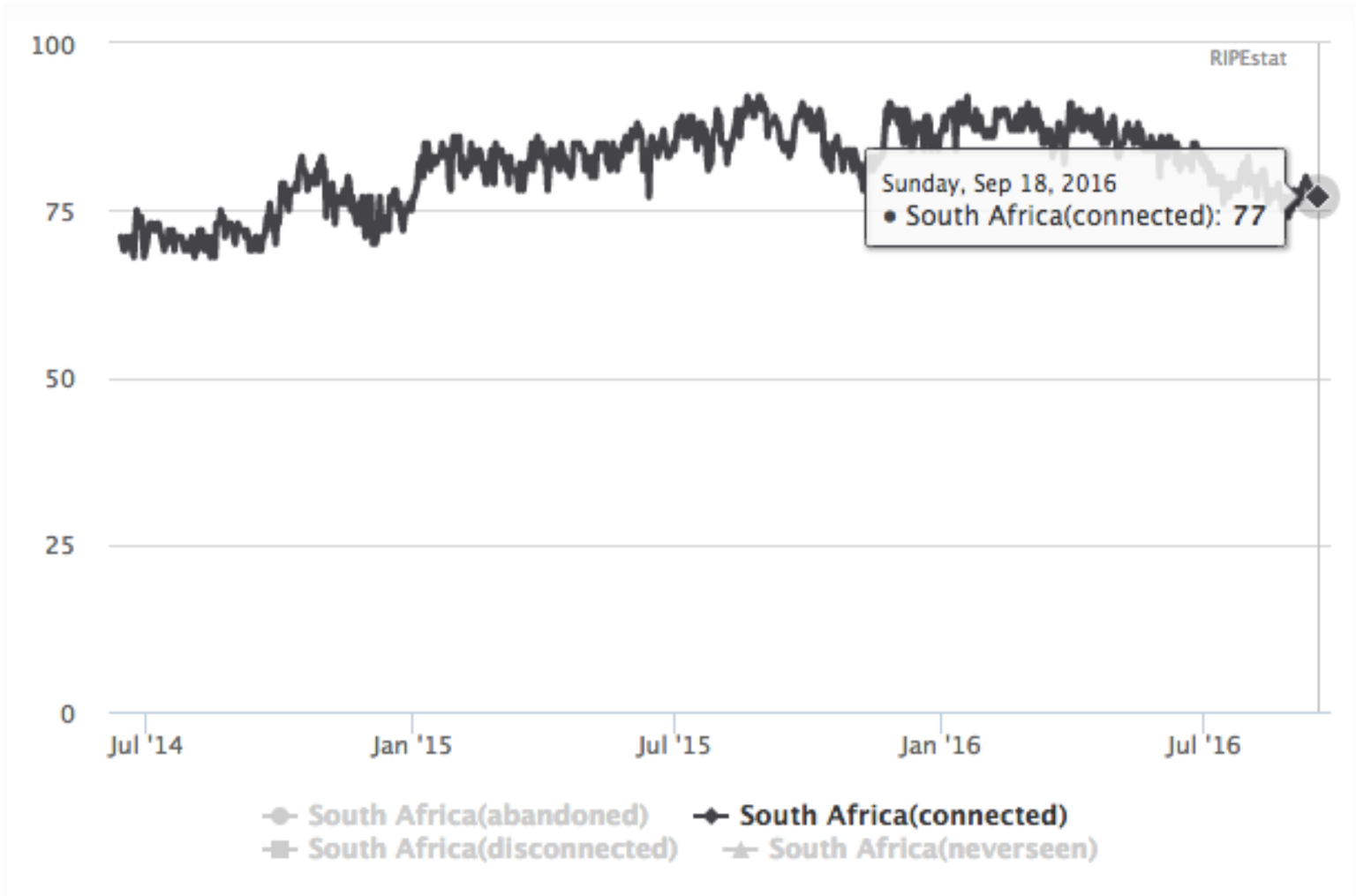
- RIPE Atlas probes in South Africa



https://stat.ripe.net/za#tabId=activity

RIPE Atlas

- RIPE Atlas probes in South Africa



https://stat.ripe.net/za#tabId=activity

RIPE Atlas

- RIPE Atlas anchors in South Africa

Hostname	Probe	Company	City	Country	Capabilities
za-cpt-as37663	6187	INX-ZA / Internet Service Providers' Association of South Africa	Cape Town	South Africa	ping IPv4 IPv6 traceroute IPv4 IPv6 http IPv4 IPv6
za-jnb-as10474	6053	MWEB AR13627-RIPE	Johannesburg	South Africa	ping IPv4 IPv6 traceroute IPv4 IPv6 http IPv4 IPv6
za-jnb-as37474	6179	INX-ZA / Internet Service Providers' Association of South Africa	Johannesburg	South Africa	ping IPv4 IPv6 traceroute IPv4 IPv6 http IPv4 IPv6
za-umr-as37668	6176	INX-ZA / Internet Service Providers' Association of South Africa	Umhlanga	South Africa	ping IPv4 IPv6 traceroute IPv4 IPv6 http IPv4 IPv6

https://atlas.ripe.net/anchors/list/

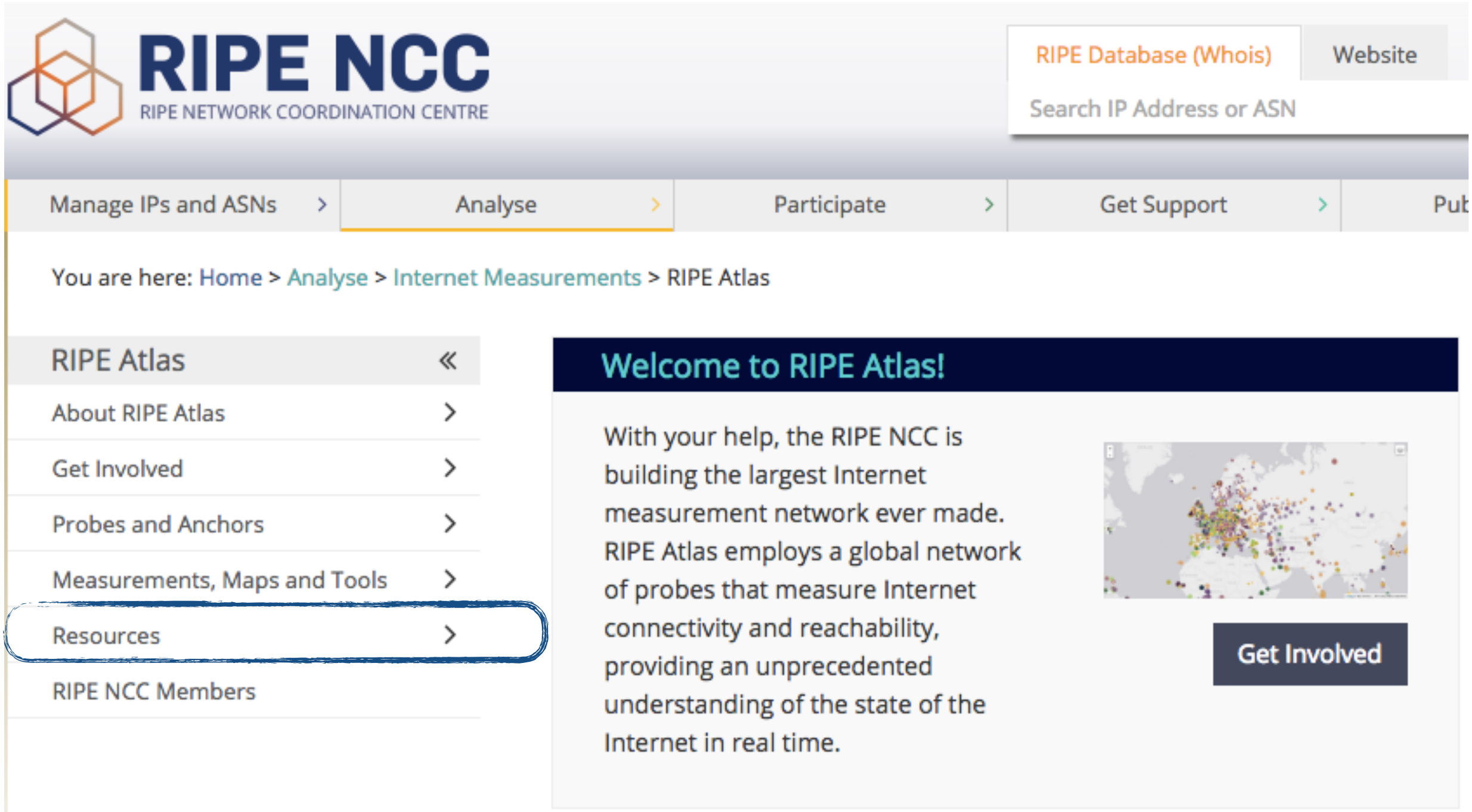
Agenda

- Introduction to web UI
- Measurements
- Tools
  - LatencyMon, QuickLook, DNSMON, DomainMON and IXP-Country-Jedi
- Command line tools
- RIPE Atlas APIs
- DIY workshop

RIPE Atlas

Web UI

Web UI


RIPE NCC
RIPE NETWORK COORDINATION CENTRE
RIPE Database (Whois)
Website
Search IP Address or ASN
Manage IPs and ASNs
Analyse
Participate
Get Support
Pub
You are here: Home > Analyse > Internet Measurements > RIPE Atlas
RIPE Atlas
About RIPE Atlas
Get Involved
Probes and Anchors
Measurements, Maps and Tools
Resources
RIPE NCC Members
Welcome to RIPE Atlas!
With your help, the RIPE NCC is building the largest Internet measurement network ever made. RIPE Atlas employs a global network of probes that measure Internet connectivity and reachability, providing an unprecedented understanding of the state of the Internet in real time.
Get Involved

Exercise I

- Go to https://atlas.ripe.net
- Check if you can log in with your RIPE NCC Access account!

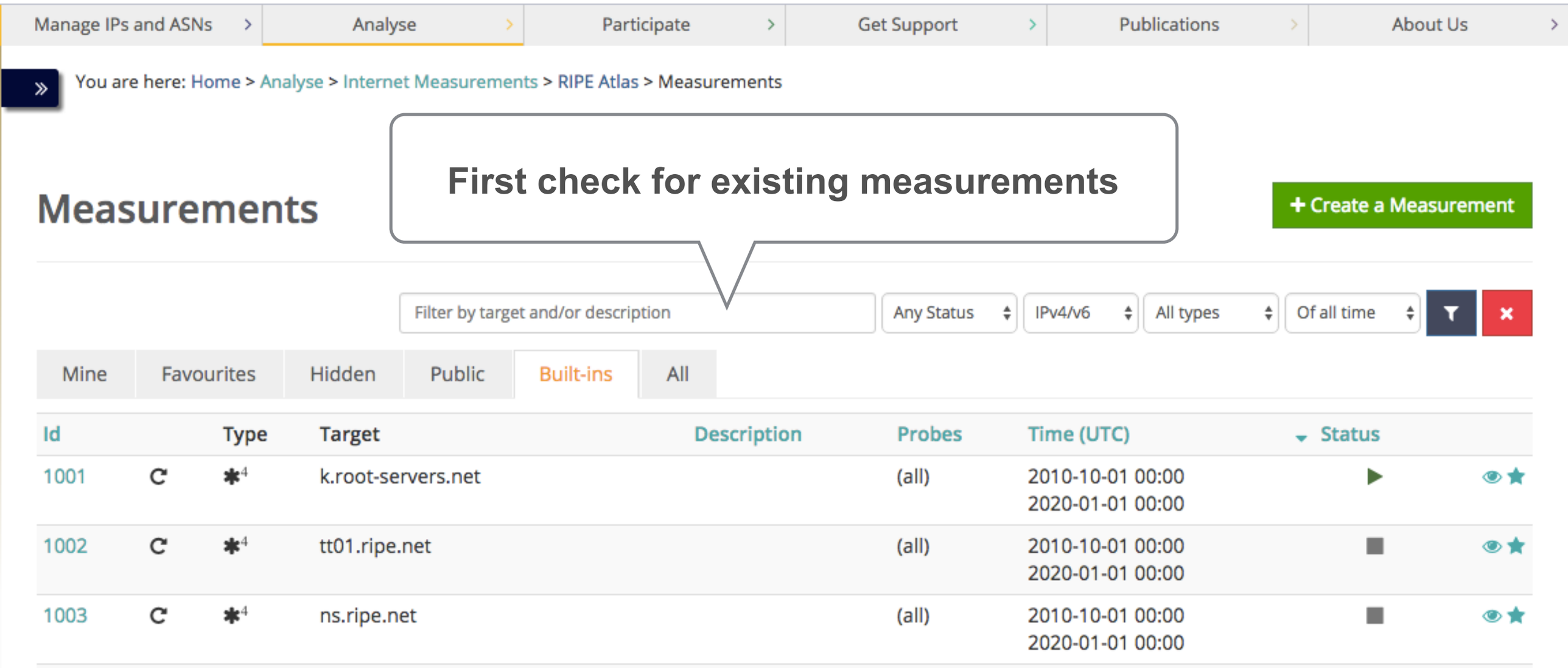
RIPE Atlas

Measurements

Build-In Measurements

- What is it?

  https://atlas.ripe.net/measurements/



Build-In Measurements

- Probe view

https://atlas.ripe.net/probes/

Manage IPs and ASNs | Analyse | Participate | Get Support | Publications | About Us

You are here: Home > Analyse > Internet Measurements > RIPE Atlas > Probes

Probes

This is a list of all current RIPE Atlas probes, including information specific to each probe. More probes are continually coming online.

- Learn more about probes
- See the probes map
- Apply for your own probe

Filter by id/asn/country/description | Any Status | IPv4/v6 | Any Country

Mine | Shared with Me | Favourites | Hidden | Sponsored | Ambassadorships | Public | All

Id	ASN v4	ASN v6	Country	Description	Connection Status
3	3265	3265		Ανδρέας@Άμστερνταμ	1 week, 2 days
4	3265			xs4all adsl 52/5 IPv6	1 day, 2 hours
5	3265			Bert's home; xs4all vDSL 40/4 IPv6	5 months, 2 weeks
7	9143			@dfk ziggo cable 40/4 Mbit/s	2 weeks, 3 days
8	3265	3265		@dfk xs4all 500/500Mbit/s FTTH	1 day, 14 hours

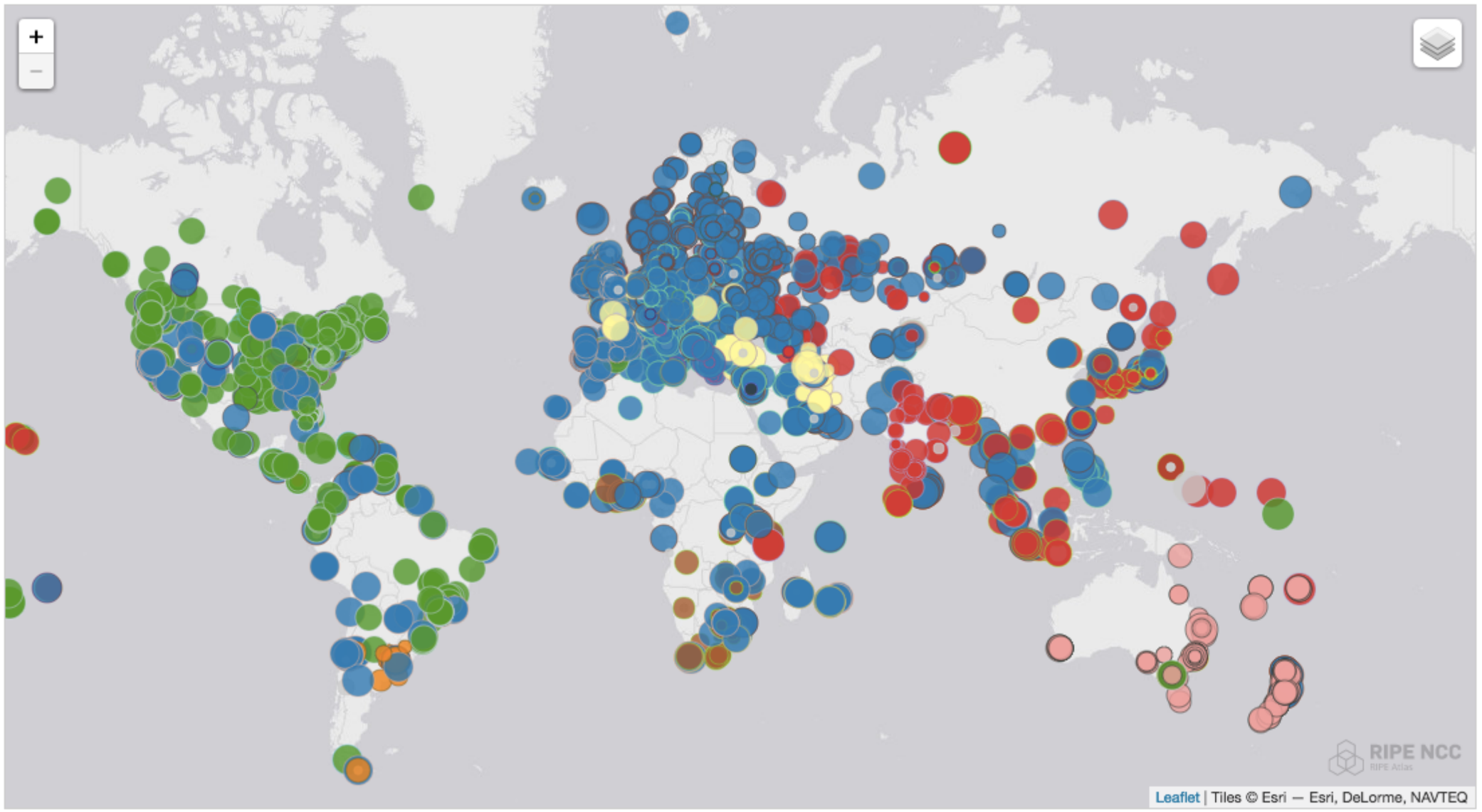
Exercise II

- Pick a probe and look up build-in measurement results!

Build-In Measurements

- Global view

https://atlas.ripe.net/results/maps/



User-Defined Measurements

- Custom measurements
  - All measurement types possible
  - Credit system to keep the resource allocation fair

User-Defined Measurements

- Credit system

  https://atlas.ripe.net/user/credits

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» You are here: Home > Analyse > Internet Measurements > RIPE Atlas > My Atlas > My Credits

Credits

Here you can see the history of your credit use and current consumption, transfer credits to someone else, and redeem a voucher for credits if you have one.

935,356

0.00 credits / hour

History | Charts & Archives | Transfer | Standing Order | Share Access | Redeem voucher

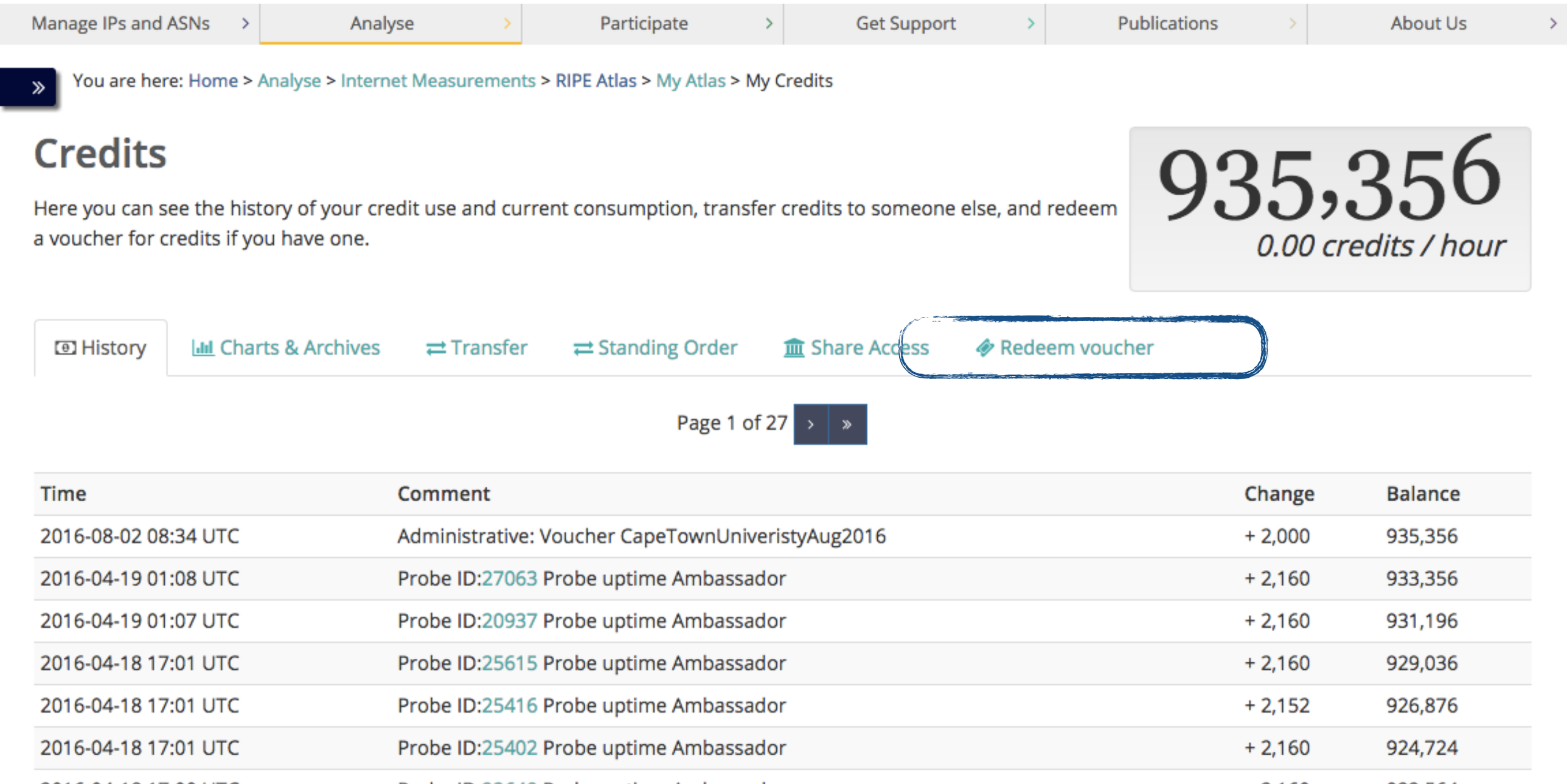
Page 1 of 27 › »

Time	Comment	Change	Balance
2016-08-02 08:34 UTC	Administrative: Voucher CapeTownUniveristyAug2016	+ 2,000	935,356
2016-04-19 01:08 UTC	Probe ID:27063 Probe uptime Ambassador	+ 2,160	933,356
2016-04-19 01:07 UTC	Probe ID:20937 Probe uptime Ambassador	+ 2,160	931,196
2016-04-18 17:01 UTC	Probe ID:25615 Probe uptime Ambassador	+ 2,160	929,036
2016-04-18 17:01 UTC	Probe ID:25416 Probe uptime Ambassador	+ 2,152	926,876
2016-04-18 17:01 UTC	Probe ID:25402 Probe uptime Ambassador	+ 2,160	924,724

Exercise III

- Redeem your voucher “iweek_2016”

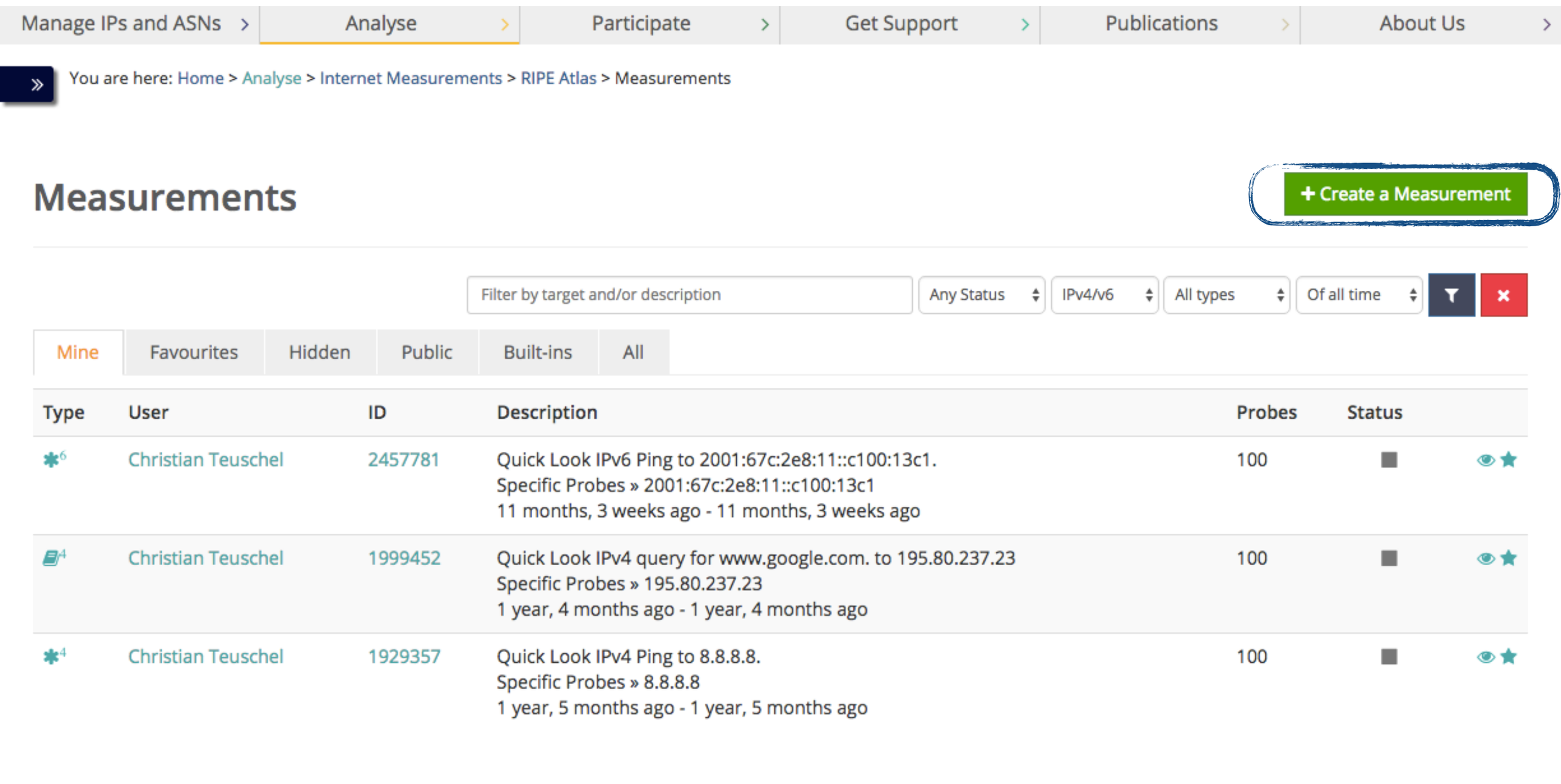
  https://atlas.ripe.net/user/credits



Exercise IV

- Create a ping measurement

  https://atlas.ripe.net/measurements/



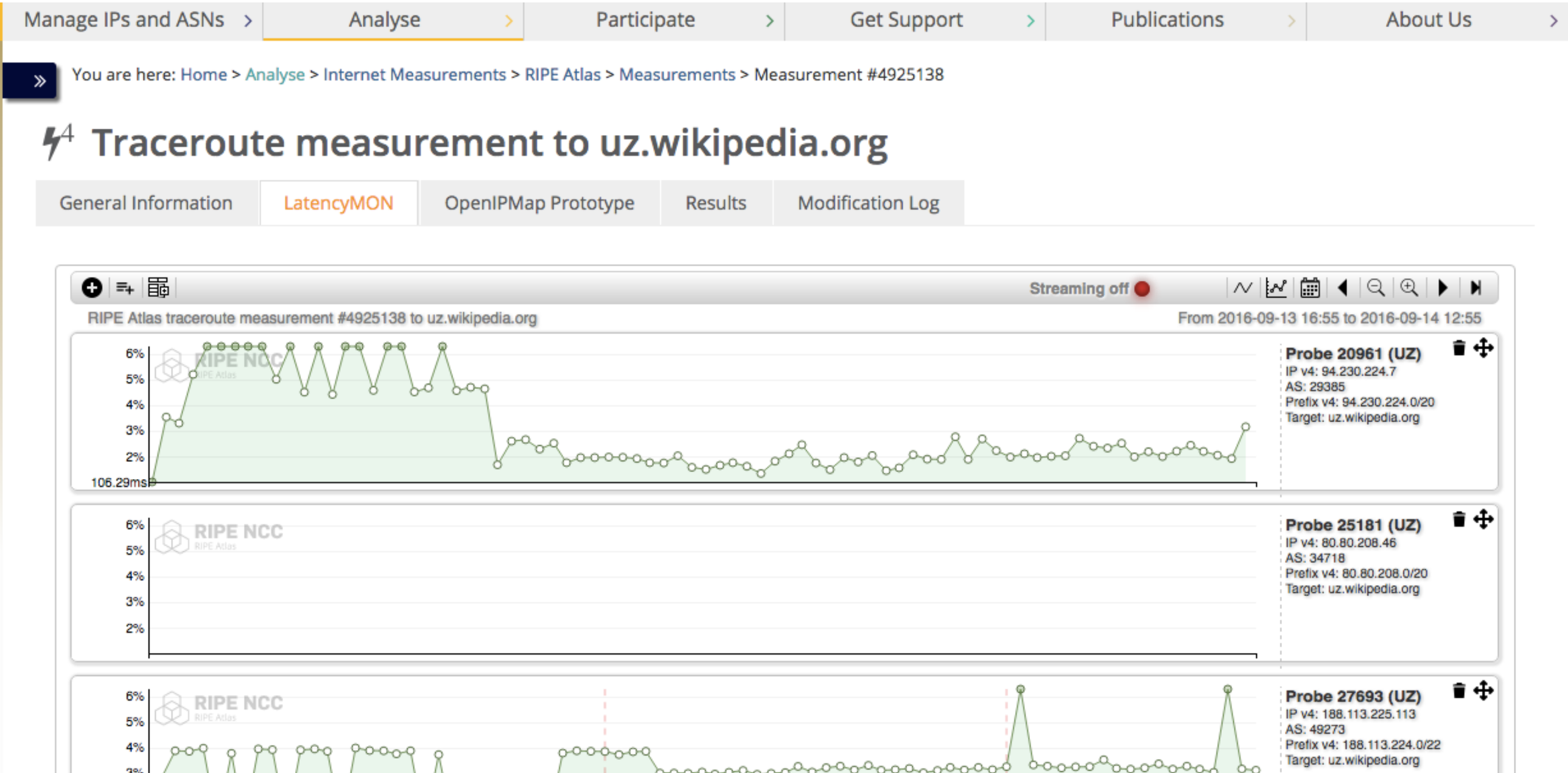
RIPE Atlas

LatencyMON

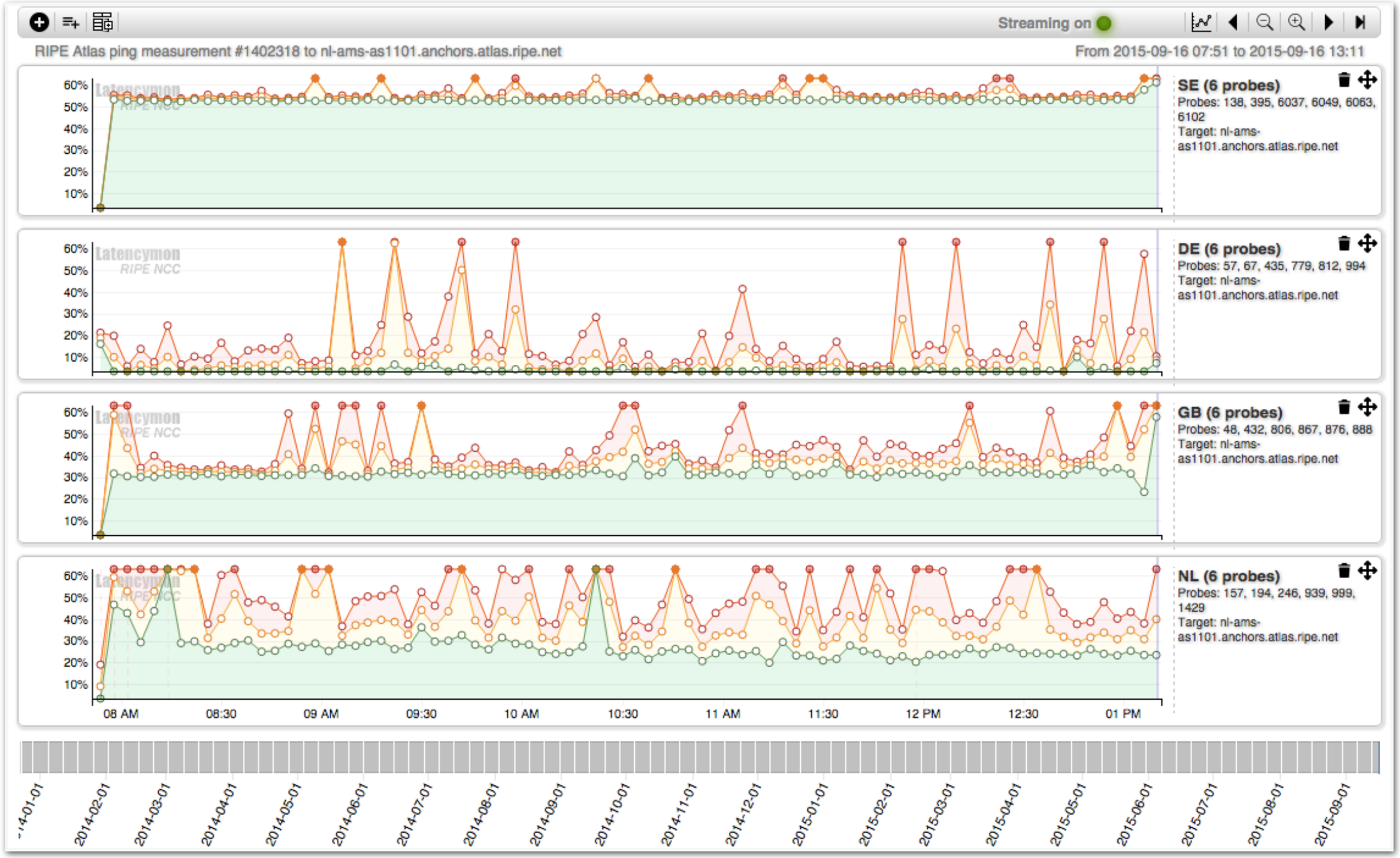
LatencyMON

- Every running ping measurement

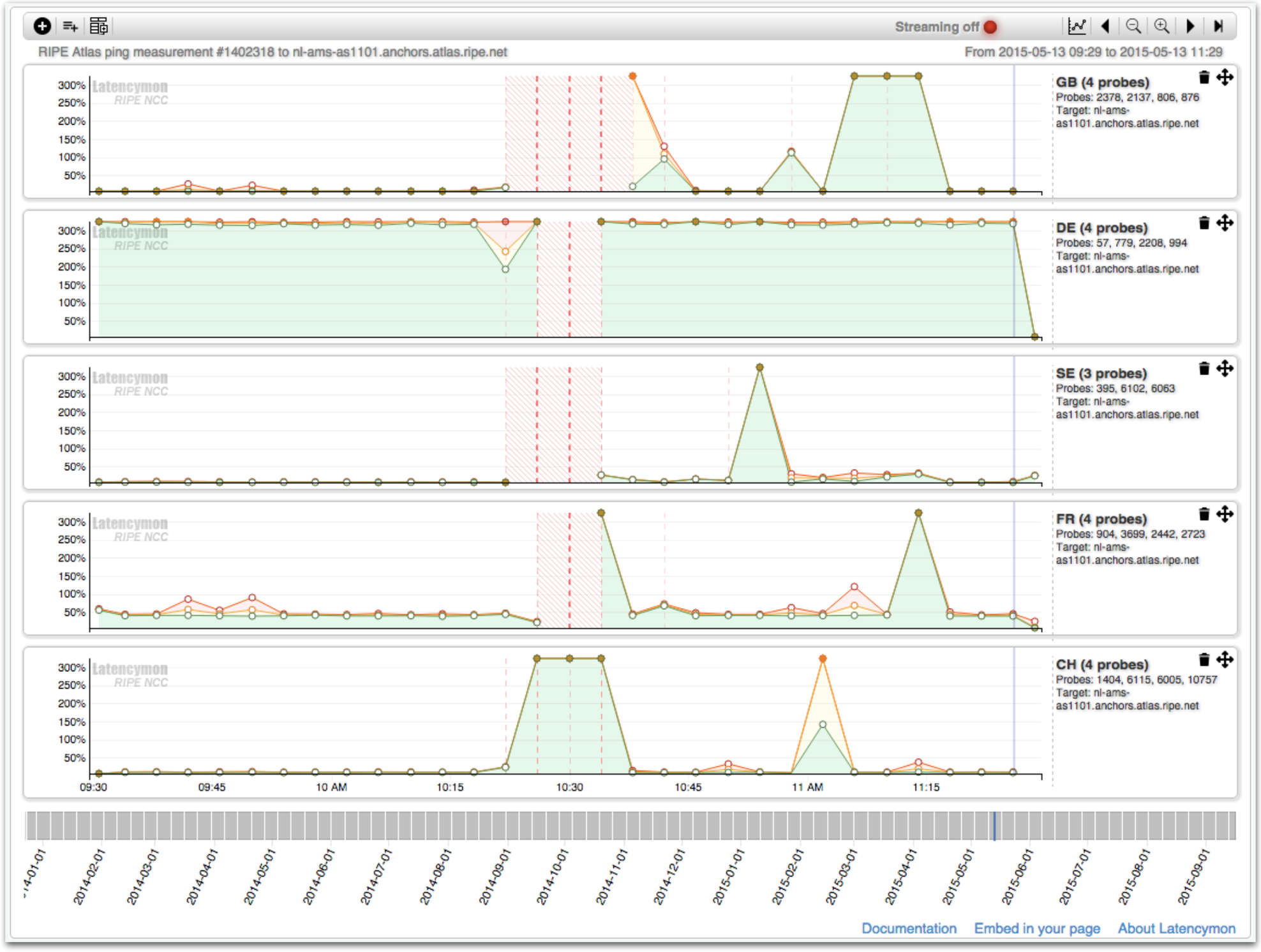
  https://atlas.ripe.net/measurements



LatencyMON


Streaming on
RIPE Atlas ping measurement #1402318 to nl-ams-as1101.anchors.atlas.ripe.net
From 2015-09-16 07:51 to 2015-09-16 13:11
SE (6 probes)
Probes: 138, 395, 6037, 6049, 6063, 6102
Target: nl-ams-as1101.anchors.atlas.ripe.net
DE (6 probes)
Probes: 57, 67, 435, 779, 812, 994
Target: nl-ams-as1101.anchors.atlas.ripe.net
GB (6 probes)
Probes: 48, 432, 806, 867, 876, 888
Target: nl-ams-as1101.anchors.atlas.ripe.net
NL (6 probes)
Probes: 157, 194, 246, 939, 999, 1429
Target: nl-ams-as1101.anchors.atlas.ripe.net
60%
50%
40%
30%
20%
10%
08 AM
08:30
09 AM
09:30
10 AM
10:30
11 AM
11:30
12 PM
12:30
01 PM
2014-01-01
2014-02-01
2014-03-01
2014-04-01
2014-05-01
2014-06-01
2014-07-01
2014-08-01
2014-09-01
2014-10-01
2014-11-01
2014-12-01
2015-01-01
2015-02-01
2015-03-01
2015-04-01
2015-05-01
2015-06-01
2015-07-01
2015-08-01
2015-09-01

LatencyMON


Streaming off
RIPE Atlas ping measurement #1402318 to nl-ams-as1101.anchors.atlas.ripe.net
From 2015-05-13 09:29 to 2015-05-13 11:29
300%
250%
200%
150%
100%
50%
Latencymon
RIPE NCC
GB (4 probes)
Probes: 2378, 2137, 806, 876
Target: nl-ams-as1101.anchors.atlas.ripe.net
DE (4 probes)
Probes: 57, 779, 2208, 994
Target: nl-ams-as1101.anchors.atlas.ripe.net
SE (3 probes)
Probes: 395, 6102, 6063
Target: nl-ams-as1101.anchors.atlas.ripe.net
FR (4 probes)
Probes: 904, 3699, 2442, 2723
Target: nl-ams-as1101.anchors.atlas.ripe.net
CH (4 probes)
Probes: 1404, 6115, 6005, 10757
Target: nl-ams-as1101.anchors.atlas.ripe.net
09:30
09:45
10 AM
10:15
10:30
10:45
11 AM
11:15
2014-01-01
2014-02-01
2014-03-01
2014-04-01
2014-05-01
2014-06-01
2014-07-01
2014-08-01
2014-09-01
2014-10-01
2014-11-01
2014-12-01
2015-01-01
2015-02-01
2015-03-01
2015-04-01
2015-05-01
2015-06-01
2015-07-01
2015-08-01
2015-09-01
Documentation
Embed in your page
About Latencymon

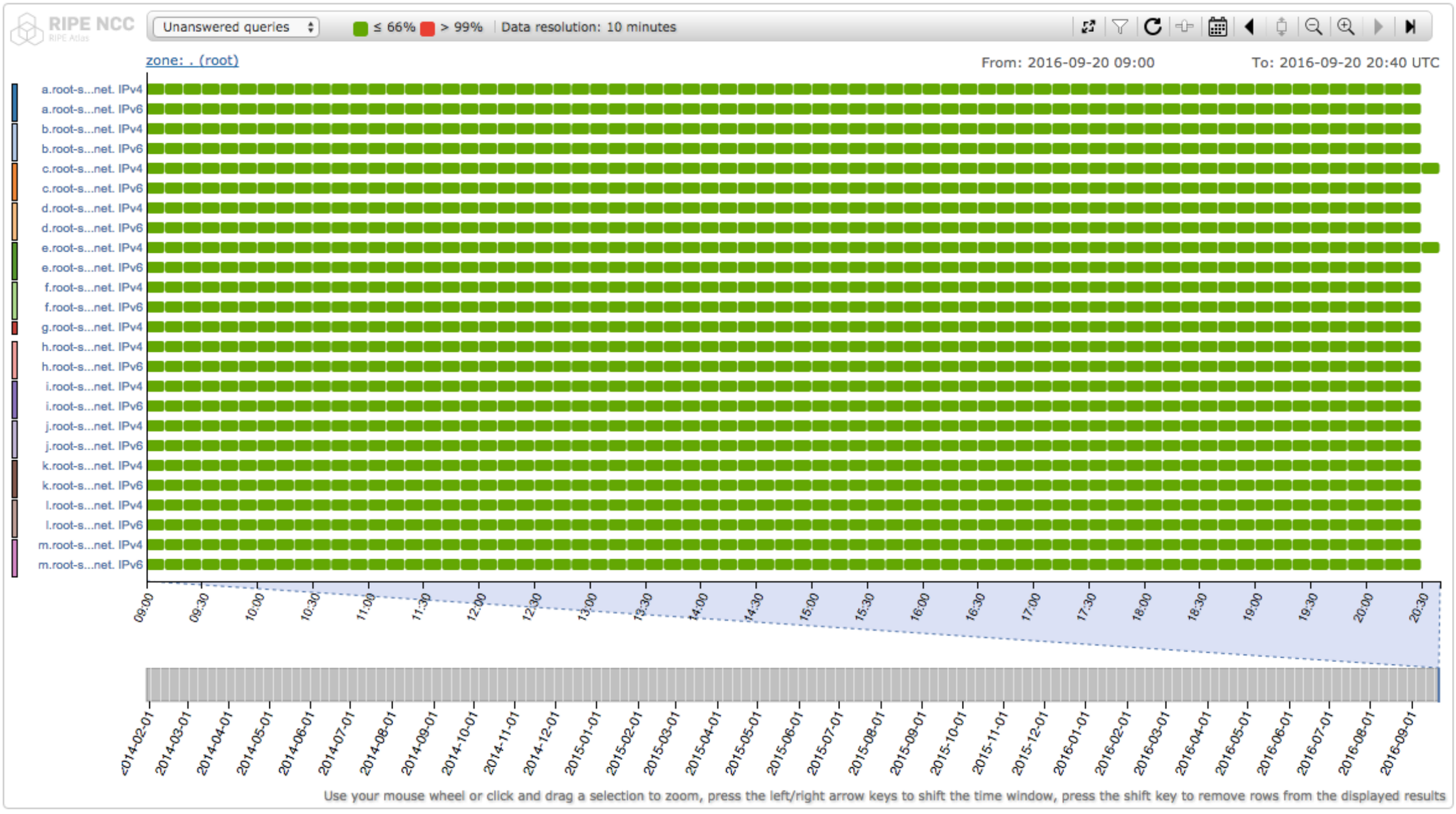
RIPE Atlas

DNSMON & DomainMON

DNSMON

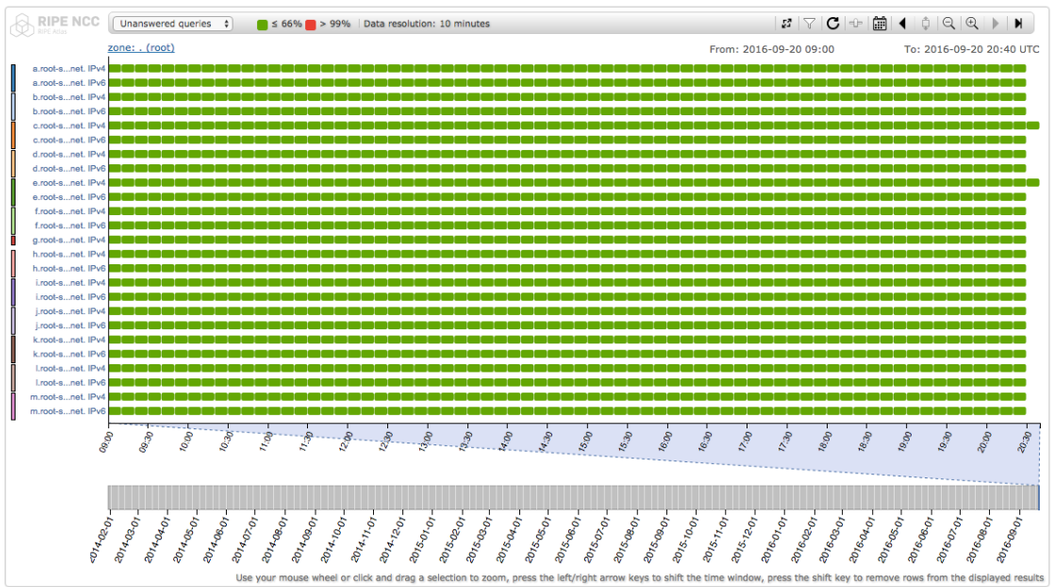
- DNS root and many TLD name servers

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



DomainMON

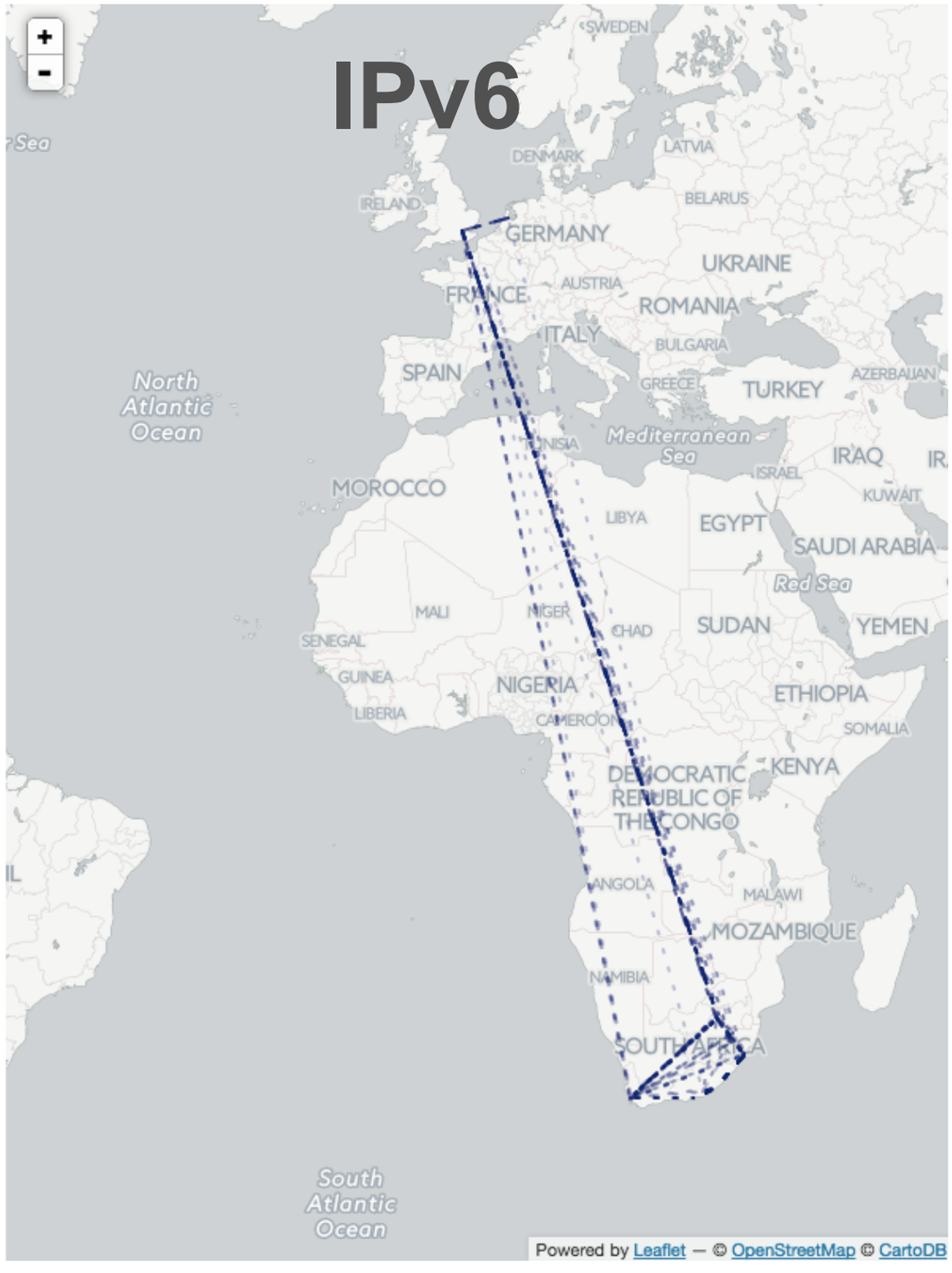
- Same visualisation as DNSMON
- For any domain server
- Runs on RIPE Atlas credits
- https://atlas.ripe.net/domainmon/



RIPE Atlas

IXP-Country-Jedi

IXP-Country-Jedi



http://sg-pub.ripe.net/emile/ixp-country-jedi/latest/ZA/geopath/

RIPE Atlas

Command Line Tool

Command Line Tool

- Access RIPE Atlas from the terminal / shell console
- Quick and dirty shortcuts for network troubleshooting
- FLOSS (free software / open-source) tools
  - Written and maintained by the RIPE NCC
  - Open to community contributions

Command Line Tool

- Before you can use the toolset:
  - Download the tools
  - Install
  - Configure
    - ripe-atlas configure --set authorisation.create=MY_API_KEY
- You need to have one (or more) API Keys
  - https://atlas.ripe.net/keys/

Command Line Tool

- Source:
  - https://github.com/RIPE-NCC/ripe-atlas-tools/
- Documentation:
  - https://ripe-atlas-tools.readthedocs.org/
- Included in the Linux / BSD distributions:
  - OpenBSD, FreeBSD, Gentoo, Arch, Debian and Ubuntu (in progress: Fedora, Windows)

Command Line Tool

- Simple: one-off, using default values (50 probes to “target”)
- $ ripe-atlas measure ping --target wikipedia.org

Command Line Tool

- Geo-specific using 20 probes from ZA:
  - $ ripe-atlas measure ping --target example.com --probes 20 --from-country za
- 20 ZA probes that support IPv6:
  - $ ripe-atlas measure ping --target example.com -- probes 20 --from-country za —include-tag system-ipv6-works
- Create a recurring measurement:
  - $ ripe-atlas measure ping —target example.com --interval 3600

Exercise V

- Make a note to try it at home!

RIPE Atlas

RIPE Atlas APIs

Rest API

- https://atlas.ripe.net/docs/api/v2/manual/

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You are here: Home > Analyse > Internet Measurements > RIPE Atlas > Measurements > Measurement #4925138

RIPE Atlas «
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- Resources ›
- RIPE NCC Members
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- Staff Pages ›

Traceroute measurement to uz.wikipedia.org

General Information | LatencyMON | OpenIPMap Prototype | Results | Modification Log

Download the raw measurement result data here.

You can use this form to download the data through your browser, or use the preview on the right to help you query the REST API directly.

Select Your Timeframe

Start Date*: 2016-09-01 (start time of this measuremen

All dates are start-of-day

Stop Date*: 2016-09-14 (end time of this measurement

All dates are end-of-day

Format: JSON

Download

URL Preview

```
https://atlas.ripe.net/api/v2/measurements/4925138/results?start=1472688000&stop=1473897599&format=json
```

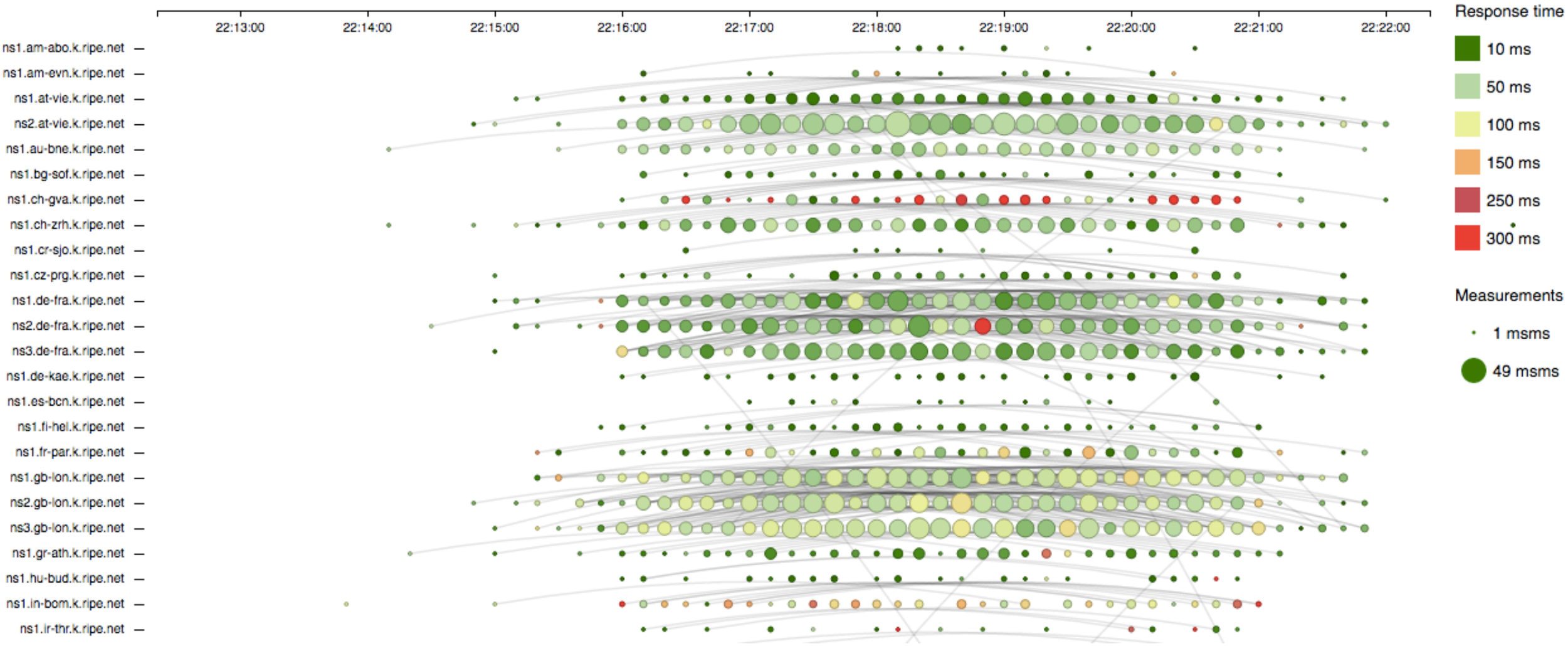
Streaming API

- RIPE Atlas streaming allows users to receive measurement results as soon as the probes send them, in real time
  - Publish / subscribe through web sockets
  - https://atlas.ripe.net/docs/result-streaming/
- Two types of data:
  - Measurement results
  - Probe connection status events

User-Defined Measurements

- Credit system

  http://sg-pub.ripe.net/demo-area/atlas-stream/dns-instances.html



RIPE Atlas

DIY Visualisation

DIY Visualisation

- Build a simple visualisation
  - https://atlas.ripe.net/webinar/streaming01.html
  - Open the console of your browser
  - Download the source code and edit the behaviour

Questions

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@cteuschel