RIPE NCC Basic Measurements Tools Tutorial

RIPE 69 - London - November 2014

Overview 1 - RIPEstat

- Introduction to RIPEstat
- More about widgets
- List of widgets
  - Exercise: Querying for a Resource
- Visualising BGP Routing Information
  - Exercise: BGPlay
- Handling abuse
  - Exercise: Handling Abuse
- Comparing Results

RIPE NCC - Who are we?

- RIPE NCC
- Located in Amsterdam
- Not-for-profit organisation
- One of the five Regional Internet Registries (RIRs)
- 10,000+ members

Introduction to RIPEstat

RIPE NCC

What is RIPEstat?

One interface for viewing all Internet number resource data

“One-stop shop”

Landing page

What data? What sources?

- RIPE Database
- Other RIR data
- BGP routing data (RIS)
- Active measurements (RIPE Atlas, DNSMON)
- Geolocation (third-party)
- Blacklist data (third-party)
- More…

Query?

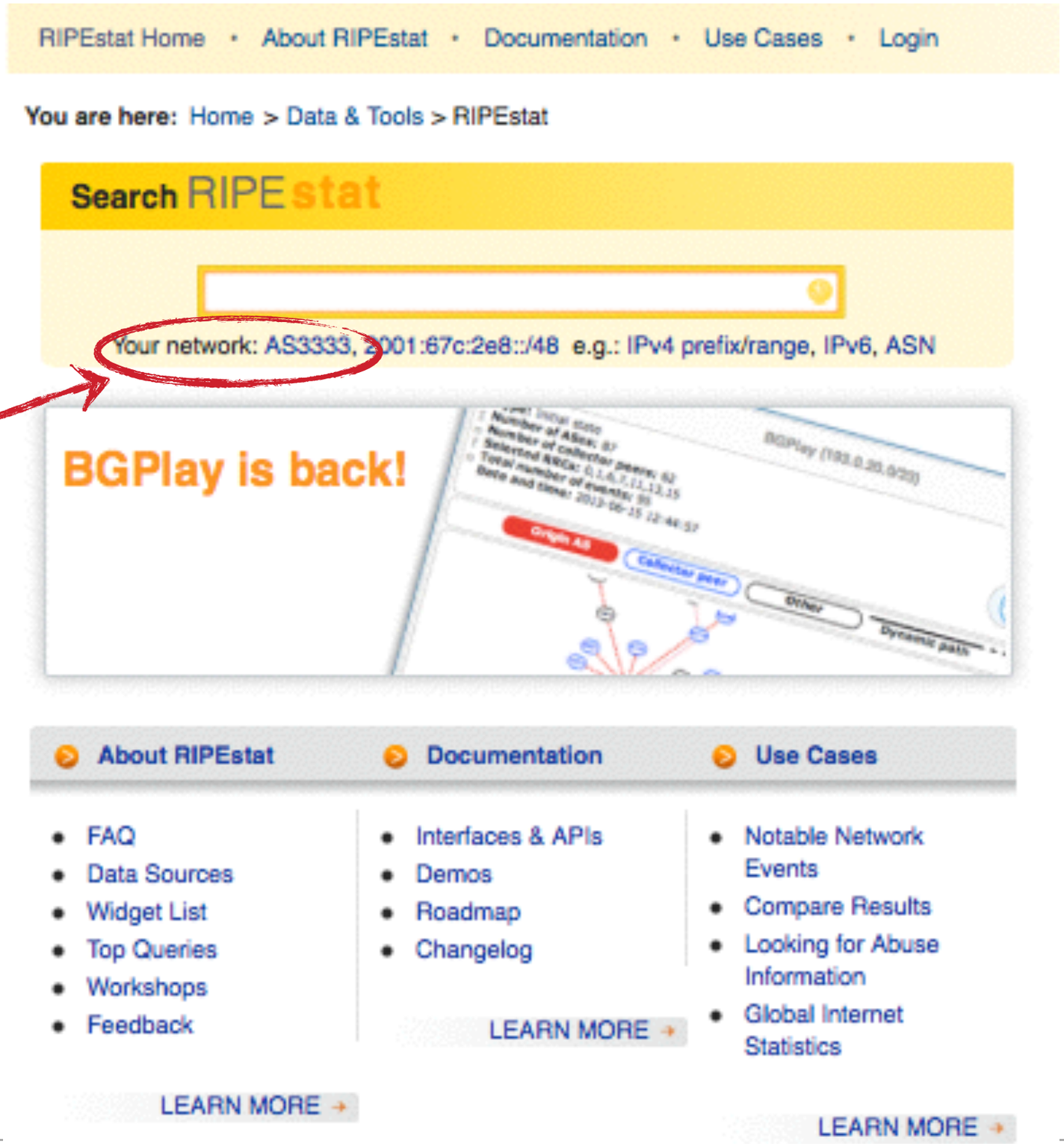
- IPv6 address
- IPv4 address
- ASN
- Hostname
- Country code

Why use RIPEstat?

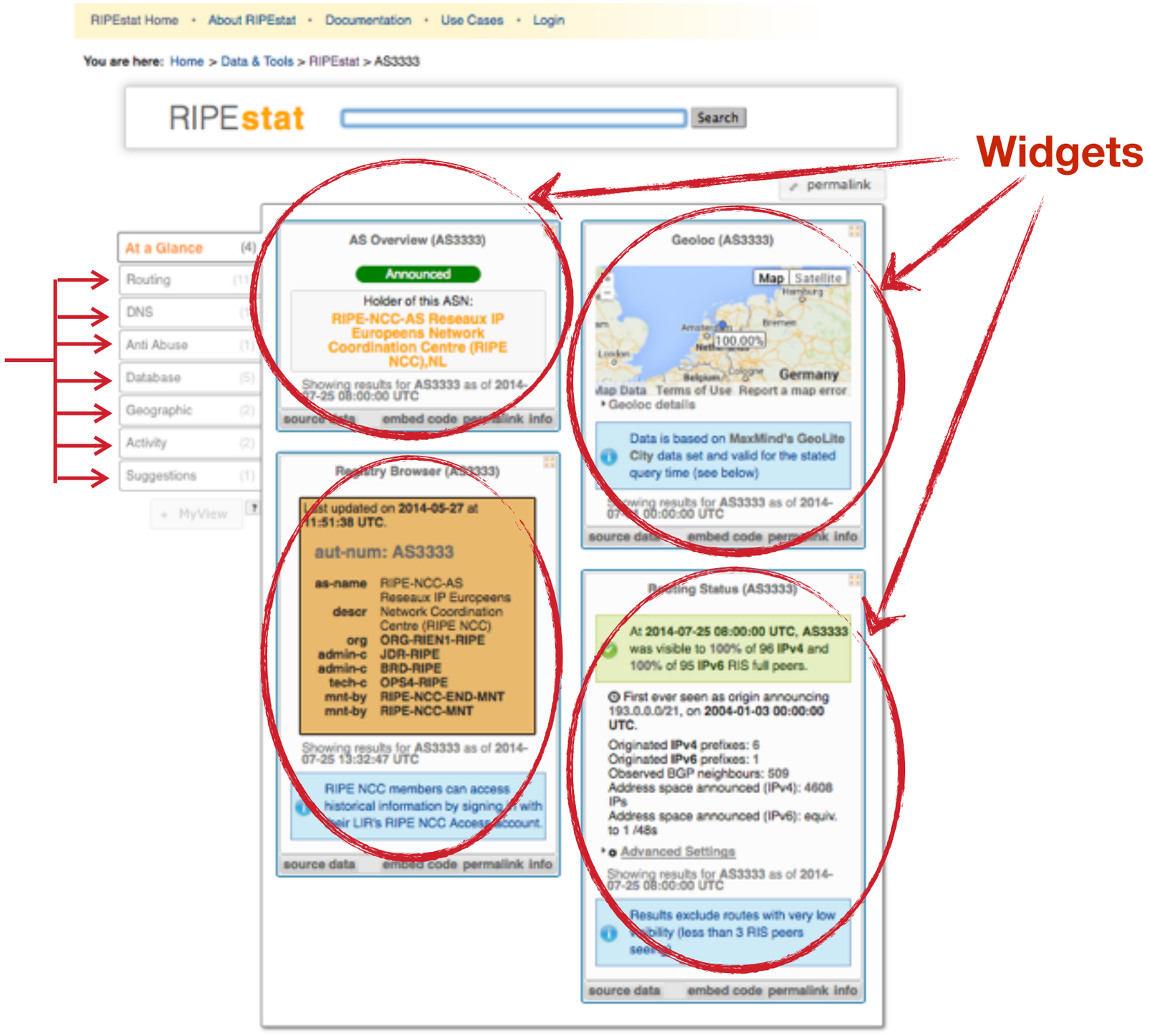
- For your own network:
  - Is someone else announcing my prefix?
  - How visible is my new IPv6 network?
  - Is my BGP routing consistent with Routing Registry?
  - Was my prefix visible yesterday in Tokyo?
- For viewing other networks:
  - IPv6 in my country compared to neighbours
  - Who has more peers, AS1 or AS2?
  - How does the upstream outage look?
  - Is the prefix/ASN that I want already announced?

Query page

RIPEstat shows your own IP/ASN



Results default tab



Warm-up Exercise

Query Country Name

More About Widgets

RIPE NCC

Widget list

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

RIPEstat Widgets

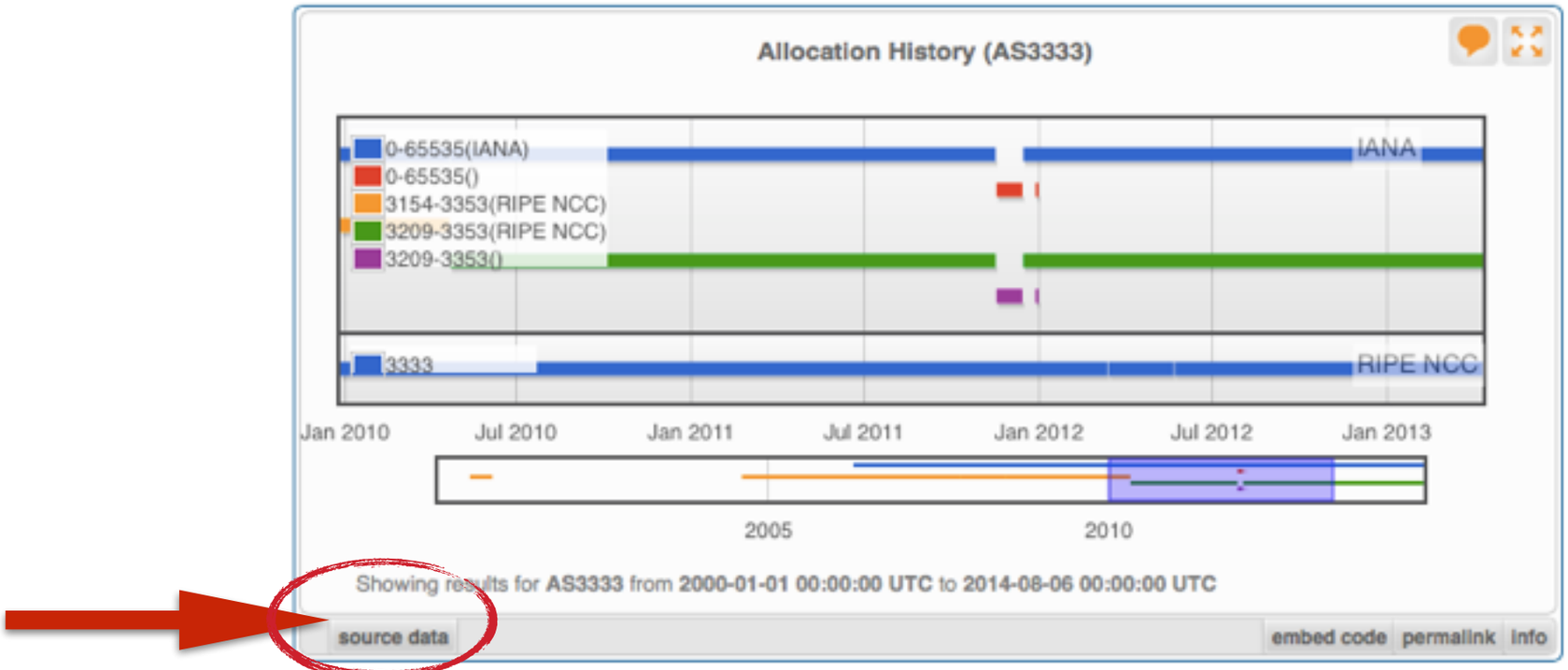
This is a complete list of all of the widgets that RIPEstat offers. Each of these widgets can be accessed using the links below.

When you view a widget you can also get code for **embedding** it in your own pages. The full procedure for embedding and configuring widgets is described in the Widget API Documentation.

Show 100 entries Search:

Title (show slug)	Example	Prefix	IP address	ASN	Hostname	Country code
Abuse Contact Finder		✓	✓	✓		
Address Space Hierarchy		✓	✓			
Address Space Usage		✓	✓			
Allocation History		✓	✓	✓		
Announced Prefixes				✓		
AS Overview				✓		
AS Path Length				✓		
AS Routing Consistency				✓		
ASN Neighbours				✓		
ASN Neighbours History				✓		
RIPE Atlas Probes		✓	✓	✓		✓
RIPE Atlas Measurement Targets		✓	✓	✓	✓	

Get the data behind the widget!



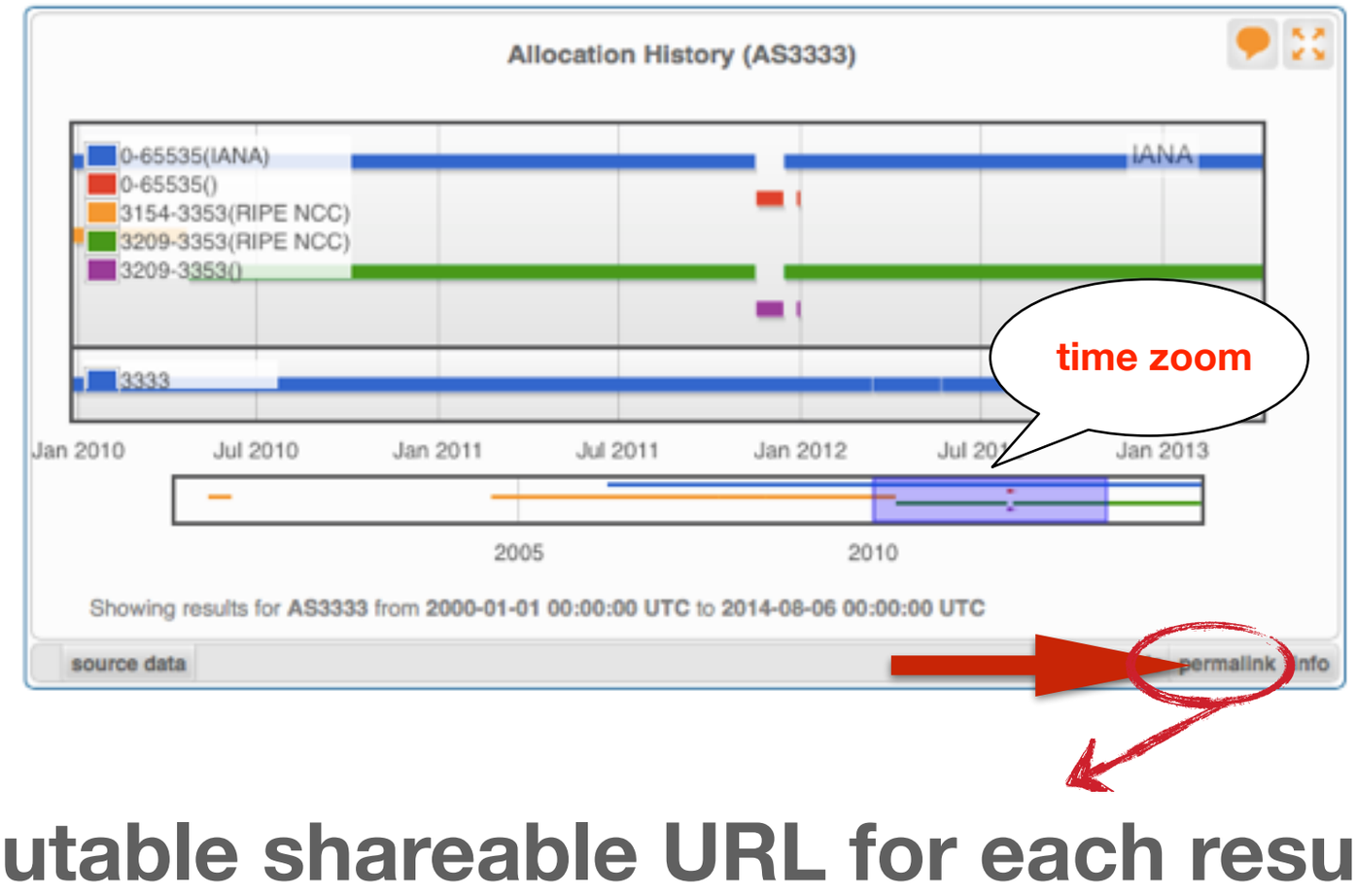
source data | embed code | permalink | info

Get the data behind this widget with the Data API

https://stat.ripe.net/data/allocation-history/data.json?resource=AS3333

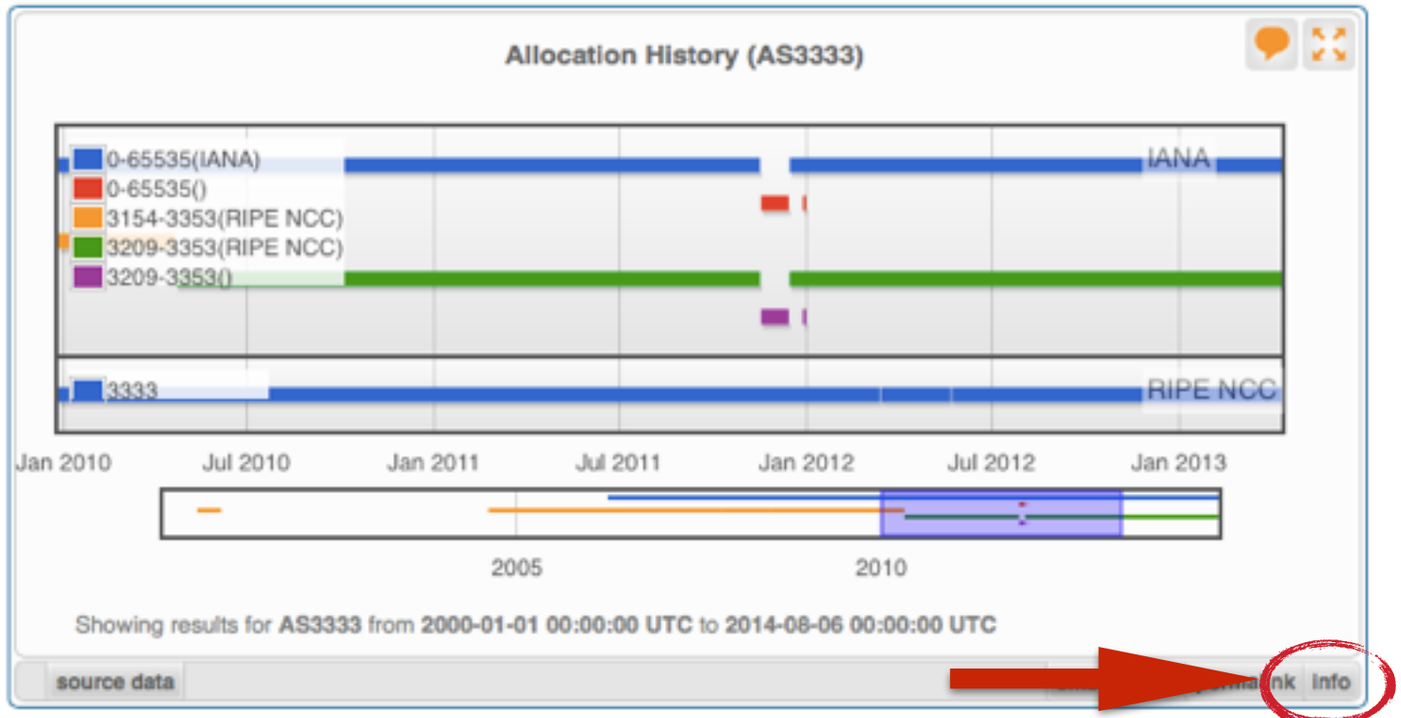

```
{
    "cached": true,
    "data": {
        "query_endtime": "2014-08-06T00:00:00",
        "query_starttime": "2000-01-01T00:00:00",
        "resource": "3333",
        "results": {
            "IANA": [
                {
                    "resource": "0-65535",
                    "status": "IANA",
                    "timelines": [
                        {
                            "endtime": "2007-10-11T00:00:00",
                            "starttime": "2007-10-11T00:00:00"
                        },
                        {
                            "endtime": "2008-11-03T00:00:00",
                            "starttime": "2007-10-27T00:00:00"
                        },
```

Shareable URL of results

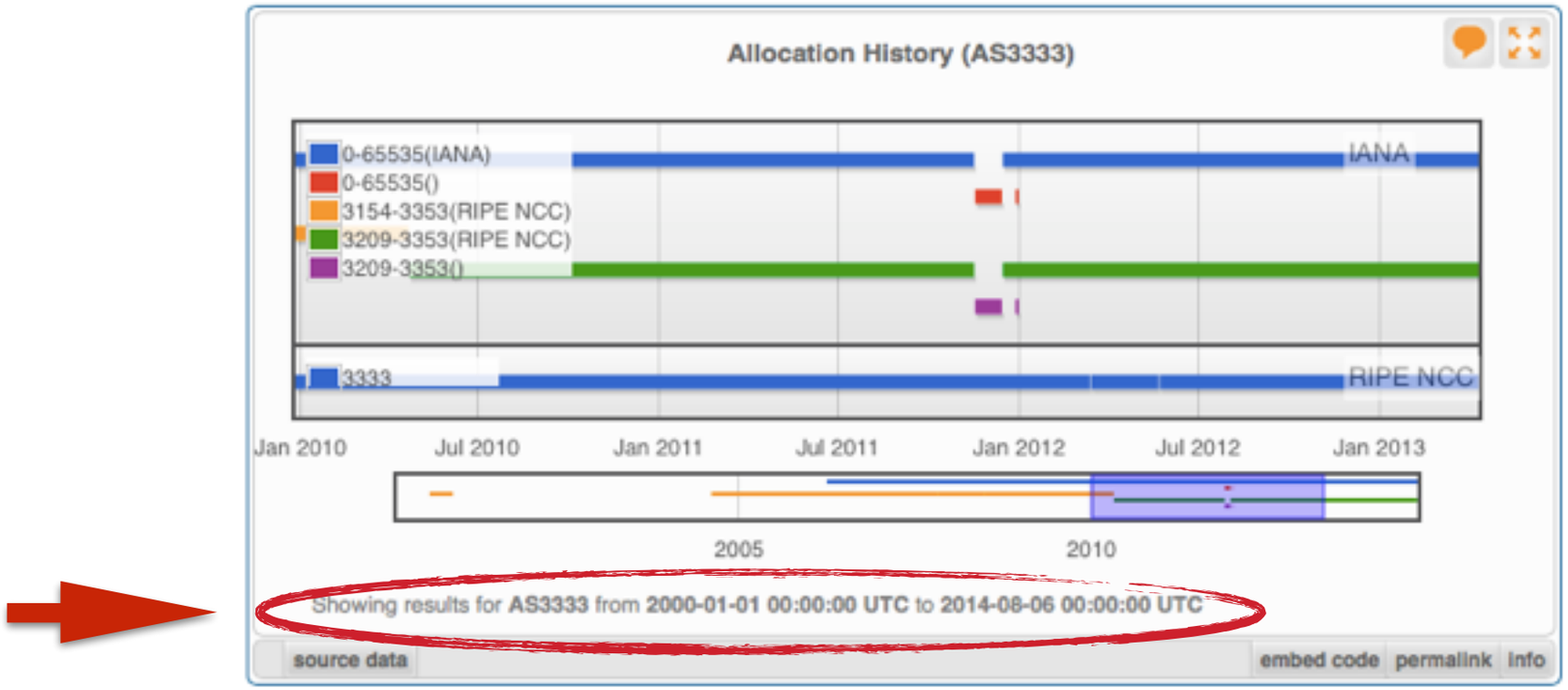


- Immutable shareable URL for each result!
- URL includes:
  - Zoom
  - History

Where's the data from?

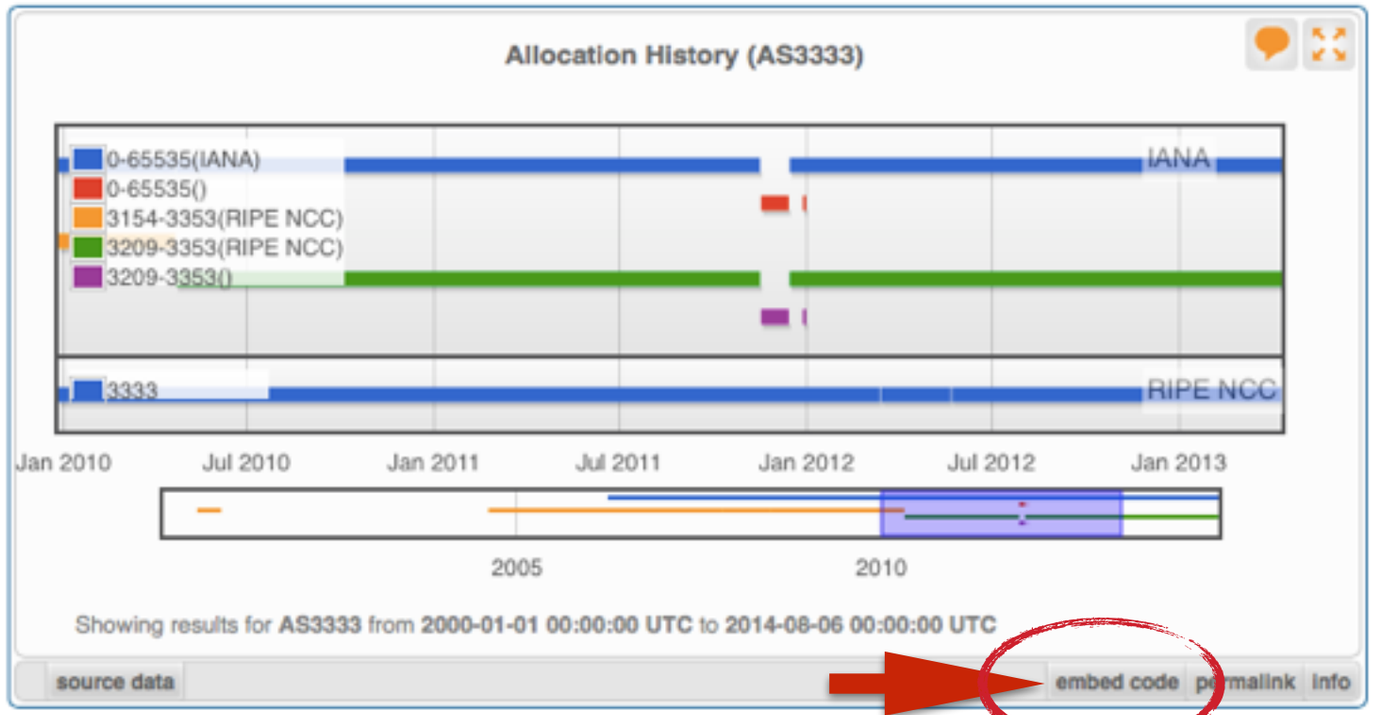


Freshness and Timescale of the Data

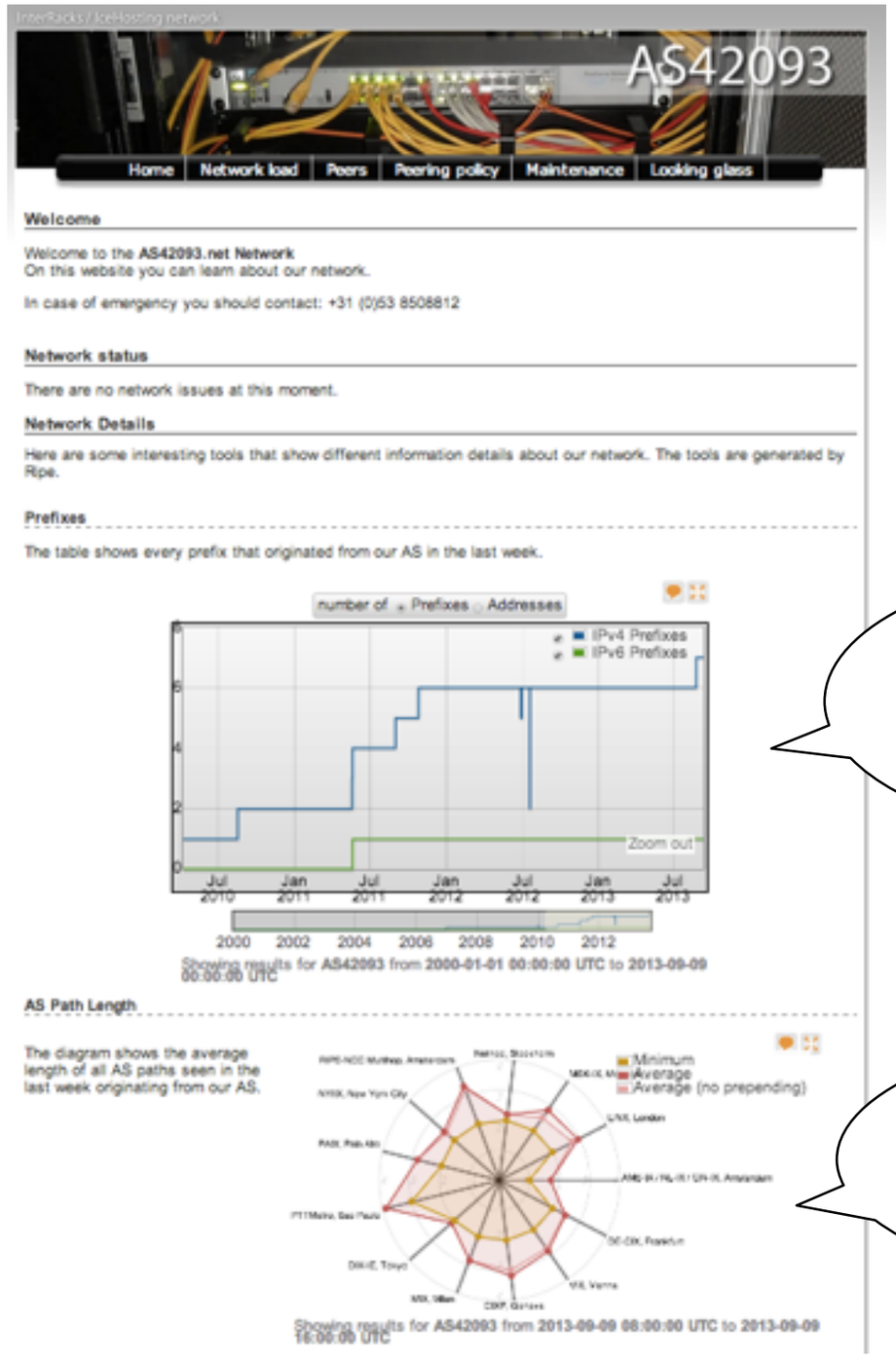


- Timestamp and time period of data
- Different widgets = different data update frequency
- Can be adjusted in most cases
  - Limits: Different maximum granularities

Embed the widget!



Embedding widgets on your site



This ISP embedded widgets on its page

Prefix Count widget

AS Path Length widget

Exercise: Querying for a resource

Tasks

- What network announces 140.78.50.90?
- Is 193.3.4.2 routed?
- In which country is 91.229.42.0/23 used?
  - What is its corresponding INETNUM object?
- What widget provides real-time routing status?
- By what percent did the number of prefixes announced within Greece increase from July 2012 to July 2014
  - Compare IPv4 and IPv6
- How would you share interesting network events with a colleague?

Visualising BGP Routing Information

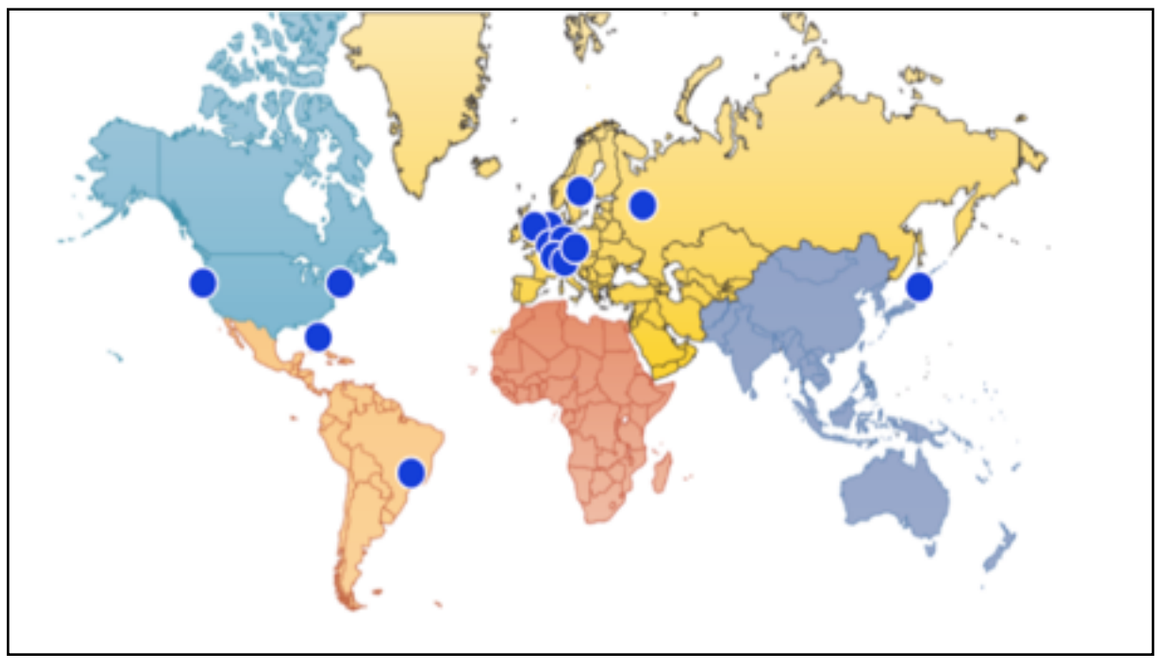
RIPE NCC

Querying

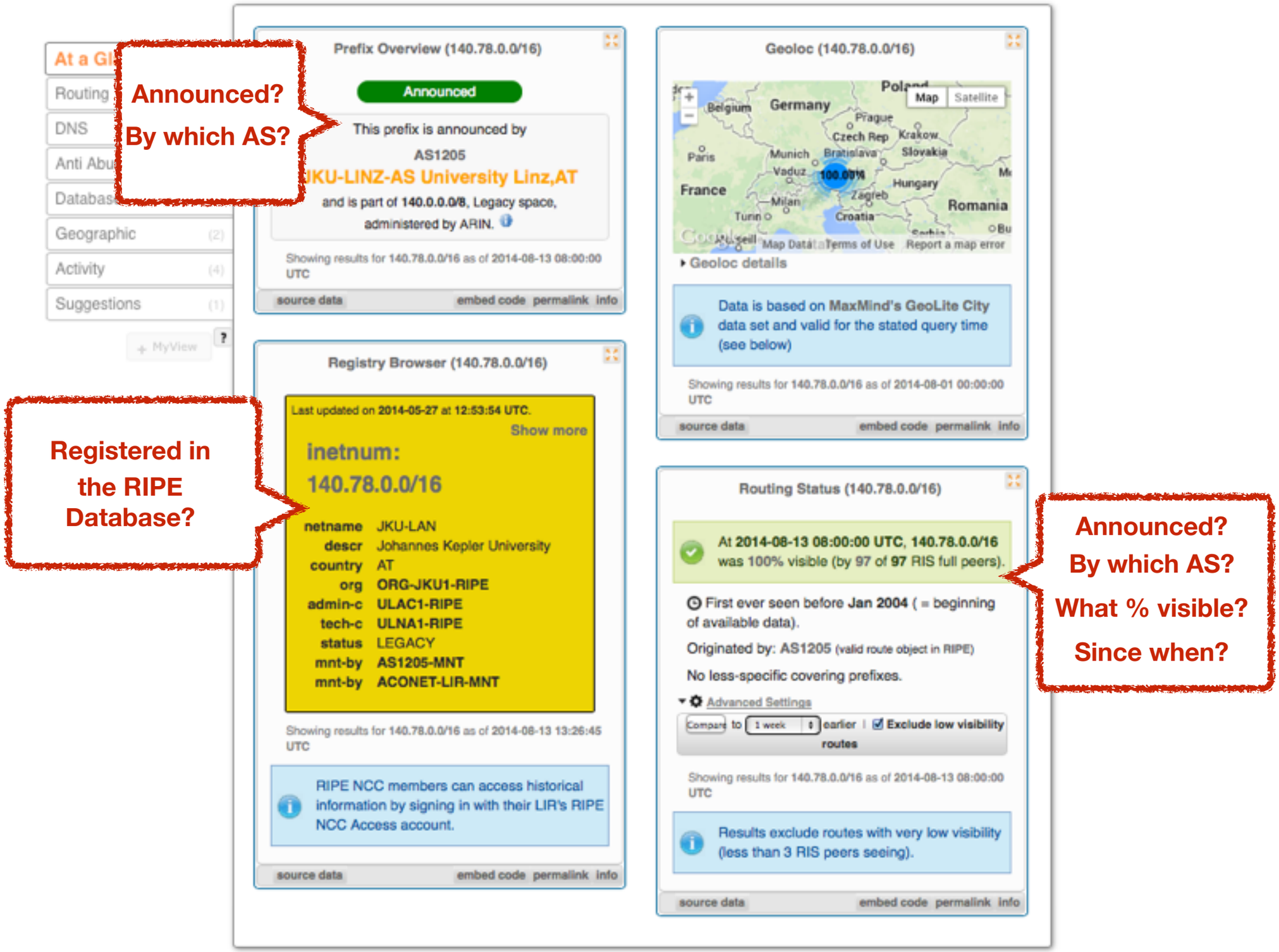
- IP or ASN queried?
  - You get different widgets!
- ASN often visualised based on the prefixes that it announces

RIS - Routing Information Service

- RIPE NCC has been collecting BGP information since 1999
  - Raw data: ris.ripe.net
- RIS has 15 route collectors and 600+ peers
- RIPEstat visualises RIS data

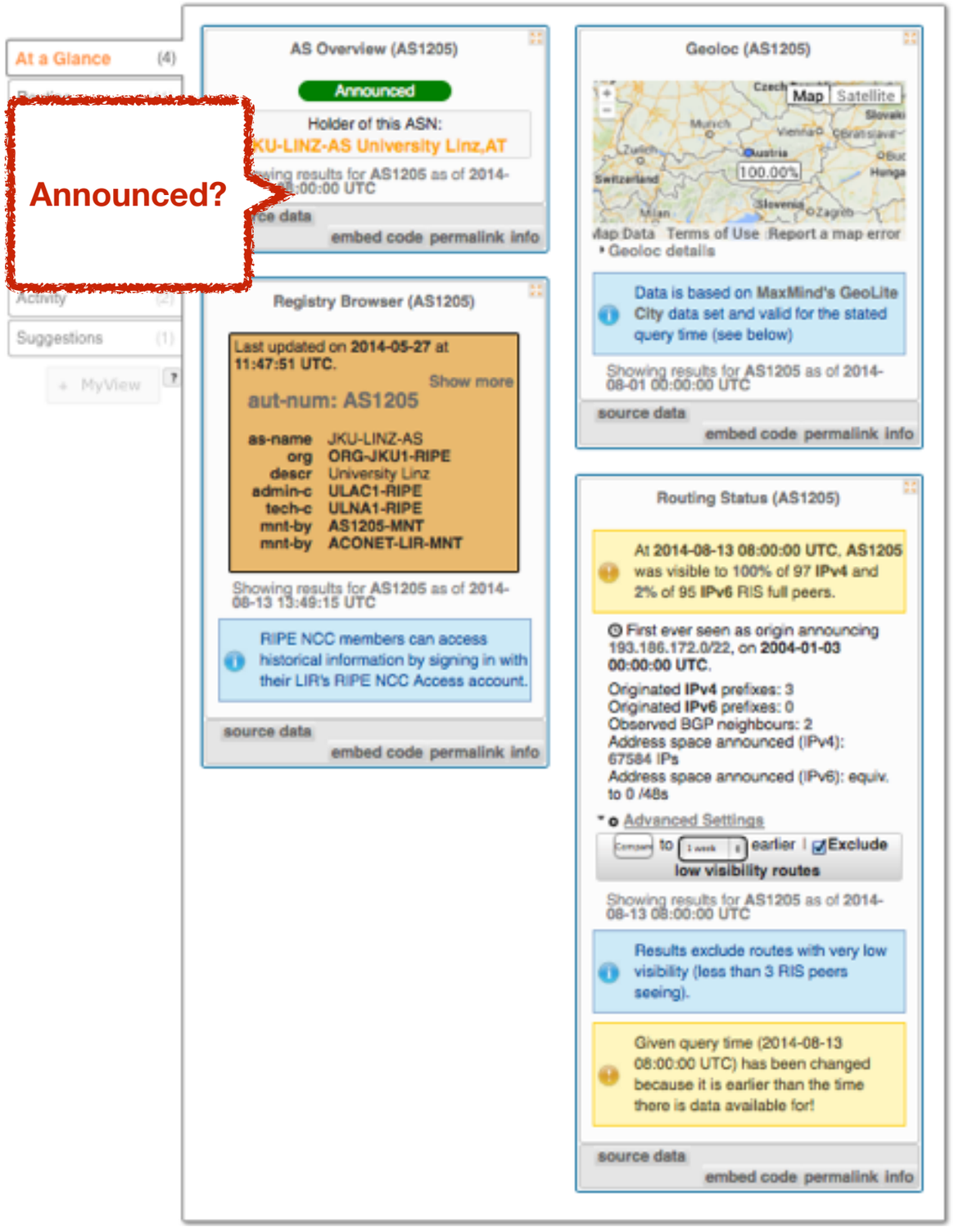


At-a-glance view: Prefix Queried

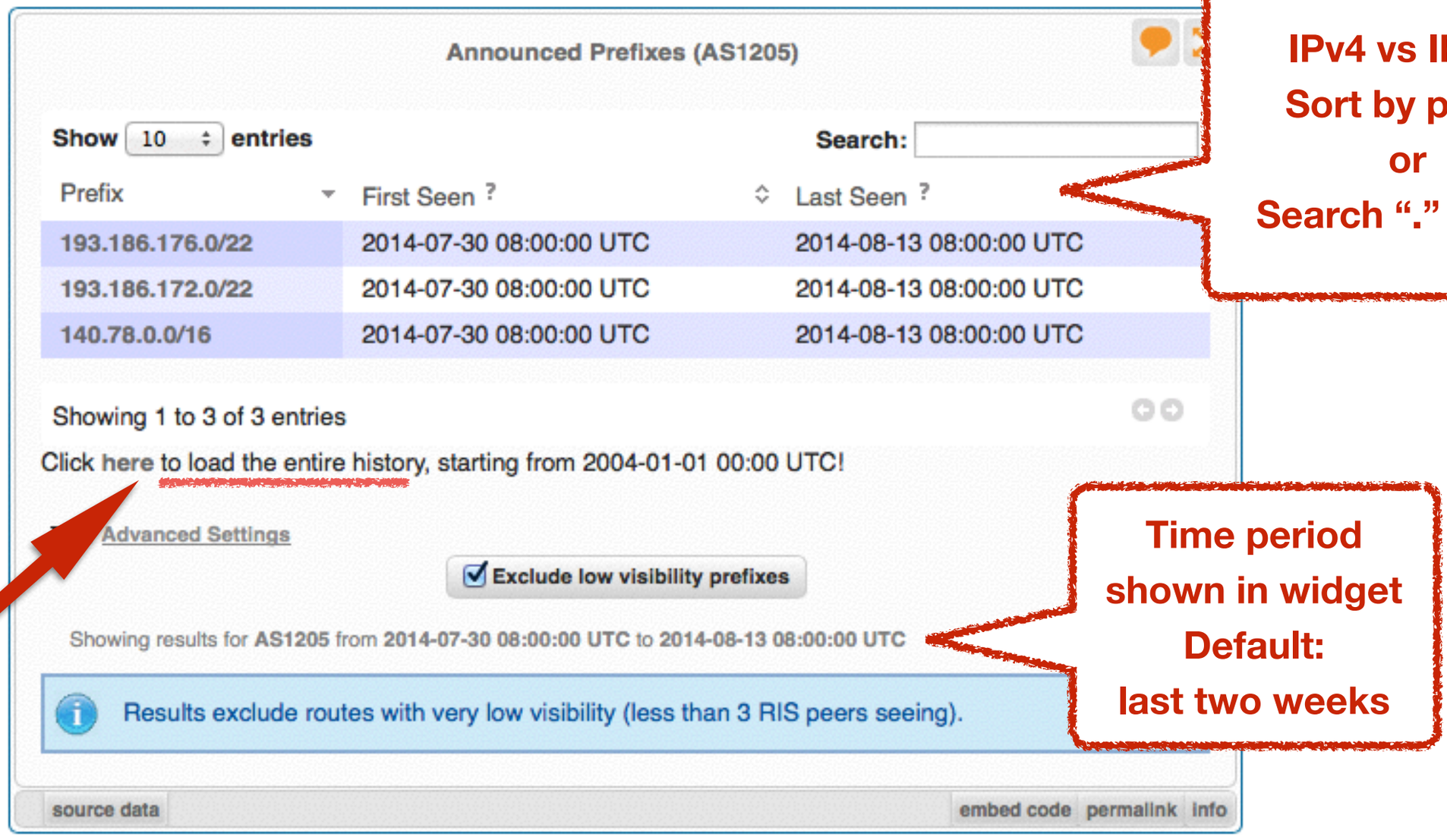


At-a-glance view: ASN Queried

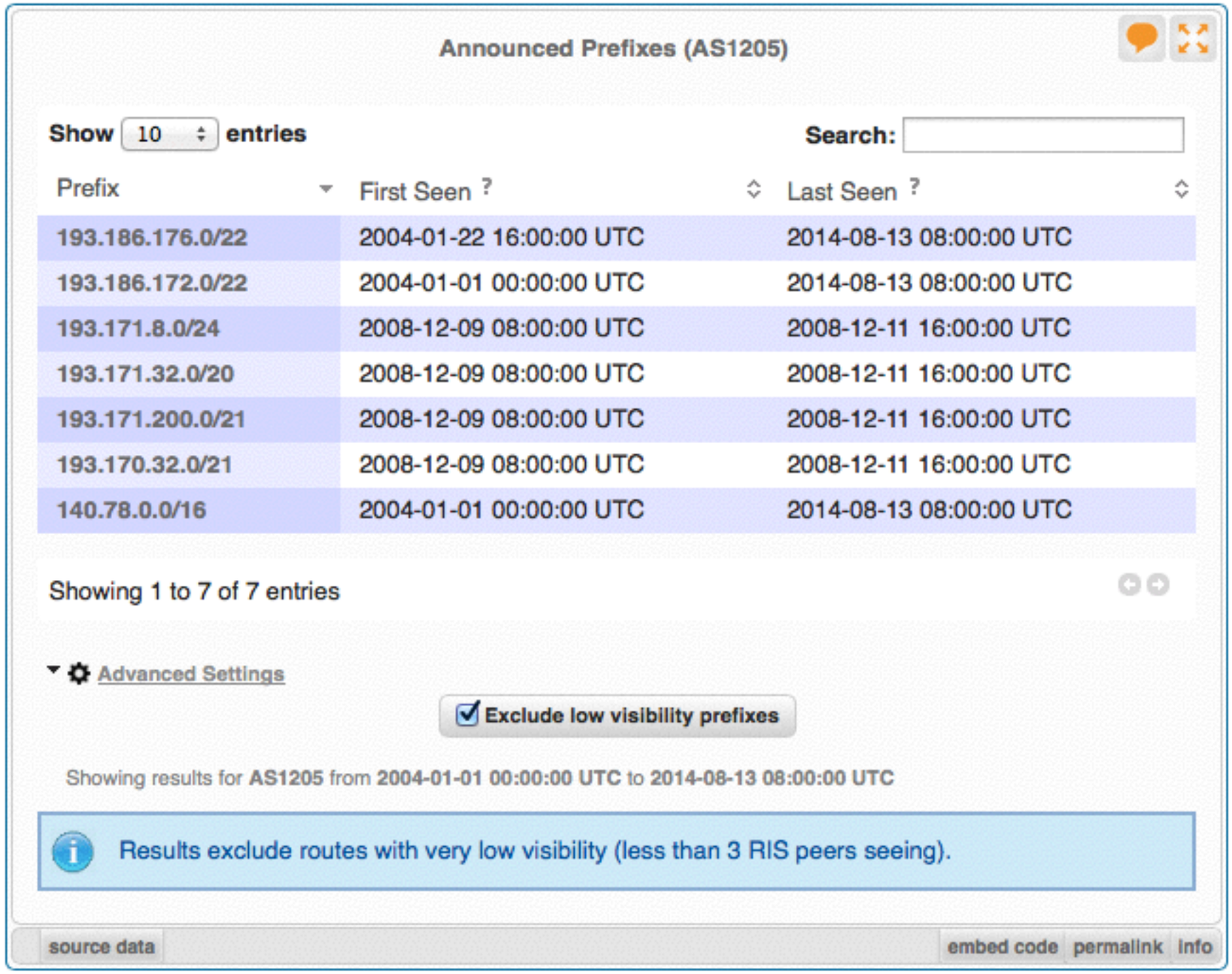
The rest is the same as for a prefix



Prefixes Visible for this ASN



Announced Prefixes - Useful for ASN



Announced Prefixes (AS1205)

Show 10 entries

Search:

Prefix	First Seen ?	Last Seen ?
193.186.176.0/22	2004-01-22 16:00:00 UTC	2014-08-13 08:00:00 UTC
193.186.172.0/22	2004-01-01 00:00:00 UTC	2014-08-13 08:00:00 UTC
193.171.8.0/24	2008-12-09 08:00:00 UTC	2008-12-11 16:00:00 UTC
193.171.32.0/20	2008-12-09 08:00:00 UTC	2008-12-11 16:00:00 UTC
193.171.200.0/21	2008-12-09 08:00:00 UTC	2008-12-11 16:00:00 UTC
193.170.32.0/21	2008-12-09 08:00:00 UTC	2008-12-11 16:00:00 UTC
140.78.0.0/16	2004-01-01 00:00:00 UTC	2014-08-13 08:00:00 UTC

Showing 1 to 7 of 7 entries

Advanced Settings

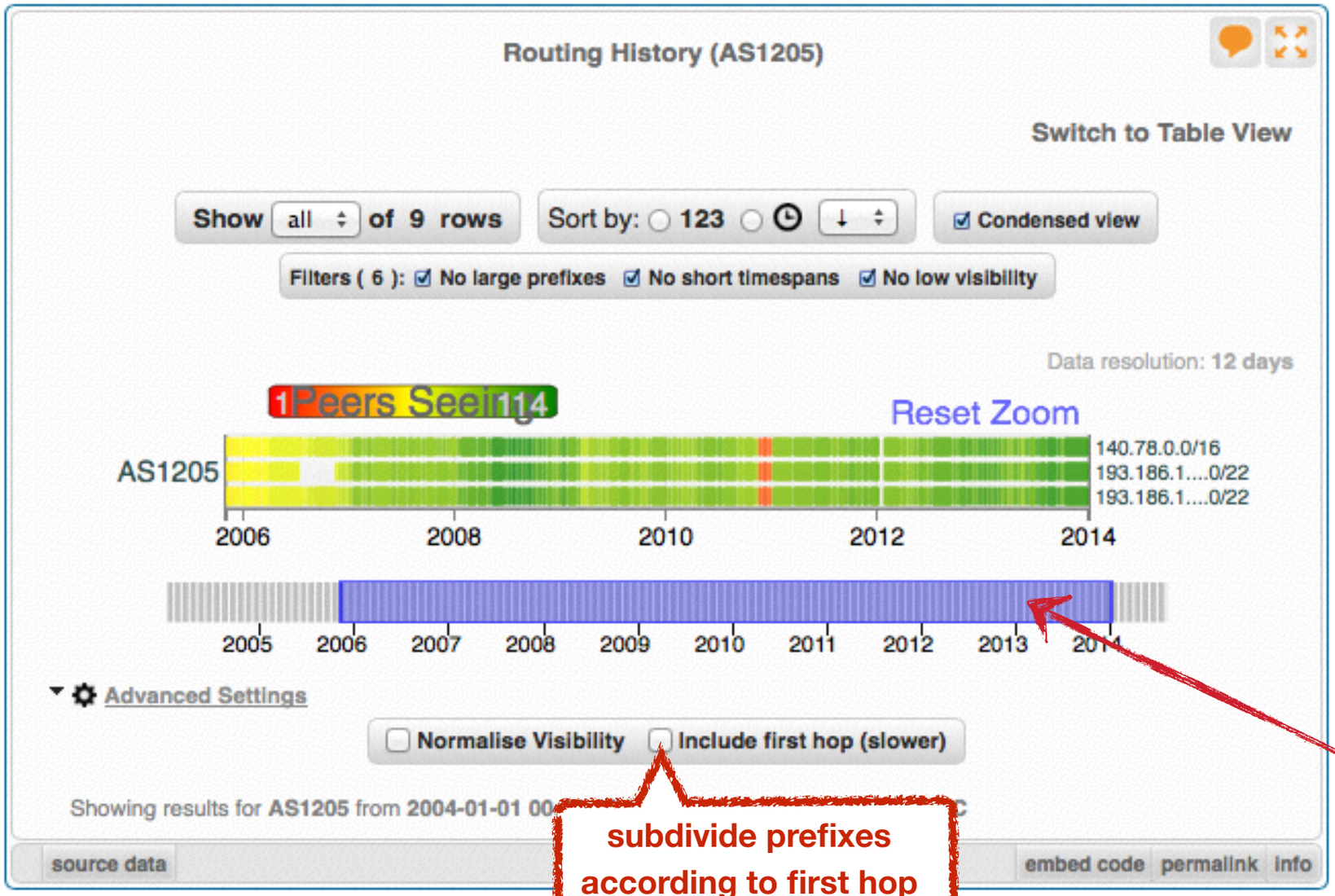
Exclude low visibility prefixes

Showing results for **AS1205** from **2004-01-01 00:00:00 UTC** to **2014-08-13 08:00:00 UTC**

Results exclude routes with very low visibility (less than 3 RIS peers seeing).

source data | embed code | permalink | info

History of Prefixes Announced by ASN



BGPlay

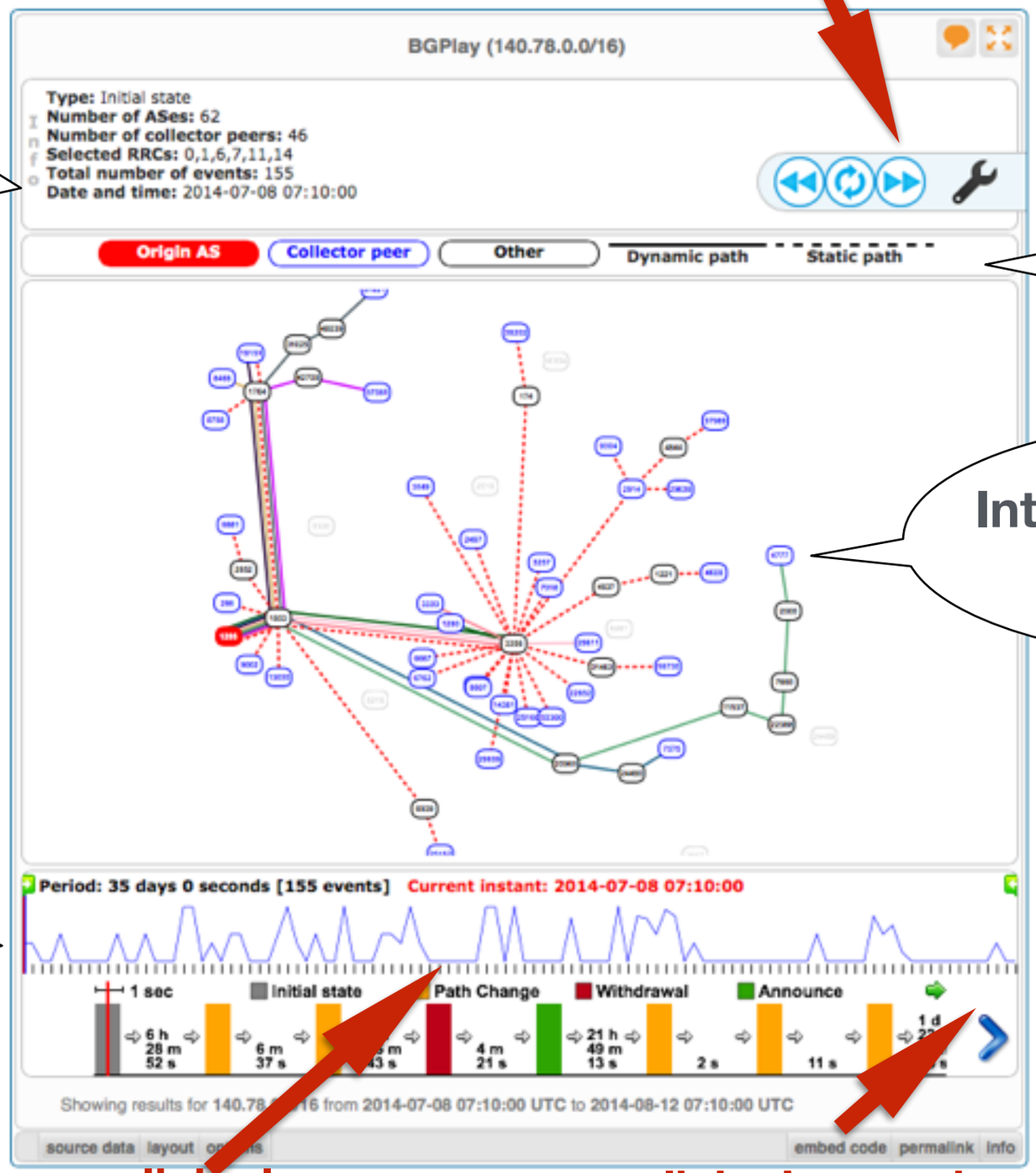
- See how your network is routed
  - Announcements
  - Withdrawals
  - Path changes
- BGPlay shows routing history
  - Animated graphic
  - Highly interactive

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

BGPlay

BGP event, ASN or ASN path details

click play



Control panel:

- Covered time period
- RRC selection

Interactive animated graph

Control timeline

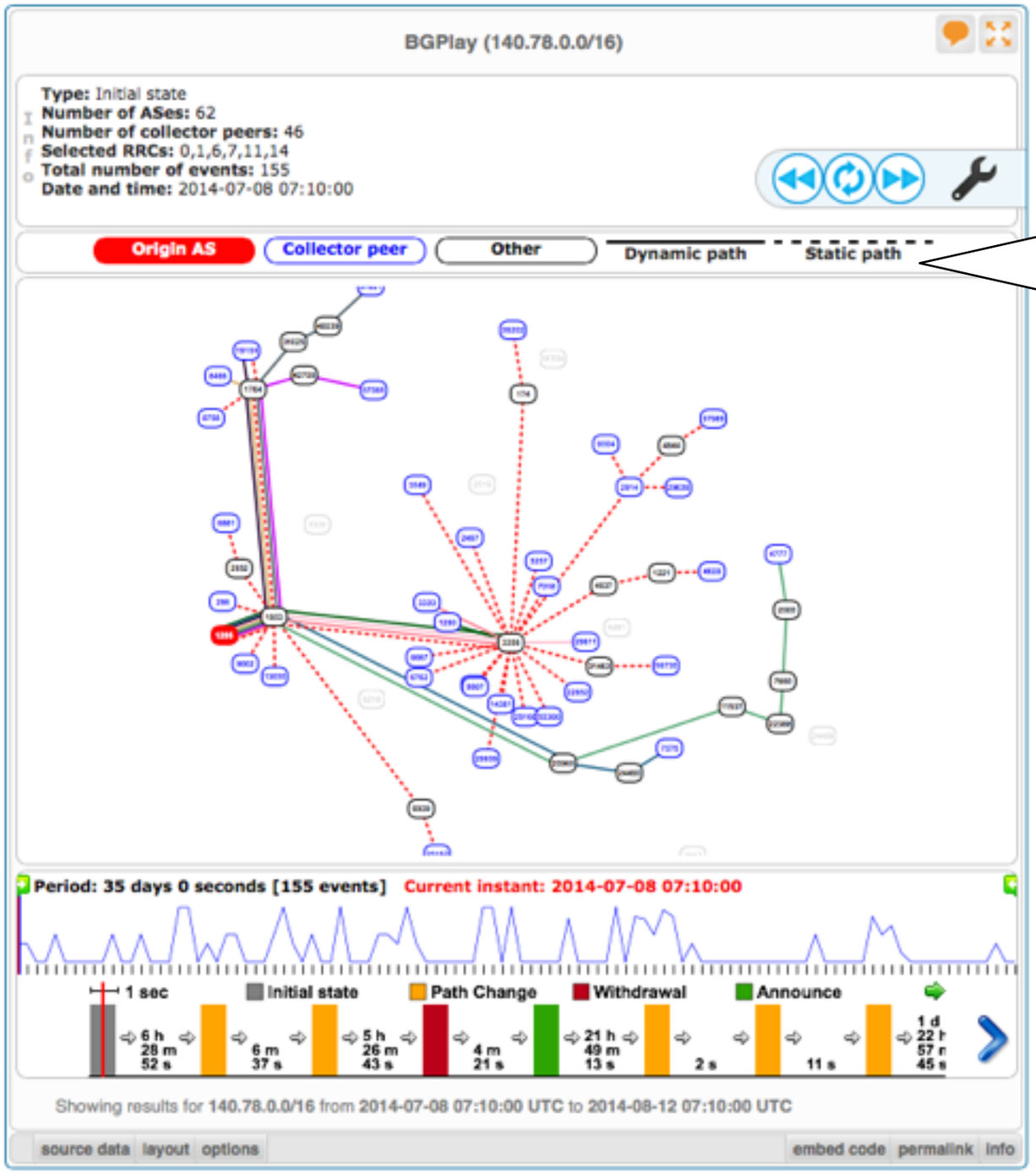
Detailed timeline with events

click play

click play movie

RIPE NCC

BGPlay



Examples: (2013/8/28-30)

- **Prefix with announcements & withdrawals: 84.205.64.0/24**
- **Check IPv6 connectivity: 2001:67c:2e8::/48**
- **Multi-homed prefix: 199.7.80.0/24**
- **BGP hijacking**
  2008-02-28: 208.65.153.0/24
  Youtube traffic by Pakistan Telecom AS17557
- **Blackholing: 193.33.96.64**

Exercise: BGPlay

RIPE NCC

Tasks

- Find the up-stream provider for AS1205
- Is AS3333 multi-homed?
- Check the IPv6 connectivity of your own network

Reporting Abuse

RIPE NCC

Reporting Abuse

- Who is attacking your network?
- What kind of attack is it?

What to do if your Network is Attacked

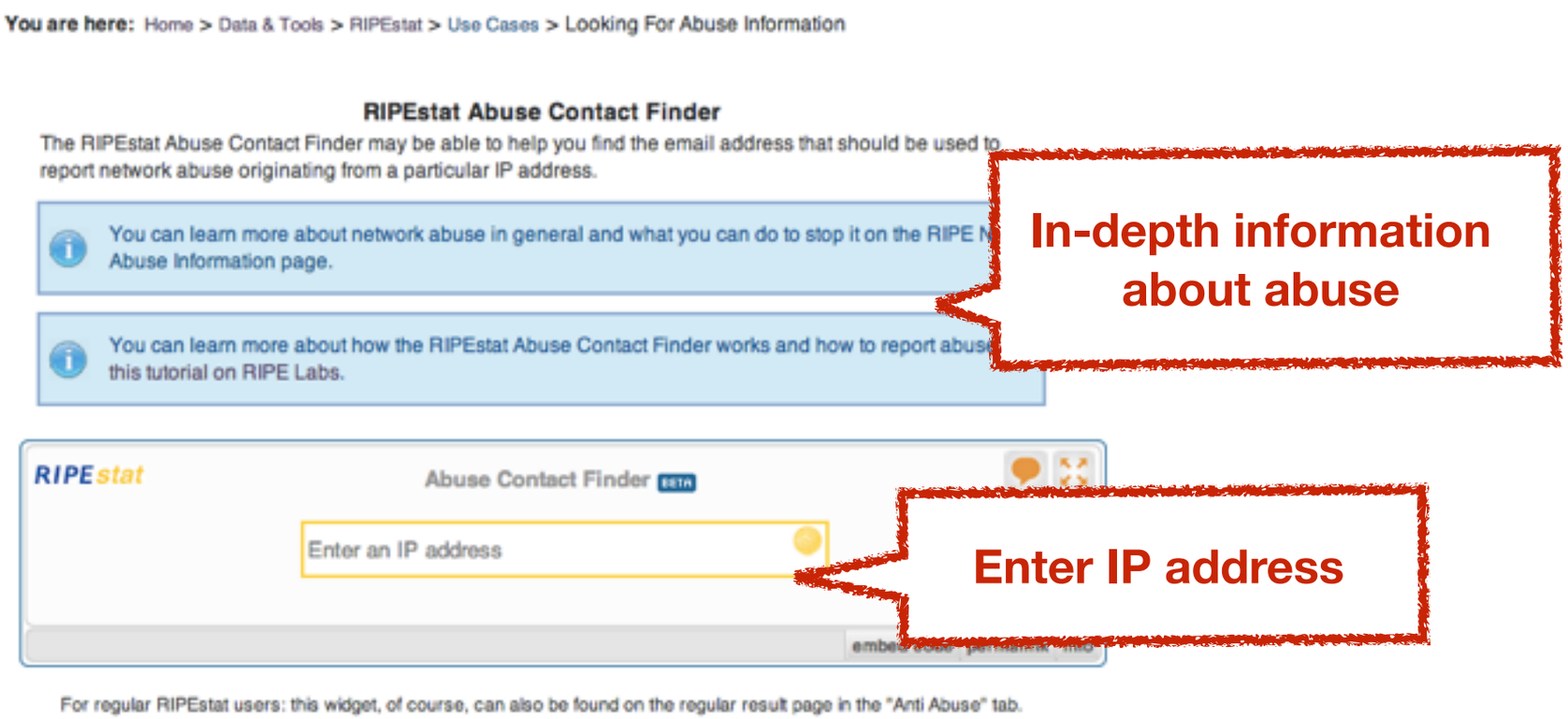
- Spam or unauthorised access?
  - Find IP in message headers or logs
- Want to contact their admin?
  - Find the correct email for reporting abuse
- RIPE Database
  - Contact details for every ASN and IP address
  - In Europe, the Middle East and parts of Central Asia

https://labs.ripe.net/Members/cteusche/finding-anti-abuse-contact-information-with-ripestat

Reporting Abuse

- Take action with the Abuse Contact Finder

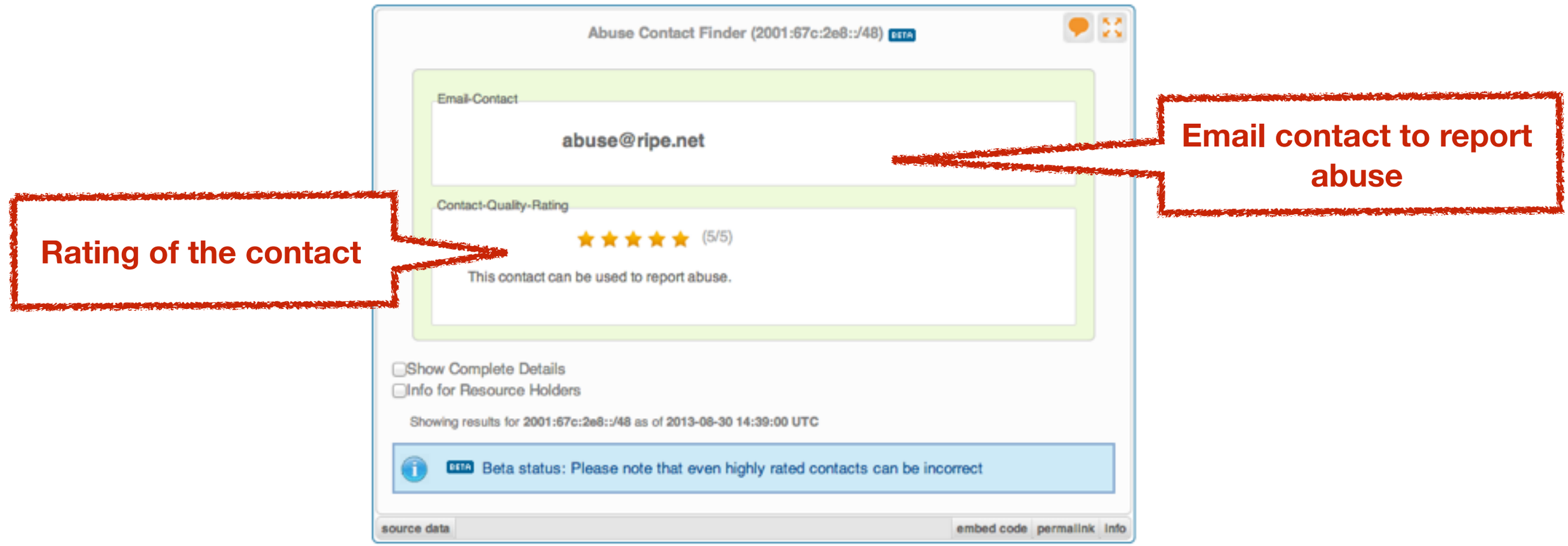
Go to “Use Cases” >
“Looking for Abuse Information”



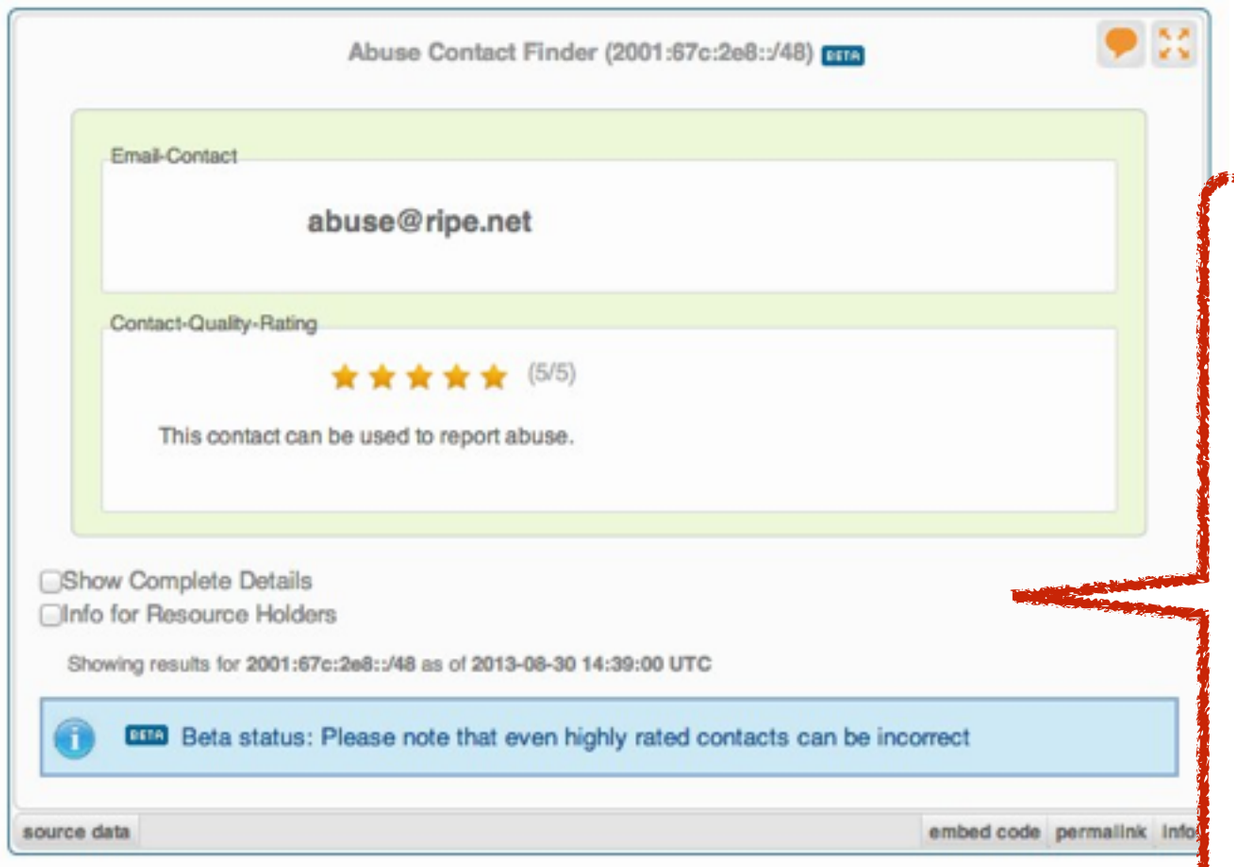
In-depth information about abuse

Enter IP address

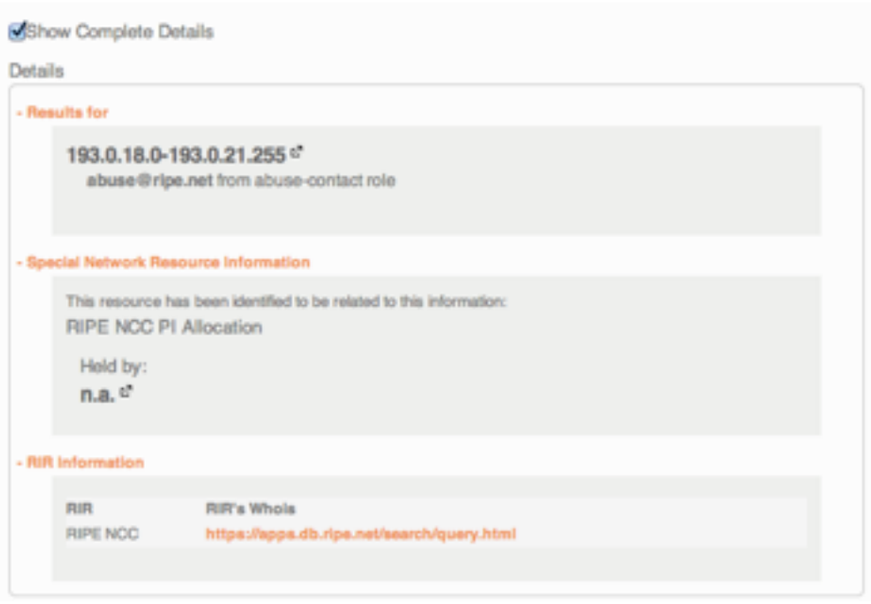
Reporting Abuse



Reporting Abuse



Details about the resource and abuse contact:



Exercise: Handling Abuse

RIPE NCC

Tasks

- What is the abuse contact for 193.0.20.22
  - Or the hotel network?
- Check an IP address from your home network
- Discussion: What can you do in these cases:
  - No abuse contact found
  - No response to an abuse report

Comparing Networks

RIPE NCC

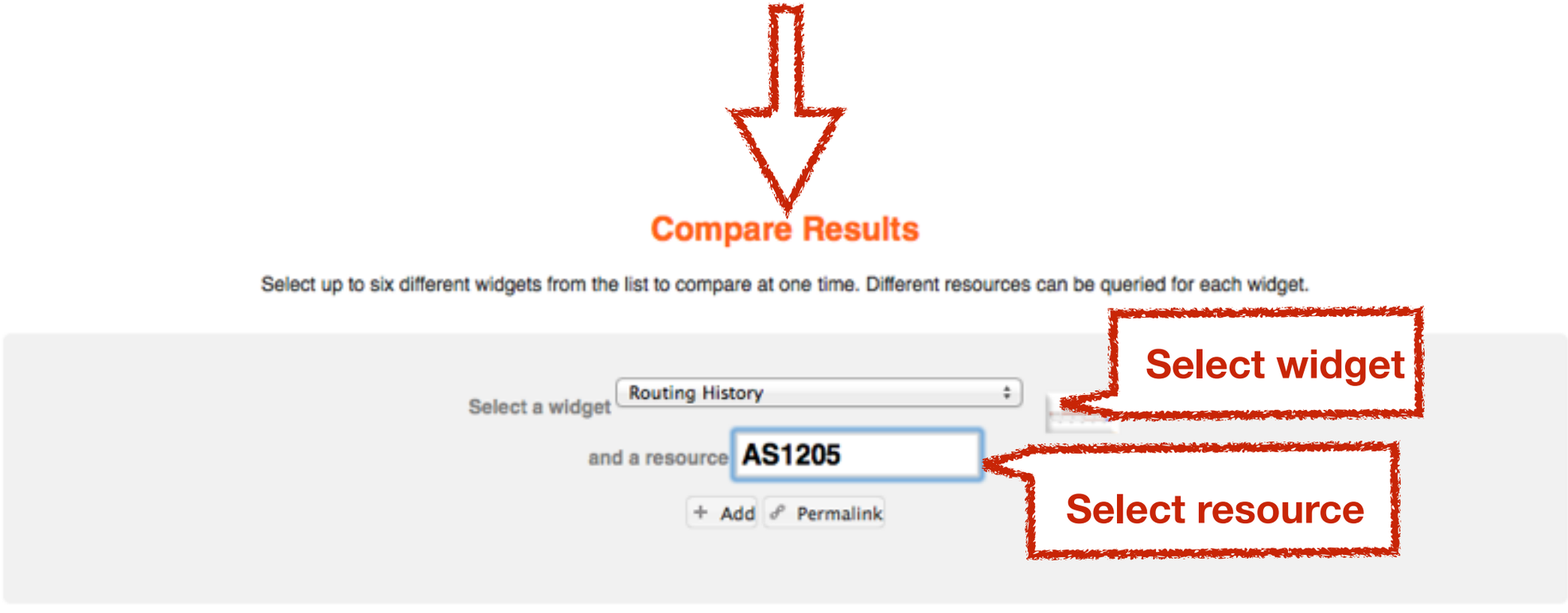
Why Compare Networks?

- Want to peer with AS-X?
  - Learn by opening multiple widgets about AS-X
- Choosing upstream ?
  - Compare AS-X with AS-Y by opening same widget loaded with two different ASNs
- Internet outage in a country?
  - Open multiple country-related widgets in same view

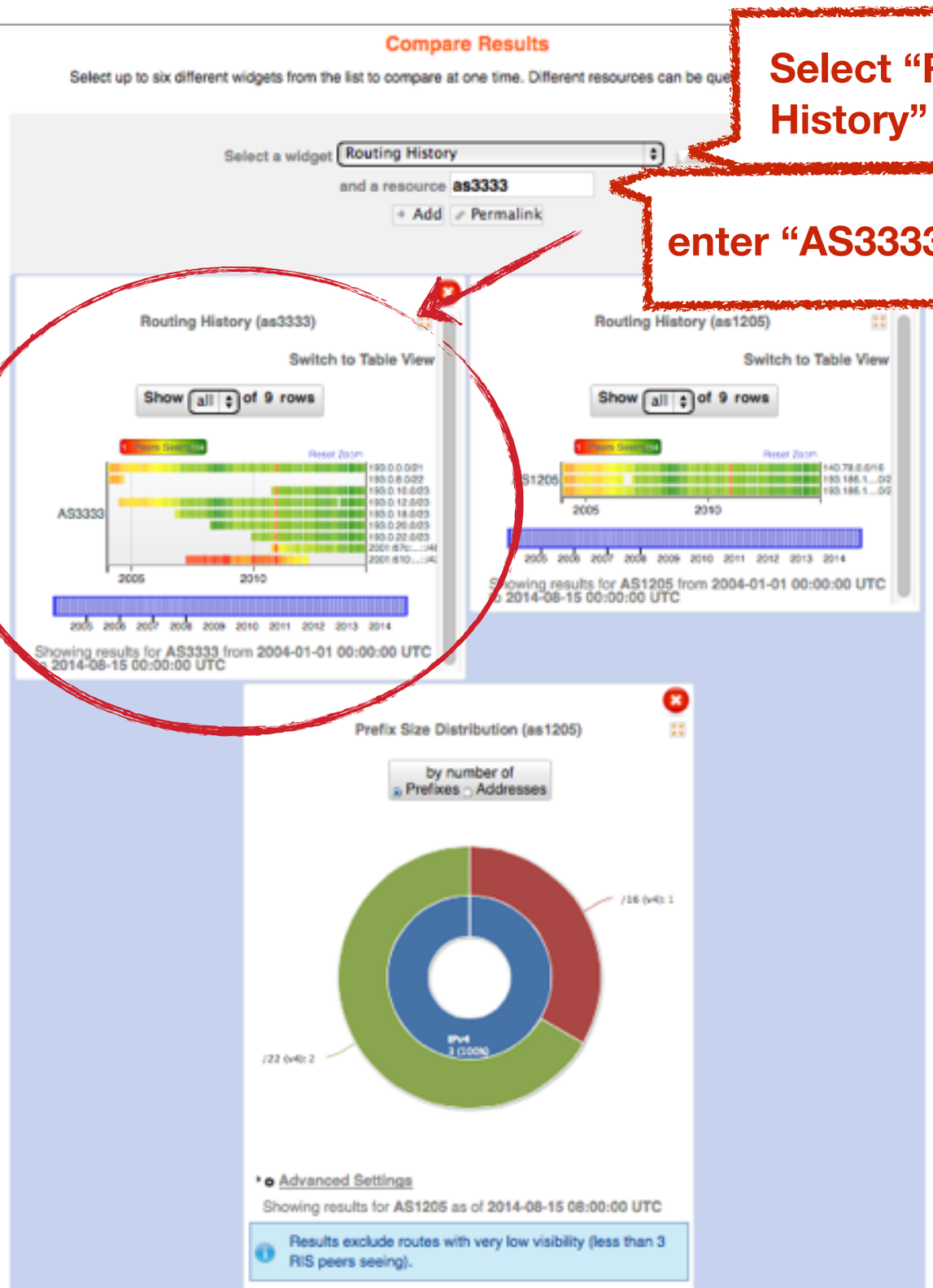
https://labs.ripe.net/Members/suzanne_taylor_muzzin/ripestats-multiple-widget-and-resource-comparison

How to Compare

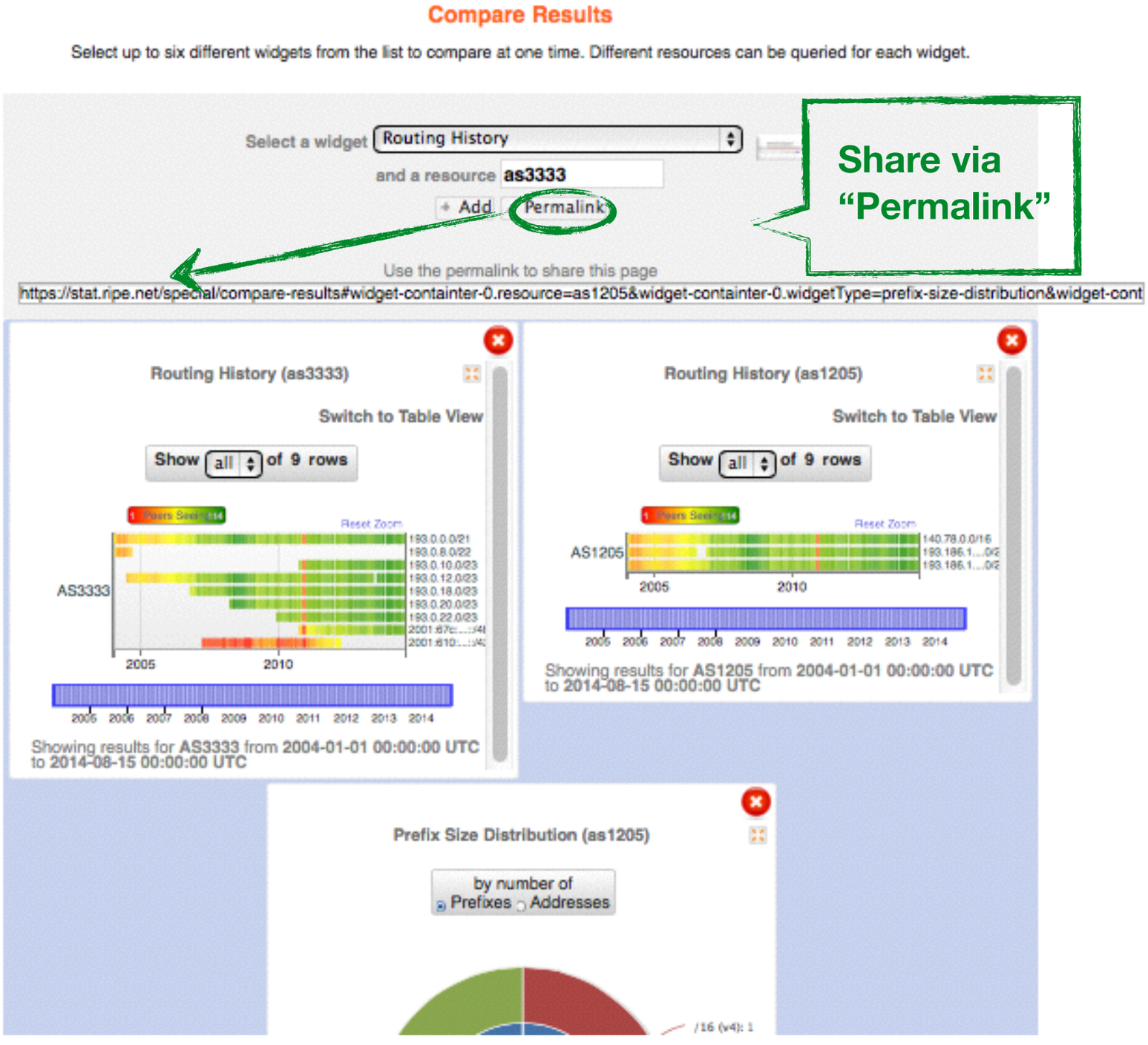
- Compare results in different widgets



Compare Results



Compare Results



Compare Resources Summary

- No login required
- Add widgets AND input query for each widget (ASN or IP or…)
- It is a result page with widgets and query results
- Share it via a permanent link

Comparing Countries in one Widget

- Compare the growth of ASNs in DE and NL
- See IPv6 adoption rate in four countries at the same time
- Analyse IP hijacking with ‘BGP Update Activity Widget’

https://labs.ripe.net/Members/wilhelm/bgp-leaks-in-indonesia

https://labs.ripe.net/Members/suzanne_taylor_muzzin/new-in-ripestat-in-widget-comparison-and-monitoring

In-widget Comparison

- Country Routing Statistics

Exercise: Comparing Results

RIPE NCC

Tasks

- Compare the number of announced prefixes for two networks over the past two years using the widget comparison page
- How does the Internet in Greece compare to the UK? Use in-widget comparison!

Questions?

RIPE Atlas

RIPE NCC

Overview Two - RIPE Atlas

- Introduction to RIPE Atlas
  - What you can get from RIPE Atlas as a visitor
- Exploring public probes
  - Live Demo
- Finding public measurements
  - Exercise: Find results

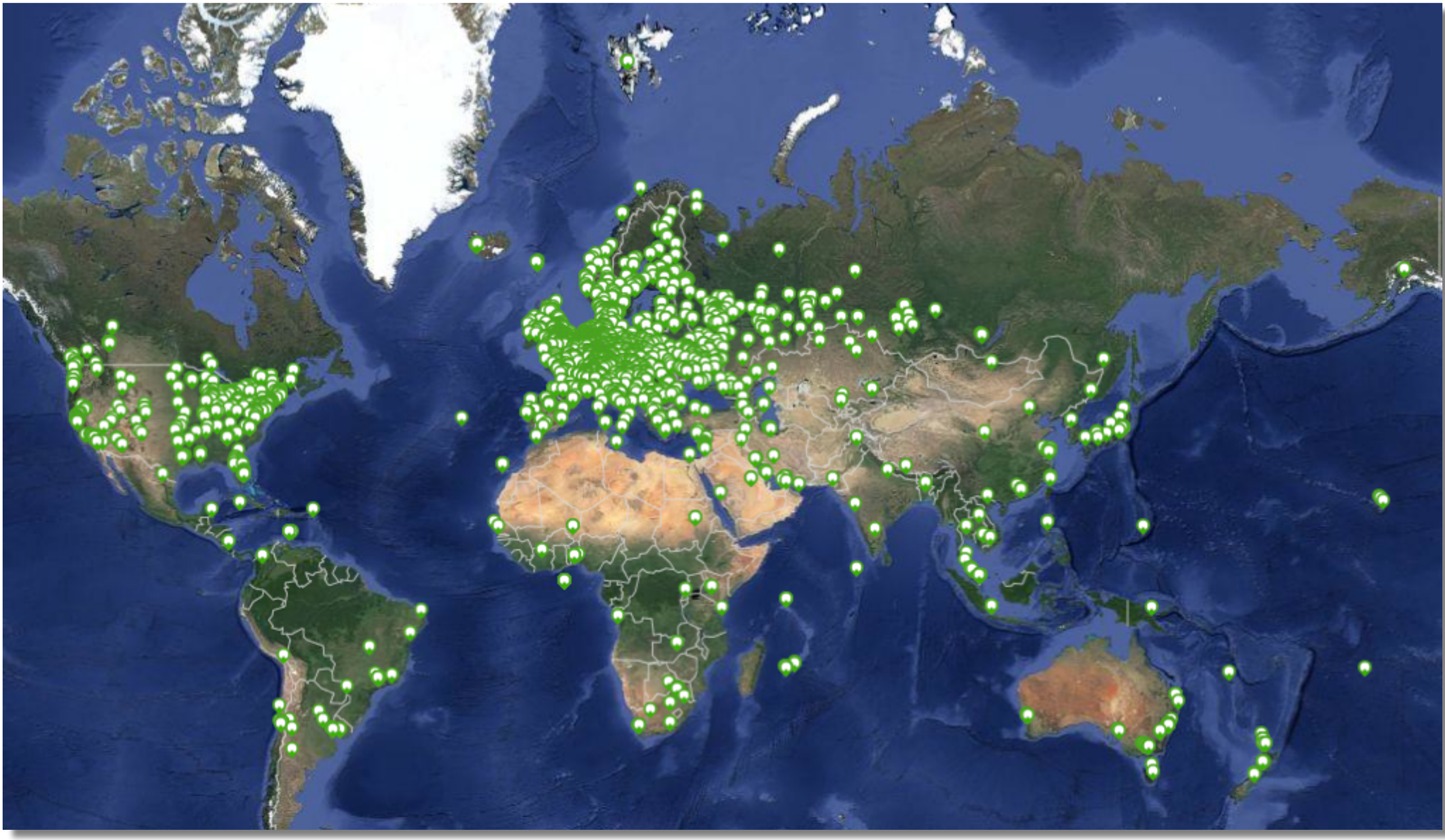
Introduction to RIPE Atlas

RIPE NCC

Definition

- 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
- Users can also run customised measurements
  - ping, traceroute, DNS & SSL
- Data publicly available

RIPE Atlas Coverage



Measurement Devices

- v1 & 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

RIPE Atlas in Numbers: October 2014

- 7,100+ probes connected
- 3,000+ active users this year
- 1,000+ built-in measurements daily
- 5,000+ user-defined measurements daily
  - Available to hosts and members
  - ping, traceroute, DNS, SSL
- Goal by end 2014:
  - 10000 connected probes

Country	Probes
United States	848
Germany	778
France	686
United Kingdom	534
Russia	414
Nederland	409
Czech Republic	195
Ukraine	185
Belgium	174
Switzerland	170

Hosting a RIPE Atlas Probe

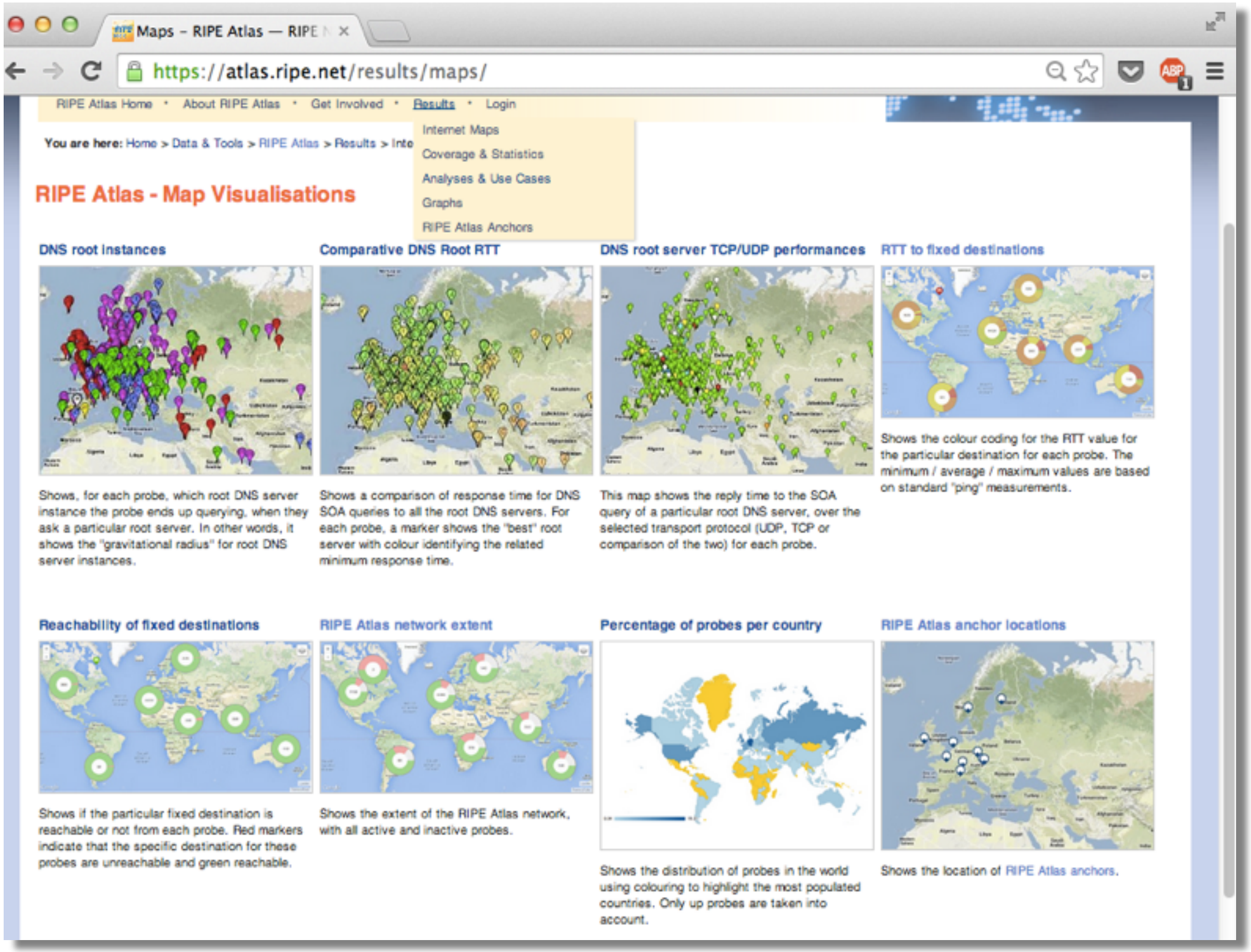
1. Create a RIPE NCC Access account
2. Go to https://atlas.ripe.net/apply
3. You will receive a probe by post
4. Register your probe
4. Plug in your probe

- If you receive a probe from an ambassador (trainer, sponsor, someone at a conference), just register it and plug it in!

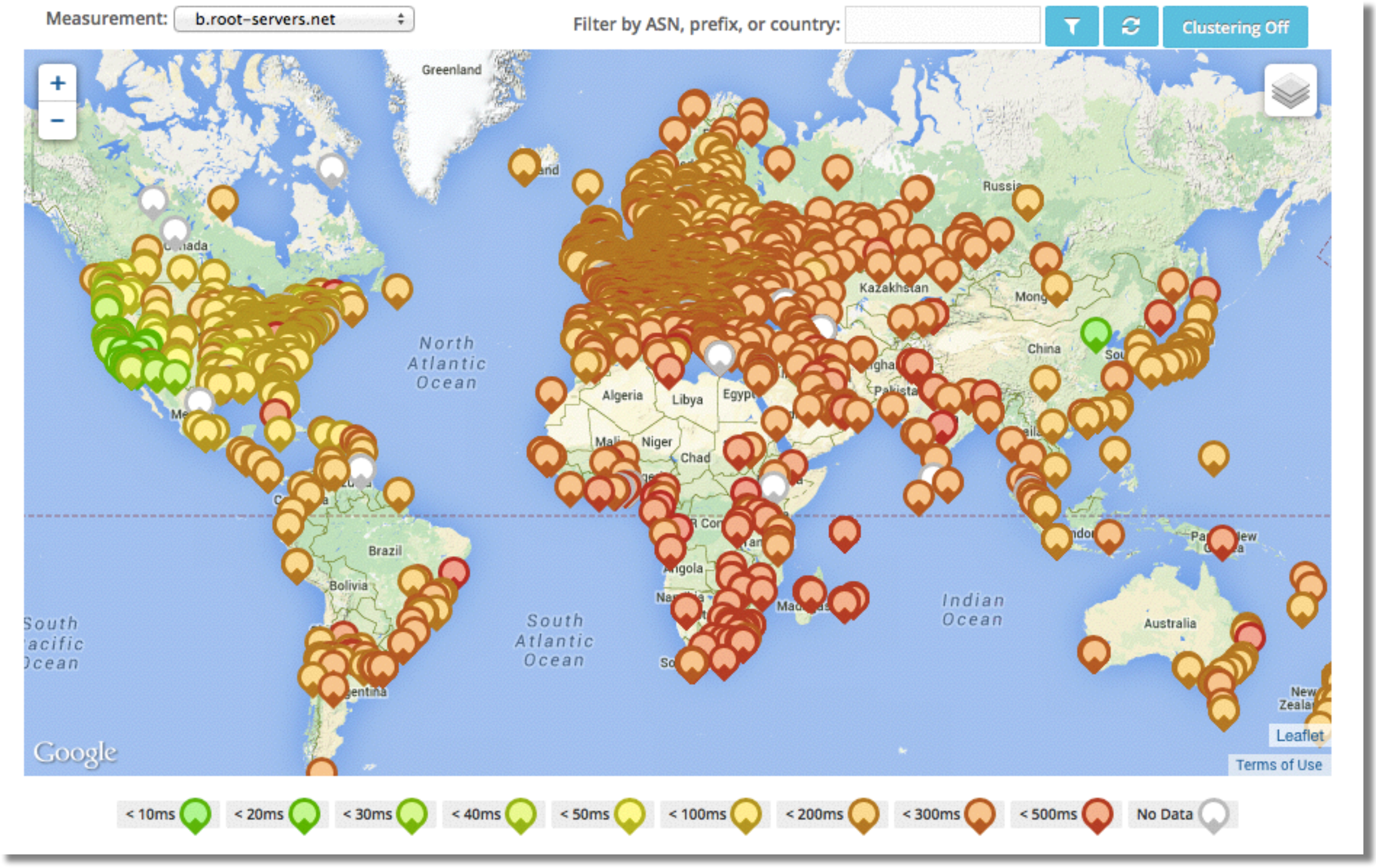
What you can get from RIPE Atlas as a visitor

RIPE NCC

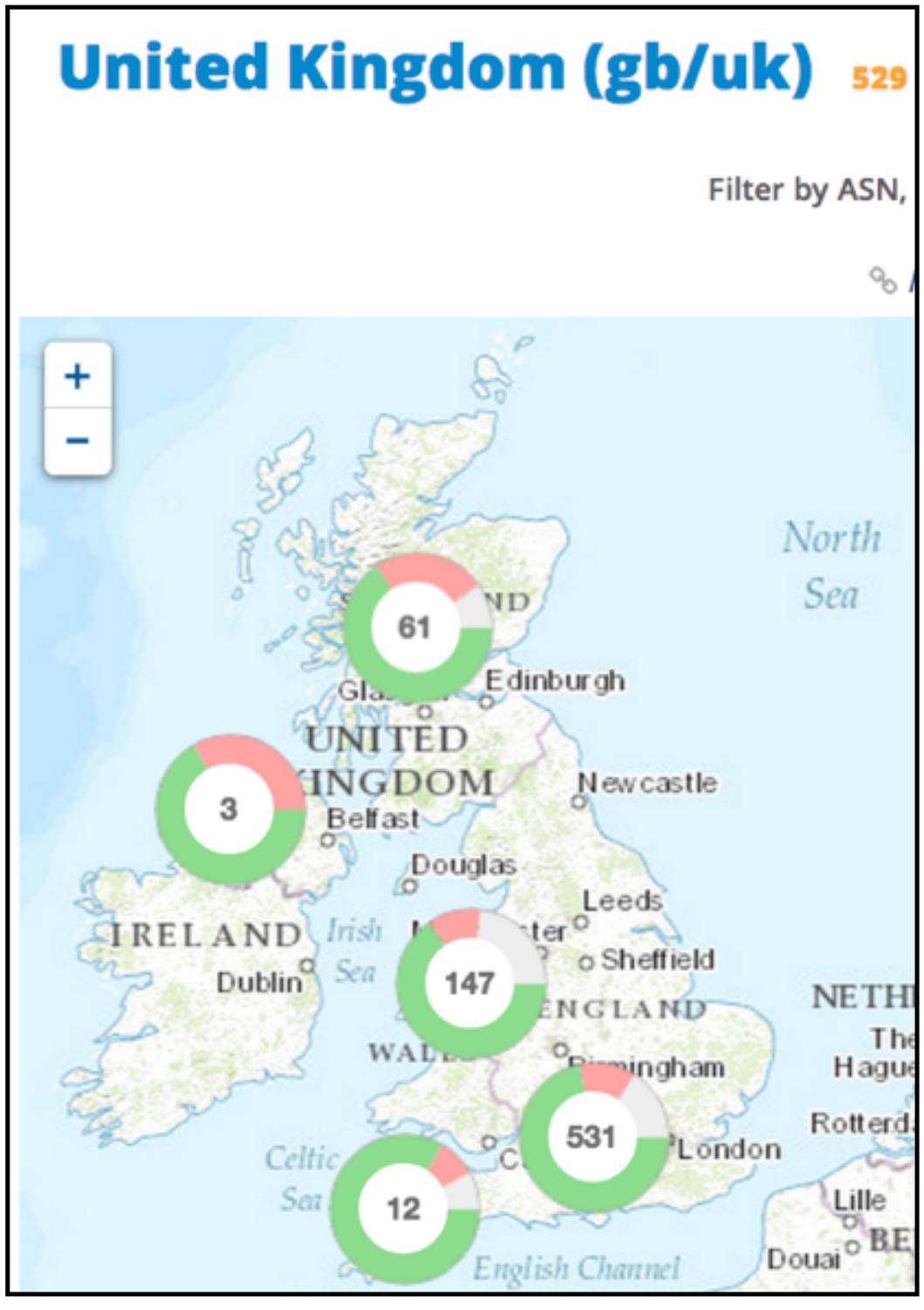
Internet Traffic Maps



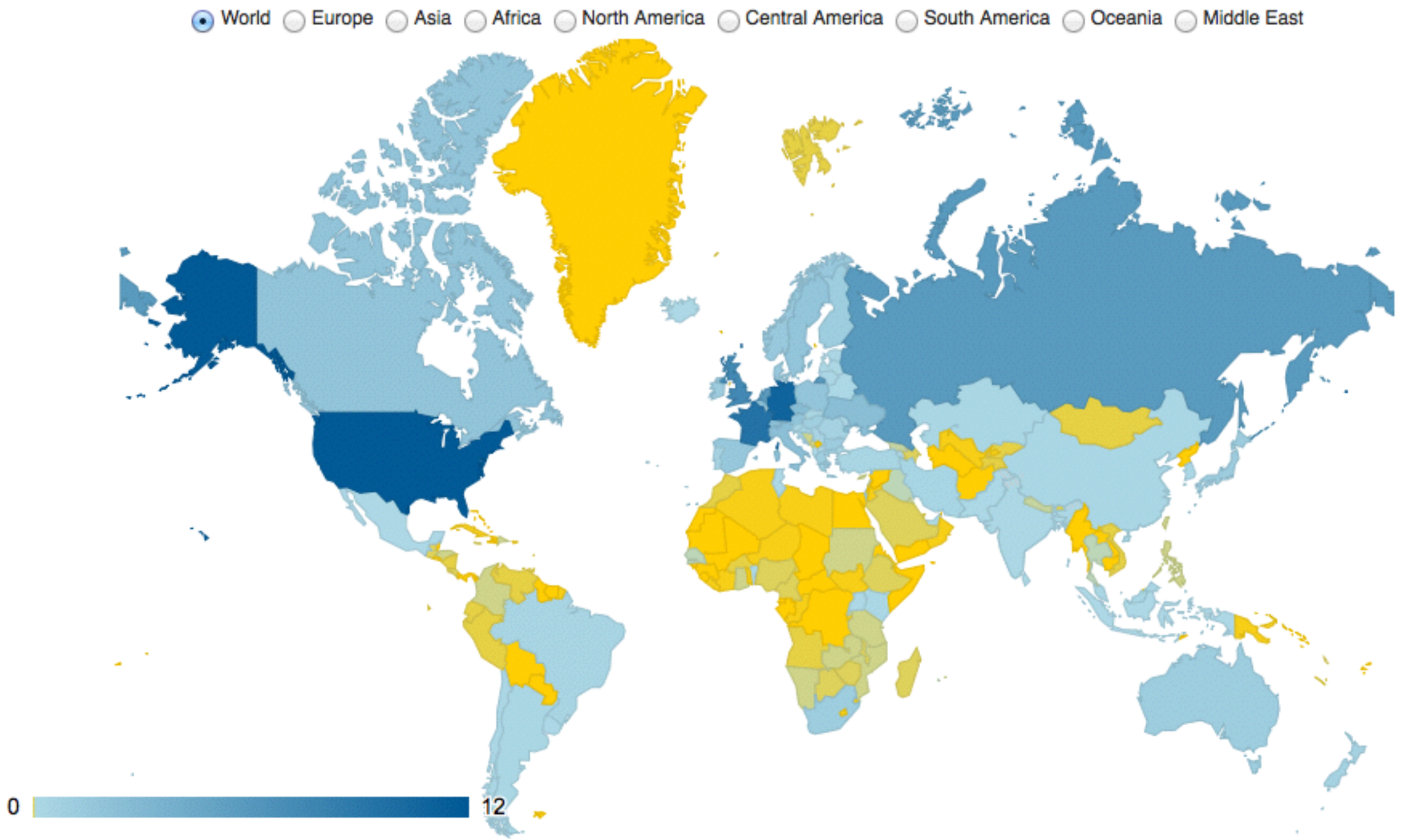
Where is B-root?



Probes per country or ASN



Where we Want to Place RIPE Atlas Probes



Articles, Papers, Use Cases, Experiences

0 comments

RIPE Atlas: Measurements With Tagged Probes Coming Soon

Suzanne Taylor Muzzin — Sep 12, 2014 12:05 PM

We've been busy working on a number of developments, and we're really excited about one in particular that will be ready soon: creating customised measurements using tagged probes. Learn more about it - along with some other recent additions - and let us know what you think.

Tags: atlas, measurements, tools

» Read more

0 comments

Time Warner Cable Outage

Emile Aben — Aug 28, 2014 04:50 PM

The Time Warner Cable network suffered an outage on 27 August 2014 between approximately 9:40 and 10:55 UTC. We looked at some interesting details of this outage using RIS and RIPE Atlas.

Tags: atlas, routing

» Read more

0 comments

RIPE Atlas Midsummer Update 2014

Fatemah Mafi — Jul 24, 2014 05:30 PM

Since RIPE 68 in Warsaw, the RIPE NCC has developed and released new features for RIPE Atlas. We would like to inform the community of what we've been working on and how you can benefit from the RIPE Atlas service.

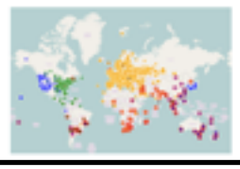
Tags: atlas, statistics

» Read more

0 comments

How RIPE Atlas Helped Wikipedia Users

Emile Aben — Jul 09, 2014 12:25 PM



Engineers from the Wikimedia Foundation and the RIPE NCC recently collaborated on a project to measure the latency of Wikimedia sites for users worldwide. Together, we identified ways to decrease latency and improve performance for users around the world.

ارسال پاسخ

جستجو در این مبحث...

جستجو

1 پست • صفحه 1 از 1

پروژه بین المللی سنجش اینترنت - رایپ اطلس

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

Khoramyar

پست ها : 122

تاریخ عضویت: شنبه فوریه 09, 2013 12:52 pm

times 52 :Has thanked

times 57 :Been thanked

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.

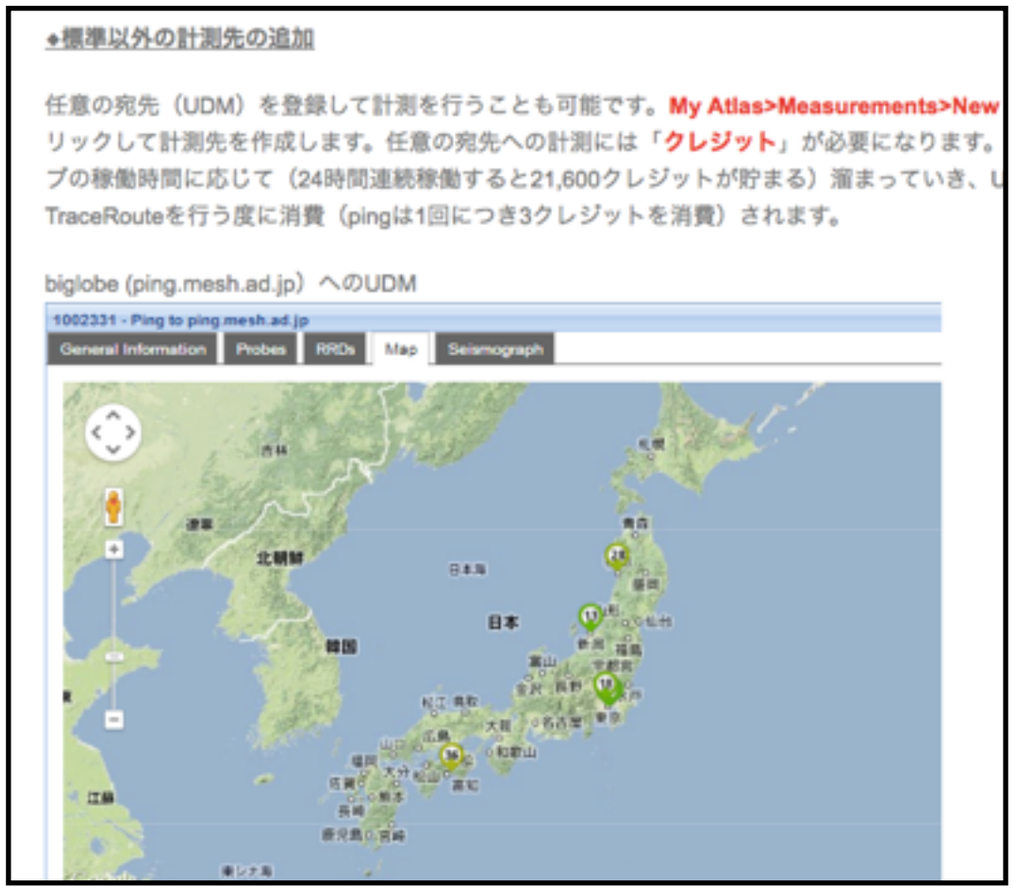
وب سایت رسمی پروژه اطلس: https://atlas.ripe.net/

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 Ping - Traceroute و چند سنجش دیگر مثل DNS و امثال آنها است.

عکس یک کاوشگر رایپ اطلس:



◆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。 プ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

Looking up Public RIPE Atlas Probes

RIPE NCC

Logging In

- Create an RIPE NCC Access account
  - The same account used to access the LIR Portal, RIPE Atlas, RIPEstat, RIPE Labs...
- Advanced
- ‘LIR contact’: additional benefits!
  - Membership benefits for RIPE Atlas
  - Share probe management with LIR colleagues
  - Historical RIPE Database view in RIPEstat
- Add yourself as ‘contact’ in LIR Portal

Searching for RIPE Atlas Probes

Filter based on ASN, Country, Location...

My Atlas / Probes

Possible to mark probes as favourites

RIPE Atlas Home • Results • My Atlas: BECHA (Xs4all) • Logout

Probes
Measurements
Credits
API Keys
Anchors
Sponsorships
Settings

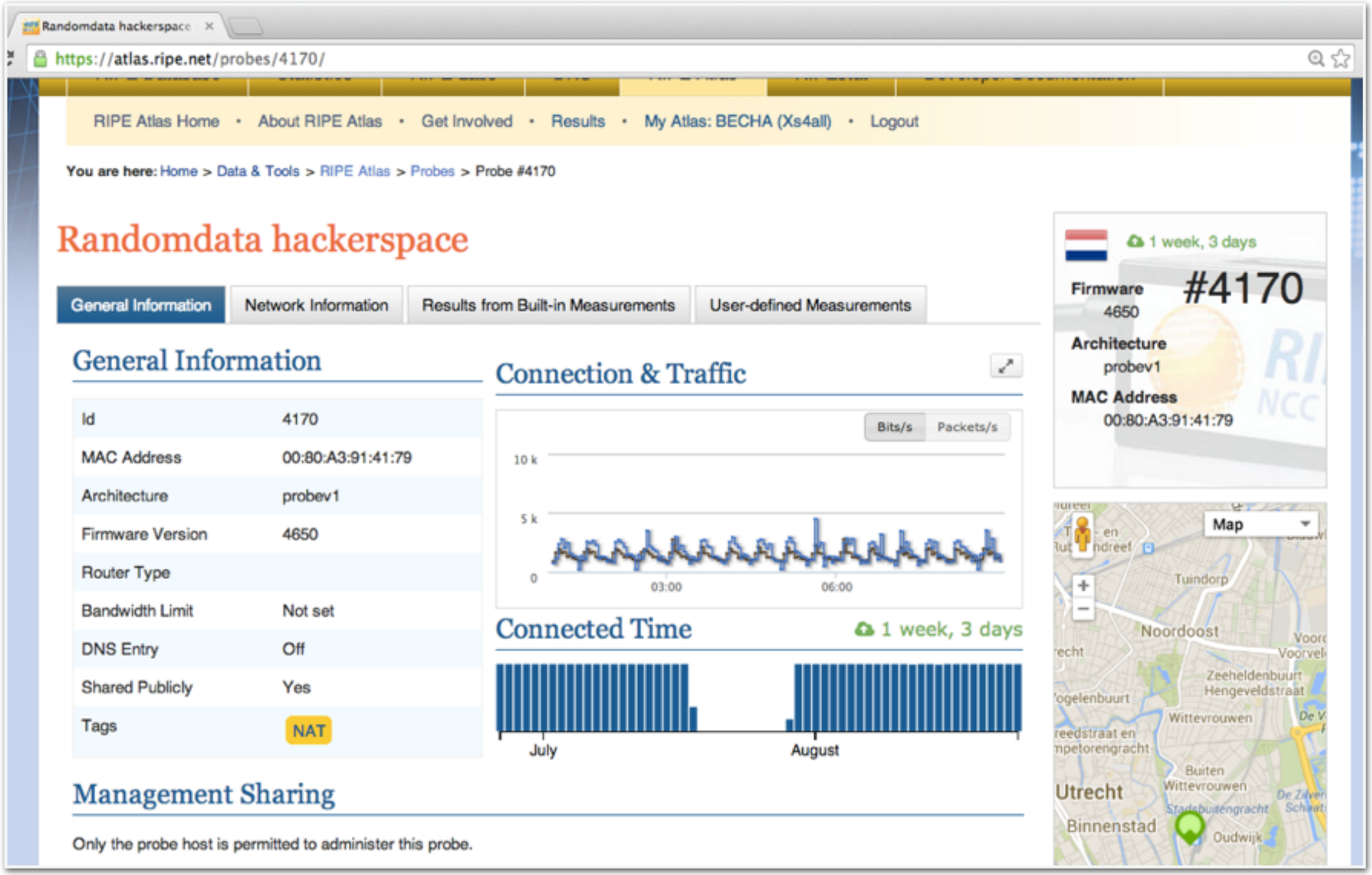
You are here: Home > Data & Tools > RIPE Atlas Probes

Filter by id/asn/location/country/description... | Connected

My Favourite Probes | My Sponsored Probes | Public Probes

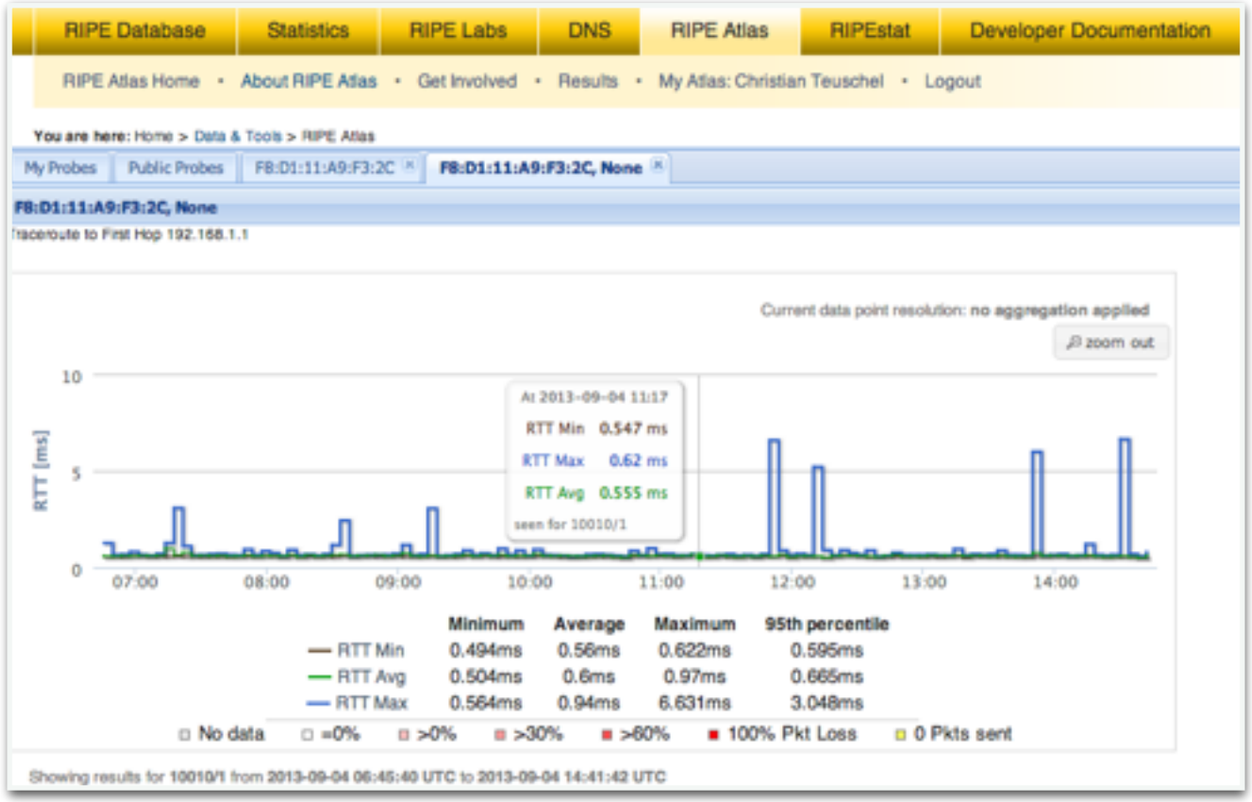
Id	ASN v4	ASN v6	Country	Description	Connection Status
20857	21775				4 days, 4 hours
20856	18[illegible]3			AirJaldi	3 days, 20 hours
20845	4766				5 days, 3 hours
2[illegible]				MG-Home	1 week
208[illegible]				Afilias YYZ1	1 week, 5 days
20825	4739	4739			2 weeks, 5 days
20488	5769	5769		Letiprobe	1 day, 20 hours
20444	5607			Cam	1 day, 11 hours

RIPE Atlas Probe Page - Live Demo



Zoomable Ping Graph

- Replace multiple RRD graphs: zoom in/out in time, in the same graph
- Easier visualisation of an event's details
- Selection of RTT class (max, min, average)

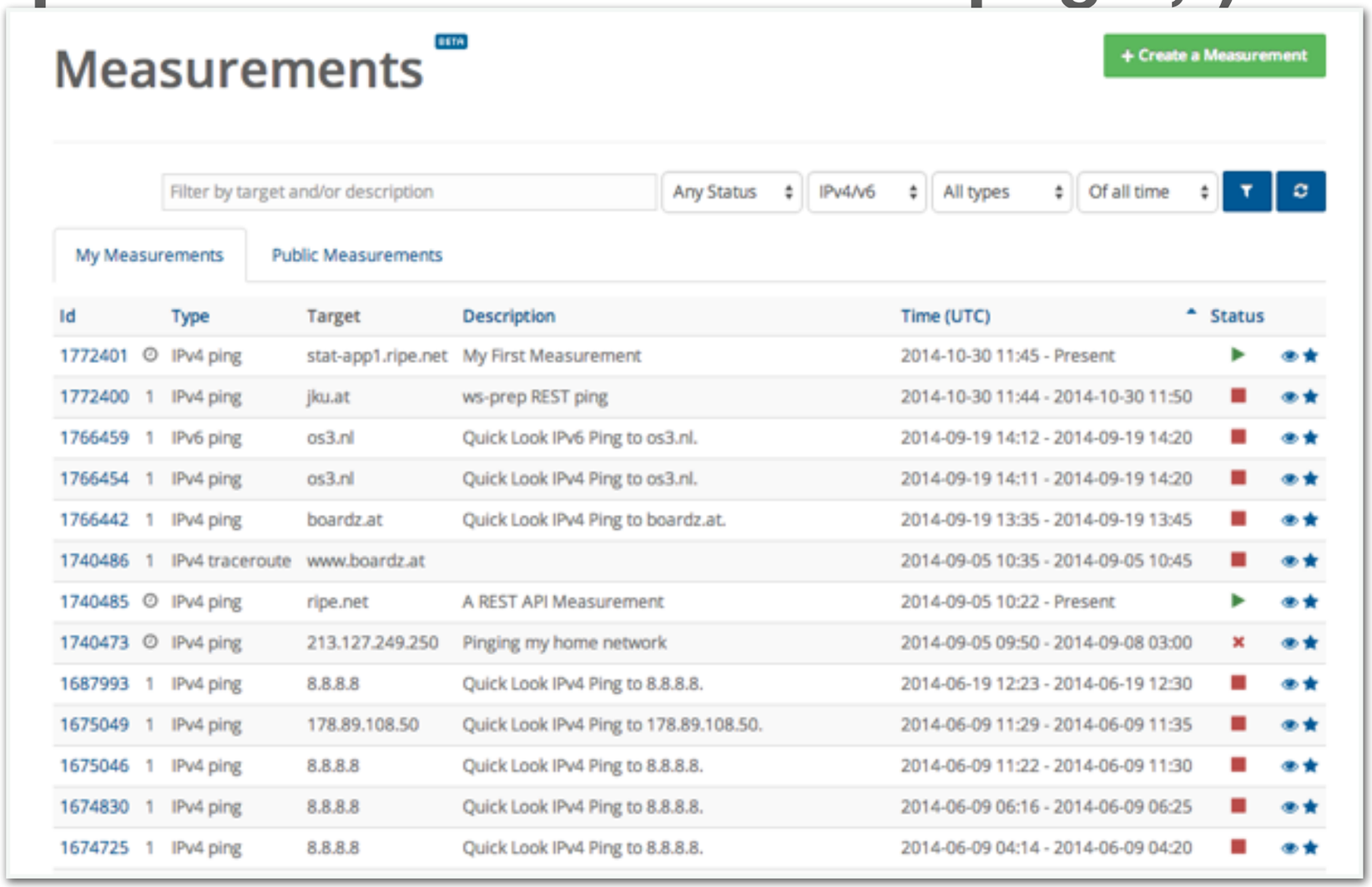


Finding Results of Public Measurements

RIPE NCC

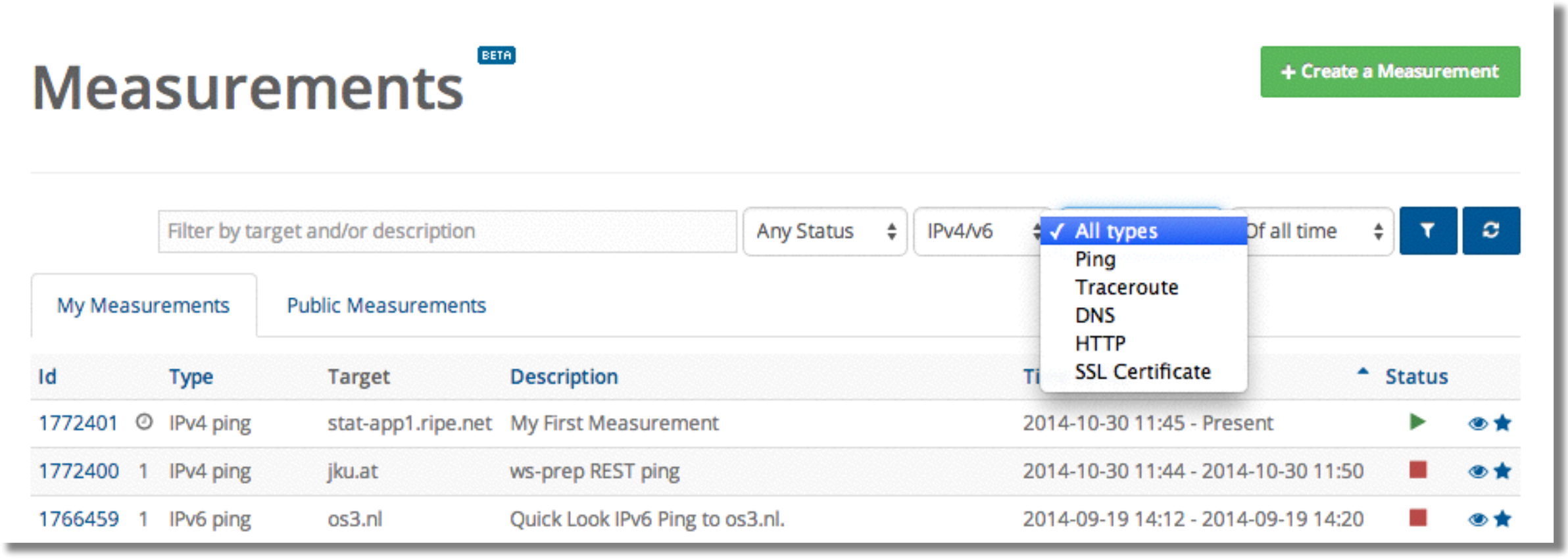
Looking up Measurement Results

- Log in to atlas.ripe.net
- Go to “My Atlas” > “Measurements”
- Tip: fast-forward to the last page ;-)



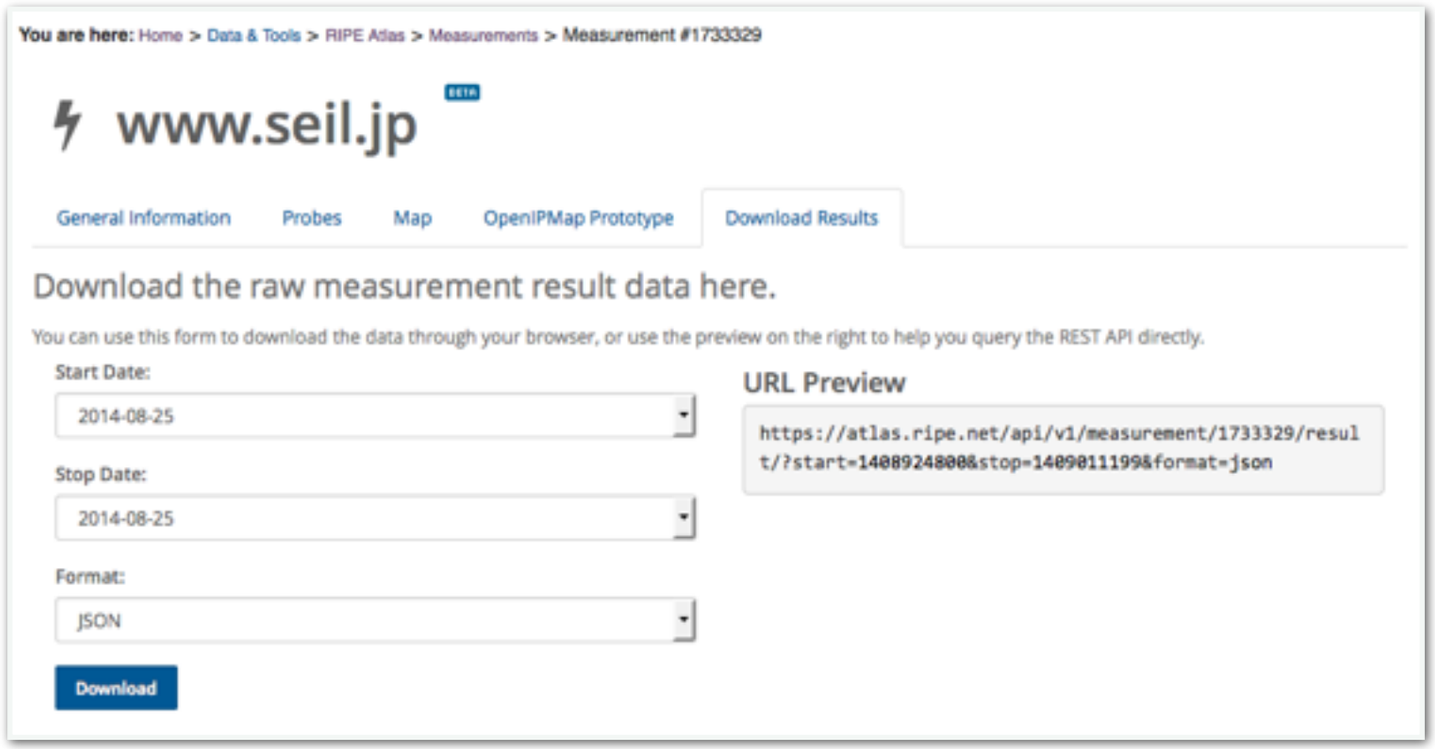
Id		Type	Target	Description	Time (UTC)	Status
1772401	⊙	IPv4 ping	stat-app1.ripe.net	My First Measurement	2014-10-30 11:45 - Present	▶
1772400	1	IPv4 ping	jku.at	ws-prep REST ping	2014-10-30 11:44 - 2014-10-30 11:50	■
1766459	1	IPv6 ping	os3.nl	Quick Look IPv6 Ping to os3.nl.	2014-09-19 14:12 - 2014-09-19 14:20	■
1766454	1	IPv4 ping	os3.nl	Quick Look IPv4 Ping to os3.nl.	2014-09-19 14:11 - 2014-09-19 14:20	■
1766442	1	IPv4 ping	boardz.at	Quick Look IPv4 Ping to boardz.at.	2014-09-19 13:35 - 2014-09-19 13:45	■
1740486	1	IPv4 traceroute	www.boardz.at		2014-09-05 10:35 - 2014-09-05 10:45	■
1740485	⊙	IPv4 ping	ripe.net	A REST API Measurement	2014-09-05 10:22 - Present	▶
1740473	⊙	IPv4 ping	213.127.249.250	Pinging my home network	2014-09-05 09:50 - 2014-09-08 03:00	✖
1687993	1	IPv4 ping	8.8.8.8	Quick Look IPv4 Ping to 8.8.8.8.	2014-06-19 12:23 - 2014-06-19 12:30	■
1675049	1	IPv4 ping	178.89.108.50	Quick Look IPv4 Ping to 178.89.108.50.	2014-06-09 11:29 - 2014-06-09 11:35	■
1675046	1	IPv4 ping	8.8.8.8	Quick Look IPv4 Ping to 8.8.8.8.	2014-06-09 11:22 - 2014-06-09 11:30	■
1674830	1	IPv4 ping	8.8.8.8	Quick Look IPv4 Ping to 8.8.8.8.	2014-06-09 06:16 - 2014-06-09 06:25	■
1674725	1	IPv4 ping	8.8.8.8	Quick Look IPv4 Ping to 8.8.8.8.	2014-06-09 04:14 - 2014-06-09 04:20	■

Searching for Measurements by Type



Downloading Measurement Results

- Click on measurement, then “Download”
  - Or go to URL
  - Or use the API

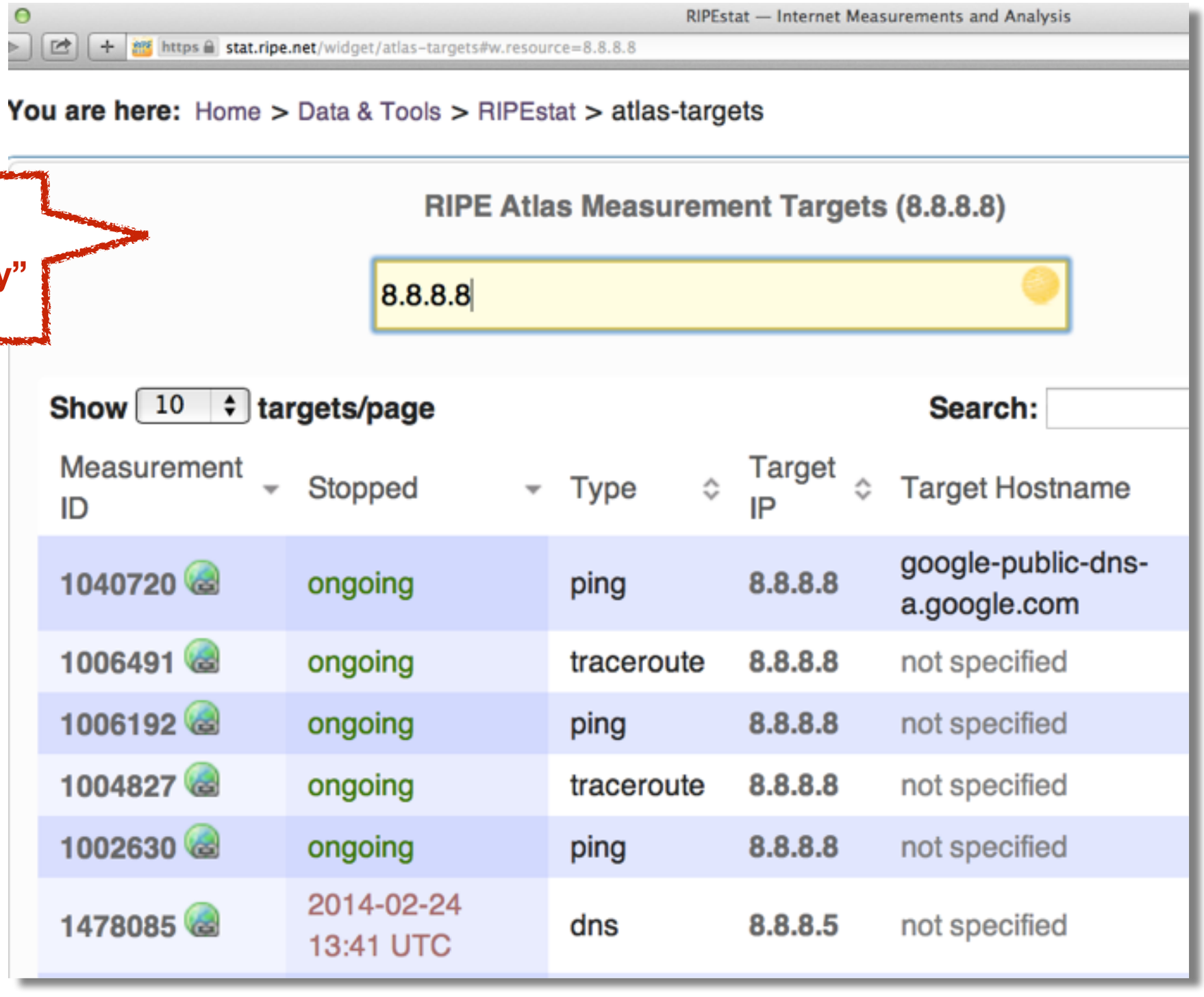


- Results in JSON
  - Libraries for parsing available on GitHub

- https://github.com/RIPE-NCC/ripe.atlas.sagan
- https://github.com/RIPE-Atlas-Community/

Search Measurements by Target in RIPEstat

Go to “RIPEstat > “RIPE Atlas Activity”



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

Exercise: Find Measurements Results

RIPE NCC

Task: Search for Measurement ID #1733329

www.seil.jp

General Information | Probes | Map | OpenIPMap Prototype | Download Results

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

General Information | Probes | Map | OpenIPMap Prototype | Download Results

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.

OpenIPMap | Add msm_id | Add msm | Msms | User: BECHA (Xs4all) | Help

1733329 **www.seil.jp** 30prbs 2014-08-25T07:30:00.000Z-2014-08-25T0

Creating a Measurement

RIPE NCC

Scheduling a Measurement

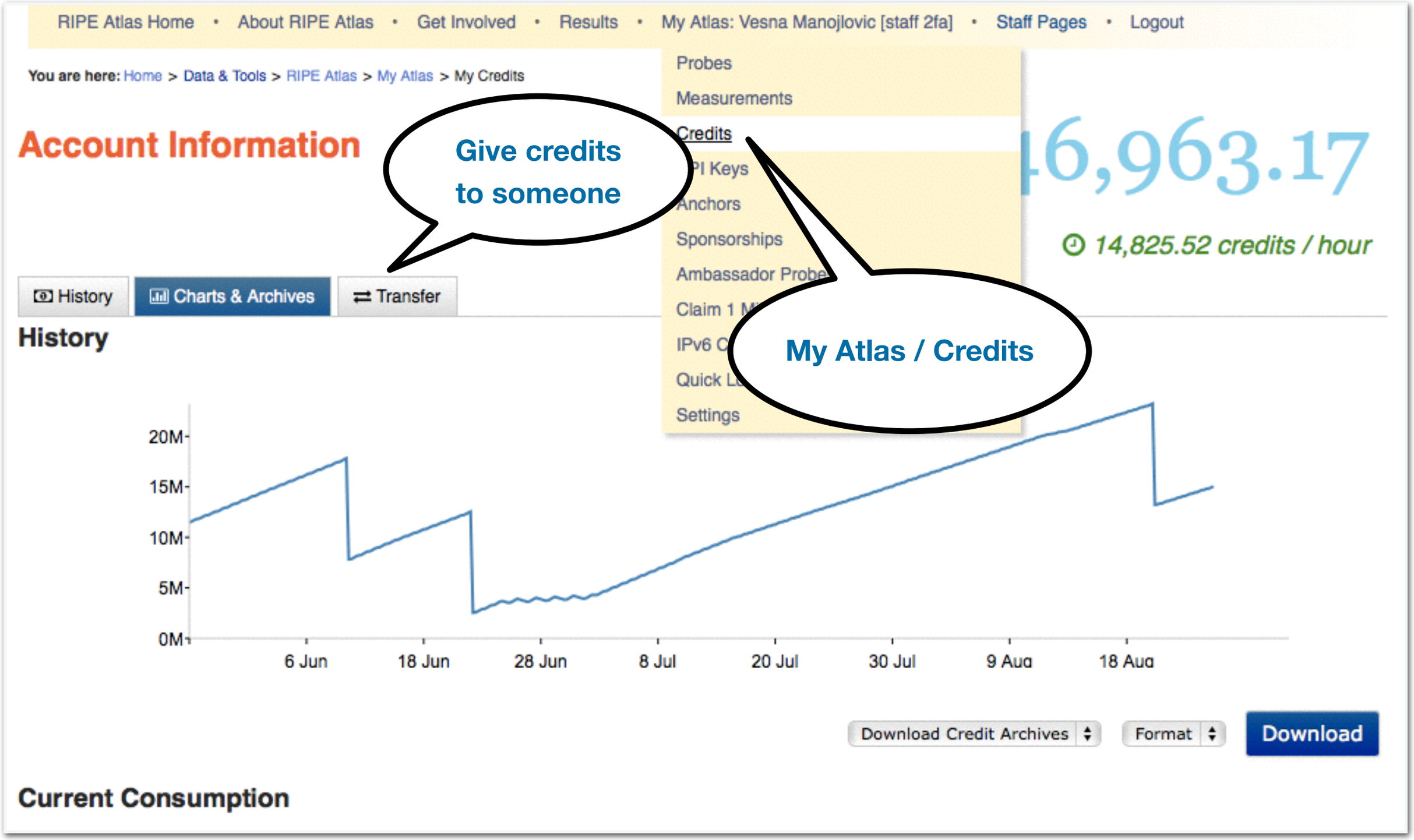
- Log in to atlas.ripe.net
- “My Atlas” > “Measurements”
- “New Measurement” or “One-off”
  - Most are periodic and last a long time
  - Choose type, target, frequency, # of probes, region...
  - You will spend credits
- https://atlas.ripe.net/doc/udm
- Or use the API:
  - https://atlas.ripe.net/docs/measurement-creation-api/

Credit System

- Measurements cost credits
  - ping = 10 credits, traceroute = 20, etc.
- Why? Fairness and to avoid overload
- Hosting a RIPE Atlas probe earns credits
- Earn extra credits by:
  - Being a member
  - Hosting an anchor
  - Sponsoring probes

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

Credits Overview



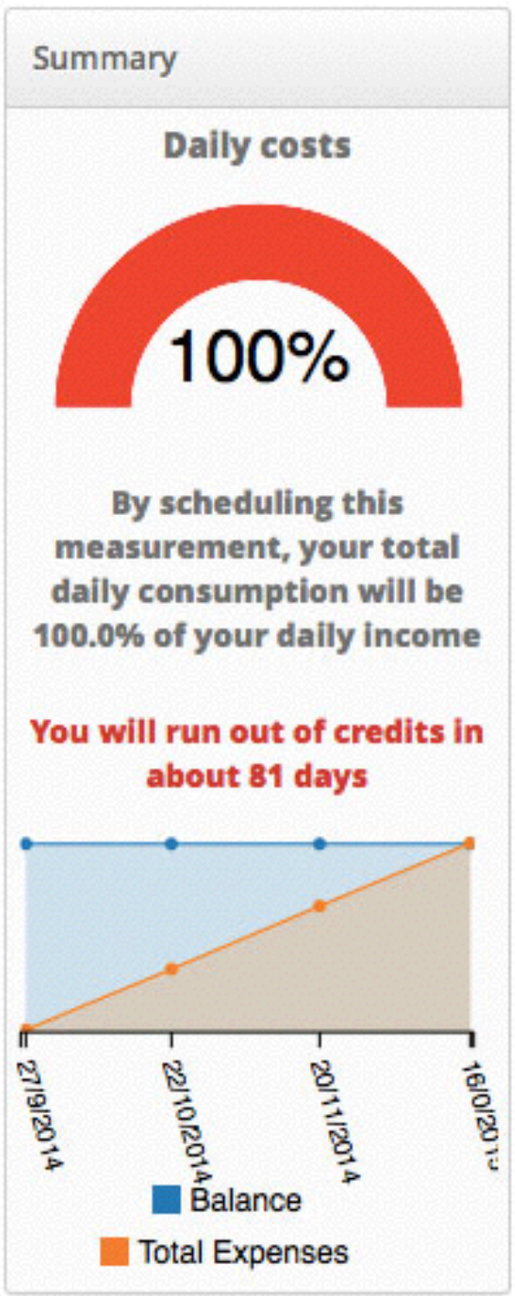
Exercise: Create a Measurement

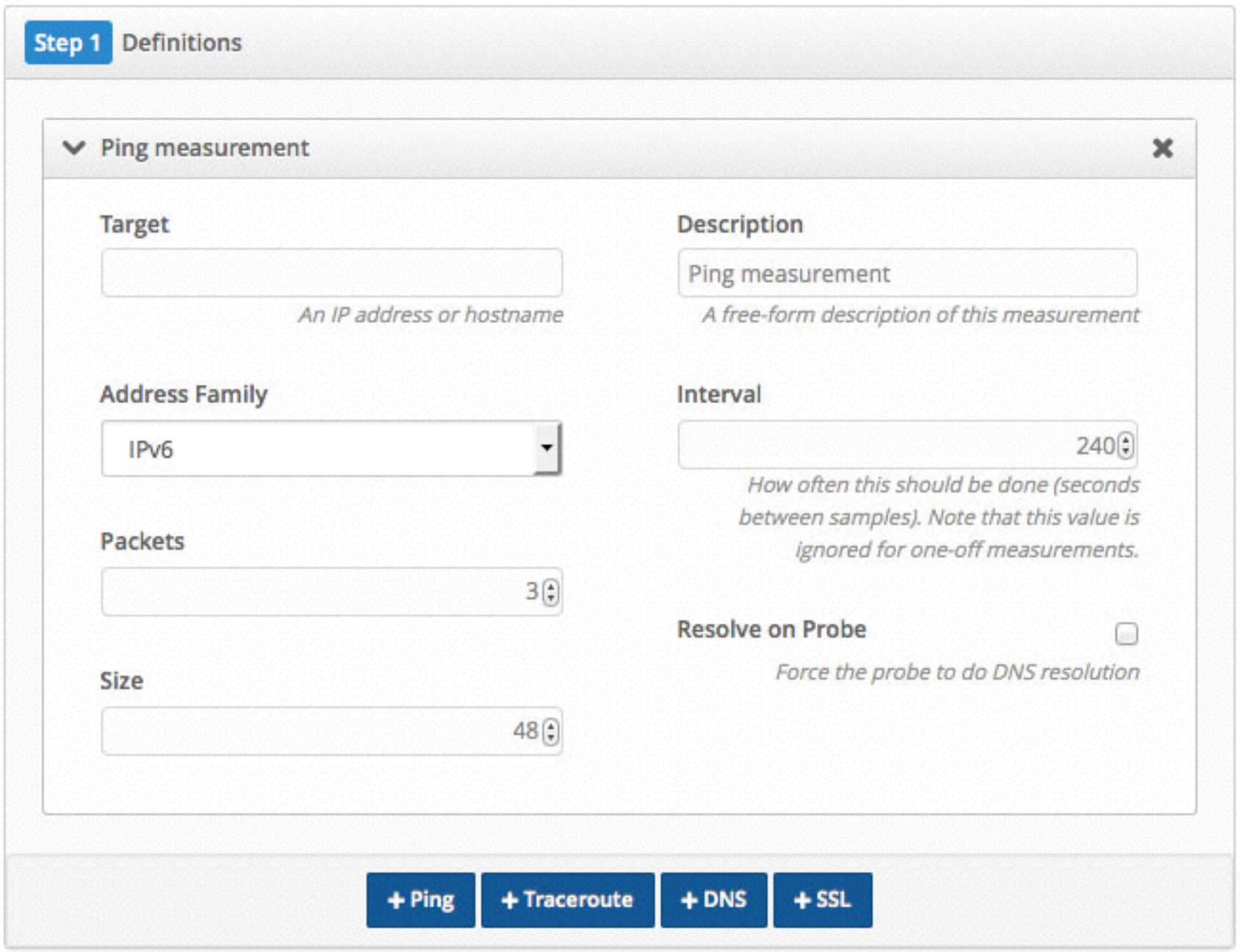
RIPE NCC

Tasks

- Create a measurement
  - ping
  - involving ten probes
  - to a target of your choice
  - Source: your country
  - Duration: two days
- Use the RIPE Atlas GUI

Create a New Measurement BETA





- https://labs.ripe.net/Members/suzanne_taylor_muzzin/ripe-atlas-new-measurements-ui-and-tagging

Contact Us: RIPEstat

- https://stat.ripe.net
- Articles and updates on RIPE Labs:

  https://labs.ripe.net/ripestat
- Questions and bugs: stat@ripe.net
- Twitter: #RIPEstat
- Tutorial:
  - http://www.ripe.net/lir-services/training/courses/tailor-made-workshops/#tools

Contact Us: RIPE Atlas

- https://atlas.ripe.net
- Users' mailing list: ripe-atlas@ripe.net
- Articles and updates on RIPE Labs:

  https://labs.ripe.net/atlas
- Questions and bugs: atlas@ripe.net
- Twitter: @RIPE_Atlas and #RIPEAtlas
- Workshop on Thursday at RIPE 69
- https://ripe69.ripe.net/programme/meeting-plan/workshops/

Questions?

More RIPE Atlas Features

RIPE NCC

“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 Creation and Sharing of Measurements

- 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

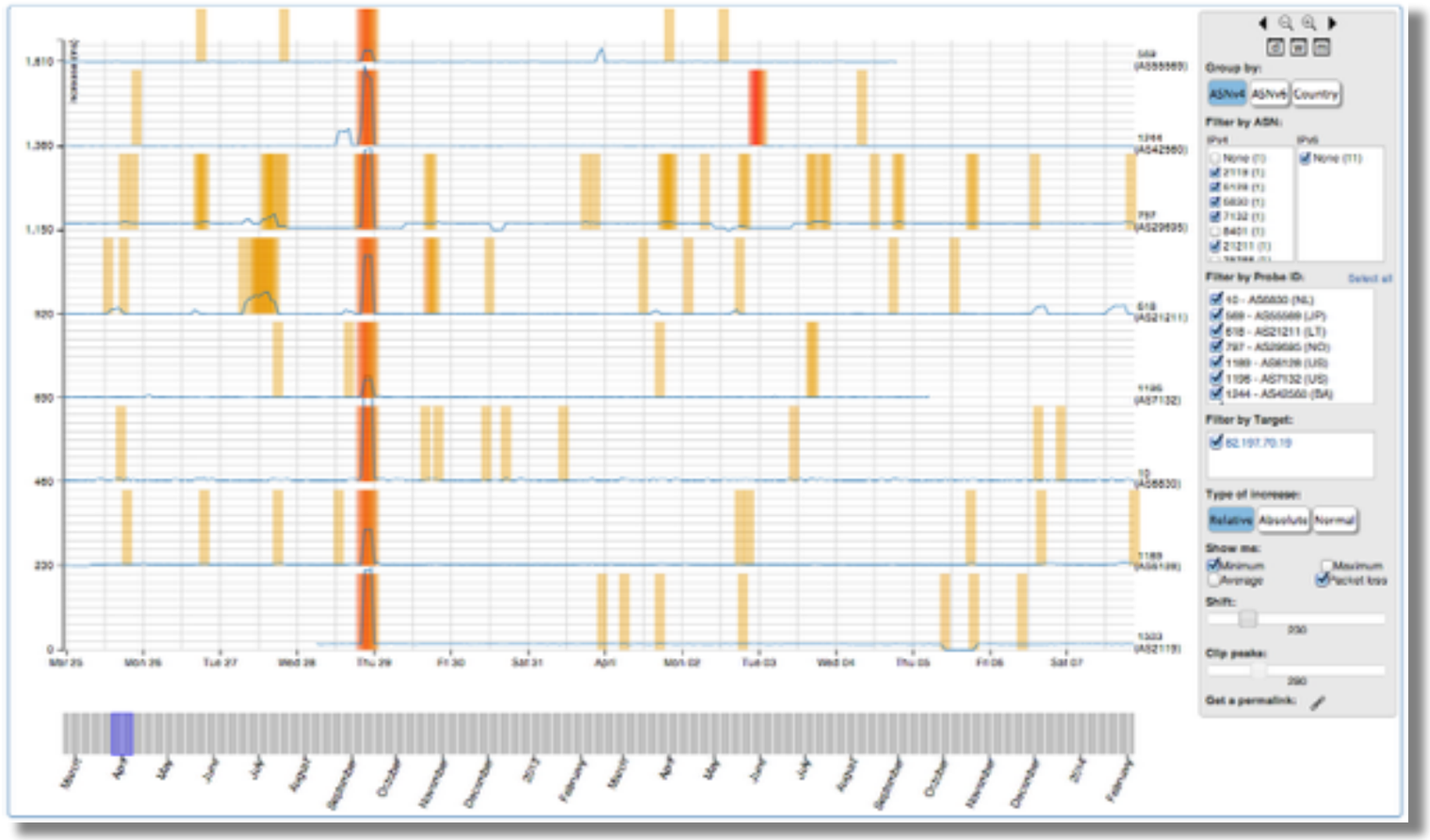
- Probes:
  - Hardware trust material (regular server address, keys)
  - No open ports; initiate connection; NAT is okay
  - Don’t listen to local traffic
  - No passive measurements
- Measurements triggered by “command servers”
  - Inverse ssh tunnels
- Source code published
- Reported vulnerabilities:
  - https://atlas.ripe.net/docs/security/

RIPE Atlas Anchors Mesh Visualisation

- Multiple ping measurements in one view
- Stacked chart and interactive control panel

- Go to Results > Anchors > choose one from the list > ping

https://labs.ripe.net/Members/massimo_candela/seismograph-user-guide



Additional Membership Benefits

- RIPE Atlas:
  - Members are guaranteed one probe each
  - Do NOT have to host a probe in order to perform customised measurements
  - 1,000,000 extra credits monthly via LIR Portal
  - “Quick Look” measurements via LIR Portal
  - IPv6 reachability testing (free - no credits needed)
  - Sharing probe management with LIR colleagues
- RIPEstat:
  - Historical view of RIPE Database objects