RIPE NCC
RIPE NETWORK COORDINATION CENTRE

Performance measurement with RIPE Atlas and RIS data
An investigative Approach

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Research and Development
RIPE NCC

4 March 2020 | Géant Performance Workshop

RIPE Atlas

overview

Hardware Probes

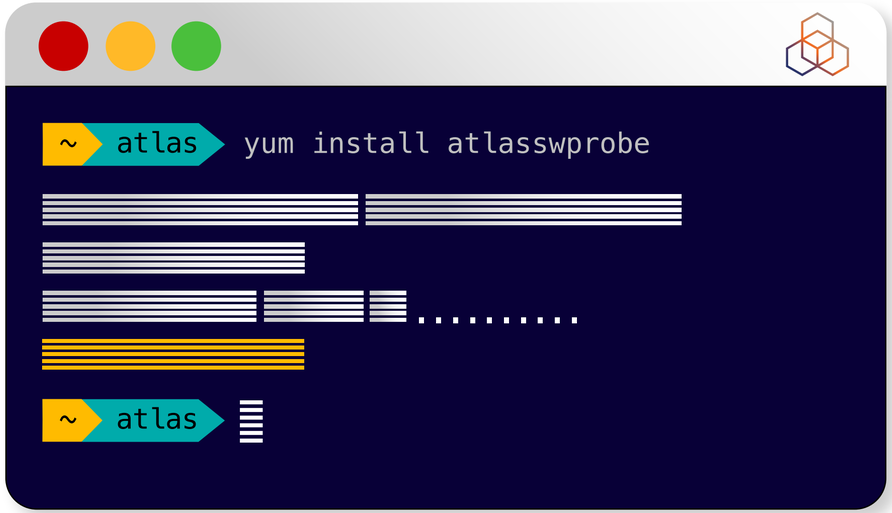
V1

V2

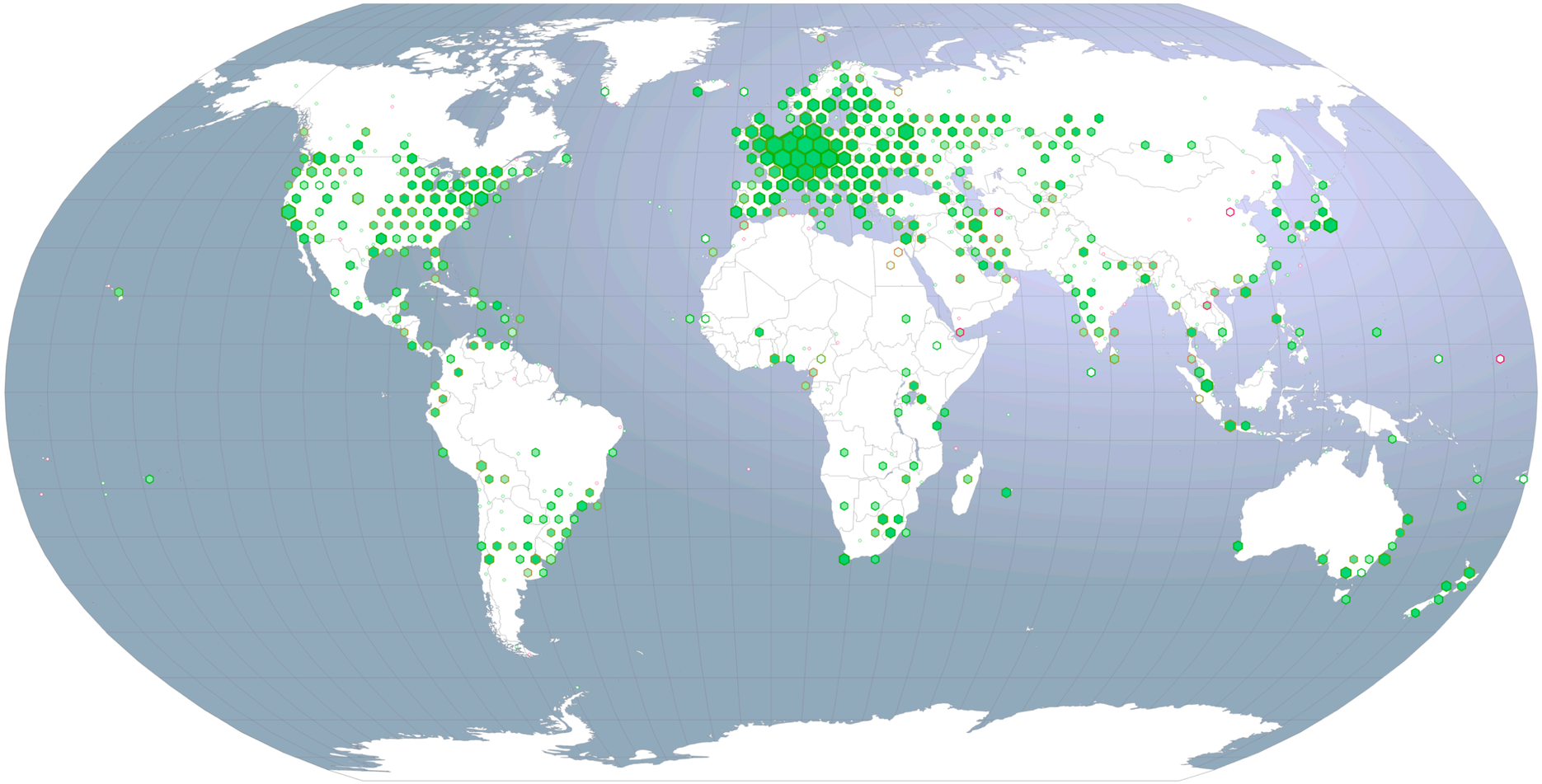
V3

V4

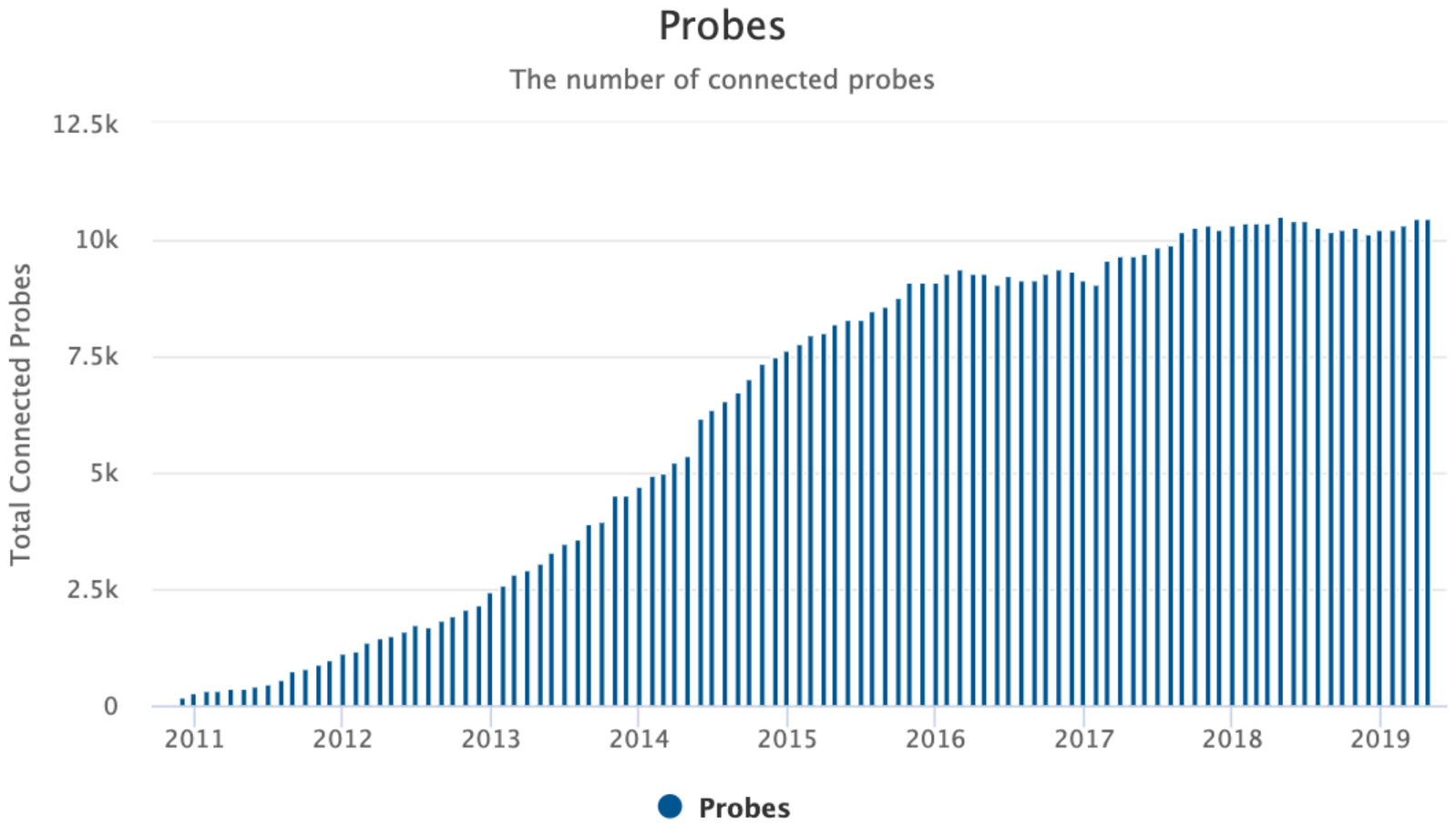
Software Probes & Virtual Anchors



Probes Distribution



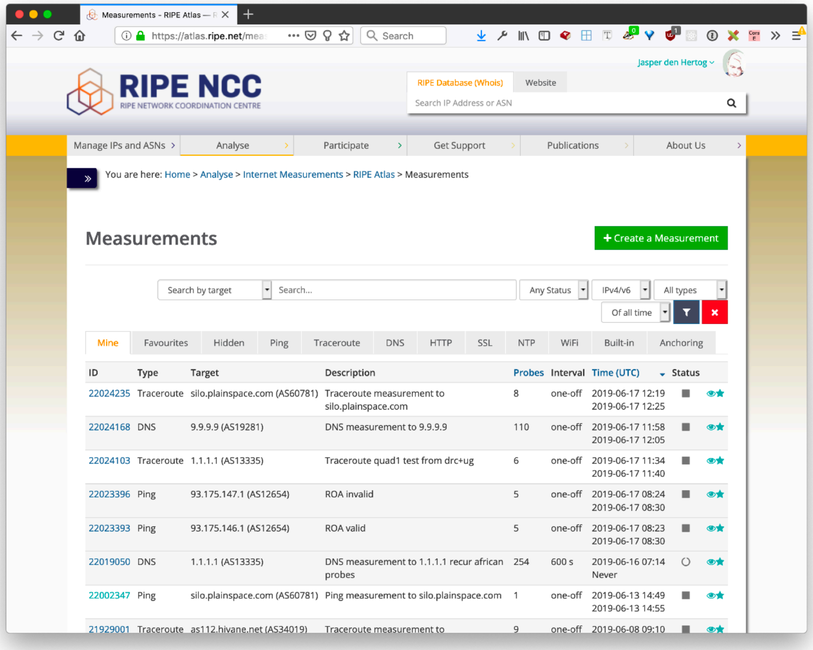
Probes Distribution

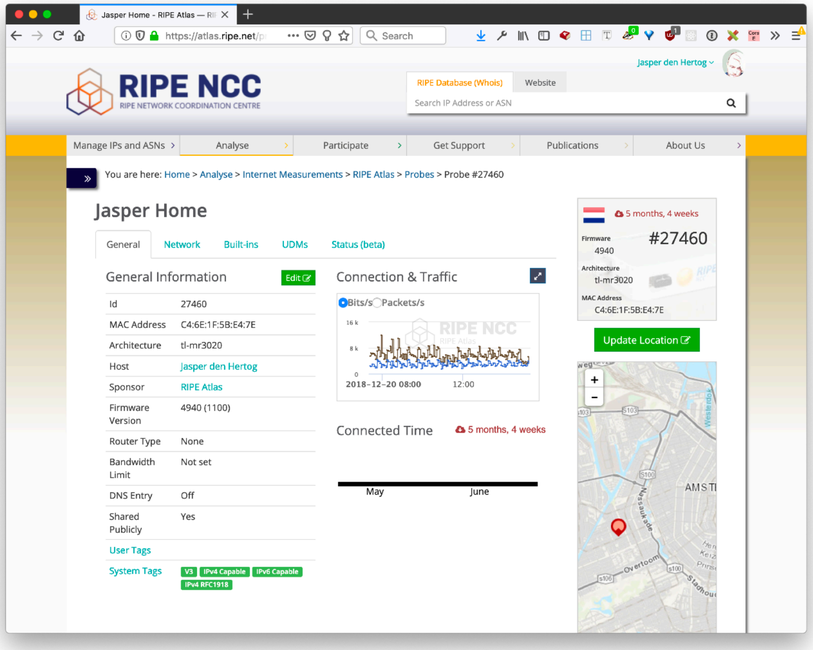


currently 10,000+ connected probes at any given time

RIPE Atlas Interfaces

web





RIPE Atlas Interfaces

command line interface

```
$ ripe-atlas measure ping --target example.com
$ ripe-atlas measure ping --packets 7 --size 42 --target example.com
$ ripe-atlas measure traceroute --target example.com
$ ripe-atlas measure traceroute --packets 2 --target example.com
$ ripe-atlas measure dns --query-argument example.com
$ ripe-atlas measure dns --use-probe-resolver --query-type AAAA --query-argument example.com
```

RIPE Atlas Interfaces

API (restful + streaming)

Terminal

```
jdenhertog ~ $ curl "https://atlas.ripe.net/api/v2/measurements/12016253/results?probe_ids=50426&start=2019-06-14T00:00" | jq .
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   500    0   500    0     0    330      0 --:--:--  0:00:01 --:--:--   330
[
  {
    "af": 4,
    "dst_addr": "1.1.1.1",
    "dst_port": "53",
    "from": "141.8.2.122",
    "fw": 4970,
    "group_id": 12016253,
    "lts": 65,
    "msm_id": 12016253,
    "msm_name": "Tdig",
    "prb_id": 50426,
    "proto": "UDP",
    "result": {
      "ANCOUNT": 1,
      "ARCOUNT": 1,
      "ID": 51022,
      "NSCOUNT": 0,
      "QDCOUNT": 1,
      "abuf": "x06AgAABAAEAAAABAmlkBnNlcnZlcgAAEAADwAwAEAADAAAAAAAEA01YUAAAKQWsAAAAAAAA",
      "answers": [
        {
          "NAME": "id.server",
          "RDATA": [
            "MXP"
          ],
          "TYPE": "TXT"
        }
      ],
      "rt": 34.02,
      "size": 54
    },
    "src_addr": "192.168.2.117",
    "stored_timestamp": 1560599501,
```

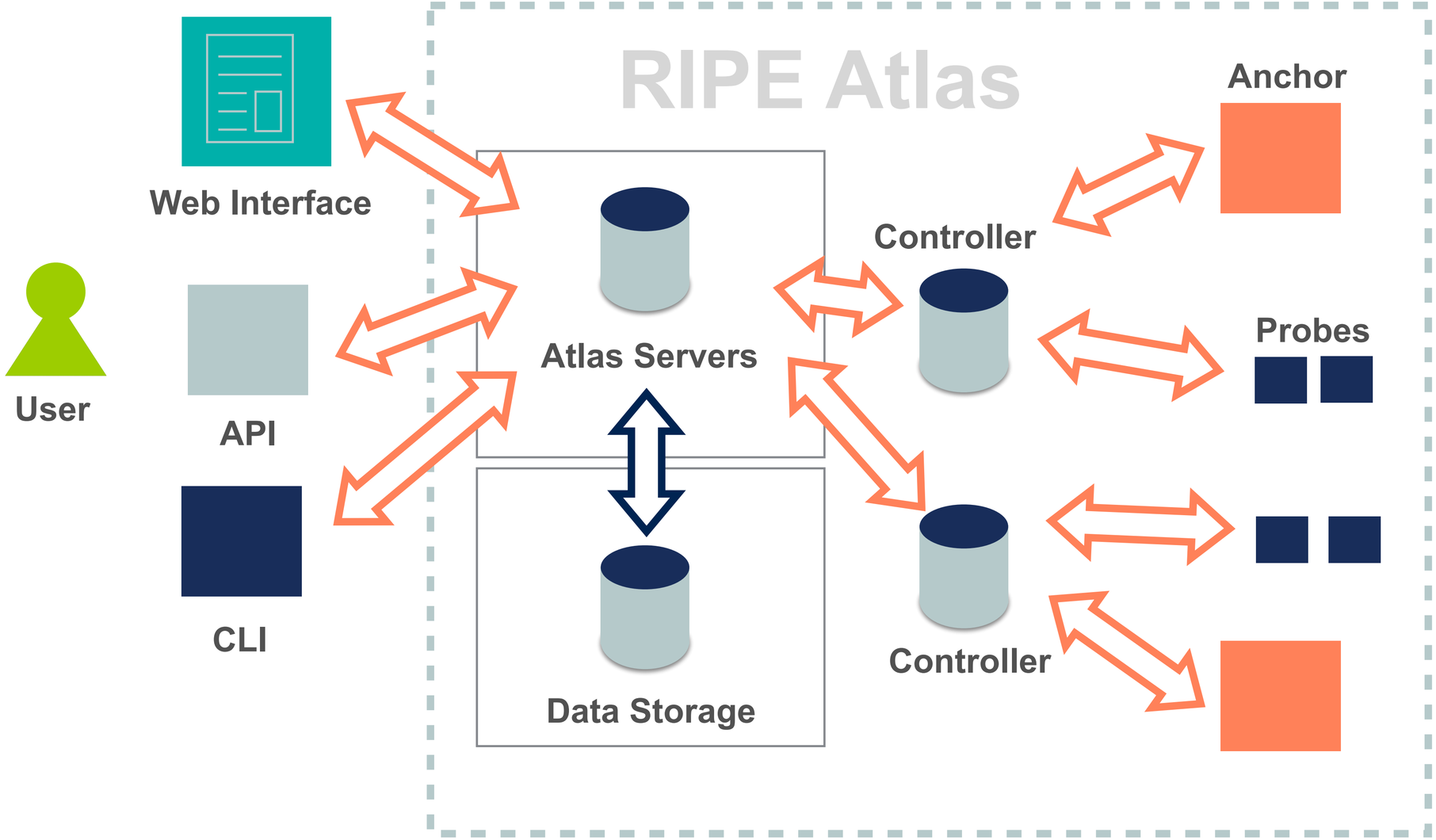
RIPE Atlas Measurements

Measurements currently running

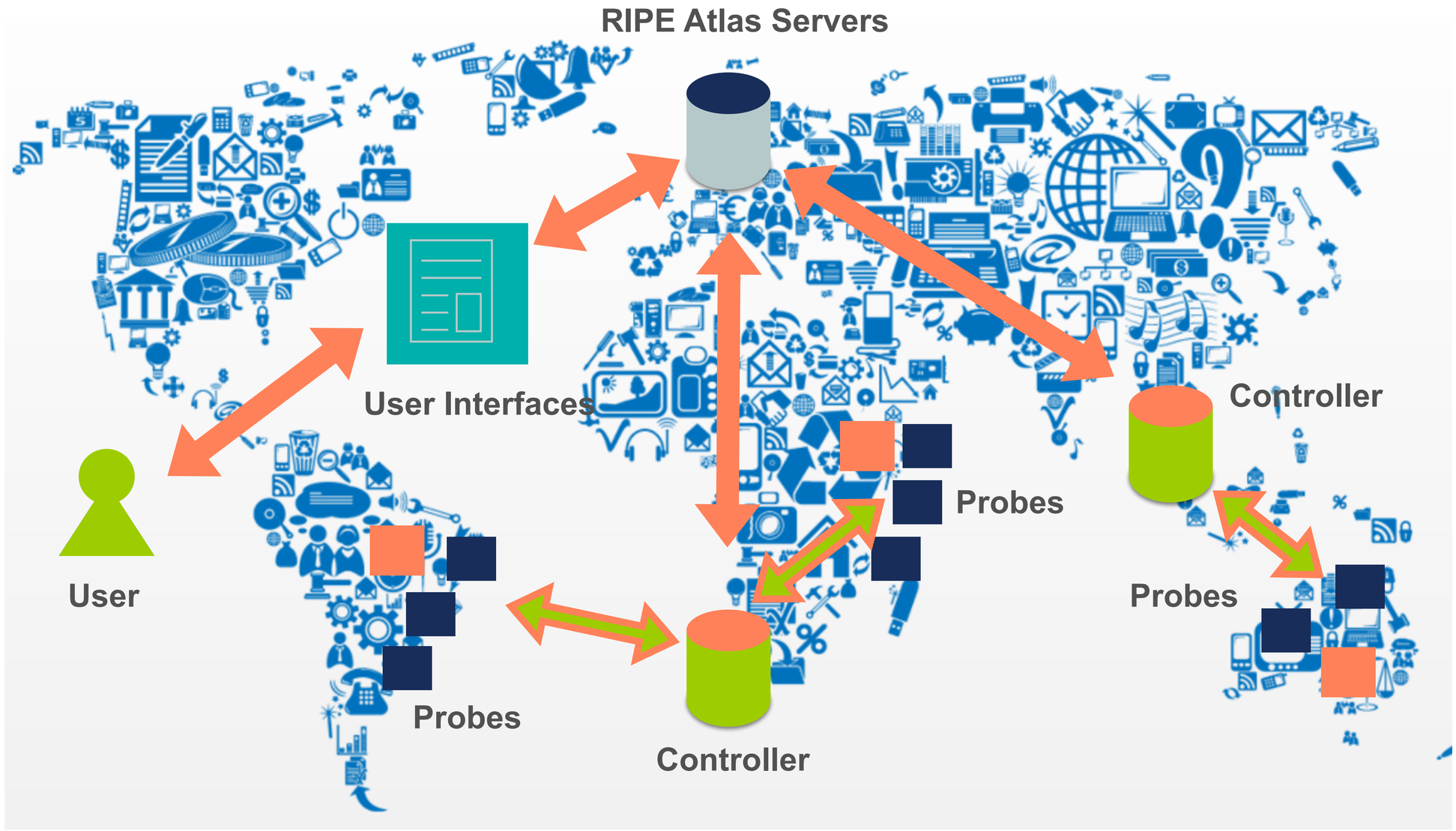
	Built-in	User-defined			
		Total UDM	Anchoring	DNSMON	Other
Ping	41	6953	1924	0	5029
Traceroute	45	6721	1926	875	3920
DNS	158	6033	1	3500	2532
SSL/TLS Certificate	4	374	0	0	374
NTP	0	140	0	0	140
HTTP	4	1982	1925	0	57
WiFi	0	14	0	0	14

Infra Structure

RIPE Atlas Overview



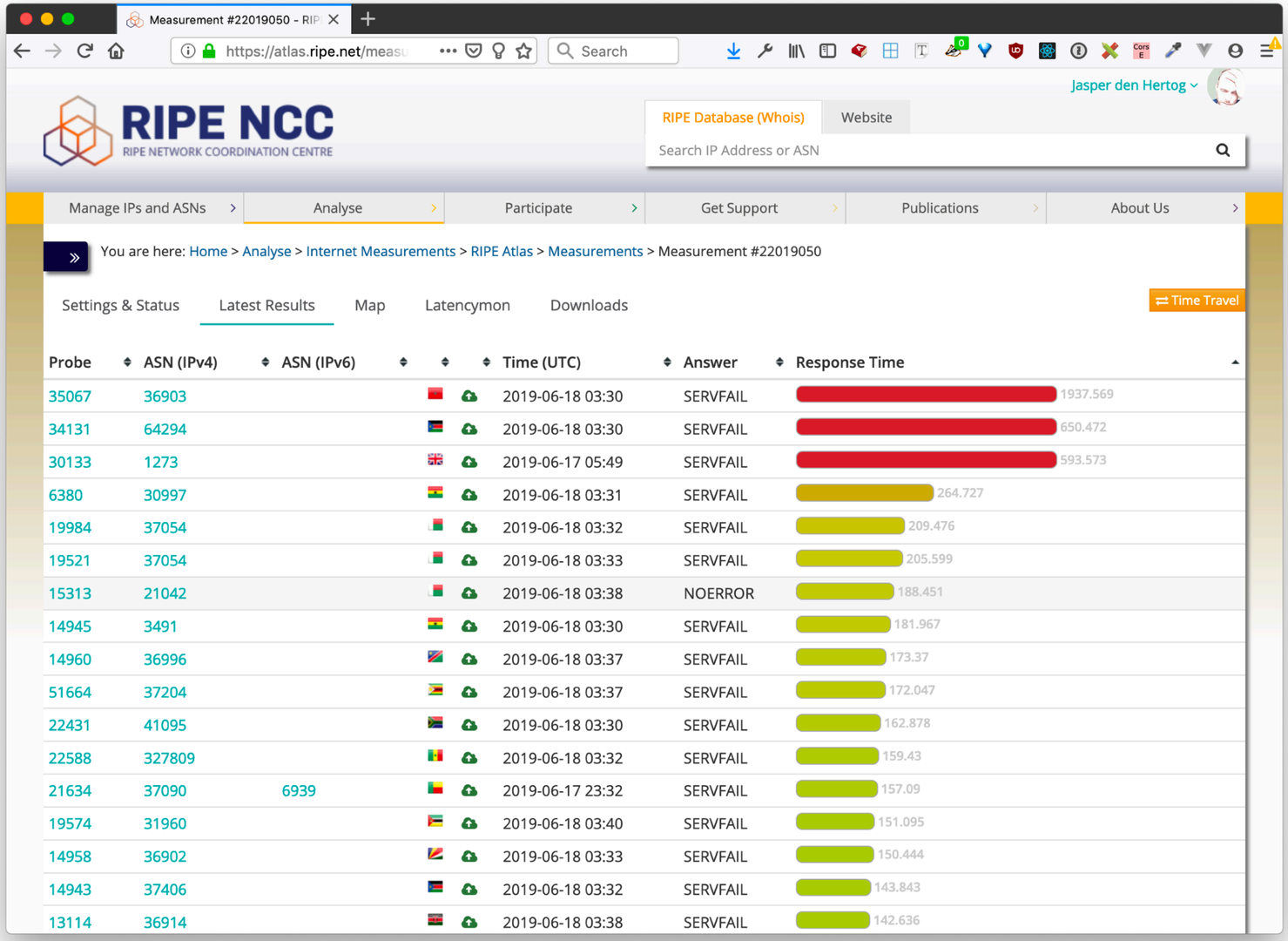
RIPE Atlas Use Case



What kind of performance can Atlas measure?

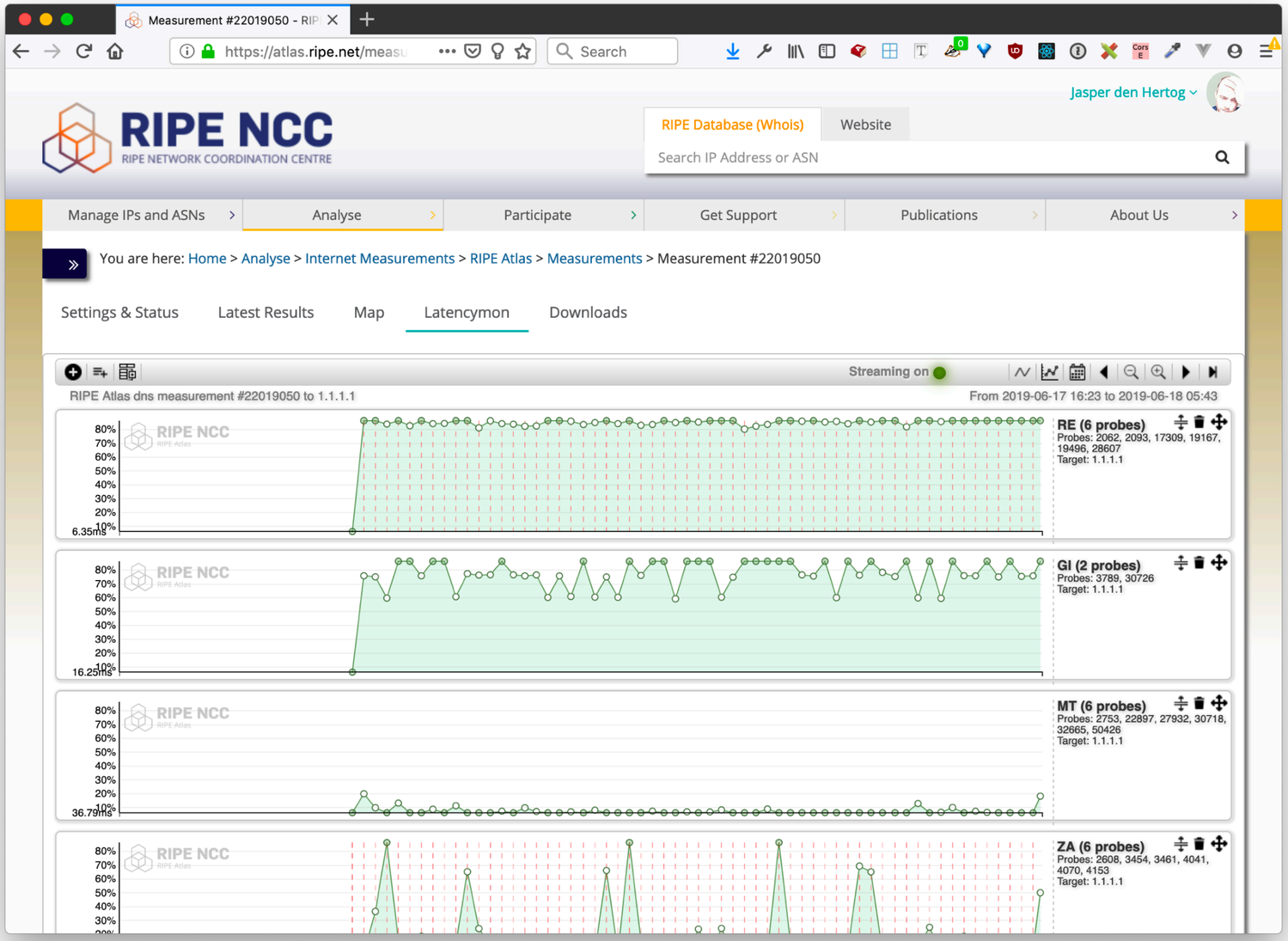
Latency

Ping Latency



Probe	ASN (IPv4)	ASN (IPv6)	Time (UTC)	Answer	Response Time
35067	36903		2019-06-18 03:30	SERVFAIL	1937.569
34131	64294		2019-06-18 03:30	SERVFAIL	650.472
30133	1273		2019-06-17 05:49	SERVFAIL	593.573
6380	30997		2019-06-18 03:31	SERVFAIL	264.727
19984	37054		2019-06-18 03:32	SERVFAIL	209.476
19521	37054		2019-06-18 03:33	SERVFAIL	205.599
15313	21042		2019-06-18 03:38	NOERROR	188.451
14945	3491		2019-06-18 03:30	SERVFAIL	181.967
14960	36996		2019-06-18 03:37	SERVFAIL	173.37
51664	37204		2019-06-18 03:37	SERVFAIL	172.047
22431	41095		2019-06-18 03:30	SERVFAIL	162.878
22588	327809		2019-06-18 03:32	SERVFAIL	159.43
21634	37090	6939	2019-06-17 23:32	SERVFAIL	157.09
19574	31960		2019-06-18 03:40	SERVFAIL	151.095
14958	36902		2019-06-18 03:33	SERVFAIL	150.444
14943	37406		2019-06-18 03:32	SERVFAIL	143.843
13114	36914		2019-06-18 03:38	SERVFAIL	142.636

LatencyMON


Measurement #22019050 - RIP
https://atlas.ripe.net/measu
Search
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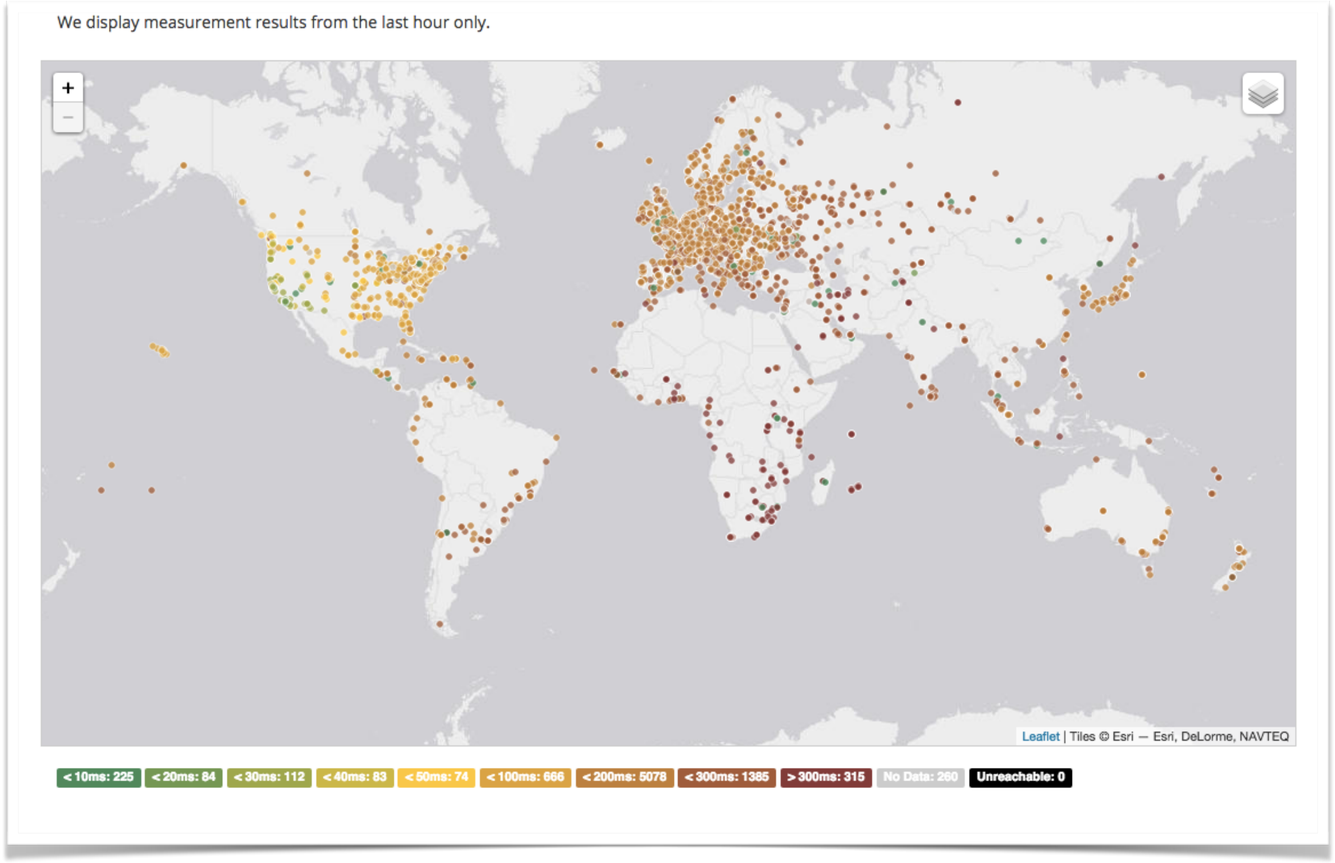
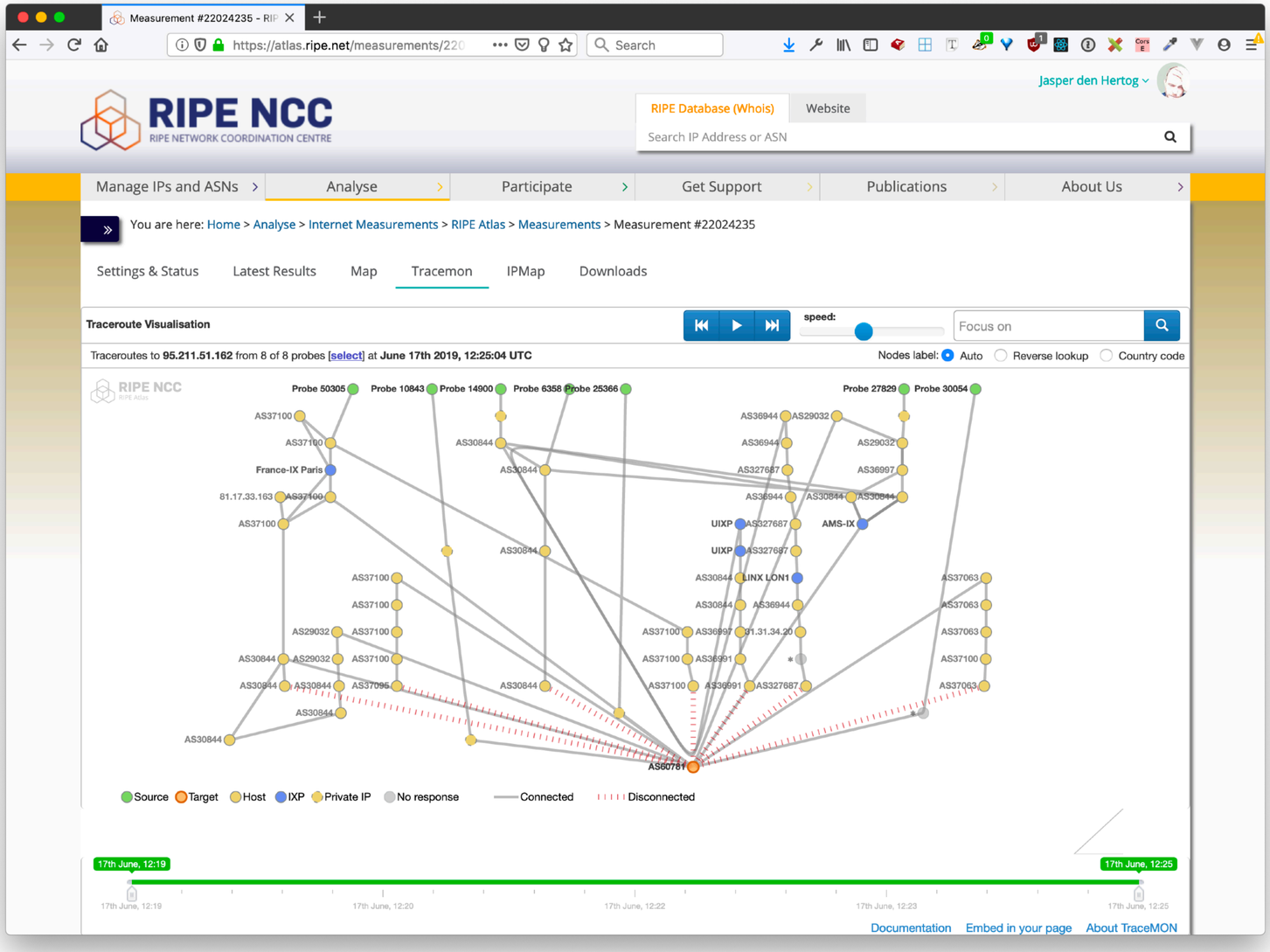
You are here: Home > Analyse > Internet Measurements > RIPE Atlas > Measurements > Measurement #22019050
Settings & Status
Latest Results
Map
Latencymon
Downloads
Streaming on
RIPE Atlas dns measurement #22019050 to 1.1.1.1
From 2019-06-17 16:23 to 2019-06-18 05:43
RE (6 probes)
Probes: 2062, 2093, 17309, 19167, 19496, 28607
Target: 1.1.1.1
6.35ms
GI (2 probes)
Probes: 3789, 30726
Target: 1.1.1.1
16.25ms
MT (6 probes)
Probes: 2753, 22897, 27932, 30718, 32665, 50426
Target: 1.1.1.1
36.79ms
ZA (6 probes)
Probes: 2608, 3454, 3461, 4041, 4070, 4153
Target: 1.1.1.1

Where is B-root?



Path Efficiency

TraceMON


Measurement #22024235 - RIP
https://atlas.ripe.net/measurements/220
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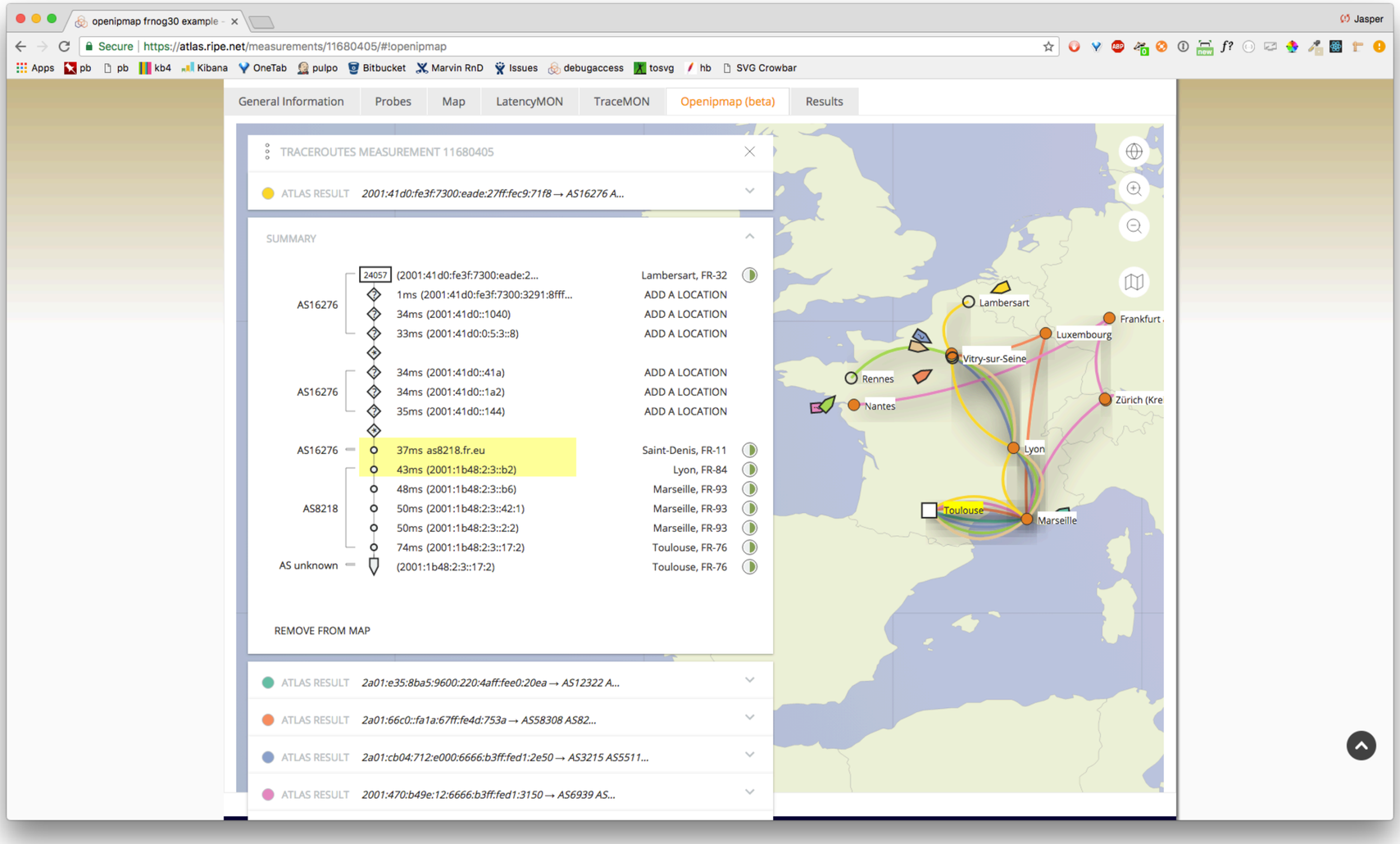
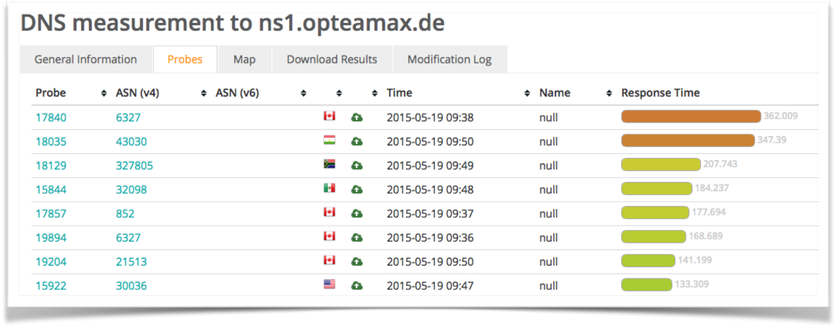
Settings & Status
Latest Results
Map
Tracemon
IPMap
Downloads
Traceroute Visualisation
speed:
Focus on
Traceroutes to 95.211.51.162 from 8 of 8 probes [select] at June 17th 2019, 12:25:04 UTC
Nodes label: Auto Reverse lookup Country code
Probe 50305
Probe 10843
Probe 14900
Probe 6358
Probe 25366
Probe 27829
Probe 30054
France-IX Paris
UIXP
AMS-IX
LINX LON1
AS50781
Source
Target
Host
IXP
Private IP
No response
Connected
Disconnected
17th June, 12:19
17th June, 12:25
17th June, 12:20
17th June, 12:22
17th June, 12:23
Documentation
Embed in your page
About TraceMON


openipmap frnog30 example
Jasper
Secure https://atlas.ripe.net/measurements/11680405/#!openipmap
Apps pb pb kb4 Kibana OneTab pulpo Bitbucket Marvin RnD Issues debugaccess tosvg hb SVG Crowbar
General Information
Probes
Map
LatencyMON
TraceMON
Openipmap (beta)
Results
TRACEROUTES MEASUREMENT 11680405
ATLAS RESULT 2001:41d0:fe3f:7300:eade:27ff:fec9:71f8 → AS16276 A...
SUMMARY
24057 (2001:41d0:fe3f:7300:eade:2... Lambersart, FR-32
AS16276
1ms (2001:41d0:fe3f:7300:3291:8fff... ADD A LOCATION
34ms (2001:41d0::1040) ADD A LOCATION
33ms (2001:41d0:0:5:3::8) ADD A LOCATION
AS16276
34ms (2001:41d0::41a) ADD A LOCATION
34ms (2001:41d0::1a2) ADD A LOCATION
35ms (2001:41d0::144) ADD A LOCATION
AS16276
37ms as8218.fr.eu Saint-Denis, FR-11
43ms (2001:1b48:2:3::b2) Lyon, FR-84
AS8218
48ms (2001:1b48:2:3::b6) Marseille, FR-93
50ms (2001:1b48:2:3::42:1) Marseille, FR-93
50ms (2001:1b48:2:3::2:2) Marseille, FR-93
74ms (2001:1b48:2:3::17:2) Toulouse, FR-76
AS unknown
(2001:1b48:2:3::17:2) Toulouse, FR-76
REMOVE FROM MAP
ATLAS RESULT 2a01:e35:8ba5:9600:220:4aff:fee0:20ea → AS12322 A...
ATLAS RESULT 2a01:66c0::fa1a:67ff:fe4d:753a → AS58308 AS82...
ATLAS RESULT 2a01:cb04:712:e000:6666:b3ff:fed1:2e50 → AS3215 AS5511...
ATLAS RESULT 2001:470:b49e:12:6666:b3ff:fed1:3150 → AS6939 AS...
Lambersart
Frankfurt
Luxembourg
Vitry-sur-Seine
Rennes
Nantes
Zürich (Kre
Lyon
Toulouse
Marseille

Available visualisations: DNS

- Map, colour-coded response time or

- List of probes, sortable by response time



Probe	ASN (v4)	ASN (v6)	Time	Name	Response Time
17840	6327		2015-05-19 09:38	null	362.009
18035	43030		2015-05-19 09:50	null	347.39
18129	327805		2015-05-19 09:49	null	207.743
15844	32098		2015-05-19 09:48	null	184.237
17857	852		2015-05-19 09:37	null	177.694
19894	6327		2015-05-19 09:36	null	168.689
19204	21513		2015-05-19 09:50	null	141.199
15922	30036		2015-05-19 09:47	null	133.309

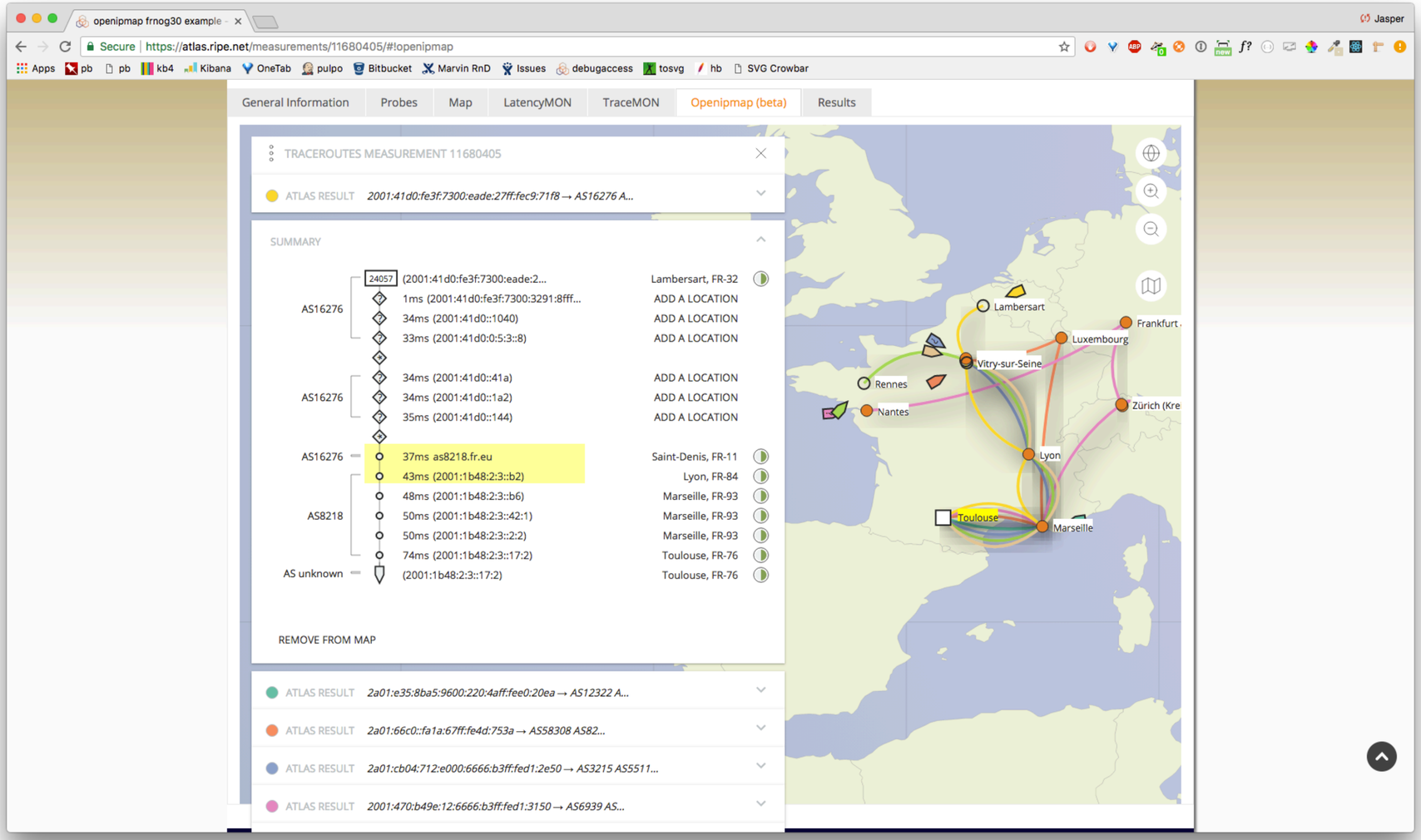
Combine with other Tools

RIPE IPmap

Geo-location internet core infra-structure

RIPE IPmap

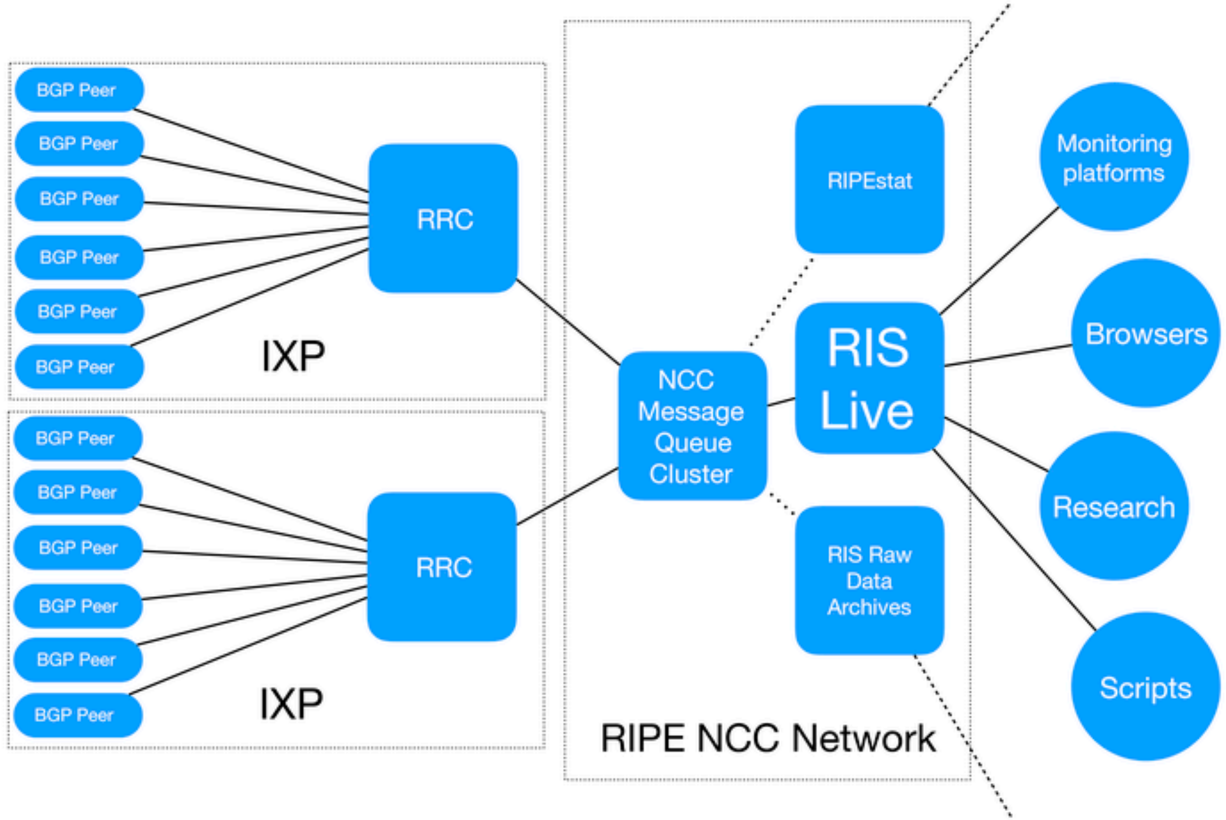
https://atlas.ripe.net/measurements/11680405/#!openipmap



RIS

Routing Information Service

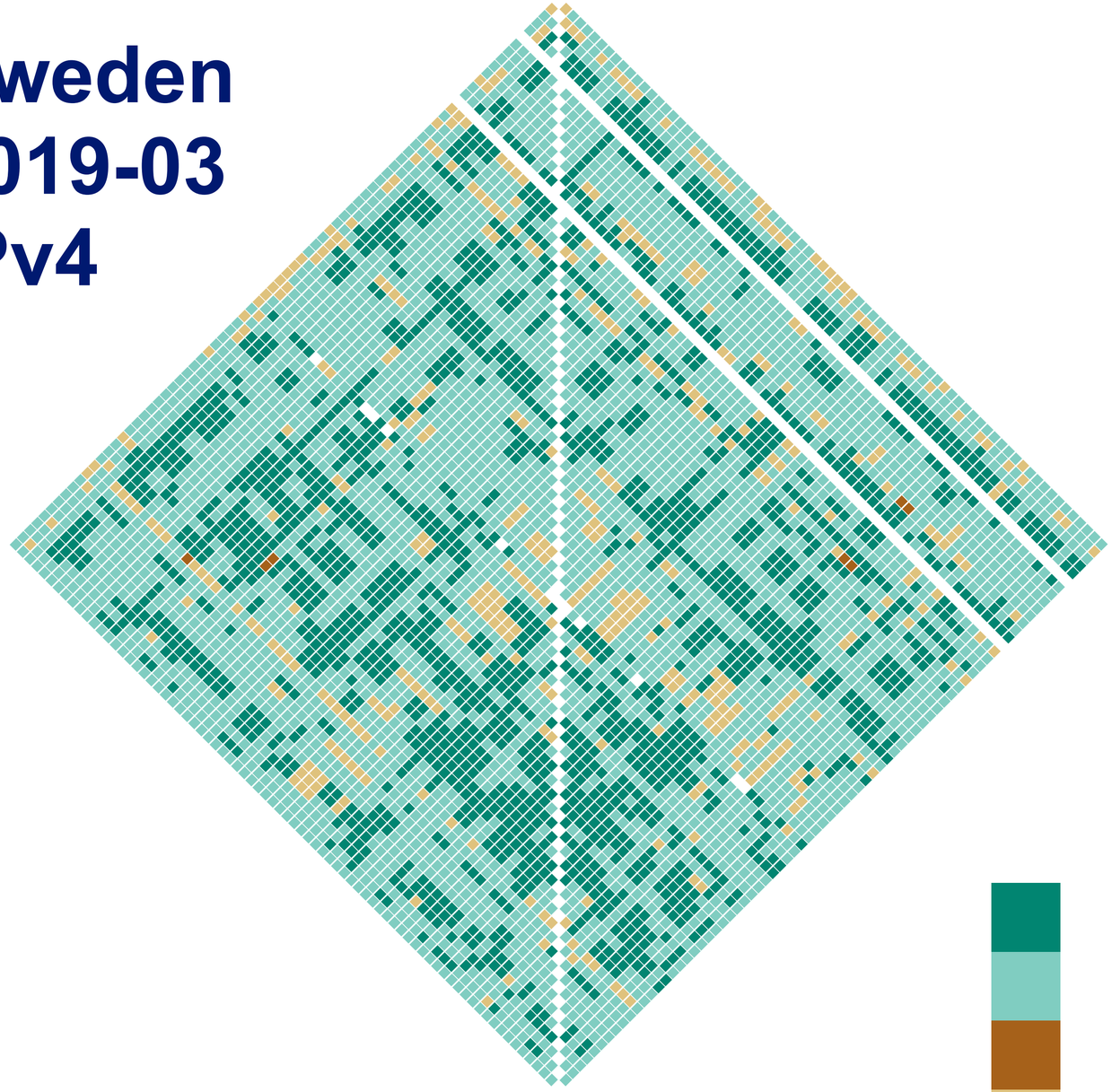
RIS Live BGP Stream



Some work that we do

IXP-Country-Jedi

Sweden 2019-03 IPv4



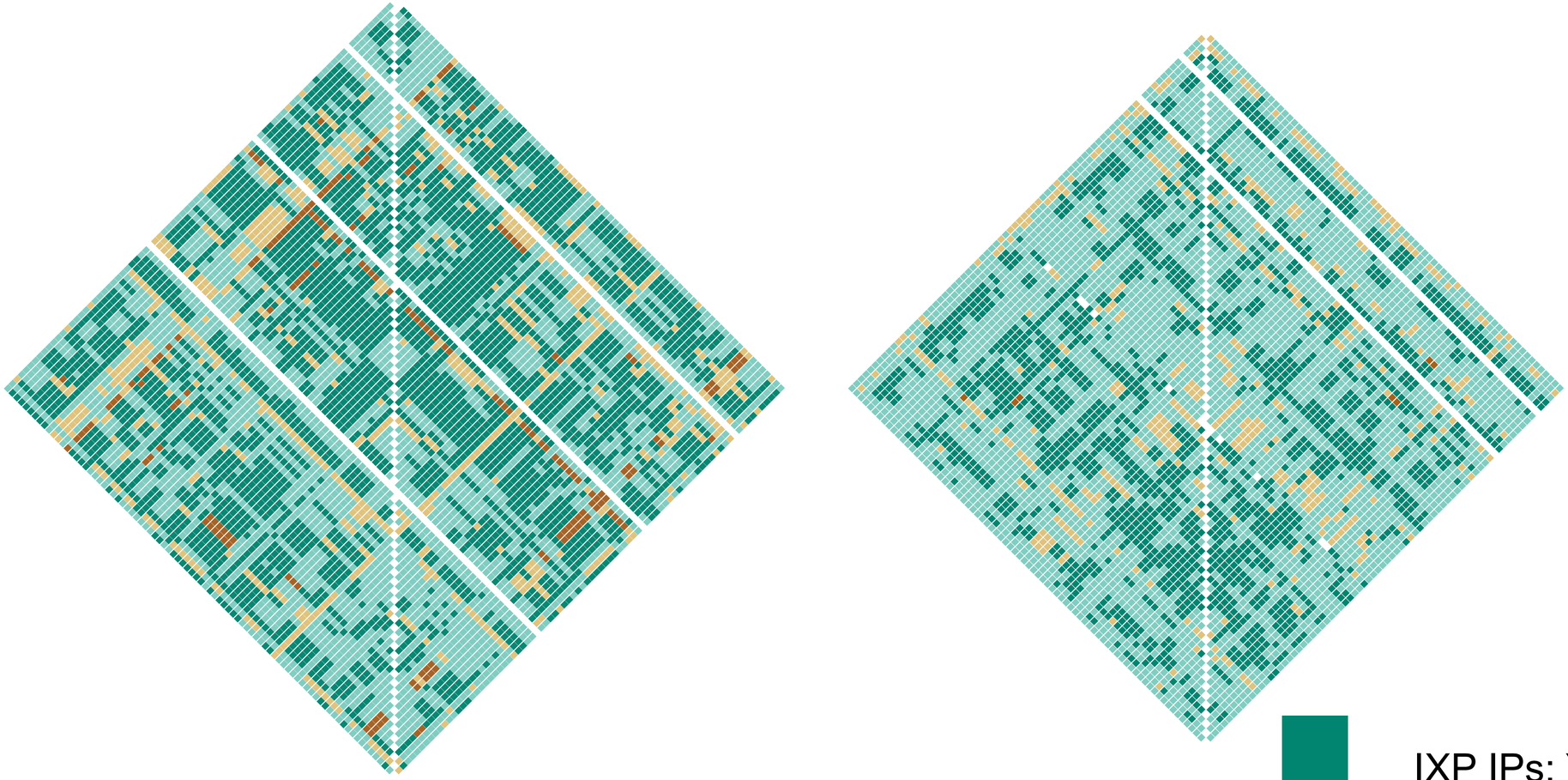
IXP IPs: YES, out-of-country IPs: NO

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

IXP IPs: YES, out-of-country IPs: YES

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

Sweden ipv4 ipv6 comparison



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

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

IXP IPs: YES, out-of-country IPs: YES

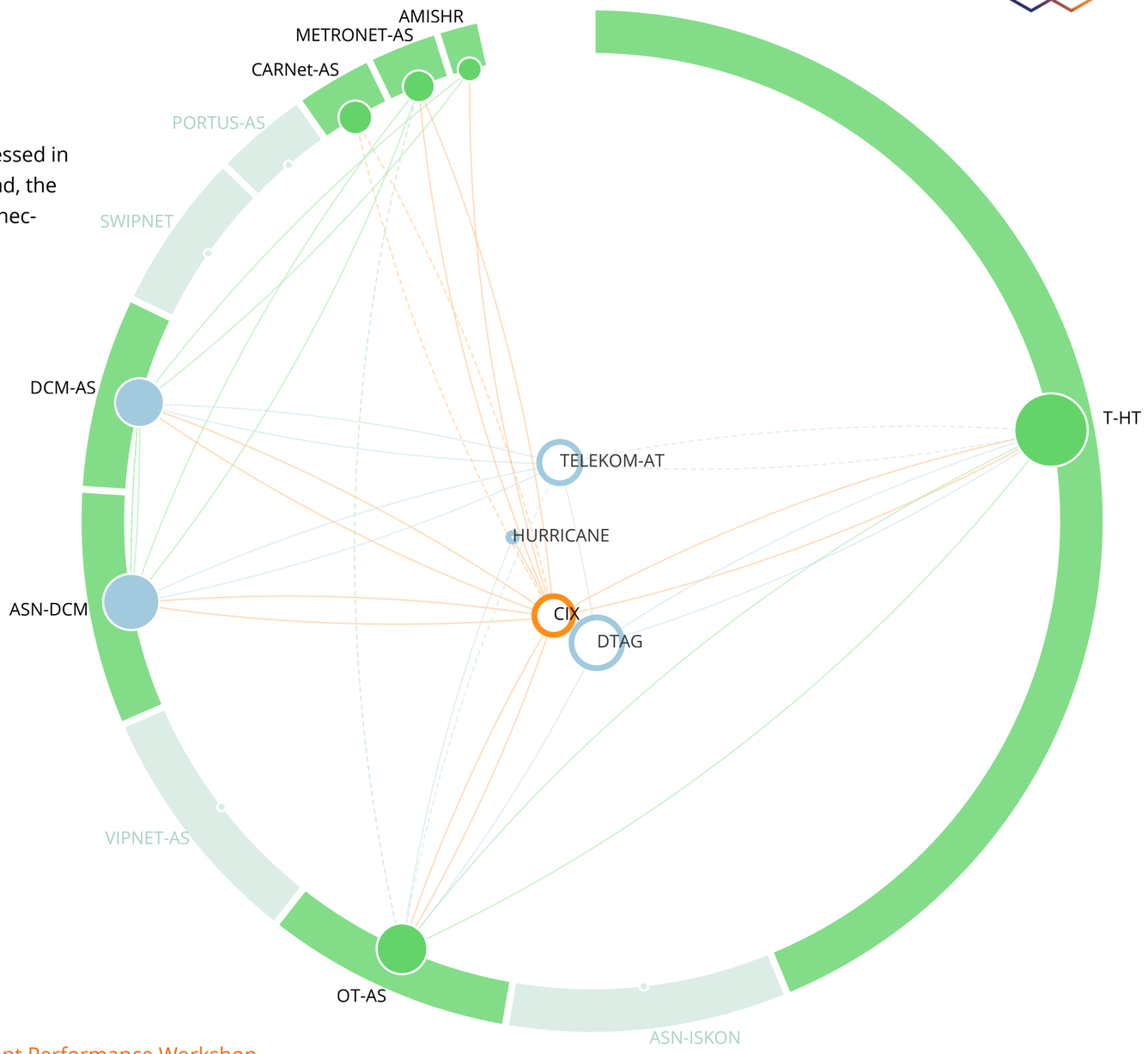
IXP IPs: NO, out-of-country IPs: YES

Sketches of the Peer-to-Peer Fabric of a Country

The quality of end-user connections are often expressed in download speeds towards content providers. Instead, the sketches presented here focus on peer-to-peer connections in a country.

The sketches explore the different ways in which end-users are interconnected within the same country: the peer-to-peer fabric. Each sketch represents a snapshot of this fabric at a single given point in time. They try to put a number on the amount of different ways the networks interconnect their users.

These sketches are created with active measurements from the RIPE Atlas measurement platform, datasets from RIPEstat, AS-to-ORG datasets from CAIDA and a dataset from APNIC that estimates the percentage of end-users in each network.



Peer-to-Peer Fabric

country

USA

snapshot date

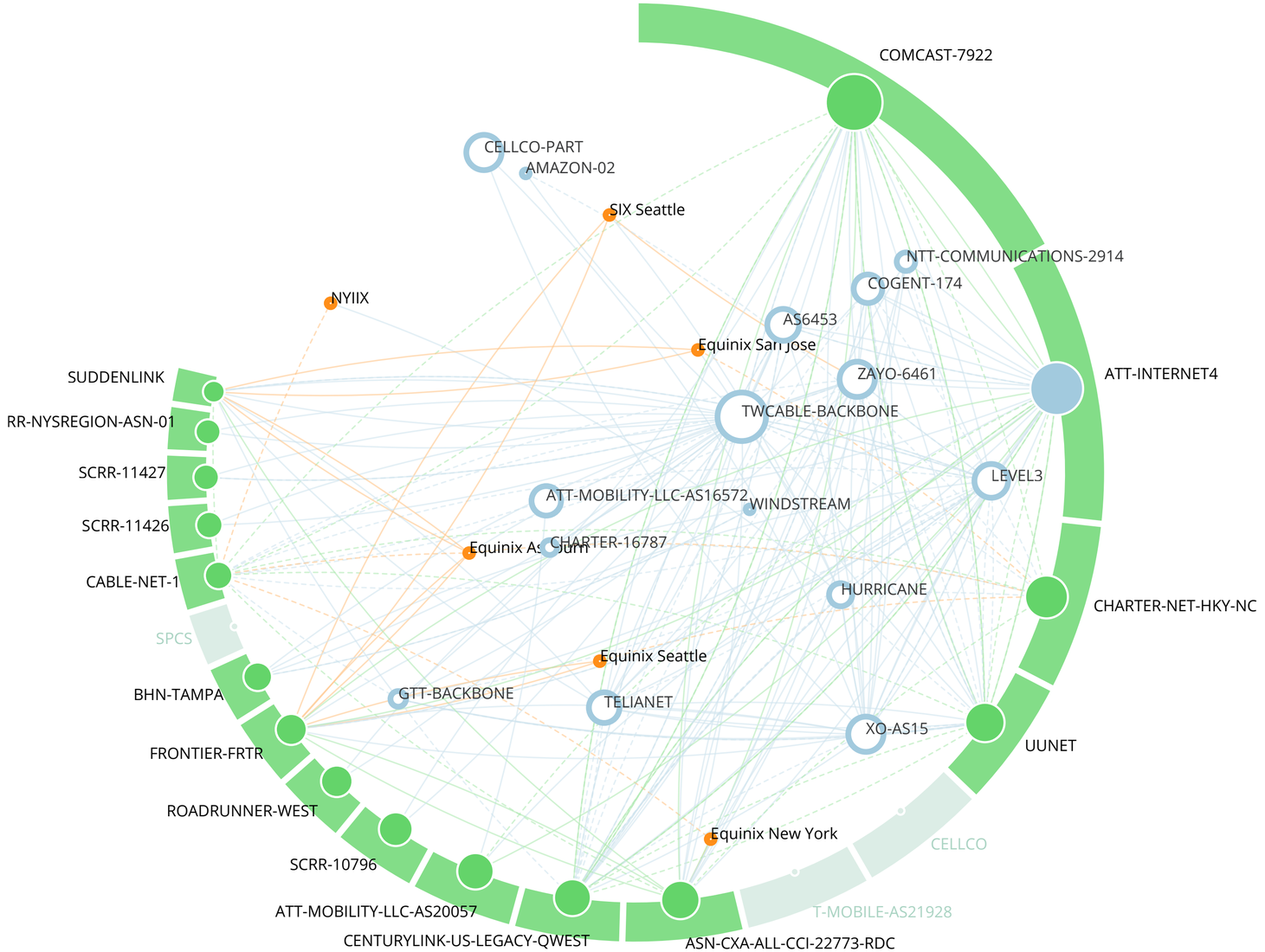
1 March 2018

github

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

url

http://sg-pub.ripe.net/ixp-country-jedi/dk/2018/03/01



A network that serves end-users

A network that serves end-users and provides transit to other end-user networks within the country

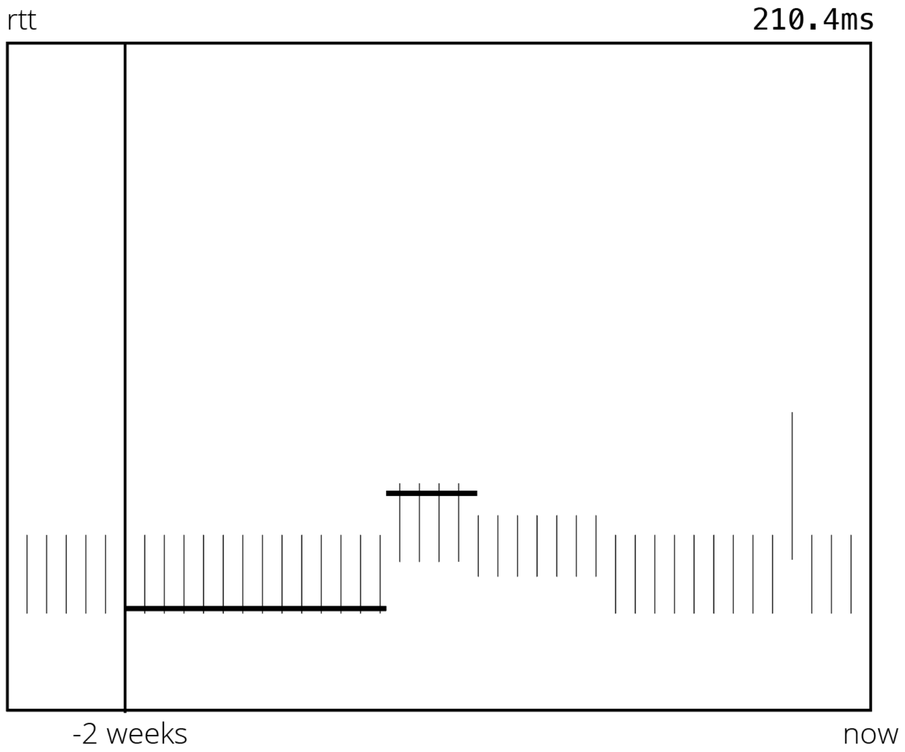
A transit network or an IXP external to this country

An IXP that is identified with this country

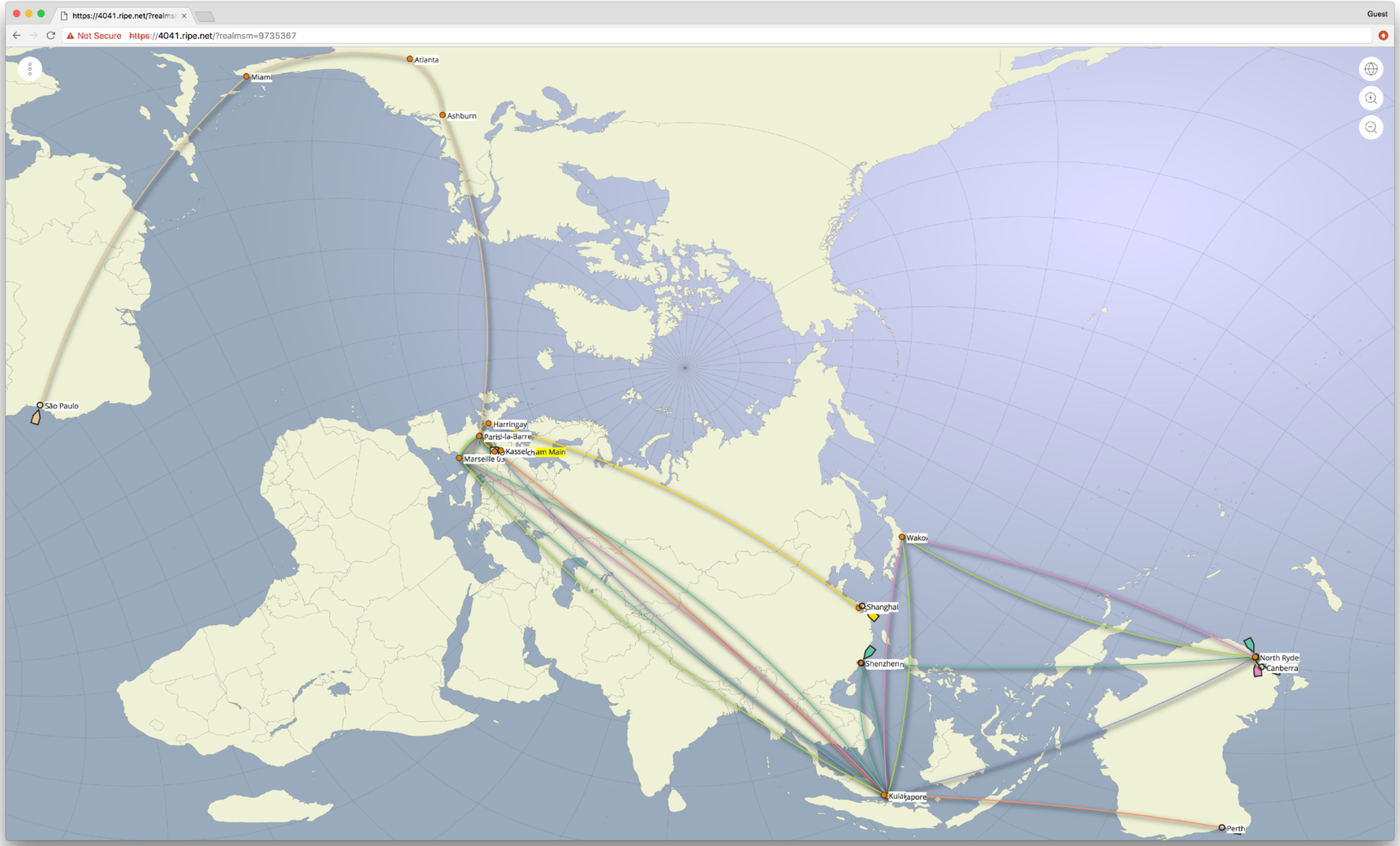
A sizable end-user network for which we have data

A sizable end-user network for which we have no data

Atlas Trends



https://ipmap.ripe.net



jdenhertog@ripe.net

@density215