RIPE NCC
RIPE NETWORK COORDINATION CENTRE

RIPE Atlas Tutorial

Christopher Amin

MENOG 16 | 23 March 2016

Goals

- Learn how to:
  - Benefit from using RIPE Atlas measurements for network monitoring and troubleshooting
  - Use API calls to create measurements
  - Contribute to open-source tools
- Opportunity for hands-on practice
- Get your questions answered

Overview

- Introduction to RIPE Atlas
- What can you get from RIPE Atlas as a visitor
- Creating a measurement and exercise
- Command Line Interface (CLI) Toolset
- Real-time performance monitoring and exercise
- Additional Topics
  - Other features
  - Network monitoring and exercise: ‘Status Checks’

Prerequisites

- Laptop
- RIPE NCC Access account
- Log in and visit atlas.ripe.net
- Credits!
  - https://atlas.ripe.net/user/credits/#!redeem
  - **Voucher** *menog16-tutorial*

Warm-up question

- What is your background?
  - Network operator?
  - Software engineer / programmer?
  - Data scientist?
  - Sysadmin?
  - Other? please specify :-)

Introduction to RIPE Atlas

Basics

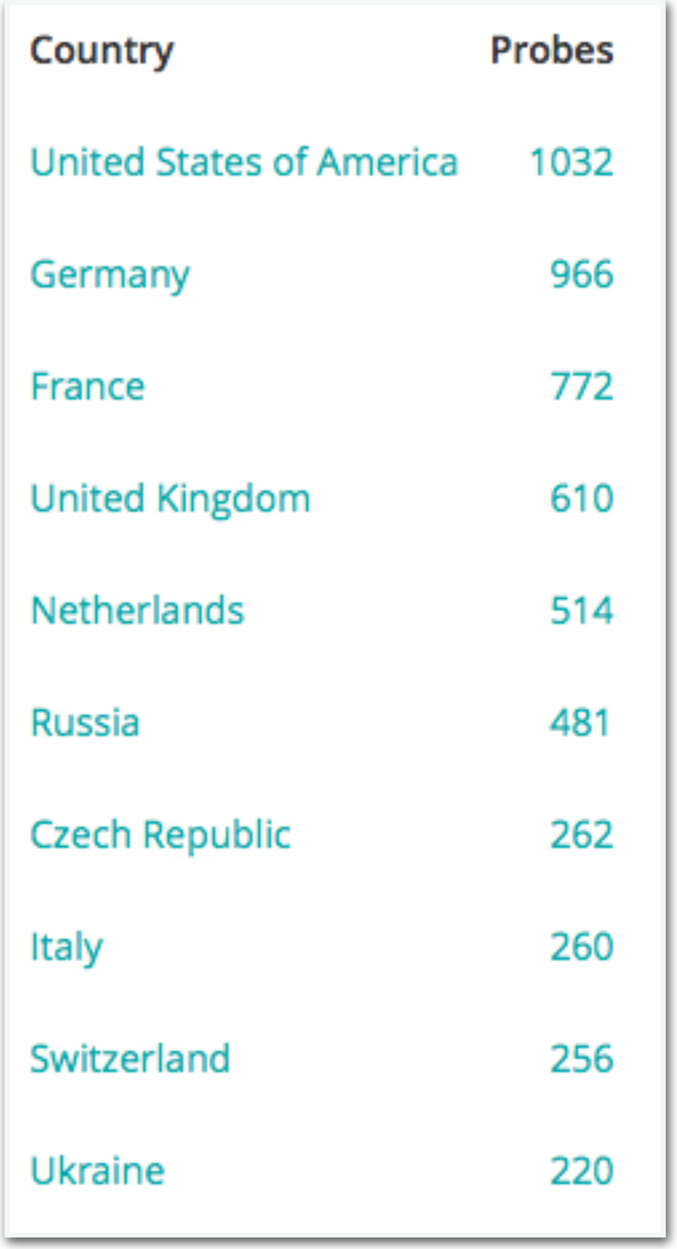
- RIPE Atlas = global active measurements platform
- Goal: View Internet reachability
- Probes hosted by volunteers
- Measurements performed towards root name servers
  - Visualised as Internet traffic maps

(cont…) Basics

- Users can also run customised measurements
  - Ping, traceroute, DNS, TLS/SSL and NTP
- Data publicly available

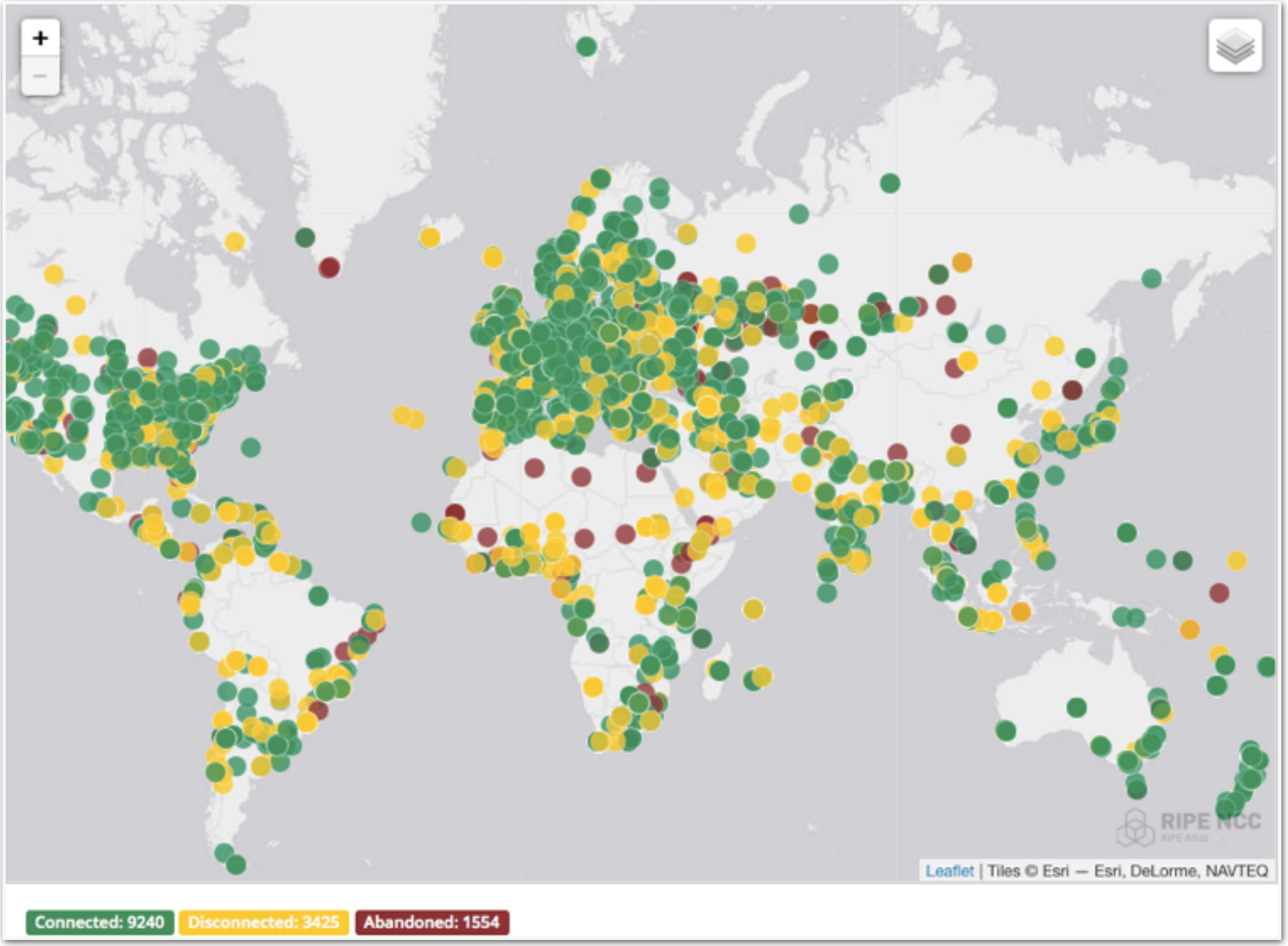
RIPE Atlas in numbers

- Countries: 181
- Originating ASNs:
  - 3,333 (IPv4) = 6,33% coverage
  - 1,212 (IPv6) = 11,22% coverage
- 9,300+ active probes
- Active users: 10,000 in 2015
- 188 RIPE Atlas anchors



Country	Probes
United States of America	1032
Germany	966
France	772
United Kingdom	610
Netherlands	514
Russia	481
Czech Republic	262
Italy	260
Switzerland	256
Ukraine	220

RIPE Atlas coverage



Connected: 9240 | Disconnected: 3425 | Abandoned: 1554

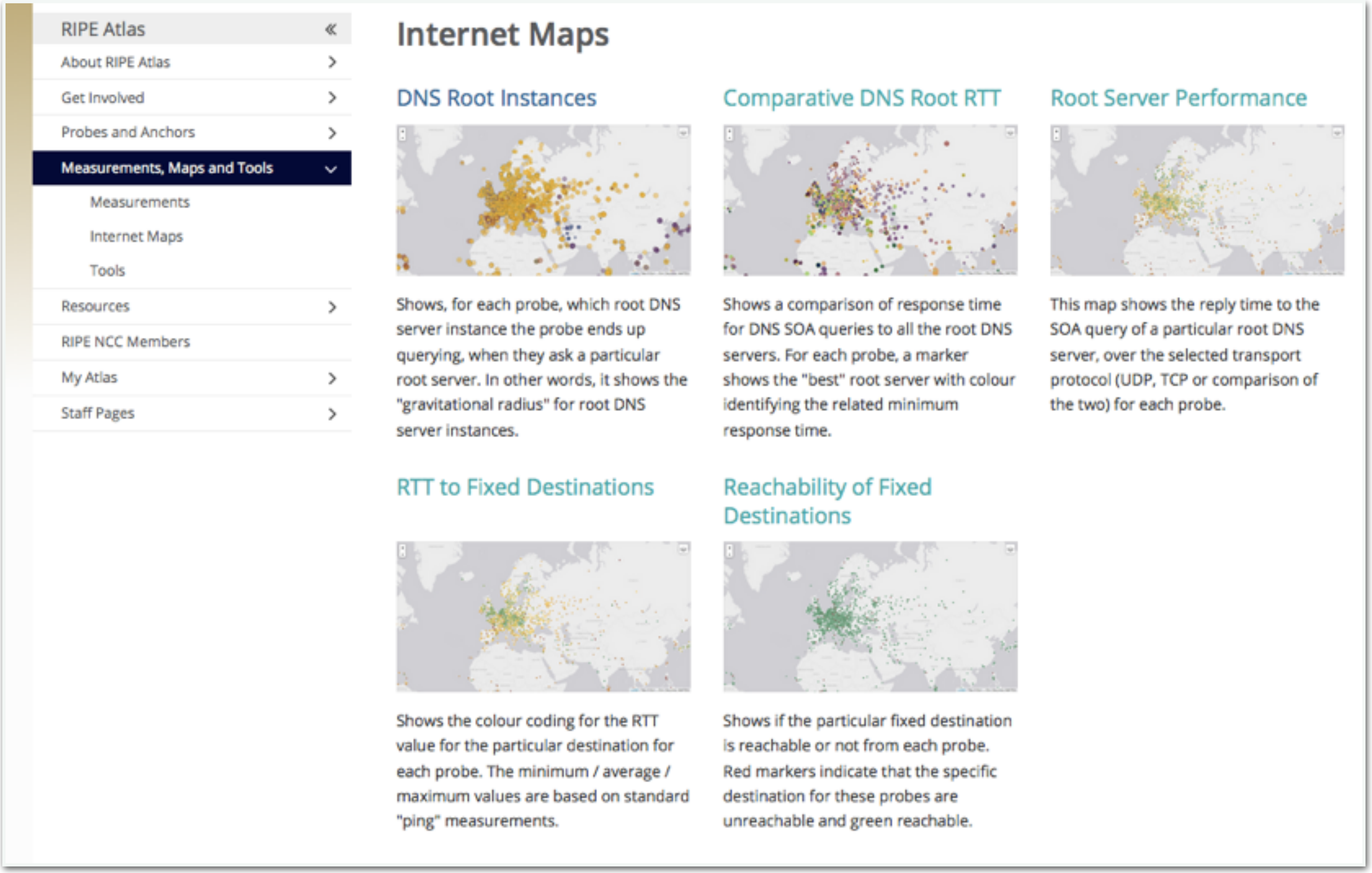
Measurements devices

- v1 and v2: Lantronix XPort Pro
- v3: TP-Link TL-MR3020 powered from USB port
  - Does not work as a wireless router
  - Same functionality as the old probe
- RIPE Atlas anchor: Soekris net6501-70

Probe photos

What you can get from RIPE Atlas as a visitor

Internet traffic maps



Internet Maps

DNS Root Instances

Shows, for each probe, which root DNS server instance the probe ends up querying, when they ask a particular root server. In other words, it shows the "gravitational radius" for root DNS server instances.

Comparative DNS Root RTT

Shows a comparison of response time for DNS SOA queries to all the root DNS servers. For each probe, a marker shows the "best" root server with colour identifying the related minimum response time.

Root Server Performance

This map shows the reply time to the SOA query of a particular root DNS server, over the selected transport protocol (UDP, TCP or comparison of the two) for each probe.

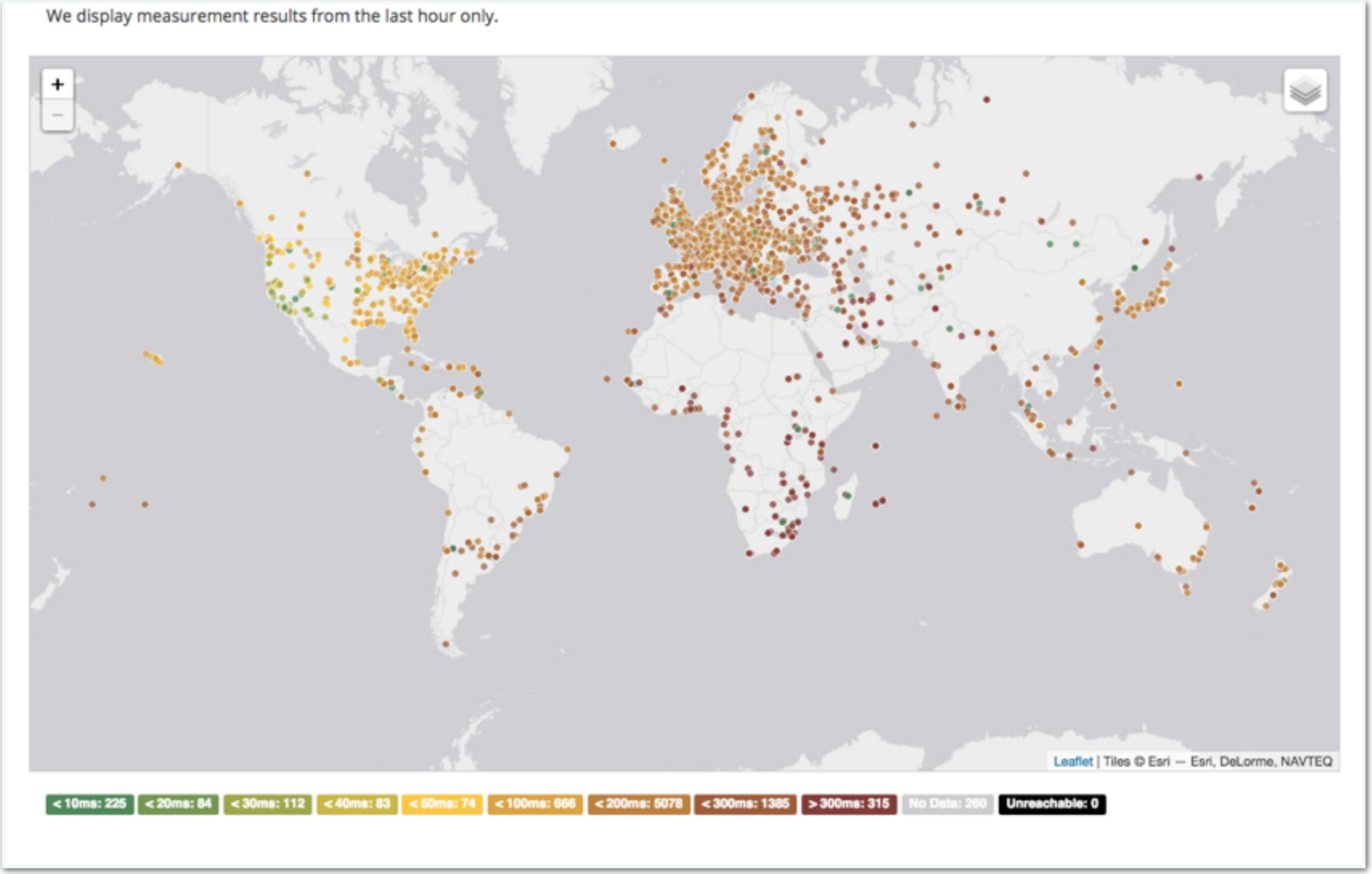
RTT to Fixed Destinations

Shows the colour coding for the RTT value for the particular destination for each probe. The minimum / average / maximum values are based on standard "ping" measurements.

Reachability of Fixed Destinations

Shows if the particular fixed destination is reachable or not from each probe. Red markers indicate that the specific destination for these probes are unreachable and green reachable.

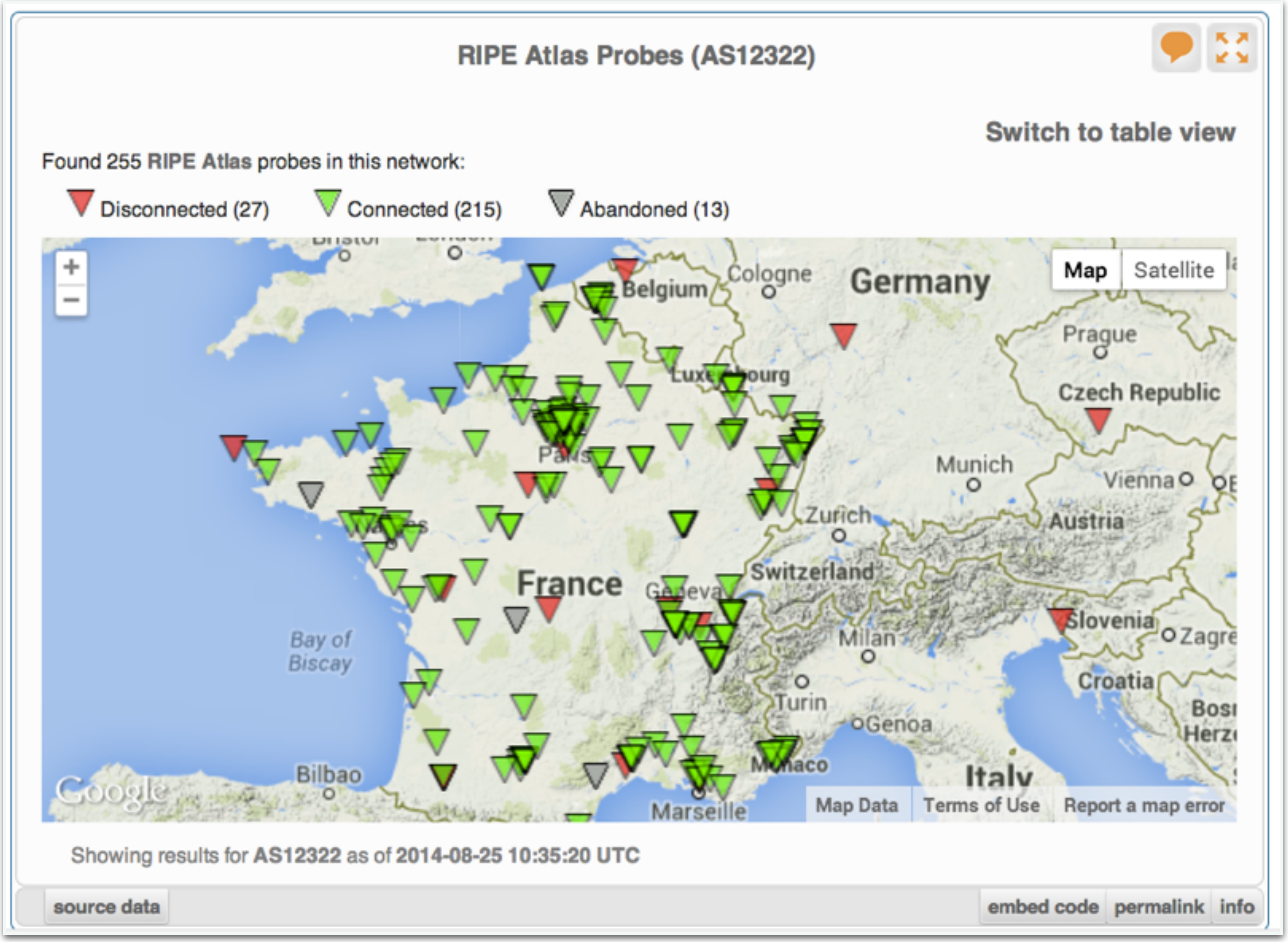
Where is B-root?



We display measurement results from the last hour only.

< 10ms: 225 | < 20ms: 84 | < 30ms: 112 | < 40ms: 83 | < 50ms: 74 | < 100ms: 666 | < 200ms: 5078 | < 300ms: 1385 | > 300ms: 315 | No Data: 260 | Unreachable: 0

Probes per ASN (in RIPEstat)



RIPE Atlas Probes (AS12322)

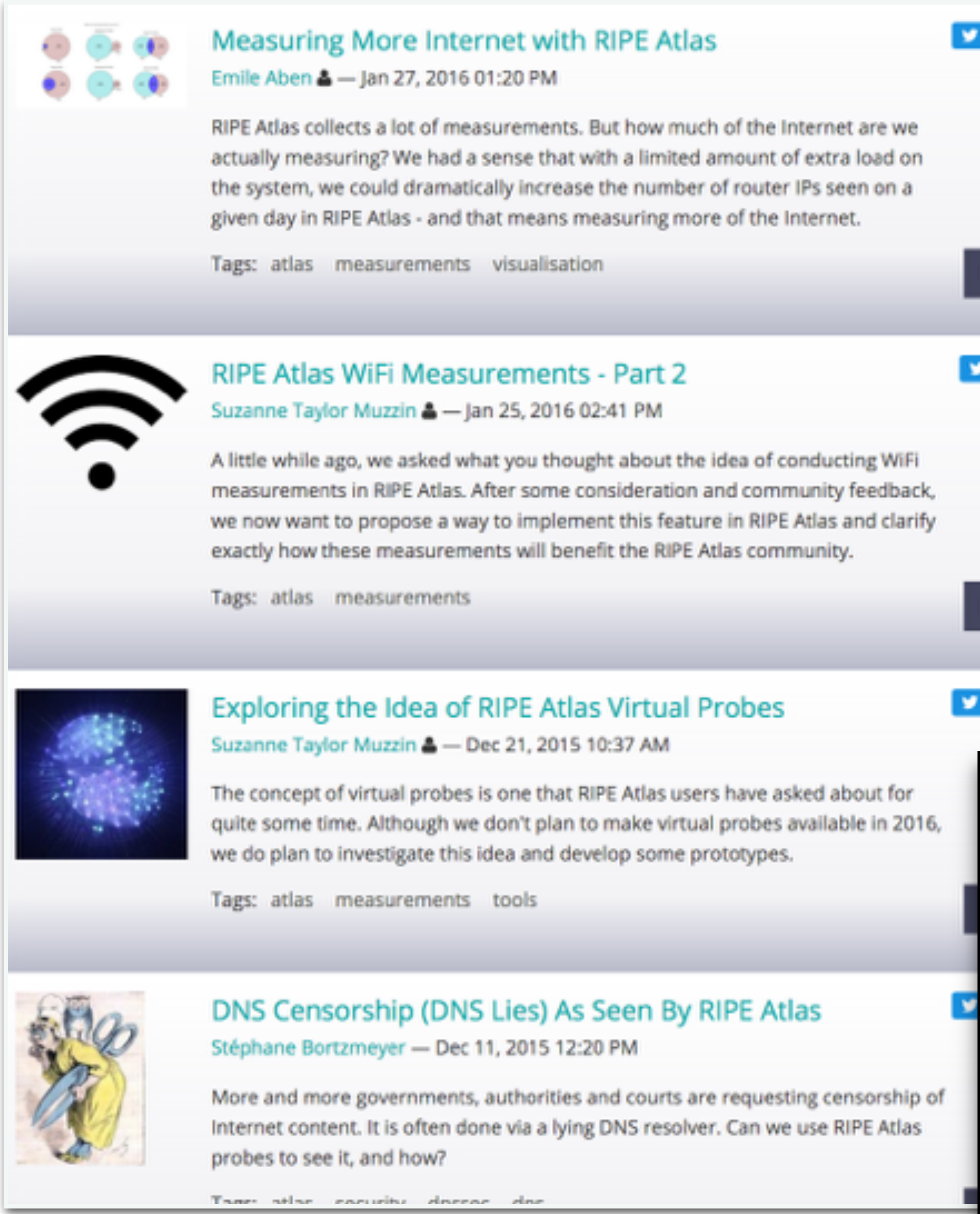
Switch to table view

Found 255 **RIPE Atlas** probes in this network:

▼ Disconnected (27) ▼ Connected (215) ▼ Abandoned (13)

Showing results for **AS12322** as of **2014-08-25 10:35:20 UTC**

Articles, papers, use cases, experiences



Measuring More Internet with RIPE Atlas

Emile Aben — Jan 27, 2016 01:20 PM

RIPE Atlas collects a lot of measurements. But how much of the Internet are we actually measuring? We had a sense that with a limited amount of extra load on the system, we could dramatically increase the number of router IPs seen on a given day in RIPE Atlas - and that means measuring more of the Internet.

Tags: atlas measurements visualisation

RIPE Atlas WiFi Measurements - Part 2

Suzanne Taylor Muzzin — Jan 25, 2016 02:41 PM

A little while ago, we asked what you thought about the idea of conducting WiFi measurements in RIPE Atlas. After some consideration and community feedback, we now want to propose a way to implement this feature in RIPE Atlas and clarify exactly how these measurements will benefit the RIPE Atlas community.

Tags: atlas measurements

Exploring the Idea of RIPE Atlas Virtual Probes

Suzanne Taylor Muzzin — Dec 21, 2015 10:37 AM

The concept of virtual probes is one that RIPE Atlas users have asked about for quite some time. Although we don't plan to make virtual probes available in 2016, we do plan to investigate this idea and develop some prototypes.

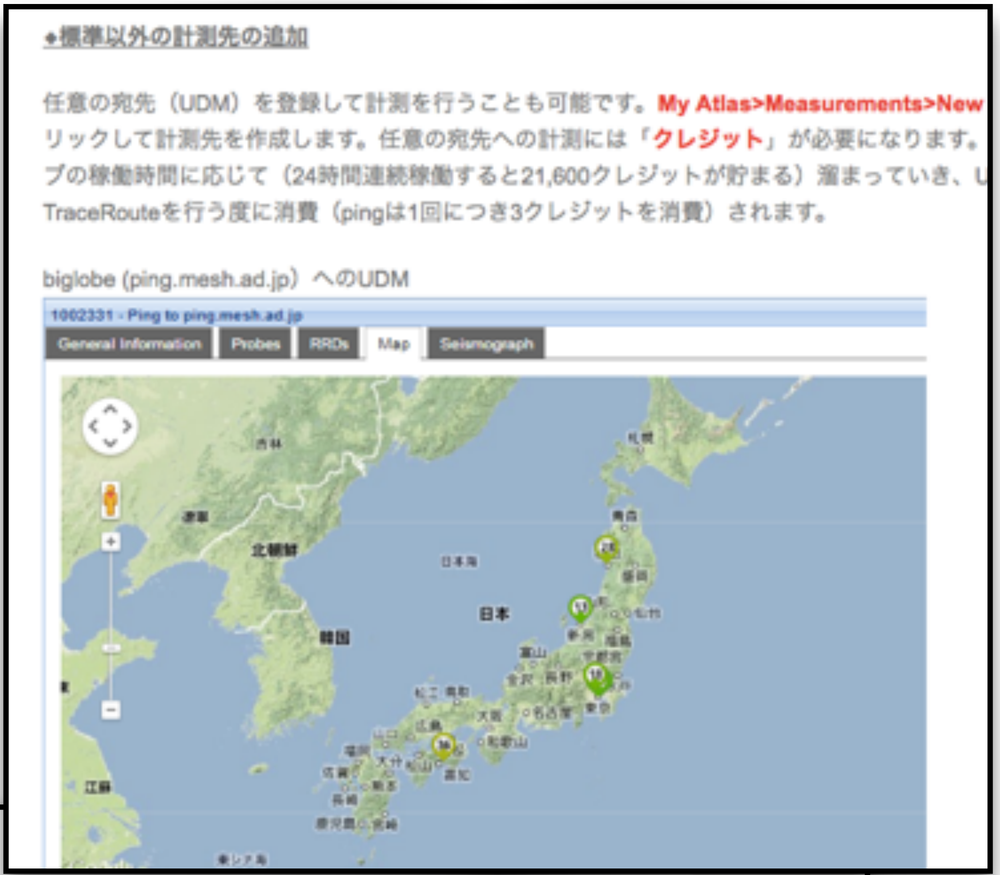
Tags: atlas measurements tools

DNS Censorship (DNS Lies) As Seen By RIPE Atlas

Stéphane Bortzmeyer — Dec 11, 2015 12:20 PM

More and more governments, authorities and courts are requesting censorship of Internet content. It is often done via a lying DNS resolver. Can we use RIPE Atlas probes to see it, and how?

Tags: atlas security dnssec dns

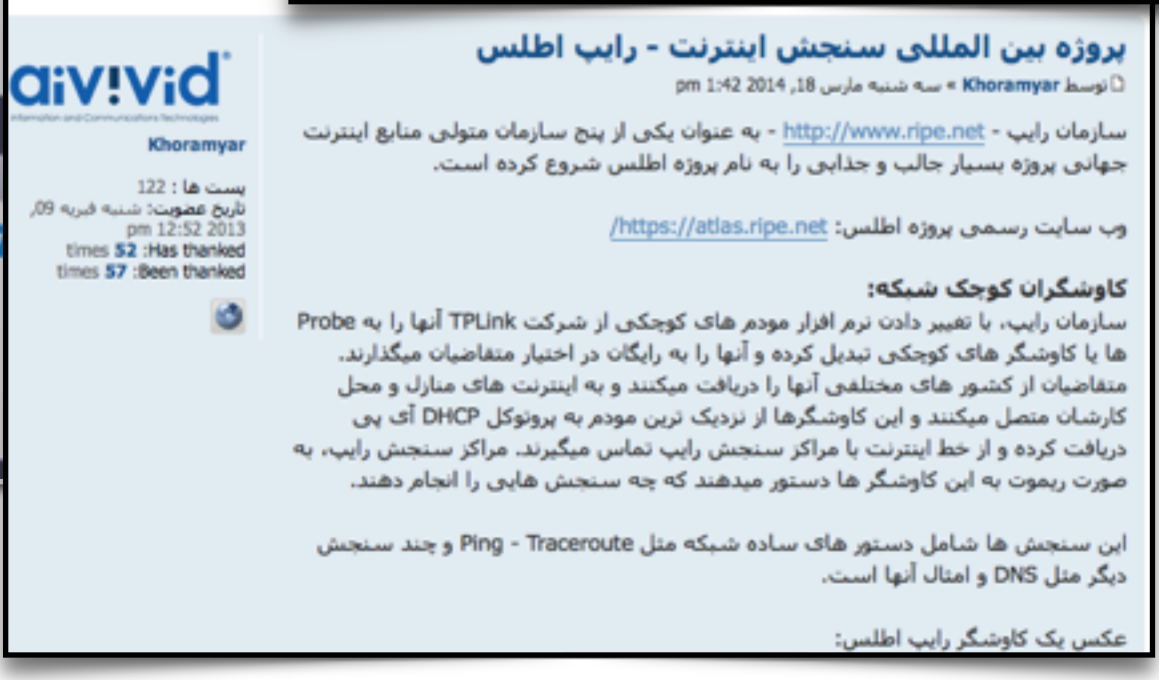


◆標準以外の計測先の追加

任意の宛先（UDM）を登録して計測を行うことも可能です。**My Atlas>Measurements>New**
リックして計測先を作成します。任意の宛先への計測には「**クレジット**」が必要になります。
ブの稼働時間に応じて（24時間連続稼働すると21,600クレジットが貯まる）溜まっていき、U
TraceRouteを行う度に消費（pingは1回につき3クレジットを消費）されます。

biglobe (ping.mesh.ad.jp）へのUDM

1002331 - Ping to ping.mesh.ad.jp



1 پست • صفحه 1 از 1

پروژه بین المللی سنجش اینترنت - رایپ اطلس

توسط Khoramyar » سه شنبه مارس 18, 2014 1:42 pm

سازمان رایپ - http://www.ripe.net - به عنوان یکی از پنج سازمان متولی منابع اینترنت جهانی پروژه بسیار جالب و جذابی را به نام پروژه اطلس شروع کرده است.

وب سایت رسمی پروژه اطلس: /https://atlas.ripe.net

کاوشگران کوچک شبکه:
سازمان رایپ، با تغییر دادن نرم افزار مودم های کوچکی از شرکت TPLink آنها را به Probe ها یا کاوشگر های کوچکی تبدیل کرده و آنها را به رایگان در اختیار متقاضیان میگذارند. متقاضیان از کشور های مختلفی آنها را دریافت میکنند و به اینترنت های منازل و محل کارشان متصل میکنند و این کاوشگرها از نزدیک ترین مودم به پروتوکل DHCP آی پی دریافت کرده و از خط اینترنت با مراکز سنجش رایپ تماس میگیرند. مراکز سنجش رایپ، به صورت ریموت به این کاوشگر ها دستور میدهند که چه سنجش هایی را انجام دهند.

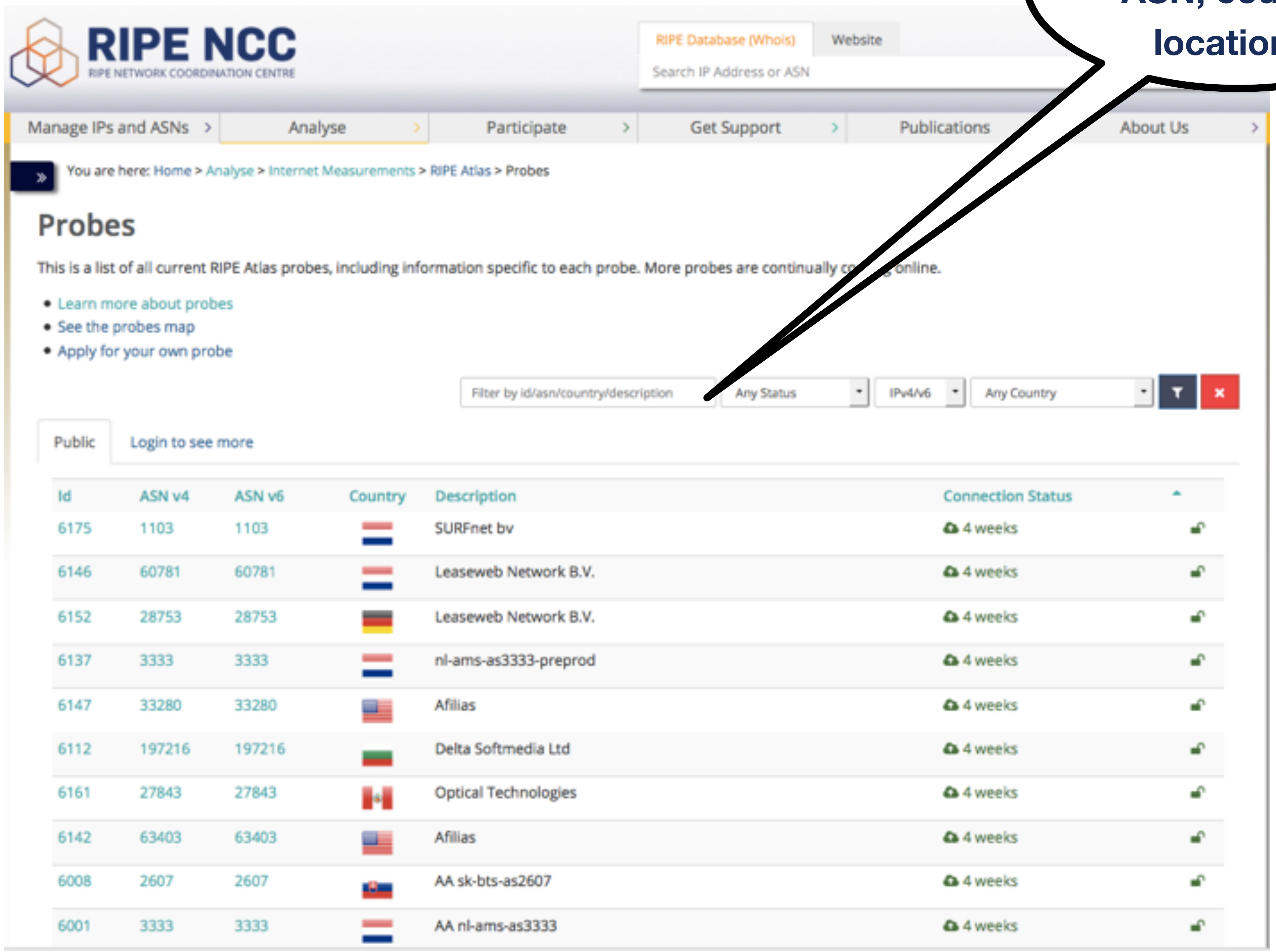
این سنجش ها شامل دستور های ساده شبکه مثل Traceroute - Ping و چند سنجش دیگر مثل DNS و امثال آنها است.

عکس یک کاوشگر رایپ اطلس:

Khoramyar
پست ها : 122
تاریخ عضویت: شنبه فبریه 09, 2013 12:52 pm
Has thanked: 52 times
Been thanked: 57 times

Searching for probes

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



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

Probes

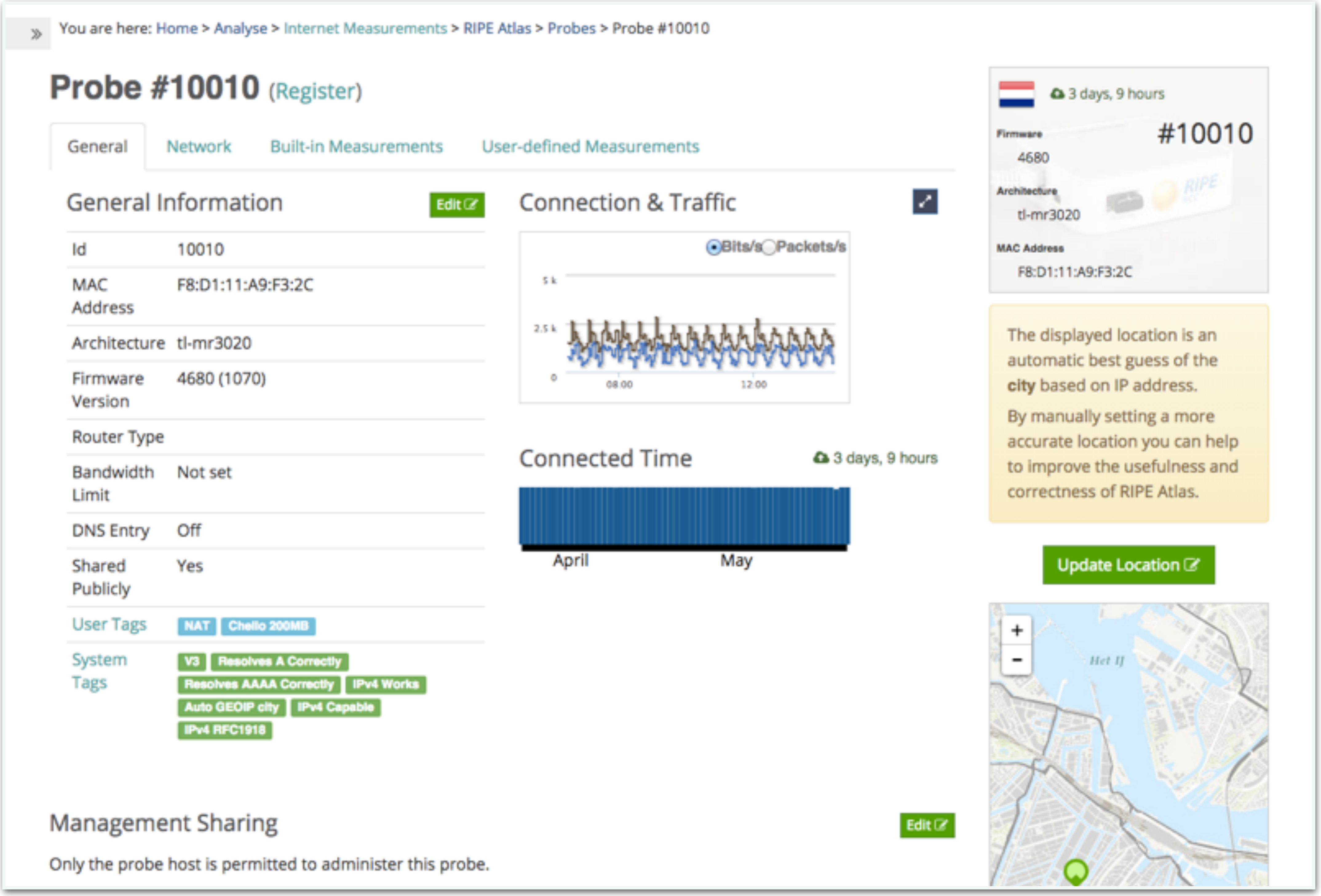
This is a list of all current RIPE Atlas probes, including information specific to each probe. More probes are continually co g online.

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

Id	ASN v4	ASN v6	Country	Description	Connection Status
6175	1103	1103	🇳🇱	SURFnet bv	4 weeks
6146	60781	60781	🇳🇱	Leaseweb Network B.V.	4 weeks
6152	28753	28753	🇩🇪	Leaseweb Network B.V.	4 weeks
6137	3333	3333	🇳🇱	nl-ams-as3333-preprod	4 weeks
6147	33280	33280	🇺🇸	Afilias	4 weeks
6112	197216	197216	🇧🇬	Delta Softmedia Ltd	4 weeks
6161	27843	27843	🇵🇪	Optical Technologies	4 weeks
6142	63403	63403	🇺🇸	Afilias	4 weeks
6008	2607	2607	🇸🇰	AA sk-bts-as2607	4 weeks
6001	3333	3333	🇳🇱	AA nl-ams-as3333	4 weeks

Filter based on ASN, country, location...

Probe details



» You are here: Home > Analyse > Internet Measurements > RIPE Atlas > Probes > Probe #10010

Probe #10010 (Register)

General Information

Id	10010
MAC Address	F8:D1:11:A9:F3:2C
Architecture	tl-mr3020
Firmware Version	4680 (1070)
Router Type	
Bandwidth Limit	Not set
DNS Entry	Off
Shared Publicly	Yes
User Tags	NAT Chello 200MB
System Tags	V3 Resolves A Correctly Resolves AAAA Correctly IPv4 Works Auto GEOIP city IPv4 Capable IPv4 RFC1918

Connection & Traffic

Connected Time

3 days, 9 hours

3 days, 9 hours

#10010

Firmware
4680

Architecture
tl-mr3020

MAC Address
F8:D1:11:A9:F3:2C

The displayed location is an automatic best guess of the **city** based on IP address.

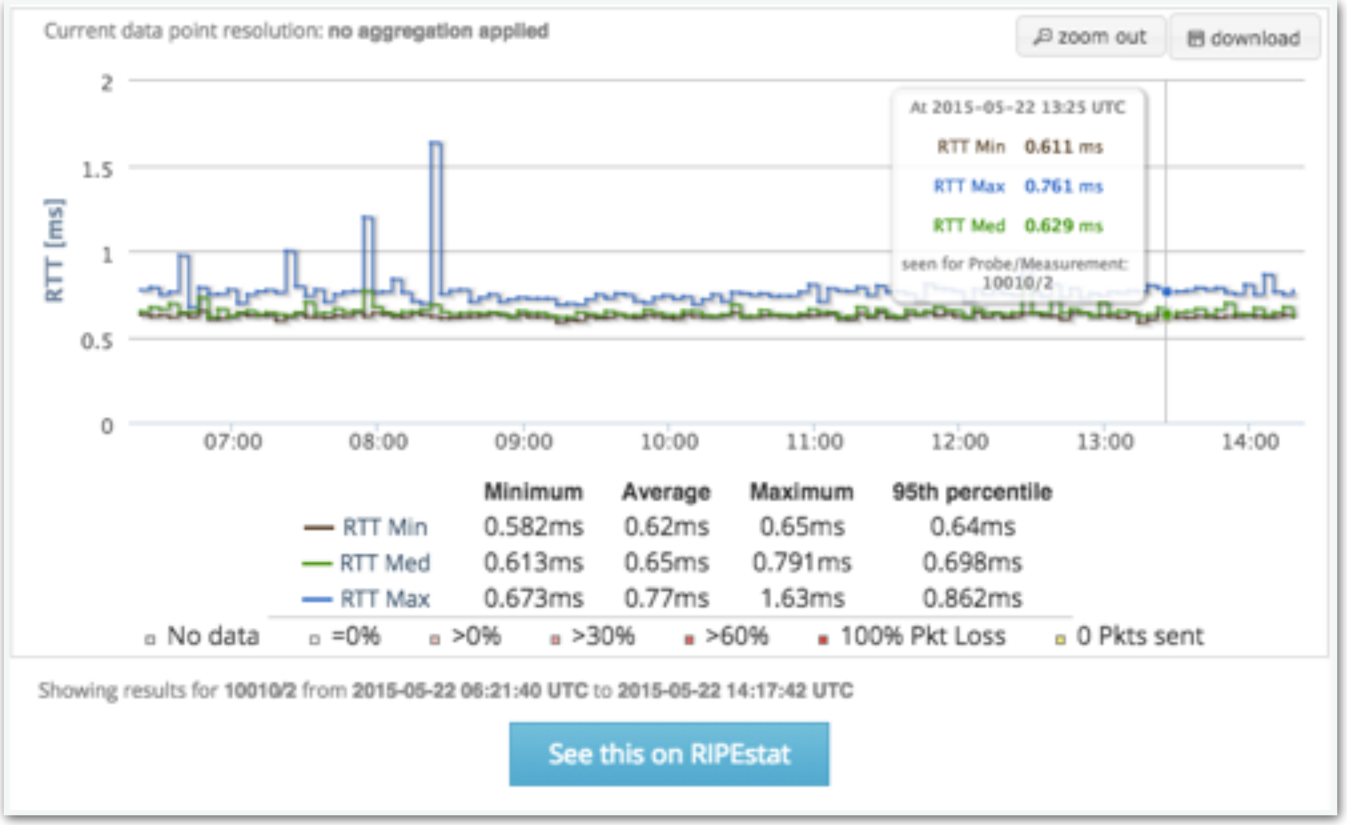
By manually setting a more accurate location you can help to improve the usefulness and correctness of RIPE Atlas.

Management Sharing

Only the probe host is permitted to administer this probe.

Zoomable ping graph

- Zoom in / out in time, in the same graph
- Easier visualisation of an event’s details
- Selection of RTT class (max, min, average)



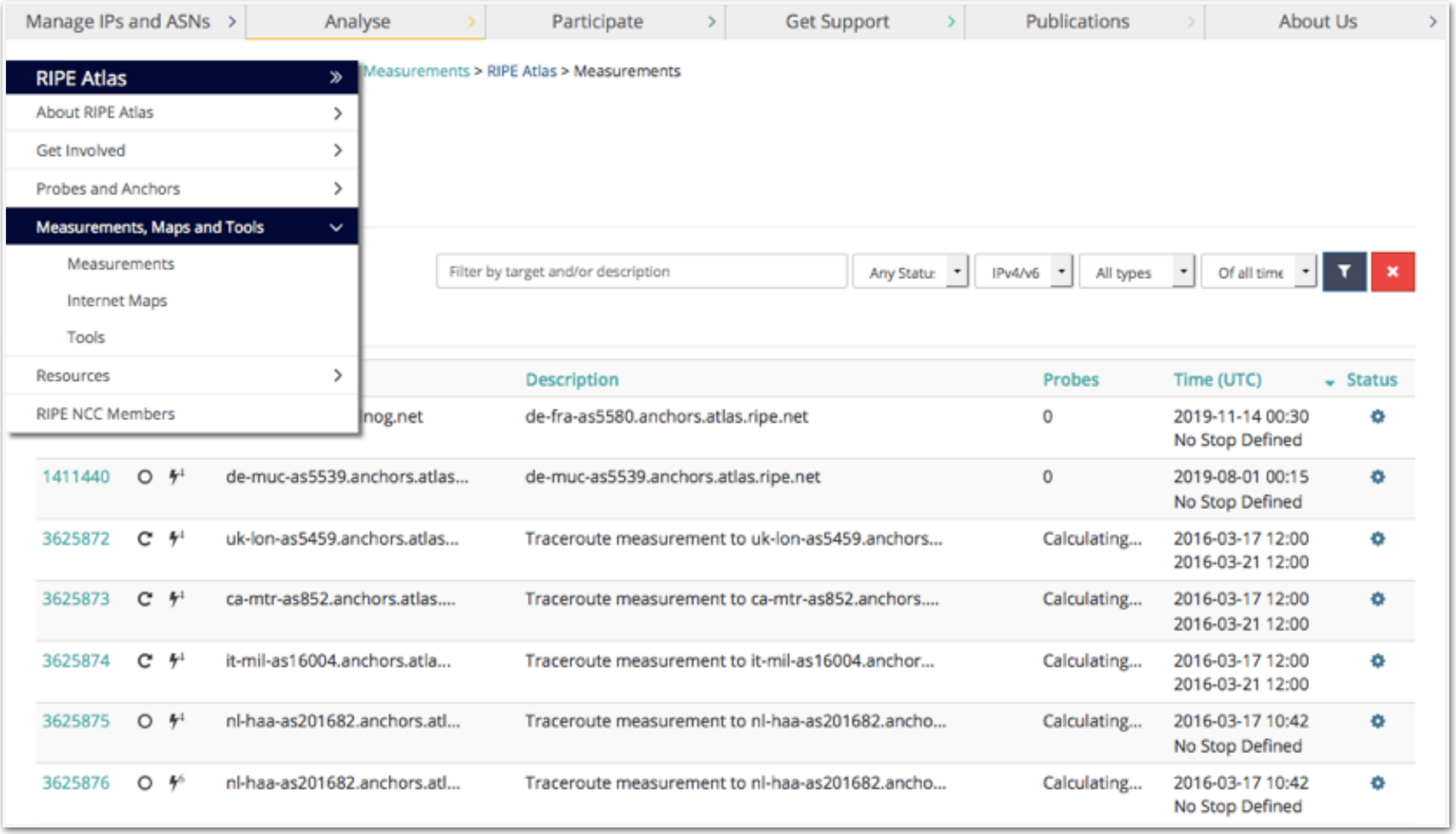
Current data point resolution: **no aggregation applied**

	Minimum	Average	Maximum	95th percentile
RTT Min	0.582ms	0.62ms	0.65ms	0.64ms
RTT Med	0.613ms	0.65ms	0.791ms	0.698ms
RTT Max	0.673ms	0.77ms	1.63ms	0.862ms

Showing results for **10010/2** from **2015-05-22 06:21:40 UTC** to **2015-05-22 14:17:42 UTC**

Looking up measurements results

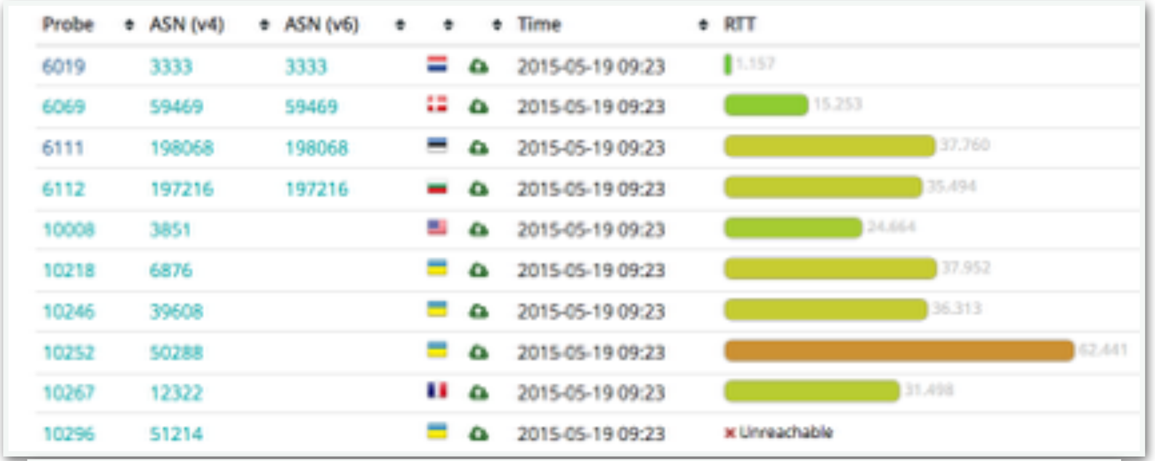
- https://atlas.ripe.net/measurements/



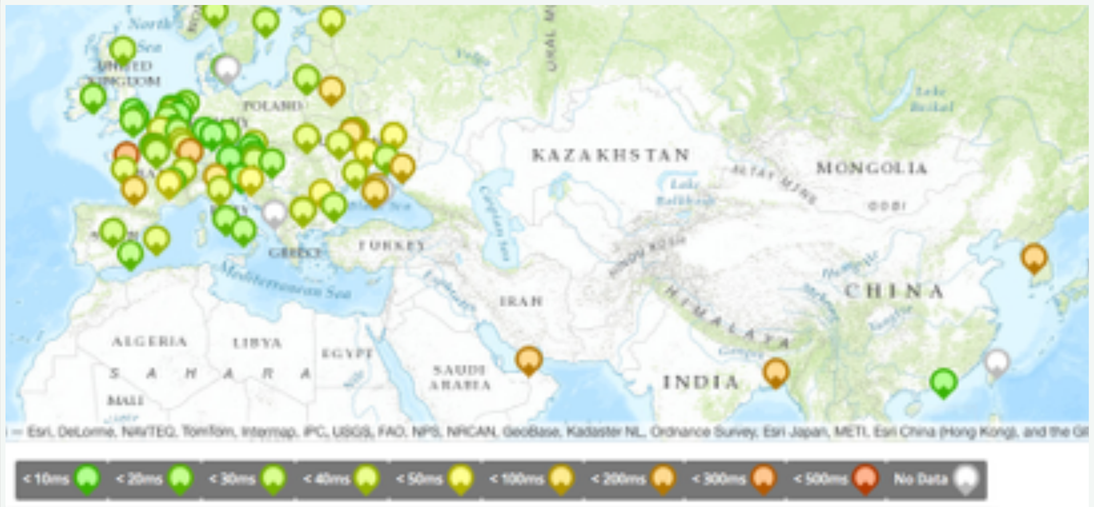
			Description	Probes	Time (UTC)	Status
		nog.net	de-fra-as5580.anchors.atlas.ripe.net	0	2019-11-14 00:30 No Stop Defined	
1411440	○	de-muc-as5539.anchors.atlas...	de-muc-as5539.anchors.atlas.ripe.net	0	2019-08-01 00:15 No Stop Defined	
3625872	↻	uk-lon-as5459.anchors.atlas...	Traceroute measurement to uk-lon-as5459.anchors...	Calculating...	2016-03-17 12:00 2016-03-21 12:00	
3625873	↻	ca-mtr-as852.anchors.atlas....	Traceroute measurement to ca-mtr-as852.anchors....	Calculating...	2016-03-17 12:00 2016-03-21 12:00	
3625874	↻	it-mil-as16004.anchors.atla...	Traceroute measurement to it-mil-as16004.anchor...	Calculating...	2016-03-17 12:00 2016-03-21 12:00	
3625875	○	nl-haa-as201682.anchors.atl...	Traceroute measurement to nl-haa-as201682.ancho...	Calculating...	2016-03-17 10:42 No Stop Defined	
3625876	○	nl-haa-as201682.anchors.atl...	Traceroute measurement to nl-haa-as201682.ancho...	Calculating...	2016-03-17 10:42 No Stop Defined	

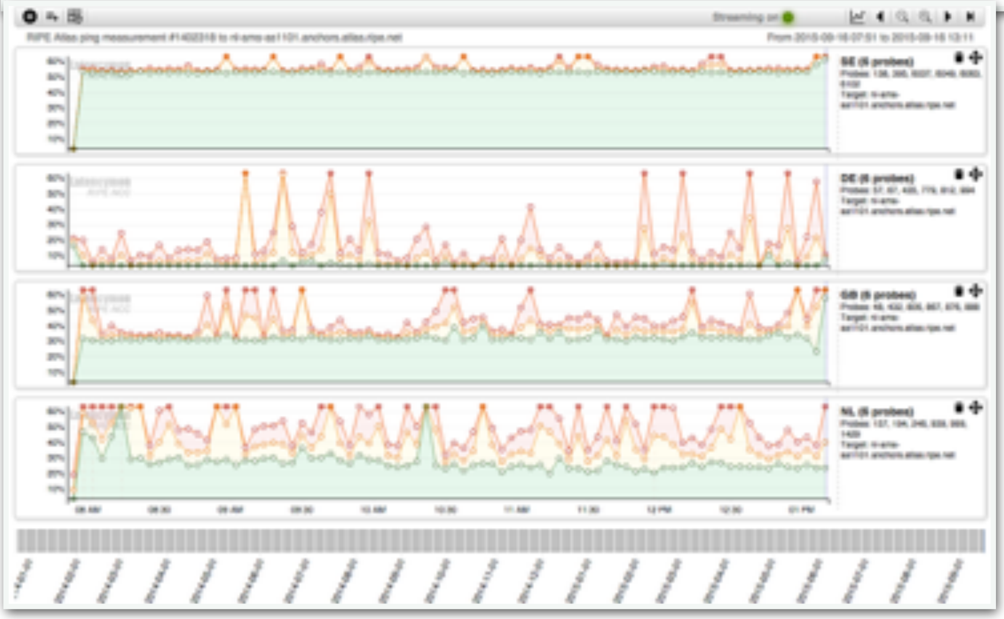
Available visualisations: ping

- List of probes: sortable by RTT
- Map: colour-coded by RTT
- LatencyMON: compare multiple latency trends



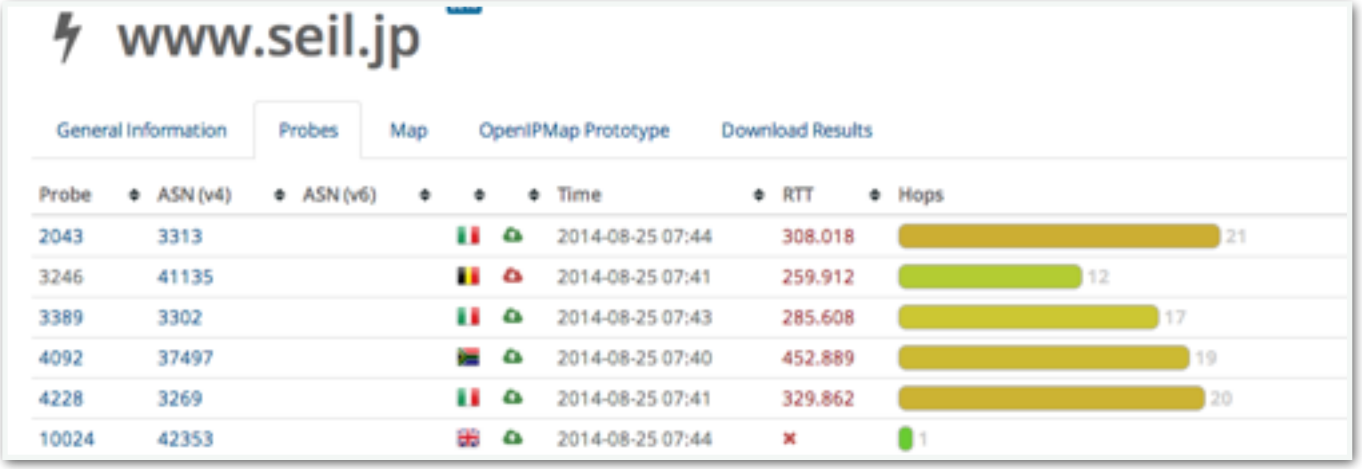
Probe	ASN (v4)	ASN (v6)			Time	RTT
6019	3333	3333			2015-05-19 09:23	1.157
6069	59469	59469			2015-05-19 09:23	15.253
6111	198068	198068			2015-05-19 09:23	37.760
6112	197216	197216			2015-05-19 09:23	35.494
10008	3851				2015-05-19 09:23	24.664
10218	6876				2015-05-19 09:23	37.952
10246	39608				2015-05-19 09:23	36.313
10252	50288				2015-05-19 09:23	62.441
10267	12322				2015-05-19 09:23	31.498
10296	51214				2015-05-19 09:23	✗ Unreachable





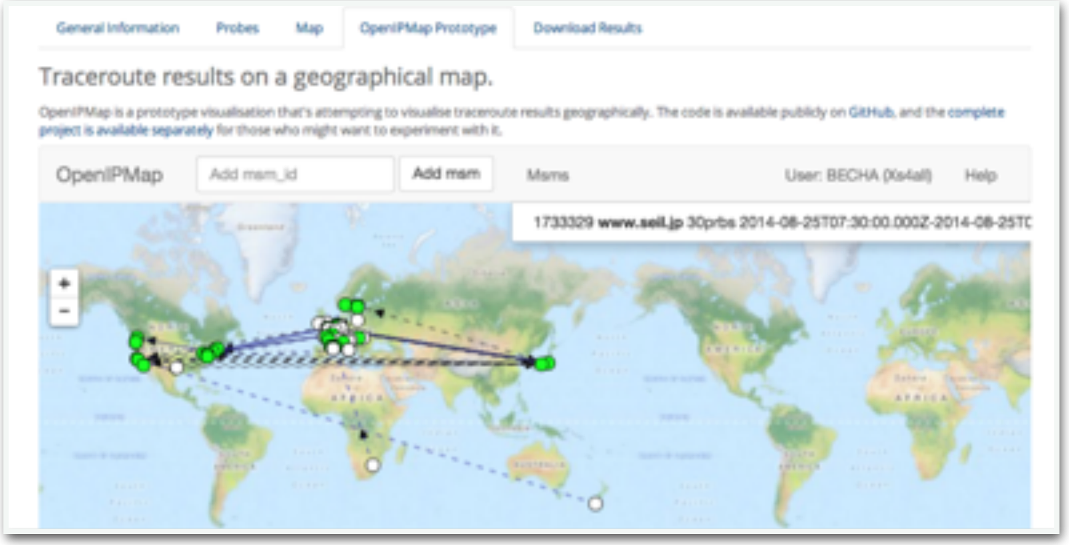
Available visualisations: traceroute

- List of probes, colour-coded number of hops
- Map
- Traceroute paths map, geolocation using OpenIPMap: github.com/RIPE-Atlas-Community/openipmap



www.seil.jp

Probe	ASN (v4)	ASN (v6)			Time	RTT	Hops
2043	3313		🇮🇹	☁	2014-08-25 07:44	308.018	21
3246	41135		🇧🇪	☁	2014-08-25 07:41	259.912	12
3389	3302		🇮🇹	☁	2014-08-25 07:43	285.608	17
4092	37497		🇿🇦	☁	2014-08-25 07:40	452.889	19
4228	3269		🇮🇹	☁	2014-08-25 07:41	329.862	20
10024	42353		🇬🇧	☁	2014-08-25 07:44	✗	1



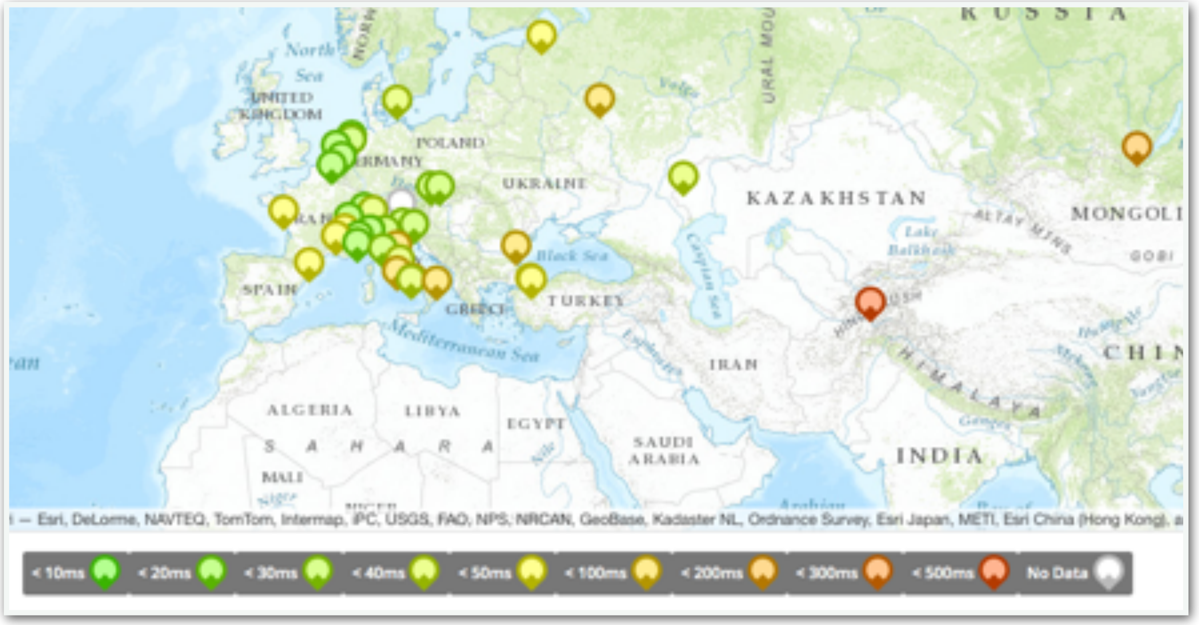
Traceroute results on a geographical map.

OpenIPMap is a prototype visualisation that's attempting to visualise traceroute results geographically. The code is available publicly on GitHub, and the complete project is available separately for those who might want to experiment with it.

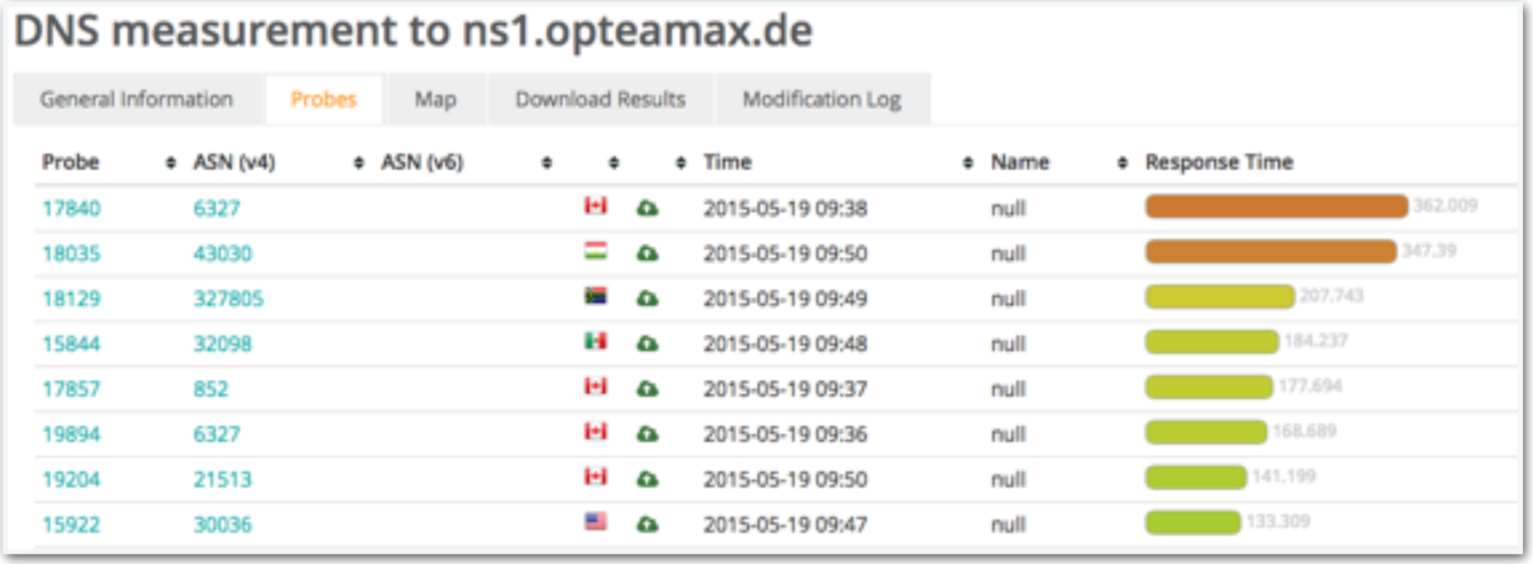
1733329 **www.seil.jp** 30prbs 2014-08-25T07:30:00.000Z-2014-08-25TC

Available visualisations: DNS

- Map, colour-coded response time or diversity
- List of probes, sortable by response time



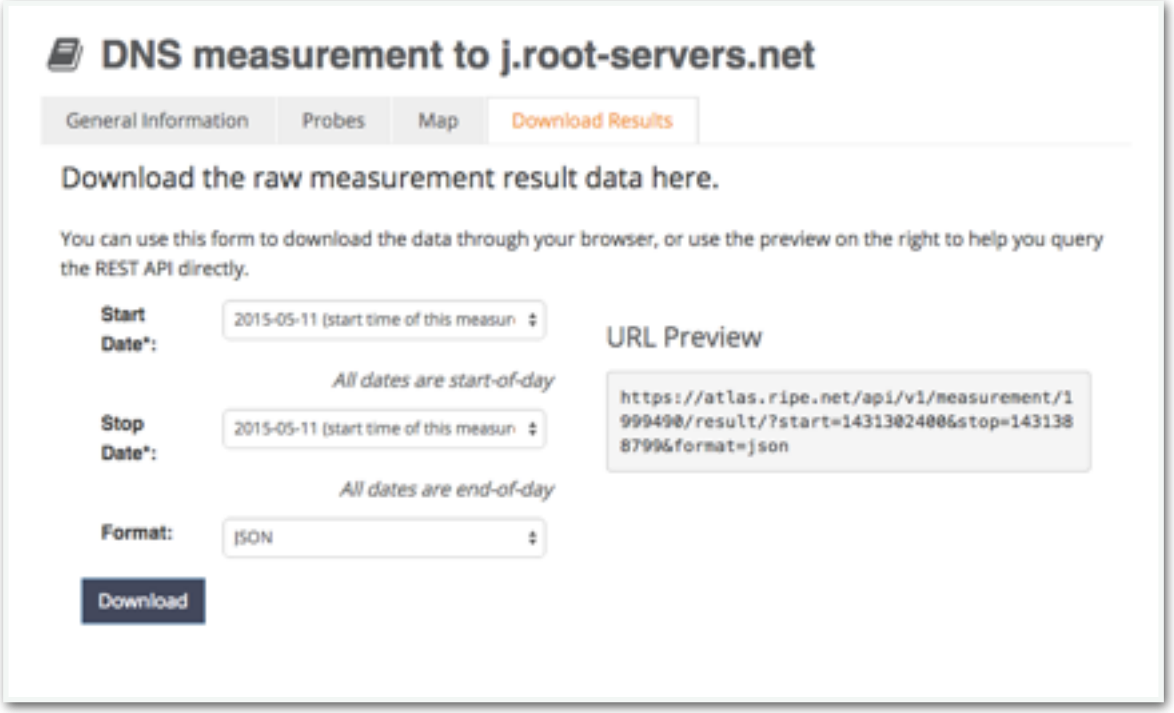
— Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), a


DNS measurement to ns1.opteamax.de

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

Downloading measurements results

- Click on msm, then “Download”
- Or go to URL
- Or use the API
- Results in JSON
- Libraries for parsing available on GitHub
  - github.com/RIPE-NCC/ripe.atlas.sagan
  - github.com/RIPE-Atlas-Community/



DNS measurement to j.root-servers.net

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.

Start Date*: 2015-05-11 (start time of this measurn

All dates are start-of-day

Stop Date*: 2015-05-11 (start time of this measurn

All dates are end-of-day

Format: JSON

URL Preview

```
https://atlas.ripe.net/api/v1/measurement/1
999490/result/?start=1431302400&stop=143138
8799&format=json
```

Looking at the result

```
[{“af":6,"avg" 61.32,

”dst_addr":"2a00:1450:4004:802::1014",“dst_name":"www.google.com",

“dup":0,

“from":"2001:8a0:7f00:b201:220:4aff:fec5:5b5b",

“fw":4660,“lts":411,

“max”:62.148,"min":60.372,

“msm_id":1004005,"msm_name":"Ping",

"prb_id":722,"proto":"ICMP","rcvd":10

“result":[{"rtt":62.148},{"rtt":61.437},{"rtt":61.444},{"rtt":61.448},
{"rtt":61.794},{"rtt":61.533},{"rtt":60.372},{"rtt":60.373},{"rtt":61.384},
{"rtt":61.267}],

“sent":10,"size"64,

“src_addr":"2001:8a0:7f00:b201:220:4aff:fec5:5b5b",

"step":240,"timestamp":1410220847,"ttl":54,"type":"ping"},
```

Destination (IP & name)

Reference (msm ID)

Source (probe public IP address)

Packet loss: difference between sent & received!

Use existing measurements

- There are many measurements already running!
- Search for existing public measurements first…
- Only then schedule your own measurement if you don’t find what you’re looking for

Creating a Measurement

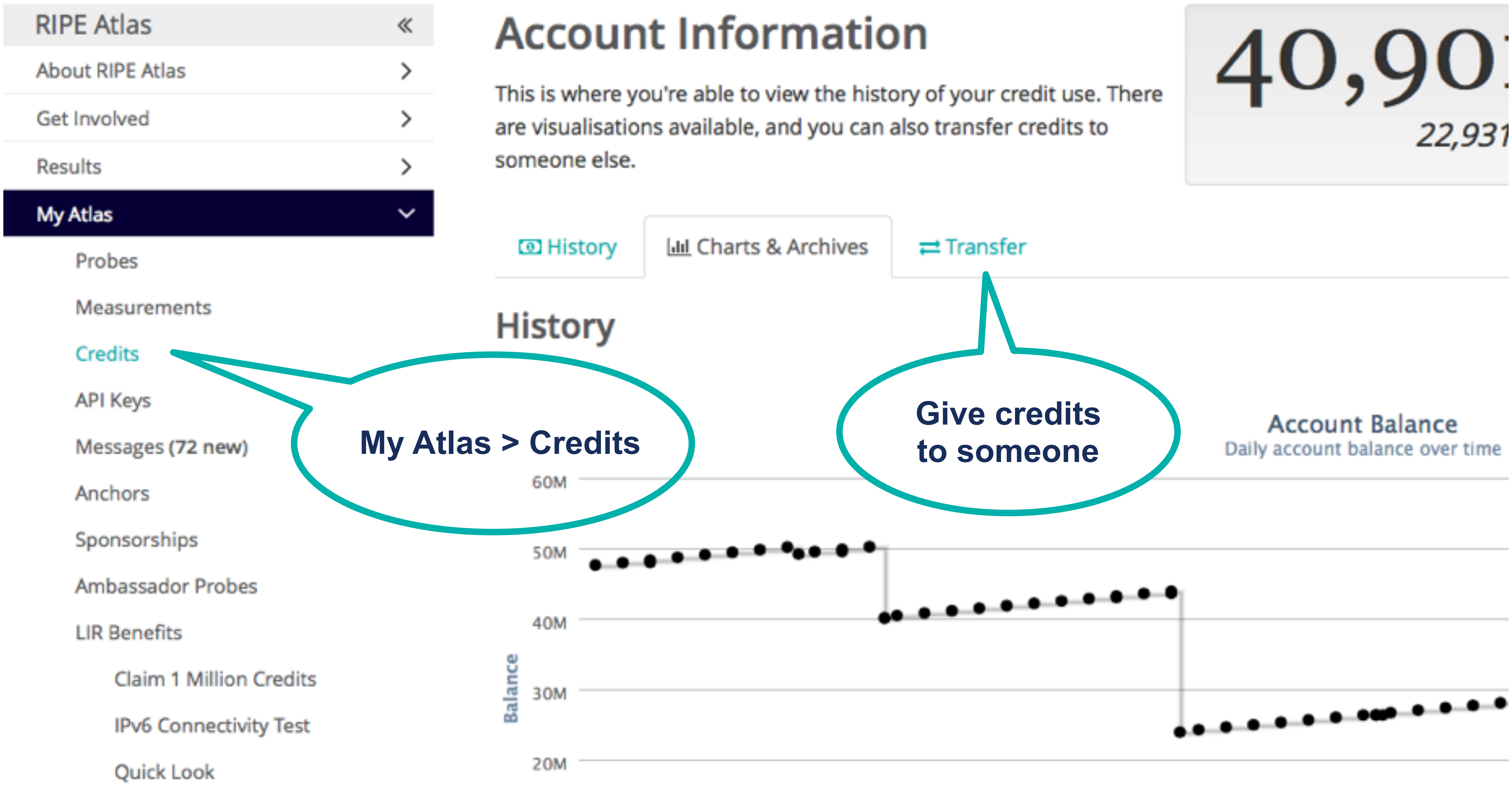
Benefits of your own measurements

- A customer reports a problem: they cannot reach one of your servers
  - You can schedule pings or traceroutes from up to 500 RIPE Atlas probes from a particular region to check where the problem might be
- Measuring packet loss on a suspected “bad” link
- Testing anycast deployment

Credits system

- Running your own measurements costs credits: ping = 10 credits, traceroute = 20, etc.
- Why? Fairness and to avoid overload
- Daily spending limit and max measurements user can create
- Earn credits by:
  - Hosting a RIPE Atlas probe + extra credits for:
  - Being a RIPE NCC member
  - Hosting an anchor
  - Sponsoring probes

Credits overview



Account Information

This is where you're able to view the history of your credit use. There are visualisations available, and you can also transfer credits to someone else.

40,90

22,931

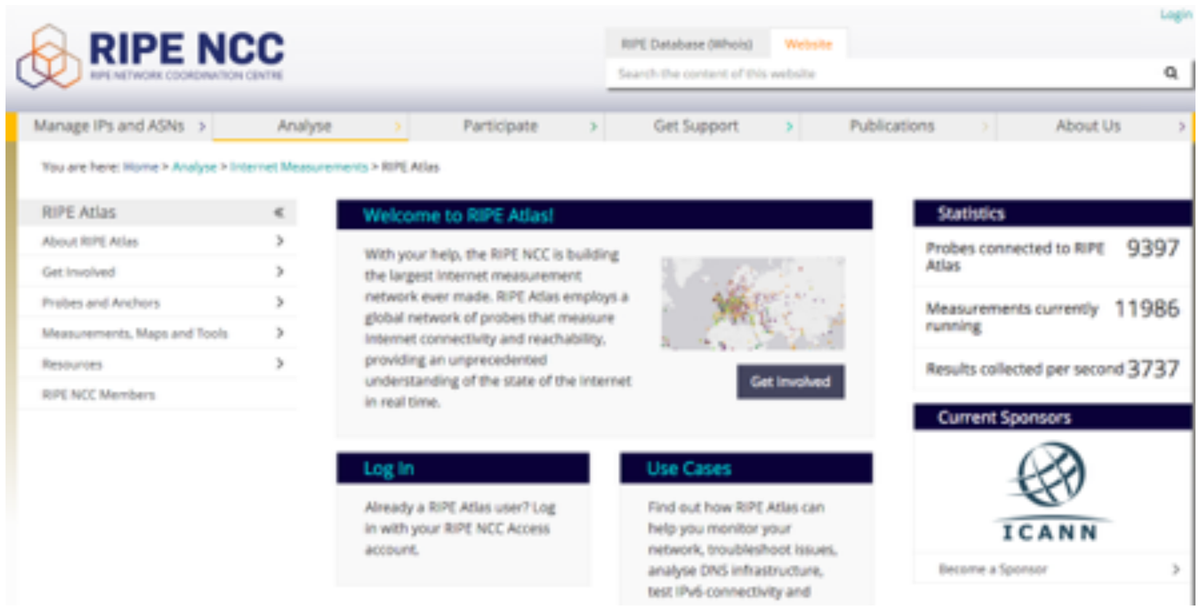
History

My Atlas > Credits

Give credits to someone

Logging in

- Log in to atlas.ripe.net
  - Use your RIPE NCC Access account
  - Same account for LIR Portal, RIPE Atlas, RIPEstat, RIPE Labs...
  - Create an account if you don’t have one already



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

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.

Statistics

Probes connected to RIPE Atlas	9397
Measurements currently running	11986
Results collected per second	3737

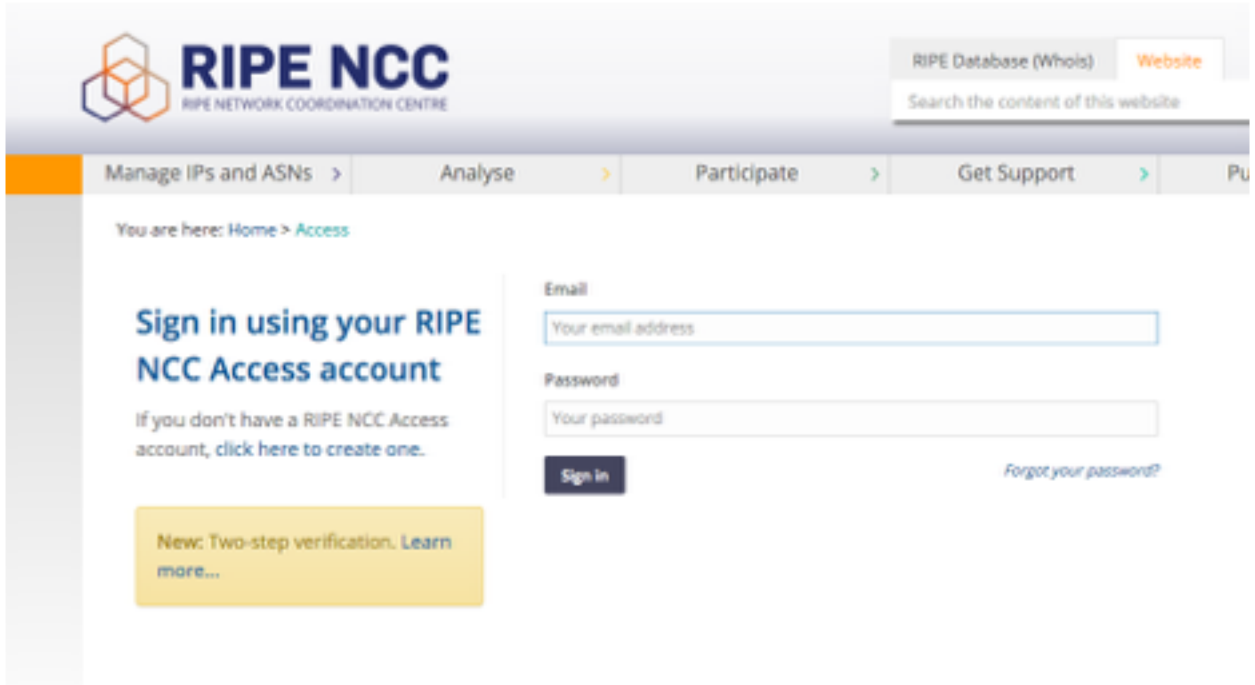
Current Sponsors

Log In

Already a RIPE Atlas user? Log in with your RIPE NCC Access account.

Use Cases

Find out how RIPE Atlas can help you monitor your network, troubleshoot issues, analyse DNS infrastructure, test IPv6 connectivity and



You are here: Home > Access

Sign in using your RIPE NCC Access account

If you don't have a RIPE NCC Access account, click here to create one.

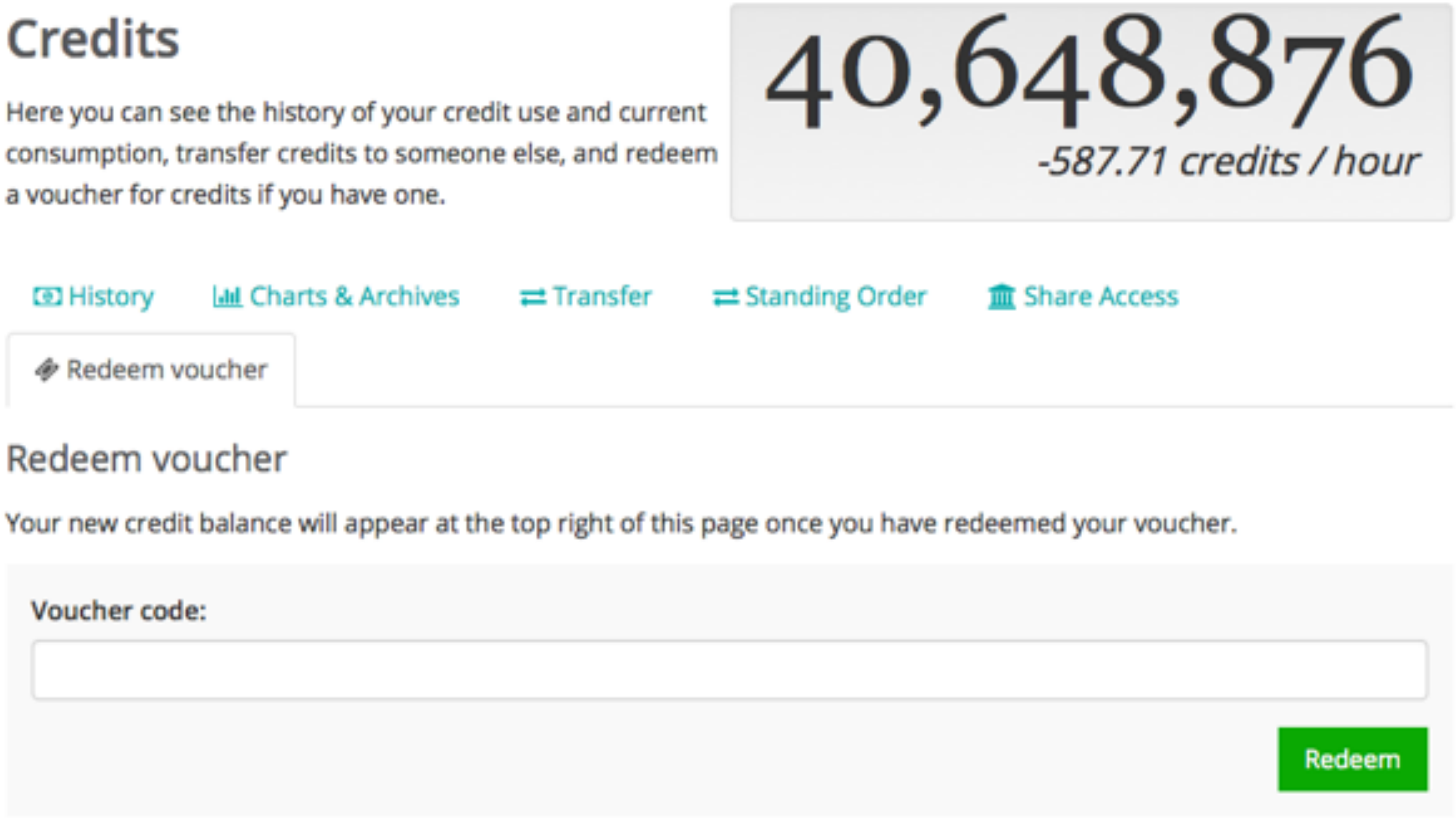
New: Two-step verification. Learn more...

Email: Your email address

Password: Your password

Get credits

- Do you have credits to spend?
  - Redeem this voucher “menog16-tutorial”
  - https://atlas.ripe.net/user/credits/#!redeem



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.

40,648,876

-587.71 credits / hour

Redeem voucher

Your new credit balance will appear at the top right of this page once you have redeemed your voucher.

Voucher code:

Scheduling a measurement

- Log in to atlas.ripe.net
- "My Atlas" > "Measurements"
- Three methods:

1. Quick and easy
   - Choose measurement type
   - Specify target
   - Done!
2. Advanced GUI usage
3. Scripting using API

2: Using GUI to schedule a measurement

- Mostly used for a periodic, long time measurement
  - If just once, ASAP, choose “One-off”
- Choose type, target, frequency, # of probes, region…
  - Interactive interface helps you at each step
- Each measurement will have unique ID
- “API Compatible Specification” is generated by the GUI

3: Using API to schedule a measurement

- Scripting with the API
  - https://atlas.ripe.net/docs/measurement-creation-api/
  - https://atlas.ripe.net/keys/
- You will need API keys
  - To create measurements without logging in
  - To securely share your measurement data

API documentation

- https://atlas.ripe.net/docs/measurement-creation-api/
  - https://atlas.ripe.net/doc/credits
  - https://atlas.ripe.net/doc/udm
- https://atlas.ripe.net/keys/

Exercise

Create a measurement

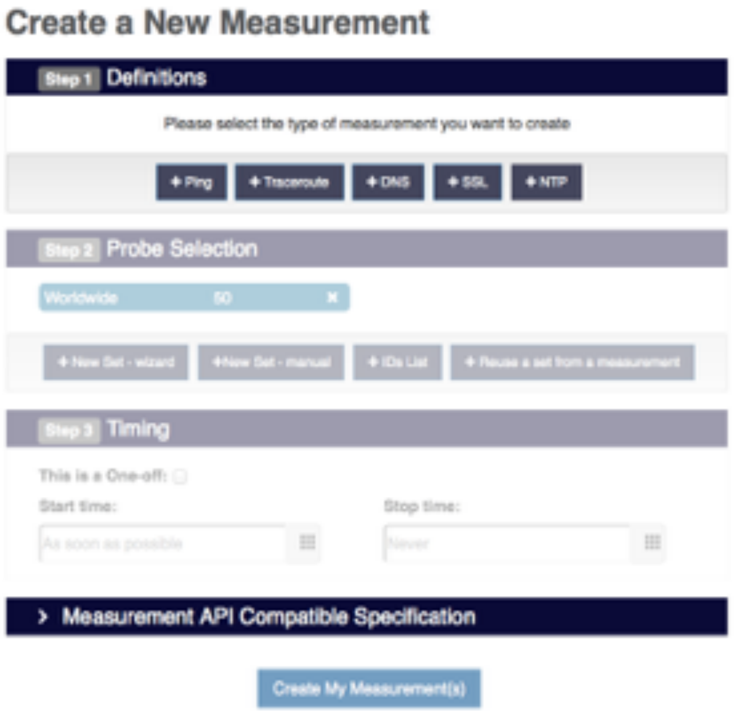
Tasks

- Create a ping measurement:
  - Involving ten probes
  - To a target of your choice
  - Source is your country
  - Duration of two days

1. Warm-up: Create a measurement using the GUI
2. Create API Key
3. Schedule a measurement using the API

Sub-task 1: Use web interface

- Useful hint: once you generate a measurement, copy “API Compatible Specification” to text file
- Note Measurement-ID



Create a New Measurement

Step 1 Definitions

Please select the type of measurement you want to create

Step 2 Probe Selection

Worldwide 50 ×

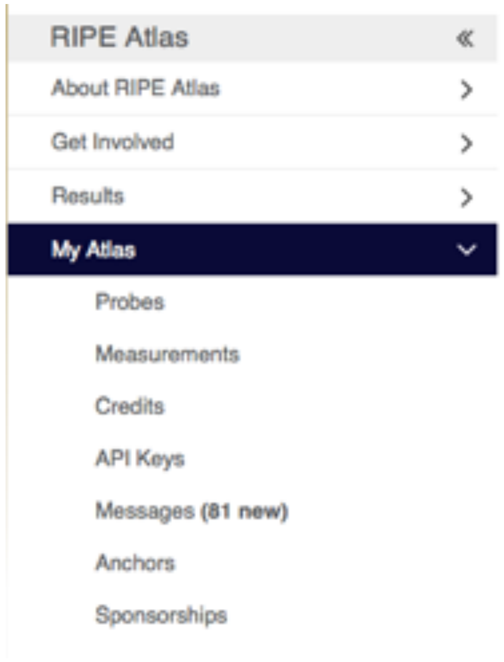
Step 3 Timing

This is a One-off: □

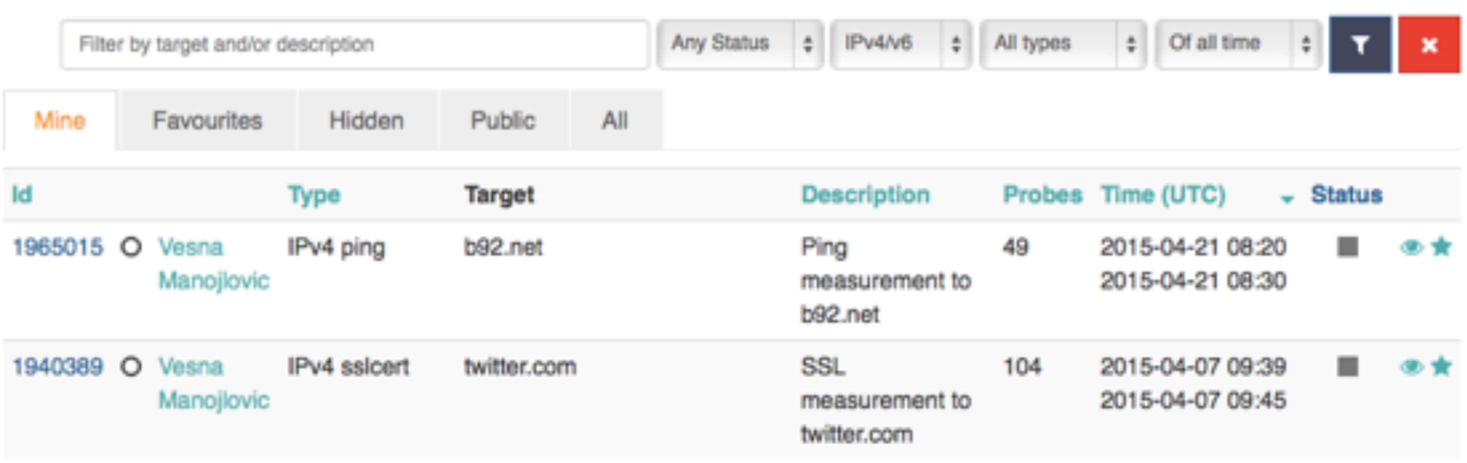
Start time: As soon as possible

Stop time: Never

› Measurement API Compatible Specification



Measurements



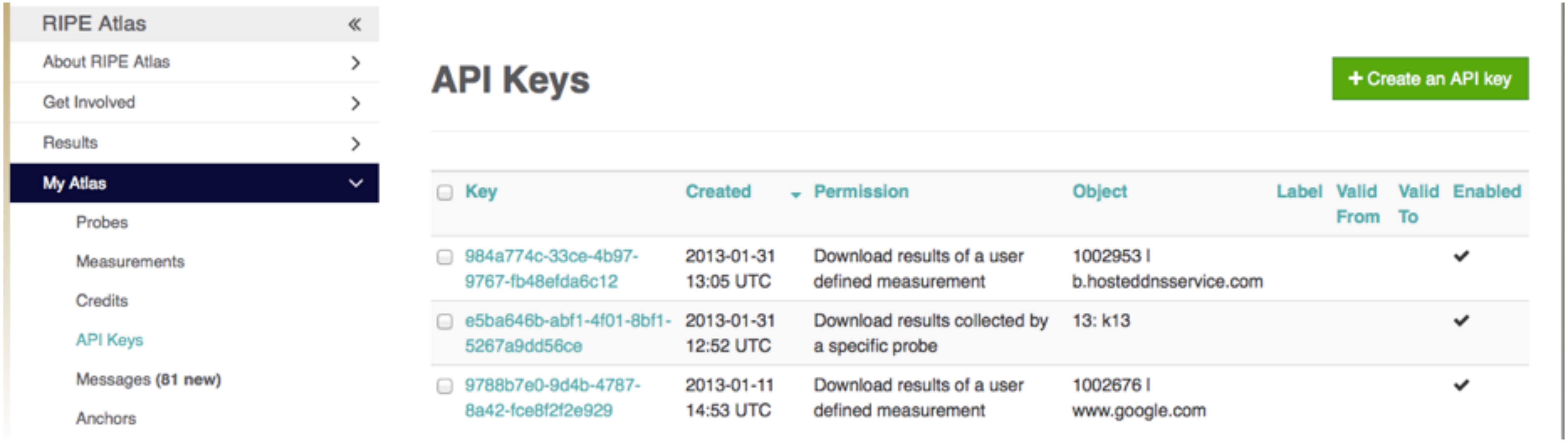
Id		Type	Target	Description	Probes	Time (UTC)	Status	
1965015 ○	Vesna Manojlovic	IPv4 ping	b92.net	Ping measurement to b92.net	49	2015-04-21 08:20 2015-04-21 08:30	■	★
1940389 ○	Vesna Manojlovic	IPv4 sslcert	twitter.com	SSL measurement to twitter.com	104	2015-04-07 09:39 2015-04-07 09:45	■	★

Sub-task 2: Create API key

- Click on “Create an API Key”
- Choose type: “create a new user-defined measurement”
- “Object” is not applicable (N/A) for this type
- Give it a label

(…cont) Sub-task 2: Create API key

- Give it a duration of validity (leave empty for defaults)
- “Key” value to be passed on to the API call (next step)



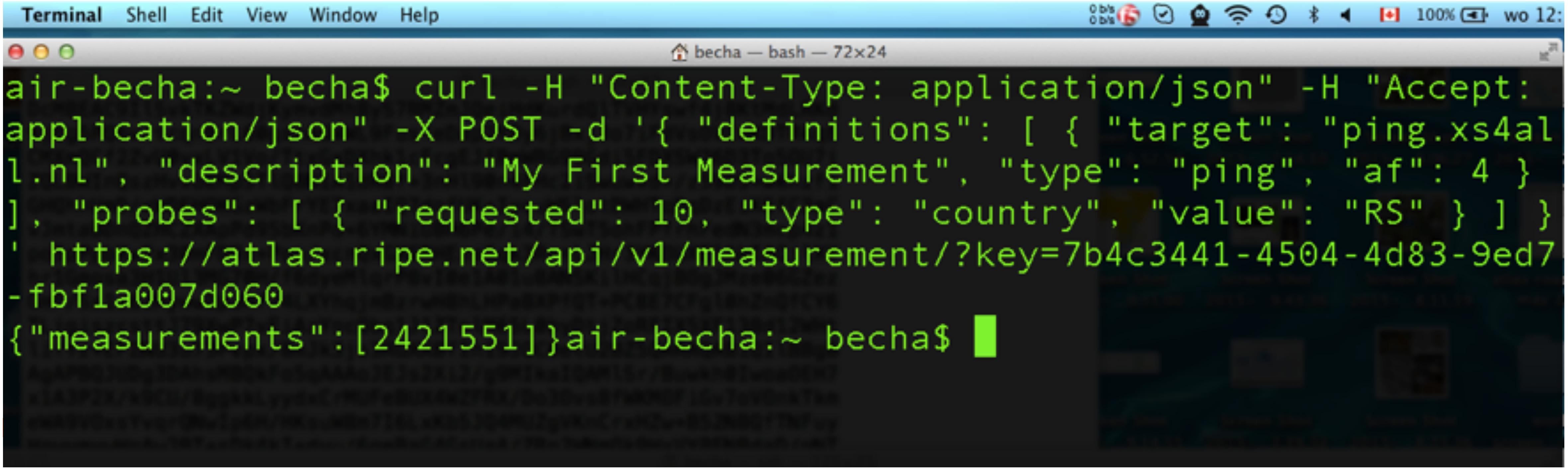
API Keys

□	Key	Created	Permission	Object	Label	Valid From	Valid To	Enabled
□	984a774c-33ce-4b97-9767-fb48efda6c12	2013-01-31 13:05 UTC	Download results of a user defined measurement	1002953 I b.hosteddnsservice.com				✓
□	e5ba646b-abf1-4f01-8bf1-5267a9dd56ce	2013-01-31 12:52 UTC	Download results collected by a specific probe	13: k13				✓
□	9788b7e0-9d4b-4787-8a42-fce8f2f2e929	2013-01-11 14:53 UTC	Download results of a user defined measurement	1002676 I www.google.com				✓

Sub-task 3: Use API

- Schedule a measurement using API
  - Use the “key” you just generated
  - Hint: copy and past API call syntax from the measurement generated by the GUI

```
$ curl -H "Content-Type: application/json" -H "Accept: application/json" -X POST
-d '{ "definitions": [ { "target": "ping.xs4all.nl", "description": "My First API
Measurement", "type": "ping", "af": 4 } ], "probes": [ { "requested": 10, "type":
"country", "value": "RS" } ] }' https://atlas.ripe.net/api/v1/measurement/?
key=YOUR_API_KEY
```



```
air-becha:~ becha$ curl -H "Content-Type: application/json" -H "Accept:
application/json" -X POST -d '{ "definitions": [ { "target": "ping.xs4al
l.nl", "description": "My First Measurement", "type": "ping", "af": 4 }
], "probes": [ { "requested": 10, "type": "country", "value": "RS" } ] }
' https://atlas.ripe.net/api/v1/measurement/?key=7b4c3441-4504-4d83-9ed7
-fbf1a007d060
{"measurements":[2421551]}air-becha:~ becha$
```

Command-line (CLI) Toolset

RIPE Atlas CLI

- Network troubleshooting for command line pros
- Familiar output (ping, dig, traceroute)
- Linux/OSX
  - http://ripe-atlas-tools.readthedocs.org/en/latest/installation.html#requirements-and-installation
- Windows [experimental]
  - https://github.com/chrisamin/ripe-atlas-tools-win32

Install RIPE Atlas tools on Ubuntu

- https://ripe-atlas-tools.readthedocs.org/en/latest/
- $ sudo apt-get install python-dev libffi-dev libssl-dev
- $ sudo apt-get install python-virtualenv python-pip
- Setup vritualenv
- pip install ripe.atlas.tools

Install RIPE Atlas tools on *nix

- Install virtualenv
  ```
  $ sudo easy_install pip
  $ sudo pip install virtualenv
  ```
- Create virtualenv for atlas-tools
  ```
  $ virtualenv venv-atlas
  ```
- Activate virtualenv (note the ‘.’)
  ```
  $ .venv-atlas/bin/activate
  ```
- Install atlas-tools
  ```
  $ pip install ripe.atlas.tools
  ```
- Add to PATH
  ```
  export PATH=$PATH:~/venv-atlas/bin
  ```

Install RIPE Atlas tools on Windows

- github.com/chrisamin/ripe-atlas-tools-win32
- github.com/chrisamin/ripe-atlas-tools-win32/releases/download/v0.1.1/RipeAtlasToolsSetup.exe

RIPE Atlas CLI

- Open source
  - RIPE NCC-led community contribution
- Documentation
  - https://ripe-atlas-tools.readthedocs.org/
- Source:
  - https://github.com/RIPE-NCC/ripe-atlas-tools/
- How to contribute:
  - https://github.com/RIPE-NCC/ripe-atlas-tools/blob/master/CONTRIBUTING.rst

Configure RIPE Atlas CLI

- Reuse the API key of the previous exercise
  - Or create a new one at https://atlas.ripe.net/keys/
- Configure your CLI
  - ripe-atlas configure --set authorisation.create=MY_API_KEY

Fetch an existing measurement

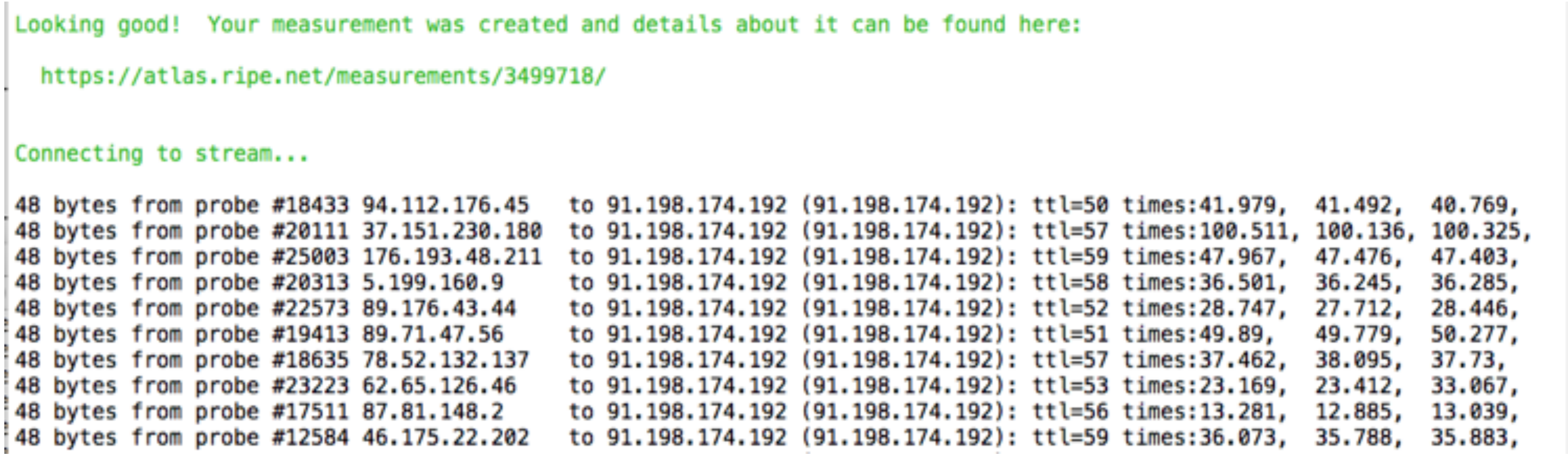
- Fetch the ping measurement 2340408
  - ripe-atlas report 2340408

Search probes

- Search all probes in AS3333
  - ripe-atlas probes --asn 3333
- Show specific fields
  - ripe-atlas probes --asn 3333 --field asn_v6 --field country --field is_public --field description --field status
- Search for probes in and around Istanbul
  - ripe-atlas probes --location "Istanbul, Turkey" --radius 15

Create a measurement

- Create a ping measurement to wikipedia.org
  - One-off, default parameters
  - ripe-atlas measure ping --target wikipedia.org



```
Looking good!  Your measurement was created and details about it can be found here:

  https://atlas.ripe.net/measurements/3499718/


Connecting to stream...

48 bytes from probe #18433 94.112.176.45   to 91.198.174.192 (91.198.174.192): ttl=50 times:41.979,  41.492,  40.769,
48 bytes from probe #20111 37.151.230.180  to 91.198.174.192 (91.198.174.192): ttl=57 times:100.511, 100.136, 100.325,
48 bytes from probe #25003 176.193.48.211  to 91.198.174.192 (91.198.174.192): ttl=59 times:47.967,  47.476,  47.403,
48 bytes from probe #20313 5.199.160.9     to 91.198.174.192 (91.198.174.192): ttl=58 times:36.501,  36.245,  36.285,
48 bytes from probe #22573 89.176.43.44    to 91.198.174.192 (91.198.174.192): ttl=52 times:28.747,  27.712,  28.446,
48 bytes from probe #19413 89.71.47.56     to 91.198.174.192 (91.198.174.192): ttl=51 times:49.89,   49.779,  50.277,
48 bytes from probe #18635 78.52.132.137   to 91.198.174.192 (91.198.174.192): ttl=57 times:37.462,  38.095,  37.73,
48 bytes from probe #23223 62.65.126.46    to 91.198.174.192 (91.198.174.192): ttl=53 times:23.169,  23.412,  33.067,
48 bytes from probe #17511 87.81.148.2     to 91.198.174.192 (91.198.174.192): ttl=56 times:13.281,  12.885,  13.039,
48 bytes from probe #12584 46.175.22.202   to 91.198.174.192 (91.198.174.192): ttl=59 times:36.073,  35.788,  35.883,
```

Other examples of ping

- Geo-specific from 20 probes from Canada:
  - ripe-atlas measure ping --target example.com --probes 20 --from-country ca
- 20 Canadian probes that definitely support IPv6:
  - ripe-atlas measure ping --target example.com --probes 20 --from-country ca --include-tag system-ipv6-works
- Create a recurring measurement:
  - ripe-atlas measure ping --target example.com --interval 3600

Exercise

Using RIPE Atlas CLI

Search probes

- Use the traceroute command to test the reachability of wikipedia.org on TCP port 443 from 20 probes in France
- Render the results collected in the previous exercise in JSON format

Search probes

- Use the traceroute command to test the reachability of wikipedia.org on TCP port 443 from 20 probes in France

    -
      ```
      ripe-atlas measure traceroute  --protocol TCP --target wikipedia.org --port 443 --probes 20 --from-country fr
      ```
- Render the results collected in the previous exercise in JSON format

    -
      ```
      ripe-atlas report {MSM_ID} --renderer raw
      ```

Monitoring

See your network from the outside

- Integrate “status checks” with existing monitoring tools (such as Icinga)
- Developed by community: RIPE Atlas Monitor
- Using real-time data streaming
  - Server monitoring
  - Detecting and visualising outages

Steps for integration

1. Create a RIPE Atlas ping measurement
2. Go to “status checks” URL (RESTful API call)
    - https://atlas.ripe.net/api/v1/status-checks/2340408/?median_rtt_threshold=10
    - https://atlas.ripe.net/docs/status-checks/
3. Add your alerts in Nagios or Icinga
    - Make use of the built-in “check_http” plugin
    - https://github.com/RIPE-Atlas-Community/ripe-atlas-community-contrib/blob/master/scripts_for_nagios_icinga_alerts

Versatile “RIPE Atlas Monitor”

- Pier Carlo Chiodi’s work (@pierky)
  - https://github.com/pierky/ripe-atlas-monitor
  - https://ripe-atlas-monitor.readthedocs.org/
- Additional use cases: traceroute analysis, hostname resolution, AS path detection, verifying TLS connections…
- Recently published on RIPE Labs
  - https://labs.ripe.net/Members/pier_carlo_chiodi/ripe-atlas-monitor

RIPE Atlas streaming

- RIPE Atlas streaming is an architecture that allows users to receive the measurement results as soon as they are sent by the probes - in real time
    - Publish/subscribe through web sockets
- There are three types of data:
    - Measurement results
    - Probe connection status events
    - Measurements metadata

RIPE Atlas streaming

- Visualising network outages
  - http://sg-pub.ripe.net/demo-area/atlas-stream/conn/
- Real-time server and performance monitoring
- Filtering and reusing measurement results
- Documentation:
  - https://atlas.ripe.net/docs/result-streaming/

Exercise

Using streaming API

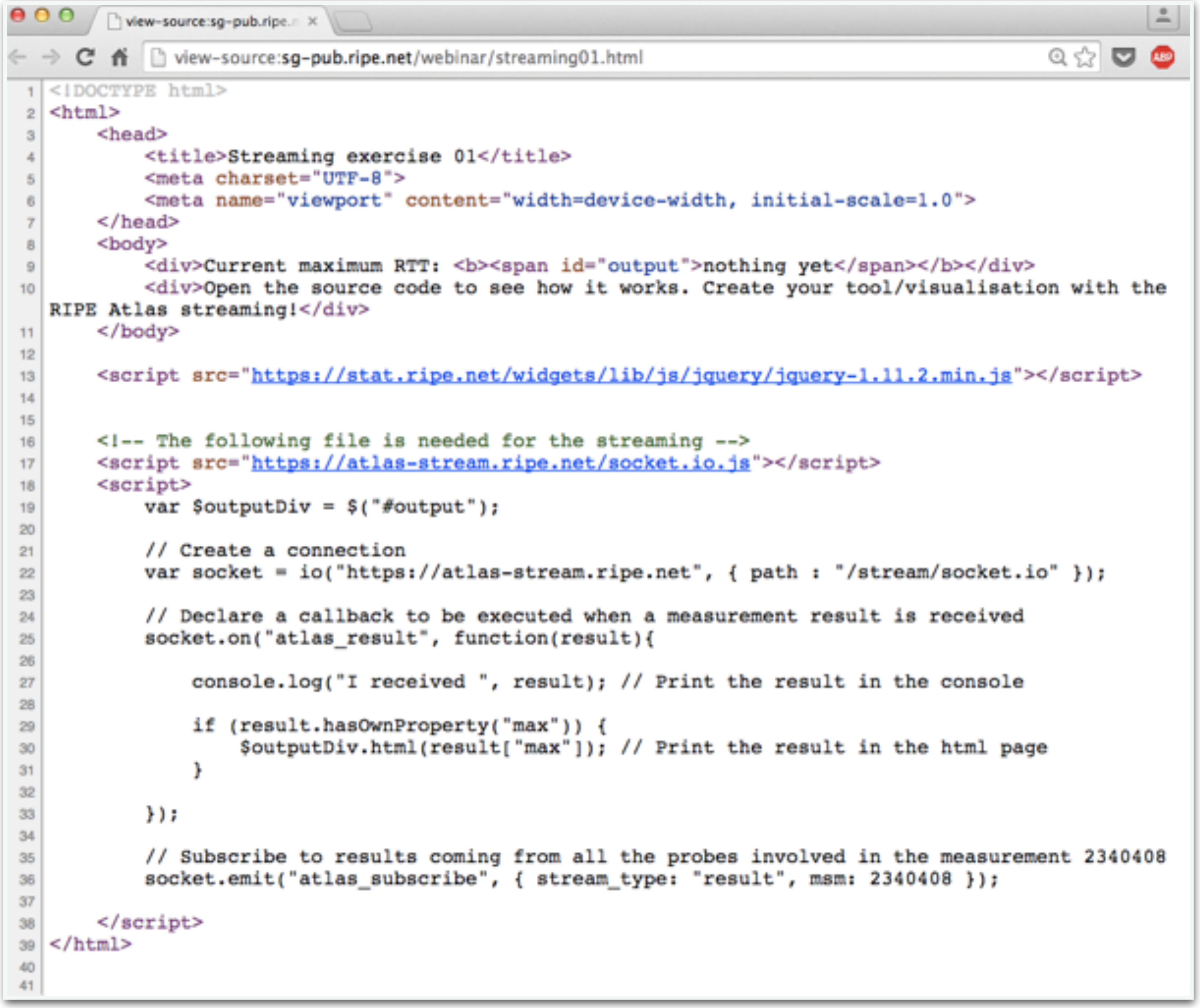
EX1: Monitoring server reachability

- Scenario: customers sometimes complain that it occasionally takes a long time to reach your service or server
- Action: ping your server from 500 probes
  - Decide what is acceptable latency threshold to apply
  - Notice and react when you start receiving samples
- Task: Use the ping measurement ID 2340408
  - Choose which threshold (e.g. greater than 30ms)
  - Imposes the threshold on “min” (the minimum result of the three ping attempts)

Steps

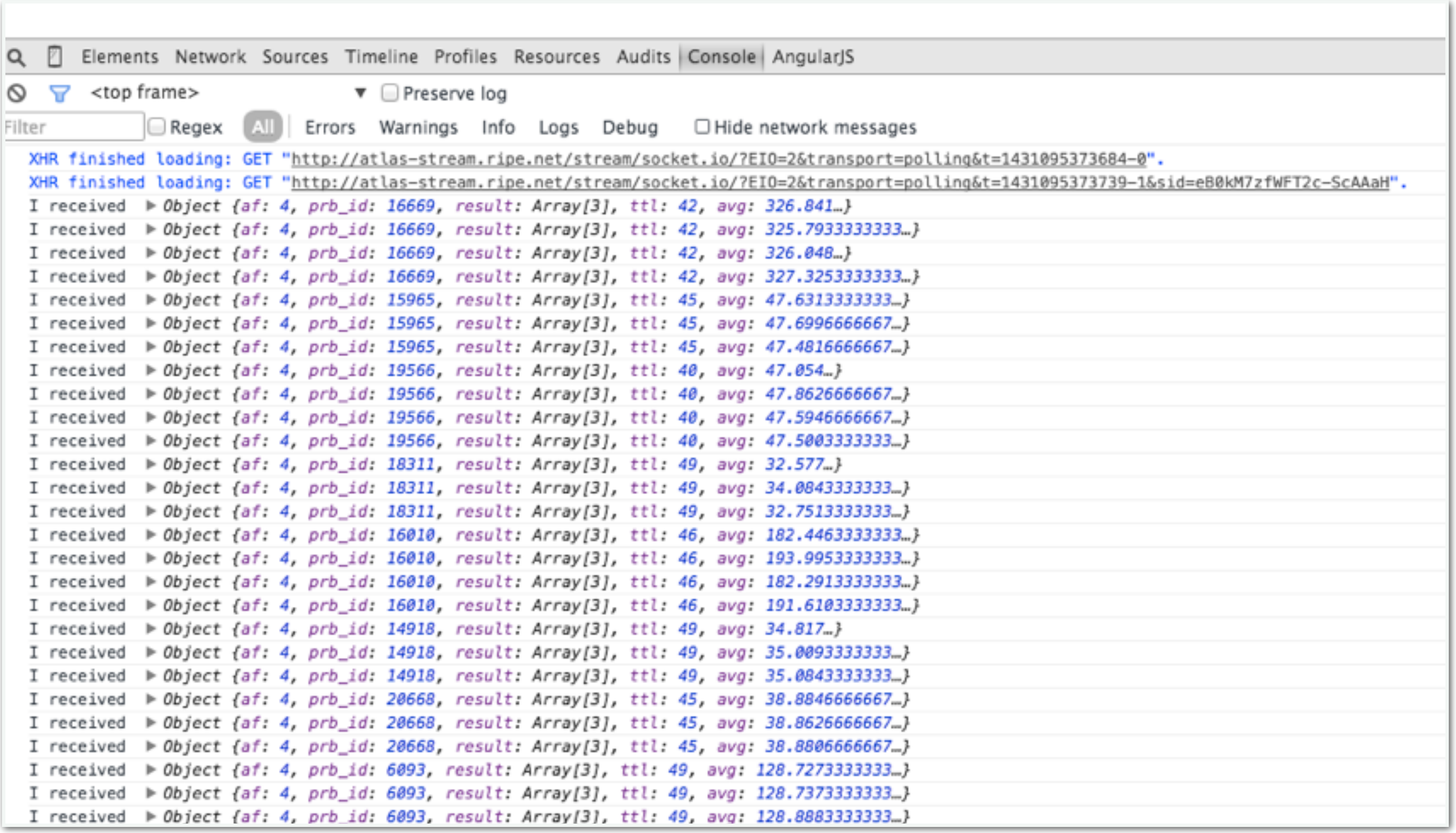
1. Go to http://atlas.ripe.net/webinar/streaming01.html
2. Open the development console
3. Wait for results to arrive
4. Save the HTML file locally and edit the code

Page source



```
<!DOCTYPE html>
<html>
    <head>
        <title>Streaming exercise 01</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <div>Current maximum RTT: <b><span id="output">nothing yet</span></b></div>
        <div>Open the source code to see how it works. Create your tool/visualisation with the RIPE Atlas streaming!</div>
    </body>

    <script src="https://stat.ripe.net/widgets/lib/js/jquery/jquery-1.11.2.min.js"></script>


    <!-- The following file is needed for the streaming -->
    <script src="https://atlas-stream.ripe.net/socket.io.js"></script>
    <script>
        var $outputDiv = $("#output");

        // Create a connection
        var socket = io("https://atlas-stream.ripe.net", { path : "/stream/socket.io" });

        // Declare a callback to be executed when a measurement result is received
        socket.on("atlas_result", function(result){

            console.log("I received ", result); // Print the result in the console

            if (result.hasOwnProperty("max")) {
                $outputDiv.html(result["max"]); // Print the result in the html page
            }

        });

        // Subscribe to results coming from all the probes involved in the measurement 2340408
        socket.emit("atlas_subscribe", { stream_type: "result", msm: 2340408 });

    </script>
</html>
```

Example of results



```
XHR finished loading: GET "http://atlas-stream.ripe.net/stream/socket.io/?EIO=2&transport=polling&t=1431095373684-0".
XHR finished loading: GET "http://atlas-stream.ripe.net/stream/socket.io/?EIO=2&transport=polling&t=1431095373739-1&sid=eB0kM7zfWFT2c-ScAAaH".
I received  ▶ Object {af: 4, prb_id: 16669, result: Array[3], ttl: 42, avg: 326.841…}
I received  ▶ Object {af: 4, prb_id: 16669, result: Array[3], ttl: 42, avg: 325.7933333333…}
I received  ▶ Object {af: 4, prb_id: 16669, result: Array[3], ttl: 42, avg: 326.048…}
I received  ▶ Object {af: 4, prb_id: 16669, result: Array[3], ttl: 42, avg: 327.3253333333…}
I received  ▶ Object {af: 4, prb_id: 15965, result: Array[3], ttl: 45, avg: 47.6313333333…}
I received  ▶ Object {af: 4, prb_id: 15965, result: Array[3], ttl: 45, avg: 47.6996666667…}
I received  ▶ Object {af: 4, prb_id: 15965, result: Array[3], ttl: 45, avg: 47.4816666667…}
I received  ▶ Object {af: 4, prb_id: 19566, result: Array[3], ttl: 40, avg: 47.054…}
I received  ▶ Object {af: 4, prb_id: 19566, result: Array[3], ttl: 40, avg: 47.8626666667…}
I received  ▶ Object {af: 4, prb_id: 19566, result: Array[3], ttl: 40, avg: 47.5946666667…}
I received  ▶ Object {af: 4, prb_id: 19566, result: Array[3], ttl: 40, avg: 47.5003333333…}
I received  ▶ Object {af: 4, prb_id: 18311, result: Array[3], ttl: 49, avg: 32.577…}
I received  ▶ Object {af: 4, prb_id: 18311, result: Array[3], ttl: 49, avg: 34.0843333333…}
I received  ▶ Object {af: 4, prb_id: 18311, result: Array[3], ttl: 49, avg: 32.7513333333…}
I received  ▶ Object {af: 4, prb_id: 16010, result: Array[3], ttl: 46, avg: 182.4463333333…}
I received  ▶ Object {af: 4, prb_id: 16010, result: Array[3], ttl: 46, avg: 193.9953333333…}
I received  ▶ Object {af: 4, prb_id: 16010, result: Array[3], ttl: 46, avg: 182.2913333333…}
I received  ▶ Object {af: 4, prb_id: 16010, result: Array[3], ttl: 46, avg: 191.6103333333…}
I received  ▶ Object {af: 4, prb_id: 14918, result: Array[3], ttl: 49, avg: 34.817…}
I received  ▶ Object {af: 4, prb_id: 14918, result: Array[3], ttl: 49, avg: 35.0093333333…}
I received  ▶ Object {af: 4, prb_id: 14918, result: Array[3], ttl: 49, avg: 35.0843333333…}
I received  ▶ Object {af: 4, prb_id: 20668, result: Array[3], ttl: 45, avg: 38.8846666667…}
I received  ▶ Object {af: 4, prb_id: 20668, result: Array[3], ttl: 45, avg: 38.8626666667…}
I received  ▶ Object {af: 4, prb_id: 20668, result: Array[3], ttl: 45, avg: 38.8806666667…}
I received  ▶ Object {af: 4, prb_id: 6093, result: Array[3], ttl: 49, avg: 128.7273333333…}
I received  ▶ Object {af: 4, prb_id: 6093, result: Array[3], ttl: 49, avg: 128.7373333333…}
I received  ▶ Object {af: 4, prb_id: 6093, result: Array[3], ttl: 49, avg: 128.8883333333…}
```

EX2: Monitoring server reachability

- Imagine you are in the situation described in the exercise before, but you didn’t schedule a measurement in advance
  - You don’t have a measurement ID
- You want to get all the measurements reaching 193.0.10.197
- Now restrict the results to just include ping measurements

More RIPE Atlas features

Most popular features

- Six types of measurements: ping, traceroute, DNS, SSL/TLS, NTP and HTTP (to anchors)
- APIs to start measurements and get results
- Powerful and informative visualisations
- CLI tools
- Streaming data: real-time results
- Plus: “Time Travel”, LatencyMON, DomainMON
- Roadmap

Latest results API

- https://atlas.ripe.net/docs/measurement-latest-api/
  - Widget monitoring value in real time (100 probes pinging websites worldwide)
  - Alert based on average measurements per hour
  - Big network event, e.g. Internet outage in a region
  - DNS domain monitoring; configurable measurements using ten RIPE Atlas anchors
- https://labs.ripe.net/Members/suzanne_taylor_muzzin/ripe-atlas-latest-results-api-and-parsing-library

Secure measurement creation and sharing

- Use API keys to:
  - Create measurements without logging in
  - Securely share your measurement data with others
- To create, manage and delete API keys:
  - https://atlas.ripe.net/keys/
  - https://atlas.ripe.net/docs/keys2/
- Examples:
  - https://atlas.ripe.net/docs/rest/

Security aspects

- Probes:
  - Hardware trust material (regular server address, keys)
  - No open ports; initiate connection; NAT is okay
  - Don’t listen to local traffic
  - No passive measurements
- Measurements triggered by “command servers”

(…cont) Security aspects

- Inverse SSH tunnels
- Source code published
- Reported vulnerabilities:
  - https://atlas.ripe.net/docs/security/

Crowdsourced Infrastructure Geolocation: OpenIPMap

- Visualising traceroutes on the map is difficult!
  - Routers' geolocation data is often very inaccurate
  - RIPE Atlas performs many traceroutes through Internet core
- Community of operators contributes data to Open IP Map (think: OpenStreetMap for IPs)
  - https://marmot.ripe.net/openipmap/
- You can modify, reuse and improve the code
  - https://github.com/RIPE-Atlas-Community/openipmap

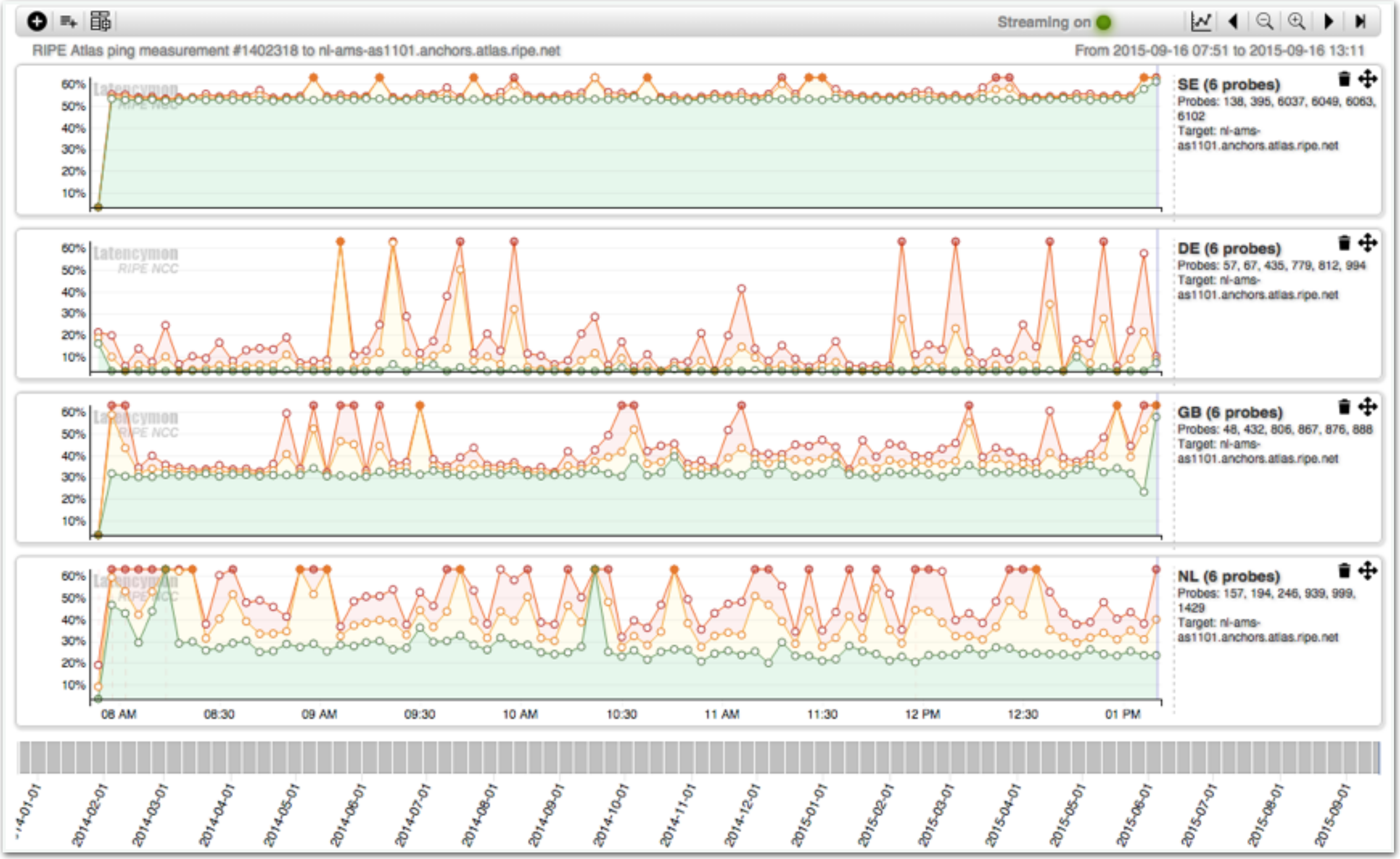
IXP Country Jedi

- Tool and concept by Emile Aben
  - https://github.com/emileaben/ixp-country-jedi
  - https://labs.ripe.net/Members/emileaben/measuring-ixps-with-ripe-atlas
- Method
  - Traceroute mesh between RIPE Atlas probes
  - Hops geolocated using “OpenIPMap” database

Part Two

LatencyMON

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

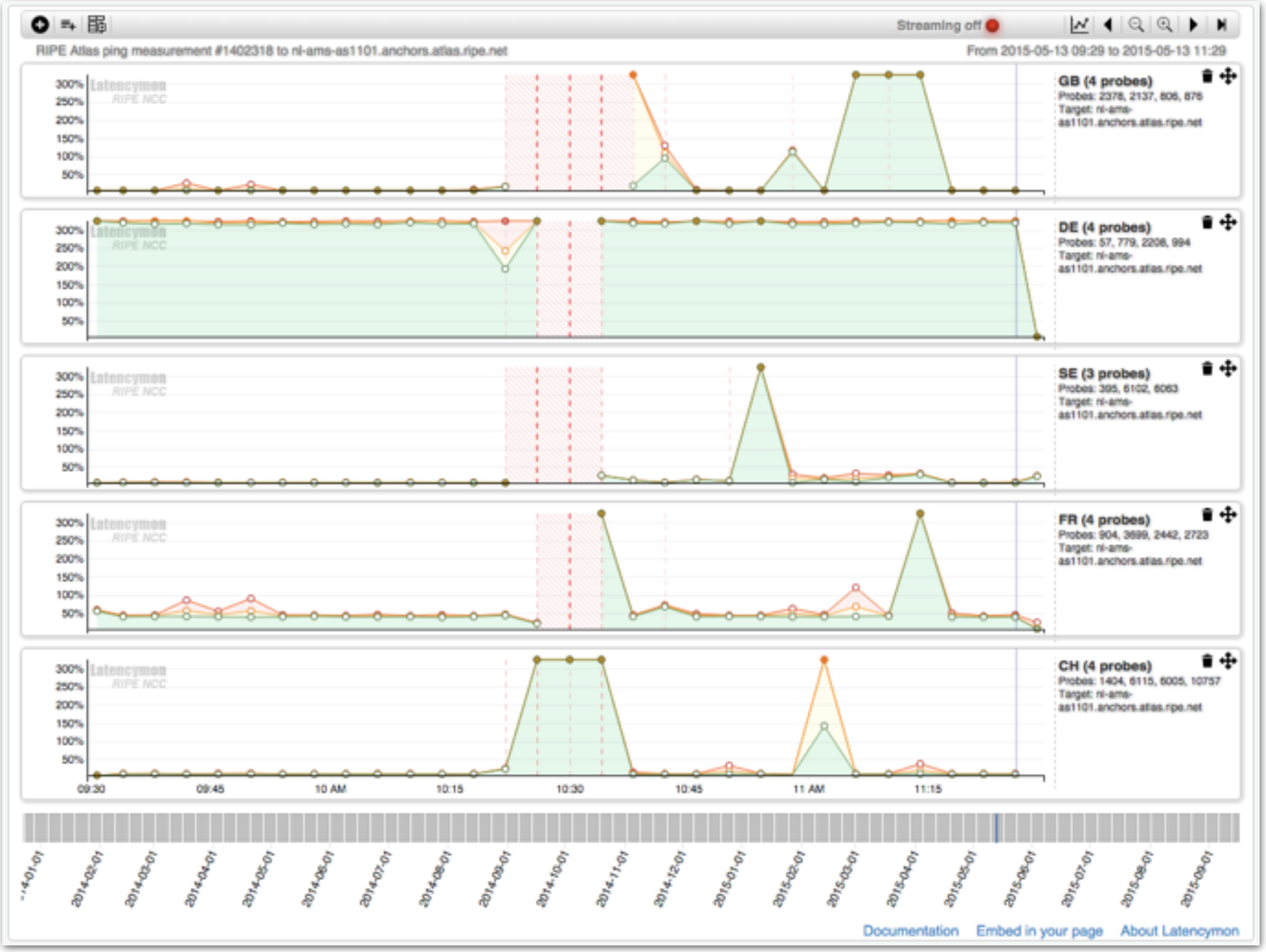
SE (6 probes)
Probes: 138, 395, 6037, 6049, 6063, 6102
Target: nl-ams-as1101.anchors.atlas.ripe.net

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

LatencyMON packet loss



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

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

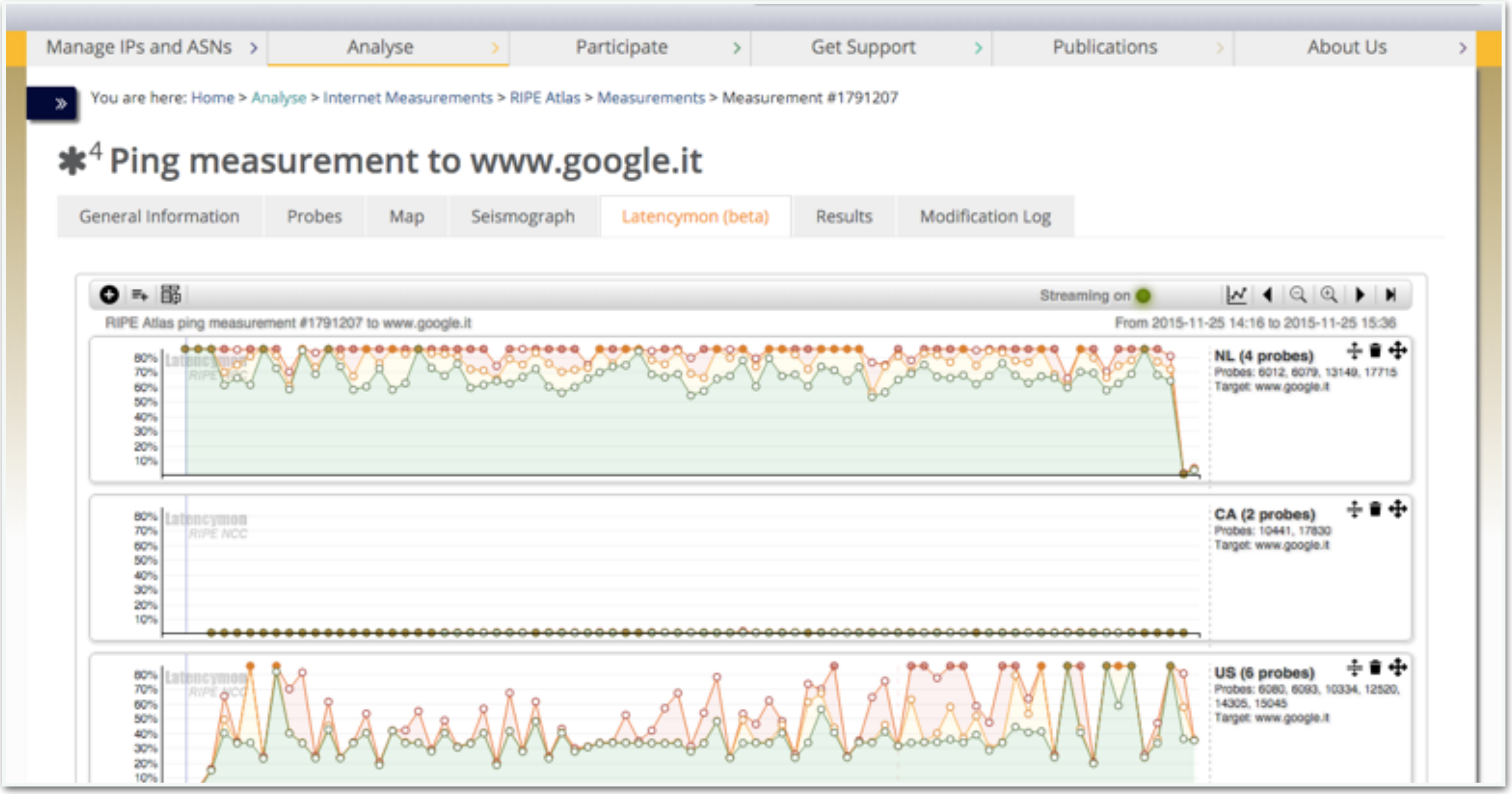
FR (4 probes)
Probes: 904, 3699, 2442, 2723
Target: nl-ams-as1101.anchors.atlas.ripe.net

CH (4 probes)
Probes: 1404, 6115, 6005, 10757
Target: nl-ams-as1101.anchors.atlas.ripe.net

Documentation Embed in your page About Latencymon

LatencyMON tab

- Demo: https://atlas.ripe.net/measurements/1791207/



You are here: Home > Analyse > Internet Measurements > RIPE Atlas > Measurements > Measurement #1791207

✱4 Ping measurement to www.google.it

RIPE Atlas ping measurement #1791207 to www.google.it

From 2015-11-25 14:16 to 2015-11-25 15:36

NL (4 probes)
Probes: 6012, 6079, 13149, 17715
Target: www.google.it

CA (2 probes)
Probes: 10441, 17830
Target: www.google.it

US (6 probes)
Probes: 6080, 6093, 10334, 12520, 14305, 15045
Target: www.google.it

LatencyMON goals

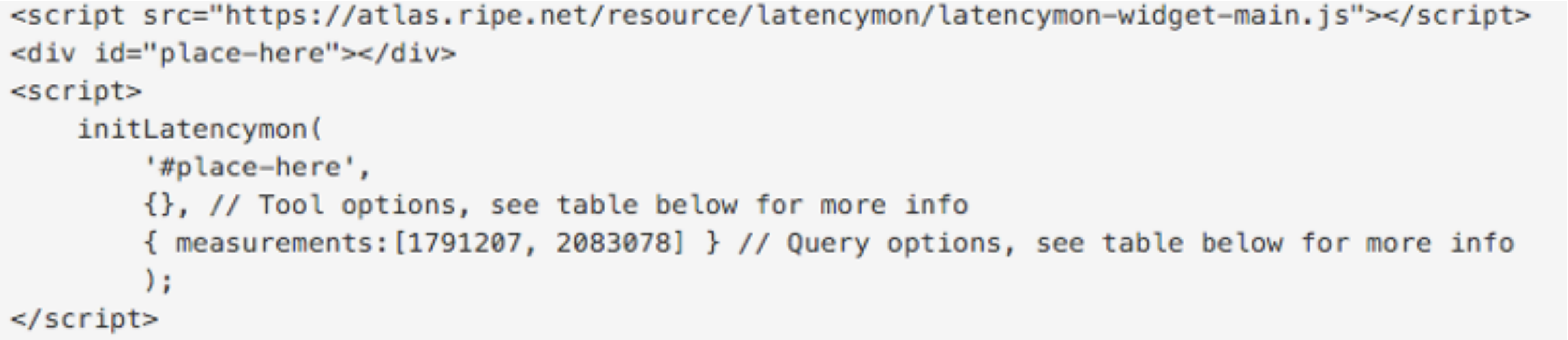
- Performance comparisons to reach a service or website from different countries or providers
- Measuring the spread of a network outage
- Measuring and comparing CDN or DNS resolution in multiple geographic areas

(…cont) LatencyMON goals

- Reusing measurements - even for measurement types other than ping - to get information about latencies
- Comparing multiple ISPs or hosting providers at the same time from vantage points with characteristics similar to those at the user end
- Creating views that are easily shareable and can be embedded in reports

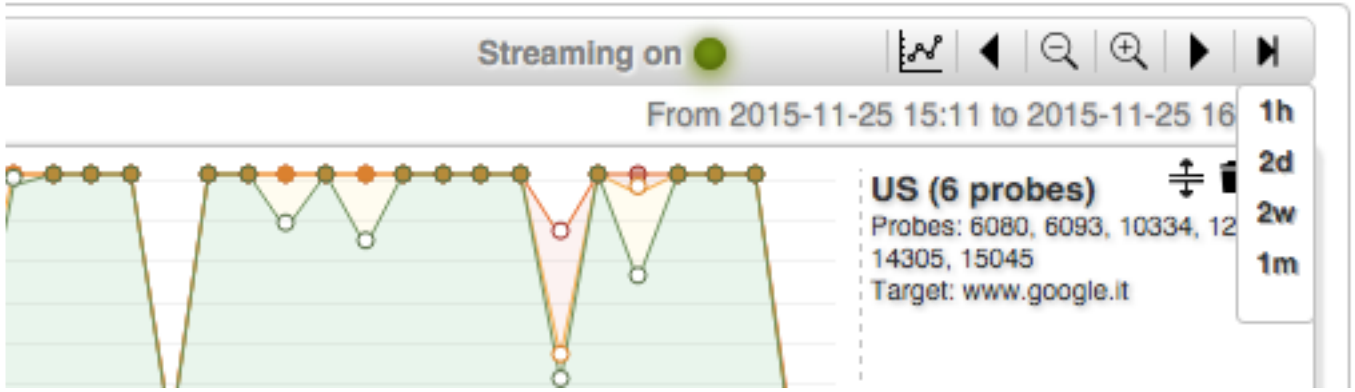
Monitoring with LatencyMON

- Embed latencyMON



```
<script src="https://atlas.ripe.net/resource/latencymon/latencymon-widget-main.js"></script>
<div id="place-here"></div>
<script>
    initLatencymon(
        '#place-here',
        {}, // Tool options, see table below for more info
        { measurements:[1791207, 2083078] } // Query options, see table below for more info
        );
</script>
```

- Enable real-time streaming



US (6 probes)
Probes: 6080, 6093, 10334, 12
14305, 15045
Target: www.google.it

- Documentation: https://atlas.ripe.net/docs/tools-latencymon/#embed

Exercise

Check your geographical distribution

Tasks 1/2

- You want to improve the geographical distribution of your contents by checking where the delay can be reduced
  - You created a measurement in the previous exercise and you have the measurement ID (otherwise use: 1791207)
  - Click on the LatencyMON tab of your measurement
  - Delete all the default-created charts

Tasks 2/2

- Create one group of two probes from DE (Germany)
- Create one group of two probes from NL (Netherlands)
- Create one group of two probes from US (United States)
- What is the country with the greatest latency in your case? Type it in the chat!

Exercise

Compare HTTP over IPv4 and IPv6

Tasks

- You want to check the performances of accessing an infrastructure over IPv4 and IPv6 (two measurements) as a real end user
  - You need an anchor for HTTP measurements!
    e.g. use https://atlas.ripe.net/probes/6001/
  - Open the LatencyMON tab of the HTTP IPv6 (2841527) measurement
  - Add the HTTP IPv4 measurement ID in LatencyMON (2841526)
  - Create **two groups of eight probes** each: one per measurement
- Share the link of the view of the last two days

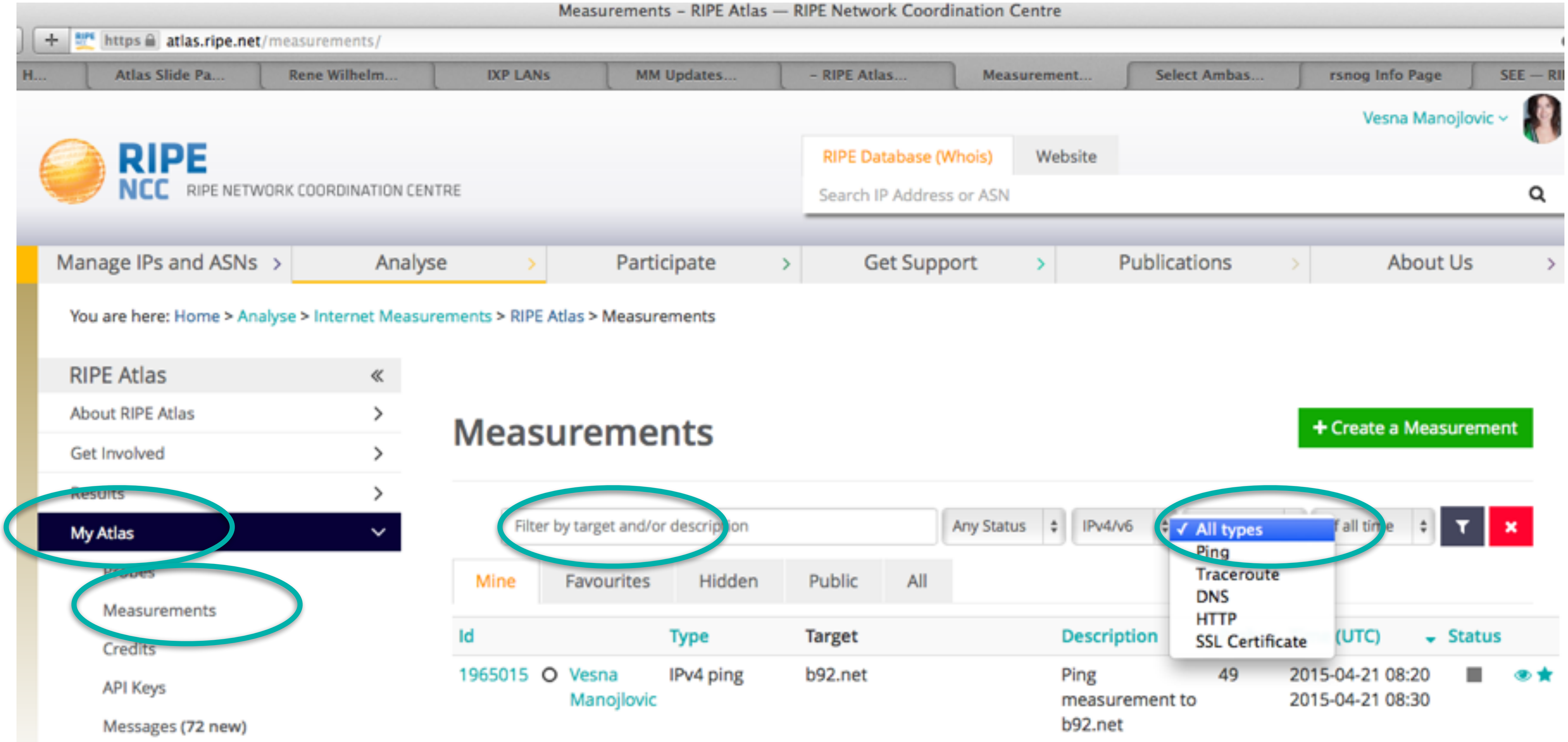
Finding results of public measurements

Use existing measurements

- There are many measurements already running!
- Search for existing public measurements first
- Schedule your own measurement if you don’t find what you’re looking for

Looking up measurements results

- Go to “My Atlas” > “Measurements”



Measurements – RIPE Atlas — RIPE Network Coordination Centre

https atlas.ripe.net/measurements/

H... | Atlas Slide Pa... | Rene Wilhelm... | IXP LANs | MM Updates... | - RIPE Atlas... | Measurement... | Select Ambas... | rsnog Info Page | SEE — RI

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

Measurements

Id		Type	Target	Description		(UTC)	Status
1965015	Vesna Manojlovic	IPv4 ping	b92.net	Ping measurement to b92.net	49	2015-04-21 08:20 2015-04-21 08:30	

Documentation

- Documentation for analysing measurements results:
  - https://atlas.ripe.net/docs/rest/
  - https://github.com/RIPE-NCC/ripe.atlas.sagan
- More tools:
  - https://github.com/RIPE-Atlas-Community
  - https://github.com/RIPE-Atlas-Community/ripe-atlas-community-contrib/blob/master/README.md

Exercise

Analyse measurement results

Tasks

- Download results of a specific public measurement
- Read the text of the result, to understand structure

Task 1: Download measurement results

- Find the measurement
  - ping, IPv6 to google.com
  - msm-ID 1004005
- Click on measurement, then “Download”
  - Specify the time period
  - (for example, YESTERDAY)
- Results in JSON

Tips for downloading results

- Solution URL:
  - https://atlas.ripe.net/api/v1/measurement/1004005/result/?start=1435104000&stop=1435276799&format=json
- Save the measurement(s) locally
  -
    ```
    $ curl https://atlas.ripe.net/api/v1/measurement/1004005/result/?start=1435104000&stop=1435276799&format=json > measurement-test.json
    ```

Task 2: Look at the result

Destination (IP & name)

Reference (msm ID)

Source (probe public IP address)

Packet loss: difference between sent & received!

```
[{“af":6,"avg" 61.32,

”dst_addr":"2a00:1450:4004:802::1014",“dst_name":"www.google.com",

“dup":0,

“from":"2001:8a0:7f00:b201:220:4aff:fec5:5b5b",

“fw":4660,“lts":411,

“max”:62.148,"min":60.372,

“msm_id":1004005,"msm_name":"Ping",

"prb_id":722,"proto":"ICMP","rcvd":10,

“result":[{"rtt":62.148},{"rtt":61.437},{"rtt":61.444},{"rtt":61.448},
{"rtt":61.794},{"rtt":61.533},{"rtt":60.372},{"rtt":60.373},{"rtt":61.384},
{"rtt":61.267}],

“sent":10,"size"64,

“src_addr":"2001:8a0:7f00:b201:220:4aff:fec5:5b5b",

"step":240,"timestamp":1410220847,"ttl":54,"type":"ping"},
```

Task 3: Analyse results (optional)

- Find out how many times RTT was above 60ms
  - Use Python or Javascript or something else
- For the Javascript solution, you can use this as a starting point:
  - https://stat.ripe.net/widgets/demo/script_me.html

Task 4: Examples of code

Python:

Parse json and find total avg:

```
import json
f = open(“measurement.json”,”r”)
measurements = json.load(f)
for m in measurements:
    for r in m[“result”]:
        rtt = r[“rtt”]
if rtt >60: i += 1
```

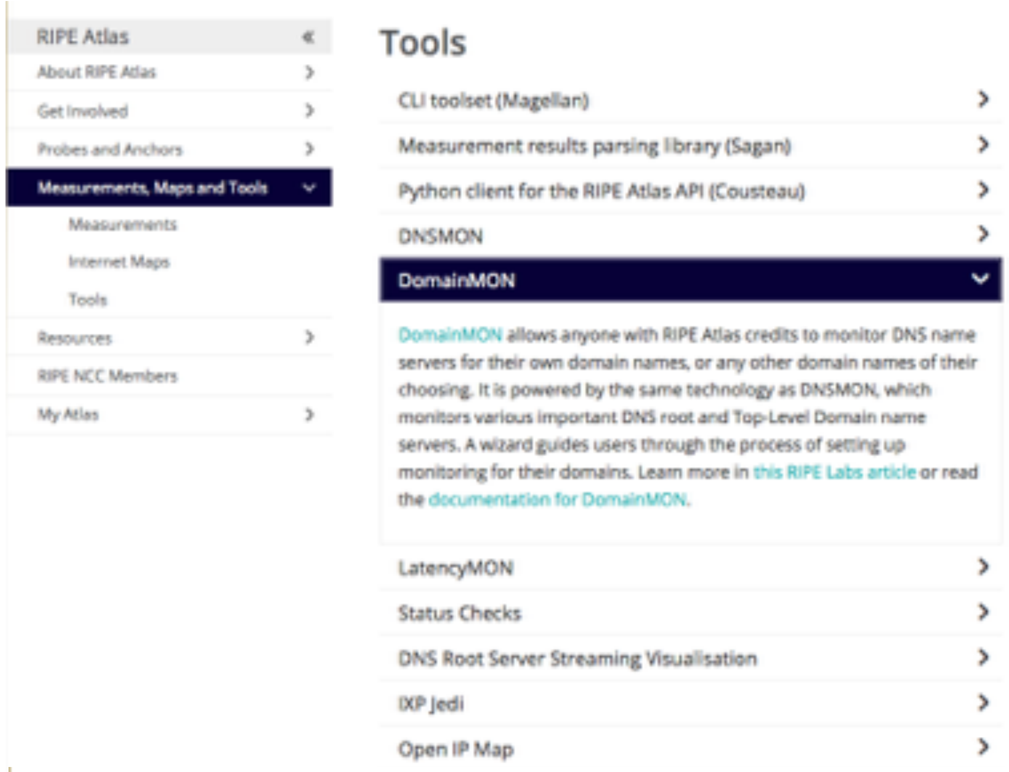
i must be > than 14563.

Javascript:

```
<script>
var dataAPIUrl = "https://atlas.ripe.net/api/v1/
measurement/1004005/result/?
start=1410220800"; jQuery.ajax({

url: dataAPIUrl, error: function() {

alert("error"); },

success: function( response ) { var i = 0;

for ( var i = 0, n = response.length; i < n; i++)
{ var measurement = response[i];

for ( var j = 0, m = measurement.result.length; j
< m; j++) { var rtt = measurement.result[j].rtt;
console.log(rtt);
if (rtt > 60)

i++; }

}
jQuery("p").html("The RTT has been above
60ms for " + i + " times");

},

dataType: "jsonp" });

</script>
```

DomainMON

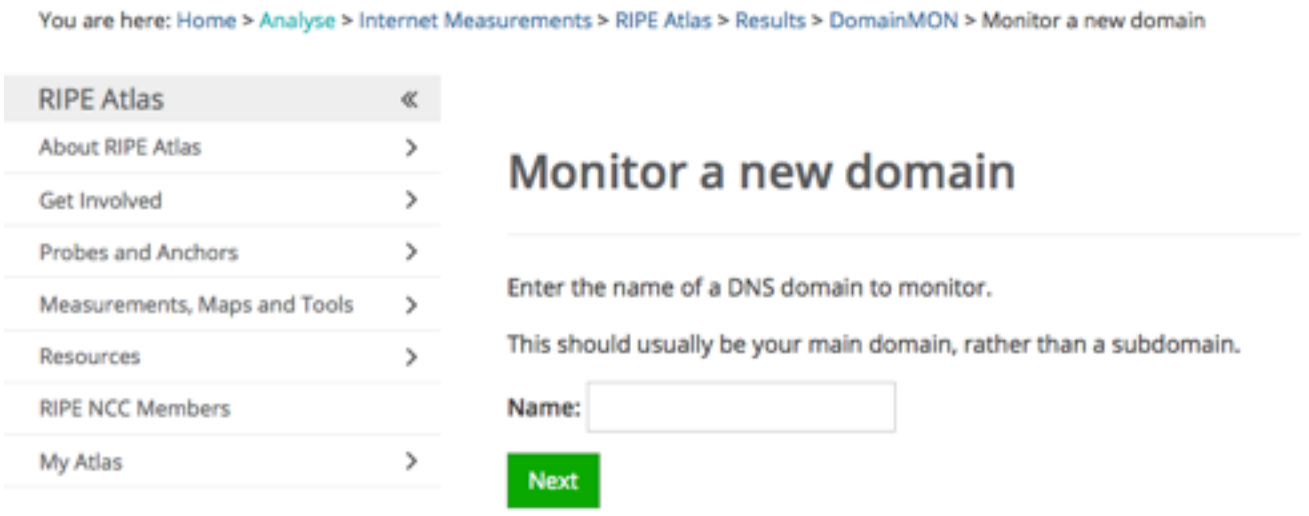
DomainMON



Tools

CLI toolset (Magellan)
Measurement results parsing library (Sagan)
Python client for the RIPE Atlas API (Cousteau)
DNSMON
DomainMON

DomainMON allows anyone with RIPE Atlas credits to monitor DNS name servers for their own domain names, or any other domain names of their choosing. It is powered by the same technology as DNSMON, which monitors various important DNS root and Top-Level Domain name servers. A wizard guides users through the process of setting up monitoring for their domains. Learn more in this RIPE Labs article or read the documentation for DomainMON.

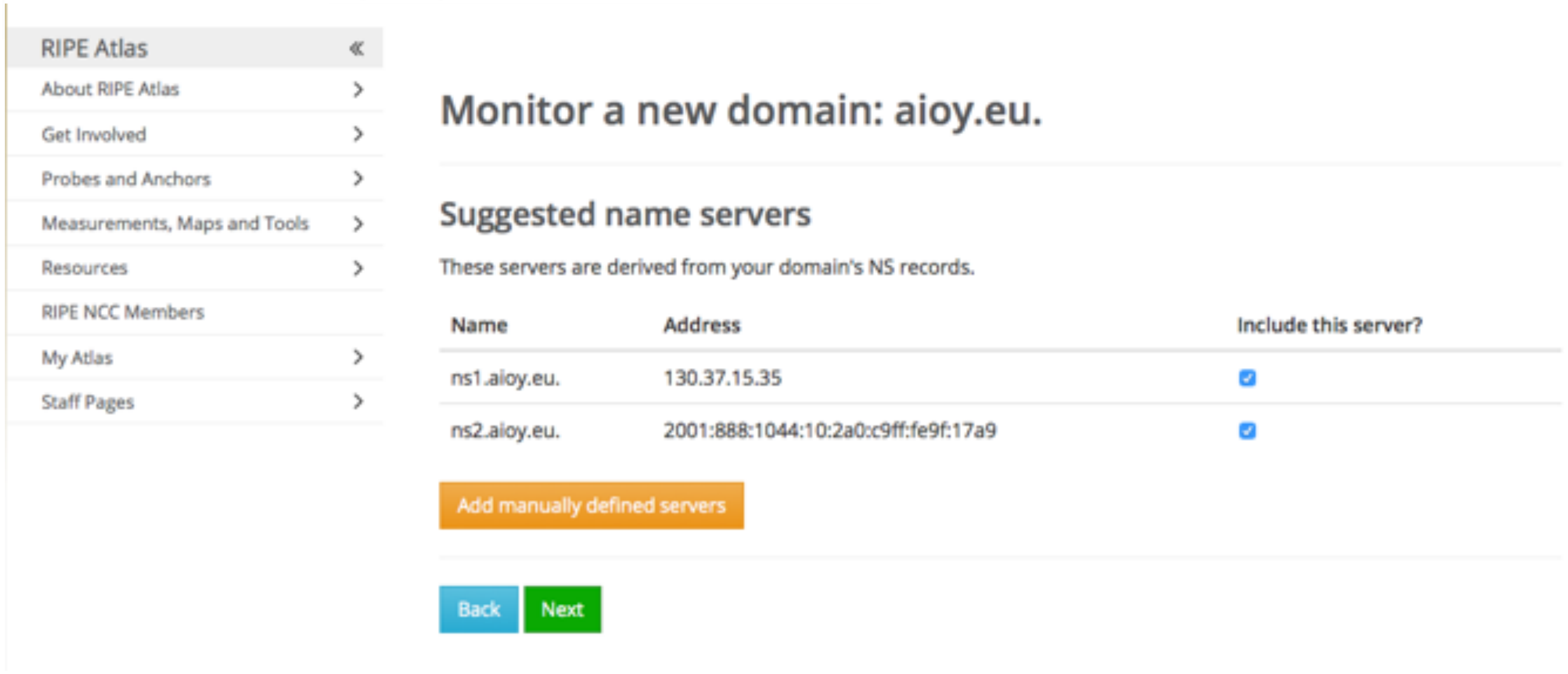

You are here: Home > Analyse > Internet Measurements > RIPE Atlas > Results > DomainMON > Monitor a new domain

Monitor a new domain

Enter the name of a DNS domain to monitor.

This should usually be your main domain, rather than a subdomain.

Name:



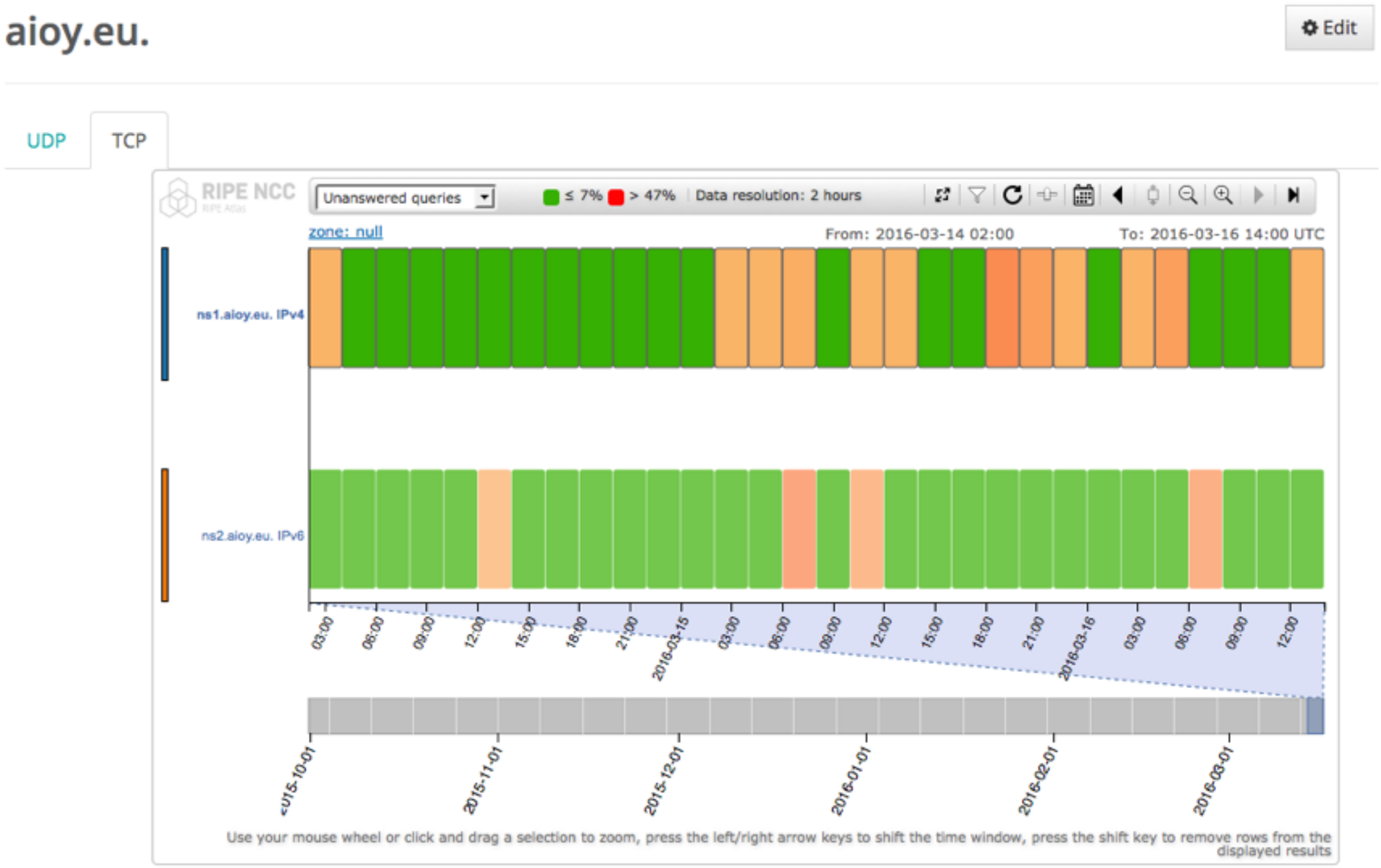
Monitor a new domain: aioy.eu.

Suggested name servers

These servers are derived from your domain's NS records.

Name	Address	Include this server?
ns1.aioy.eu.	130.37.15.35	☑
ns2.aioy.eu.	2001:888:1044:10:2a0:c9ff:fe9f:17a9	☑

DomainMON Results



aioy.eu.

Unanswered queries | 🟩 ≤ 7% 🟥 > 47% | Data resolution: 2 hours

zone: null

From: 2016-03-14 02:00

To: 2016-03-16 14:00 UTC

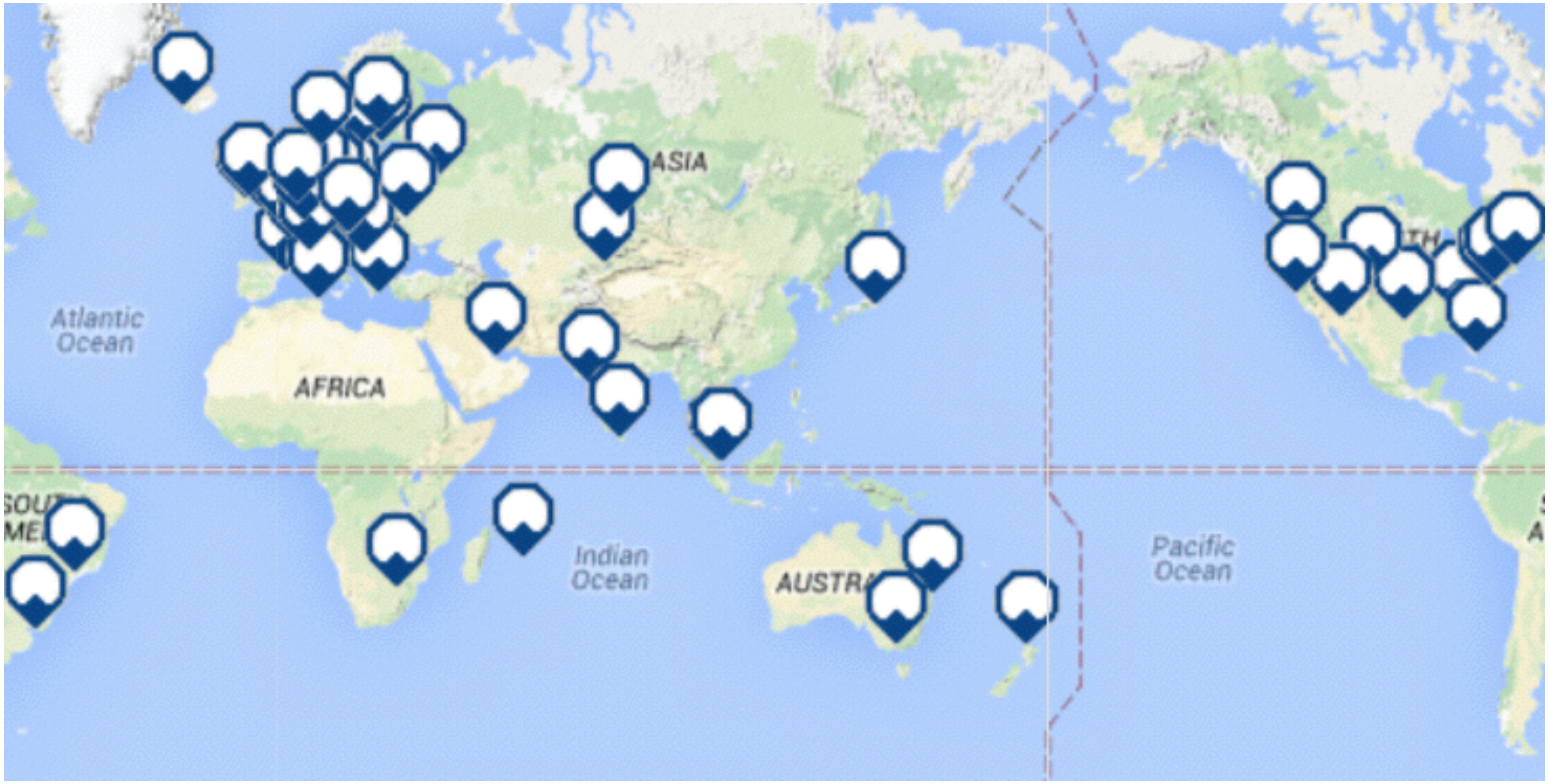
Use your mouse wheel or click and drag a selection to zoom, press the left/right arrow keys to shift the time window, press the shift key to remove rows from the displayed results

RIPE Atlas anchors

RIPE Atlas anchors

- Well-known targets and powerful probes
  - Regional baseline and “future history”
- Anchoring measurements
  - Measurements between anchors
  - 200 probes targeting each anchor with measurements
  - Each probe measures four-five anchors
  - Vantage points for DNSMON service
- 130+ RIPE Atlas anchors

Locations of anchors



https://atlas.ripe.net/results/maps/network-coverage/#anchors

“IXP country Jedi”

Measuring Impact of IXPs on
Keeping Traffic Local

Benefits (part 1)

- Operators
  - Routing and traffic optimisation
- IXP operators
  - Shows how IXPs help keep traffic local and regional
- IPv6 advocates
  - Comparing IPv4 and IPv6 paths

Benefits (part 2)

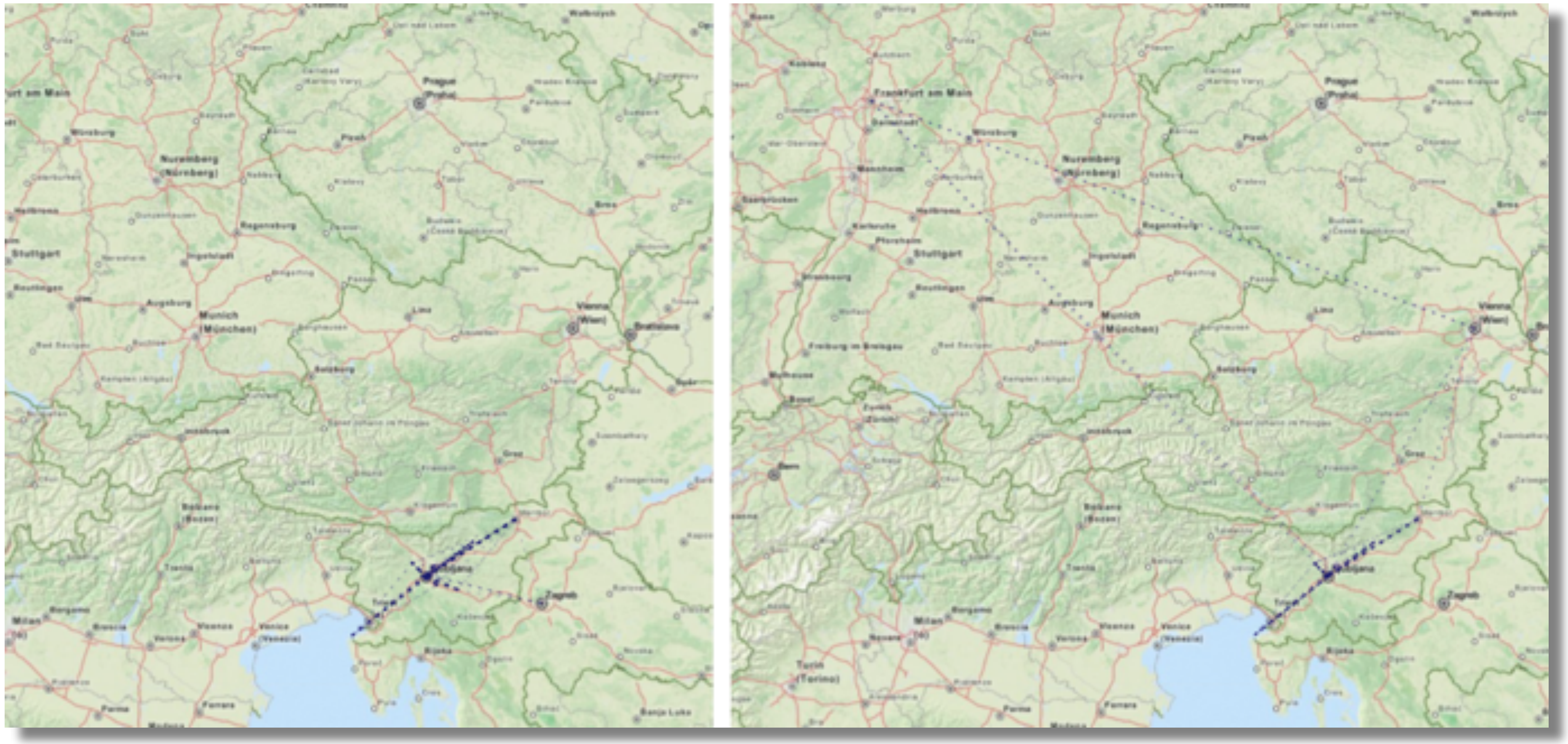
- Country level: regulators, politicians, cyber-security…
  - How much traffic stays within the country? Where do the paths go?
  - Comparing countries with each other
- RIPE Atlas community
  - More probes in more networks = higher quality of measurements data

Benefits (part 3)

- Geolocation data community
  - Use case for improving data quality
- Examples:
  - https://labs.ripe.net/Members/emileaben/measuring-ixps-with-ripe-atlas
  - https://labs.ripe.net/Members/emileaben/measuring-countries-and-ixps-in-the-see-region
  - http://sg-pub.ripe.net/emile/ixp-country-jedi/CL+AR-2015-04/geopath/

Paths staying in the country?

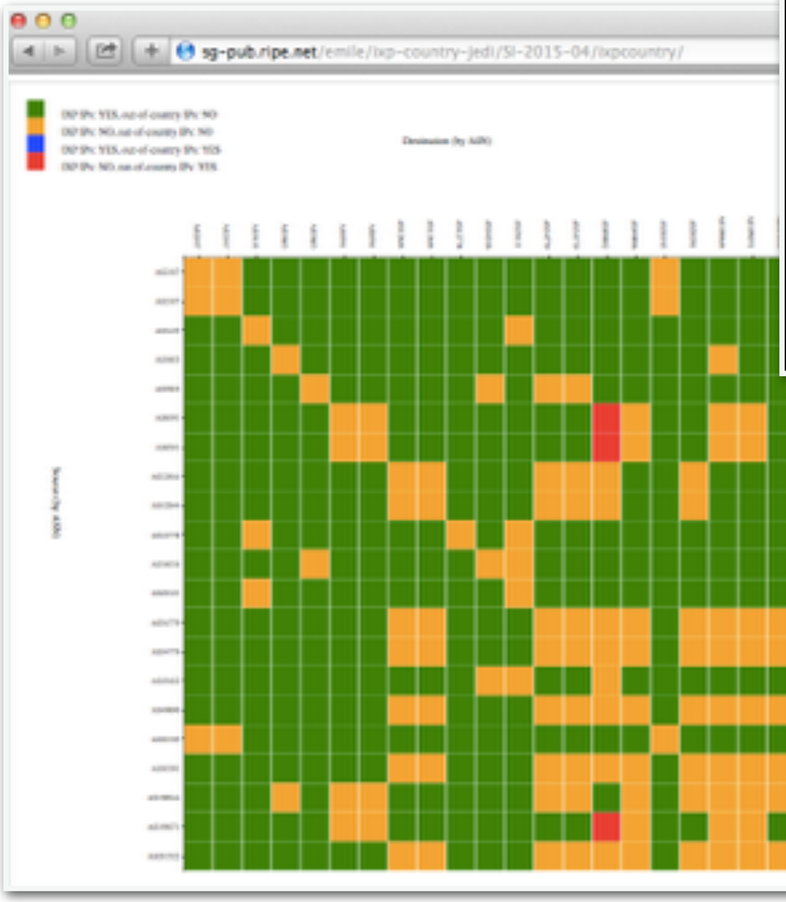
- Difference between IPv4 and IPv6 paths



http://sg-pub.ripe.net/emile/ixp-country-jedi/**SI**-2015-04/geopath/s/**SI**/{RO, BG, HR, BA, ME, AL, GR}/

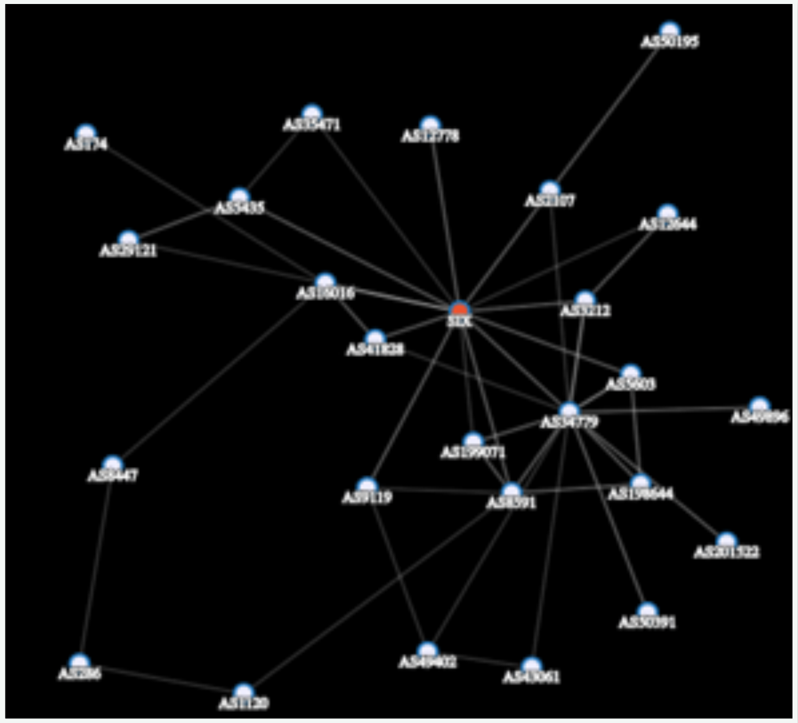
Paths going via an IXP?

- http://sg-pub.ripe.net/emile/ixp-country-jedi/SI-2015-04/ixpcountry/



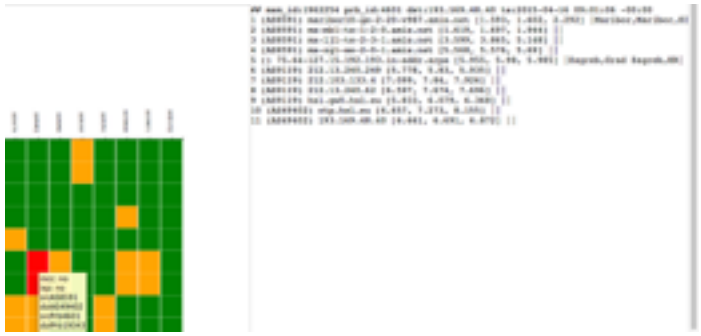
🟩 IXP IPs: YES, out-of-country IPs: NO
🟧 IXP IPs: NO, out-of-country IPs: NO
🟦 IXP IPs: YES, out-of-country IPs: YES
🟥 IXP IPs: NO, out-of-country IPs: YES

Destination (by ASN)
Source (by ASN)



Interactive diagnostic tool

- Green: “good”, as far as we can see it
  - Not a judgment, only one way of visualising data
- Red or blue: path is going out of country
  - If this is a surprise: talk to your upstream(s)
- Yellow: path is not going via a local IXP
  - If this is undesired: make a new peering agreement
  - http://sg-pub.ripe.net/emile/ixp-country-jedi/SI-2015-04/ixpcountry/



Method

- Traceroute measurements using RIPE Atlas probes
- Steps:
  - Identify ASNs in the country using RIPEstat
  - Identify IXPs and IXP LANs using PeeringDB
  - Construct mesh: from all (*) country's probes to each other
  - *Maximum of two probes per ASN and only "public" probes with "good" geolocation
- Hops geolocated using "OpenIPMap" database

Actions (part 1)

- Use this tool to find possible suboptimal routing and fix it
  - Find your ASN in the mesh
  - Find the person from another ASN
  - Take them out for tea :)

Actions (part 1)

- To improve accuracy of this diagnostic tool
  - If your ASN is not on the graph, apply for a RIPE Atlas probe
  - Add more probes to your country to increase “resolution”
  - If you move, remember to update your probe’s geolocation

Actions (part 2)

- Reuse and rewrite the code: it is free and open source software
  - https://github.com/emileaben/ixp-country-jedi
- Improve infrastructure geolocation: contribute data to OpenIPMap!
  - https://marmot.ripe.net/openipmap/
  - https://github.com/RIPE-Atlas-Community/openipmap

Exercise

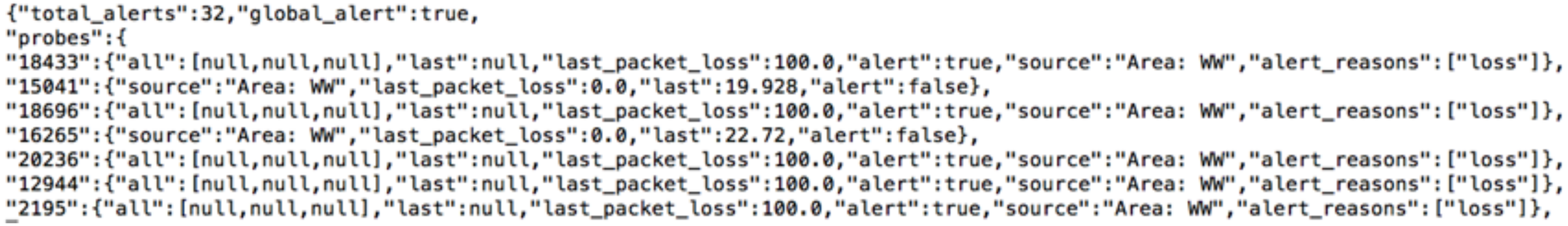
Setting up “Status Checks”

Tasks

- Set up and configure a “status check”
  - For an existing ping measurement https://atlas.ripe.net/measurements/2340408/
  - Hint: https://atlas.ripe.net/api/v1/status-checks/2340408/
- Configure the status check in such a way that you will trigger an alert for this measurement
- Optional: set up status check for your own ping measurement!

Solution

- One possible solution:
  - Set the median RTT to a lower level:
  - https://atlas.ripe.net/api/v1/status-checks/2340408/?median_rtt_threshold=10
- Example of the alerts



```
{"total_alerts":32,"global_alert":true,
"probes":{
"18433":{"all":[null,null,null],"last":null,"last_packet_loss":100.0,"alert":true,"source":"Area: WW","alert_reasons":["loss"]},
"15041":{"source":"Area: WW","last_packet_loss":0.0,"last":19.928,"alert":false},
"18696":{"all":[null,null,null],"last":null,"last_packet_loss":100.0,"alert":true,"source":"Area: WW","alert_reasons":["loss"]},
"16265":{"source":"Area: WW","last_packet_loss":0.0,"last":22.72,"alert":false},
"20236":{"all":[null,null,null],"last":null,"last_packet_loss":100.0,"alert":true,"source":"Area: WW","alert_reasons":["loss"]},
"12944":{"all":[null,null,null],"last":null,"last_packet_loss":100.0,"alert":true,"source":"Area: WW","alert_reasons":["loss"]},
"2195":{"all":[null,null,null],"last":null,"last_packet_loss":100.0,"alert":true,"source":"Area: WW","alert_reasons":["loss"]},
```

Take part in the RIPE Atlas community

RIPE Atlas community (part 1)

- Individual volunteers host probes in homes or offices
- Organisations host RIPE Atlas anchors
- Sponsor organisations give financial support or host multiple probes in their own networks

RIPE Atlas community (part 2)

- Ambassadors help distribute probes at conferences, give presentations, etc.
- Developers contribute free and open software
- Network operators create measurements to monitor and troubleshoot
- Researchers and students write papers

ICINGA
www.icinga.org

Hosting a probe

- Create a RIPE NCC Access account
- Go to https://atlas.ripe.net/apply
- You will receive a probe by post
- Register your probe
- Plug in your probe
- If you receive a probe from an ambassador (trainer, sponsor, someone at a conference), just register it and plug it in!

More Hackathons!

- Join the hackathons in 2016
  - Before each RIPE Meeting - save the dates!
  - 21-22 May, Copenhagen
  - 22-23 October, Madrid

Contact us

- https://atlas.ripe.net and 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