



RIPE NCC
RIPE NETWORK COORDINATION CENTRE

RIPE NCC Update

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RIPE NCC

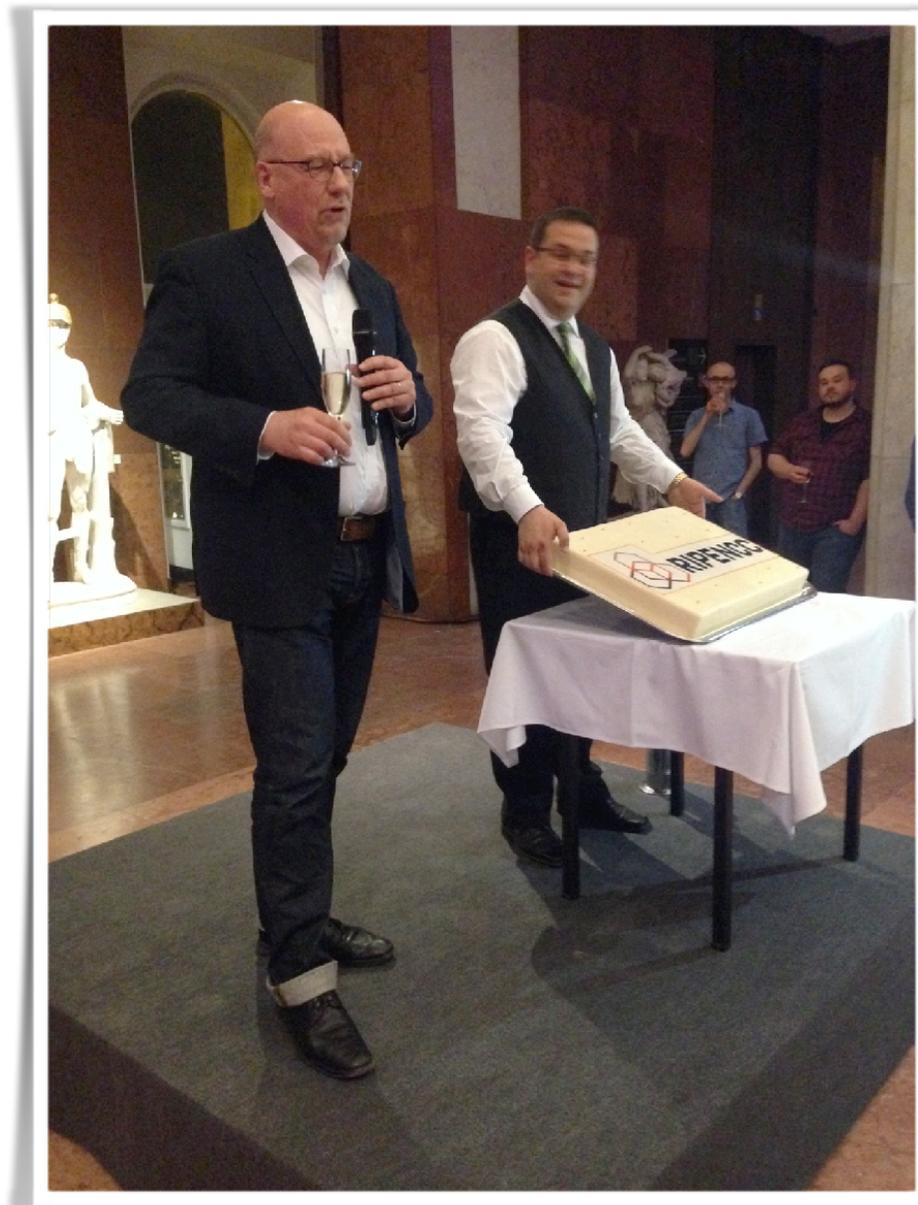
TREX 2017

25 Years of the RIPE NCC



- Established in April 1992
- RIPE NCC has grown to become a diverse organisation with almost 16,000 members
- The Internet has grown and interwoven with business and society in ways few could have predicted
- We are still evolving to meet new challenges and best serve our membership
- Thank you all for joining us on our incredible journey

25 Years of the RIPE NCC

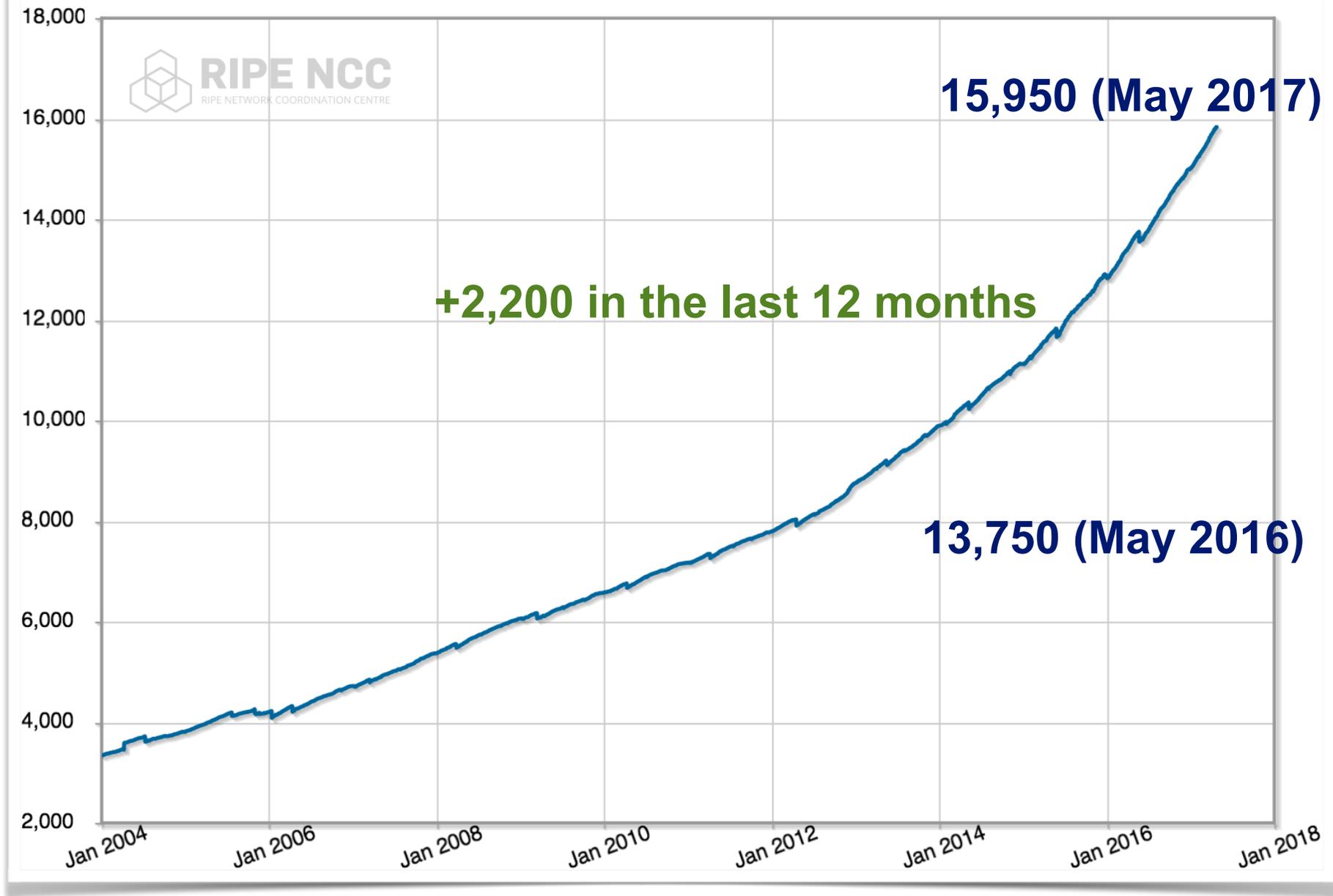




From the Annual Report 2016

- **Main Operational Highlights (end of 2016):**
 - 2,178 additional members in 2016
 - 3,291 /22 IPv4 allocations and 1,878 IPv6 allocations
 - Almost 3,000 RIPE NCC-organised event attendees
 - Over 100 training courses for almost 2,000 participants
 - More than 2,500 ARCs completed in 2016
 - Over 9,700 active RIPE Atlas probes 250+ anchors
 - 1.3 million RIPEstat requests per hour
 - Annual Report: <https://www.ripe.net/publications/docs/ripe-683>

Membership Growth





Membership Diversity is Growing

- Many new members from other sectors
 - Do not have an Internet background
 - Internet is an important part of their business case
 - Partially driven by IPv4 address shortage?
- Traditional ISP market consolidated
 - Few large players have majority of market share
- Different members have different needs
 - We always appreciate your feedback



Our Focus in 2017

- A strong, secure and accurate Registry
- Enhancing RIR stability through good governance and accountability
- Pursuing efficiency through streamlined internal processes and automation
- Engaging with members, the RIPE community, governments and regulators

Registration and Customer Services



- IPv6 Milestone
 - Very first subsequent IPv6 allocation issued
- Assisted Registry Check (ARC)
 - Targeting “less active” members
 - Has produced a high result in updated information
- Resource Transfers
 - Continues to constitute a high demand on resources
 - Complex tickets with increased levels of scrutiny

Registration and Customer Services



- Hijacks and Investigations
 - Due diligence checks have prevented several high volume unauthorised transfers
 - Following an EB decision, the RIPE NCC actively reports all cases of confirmed fraud to the police
- Continuously focusing on efficiency by improving self-service processes
 - However, a level of human interaction remains crucial
- Maintaining focus on accuracy of the Registry



Tools For You

Visualising Operational Reality



RIPE Atlas - Current Numbers

- Number of connected probes: ~9,750
 - Was ~9,350 during RIPE 73
 - Recovered from the previous slow-down/dip
- Covered ASes: ~3,400 (IPv4), ~1,250 (IPv6)
- Collecting ~4,500 results/sec (~390M/day)

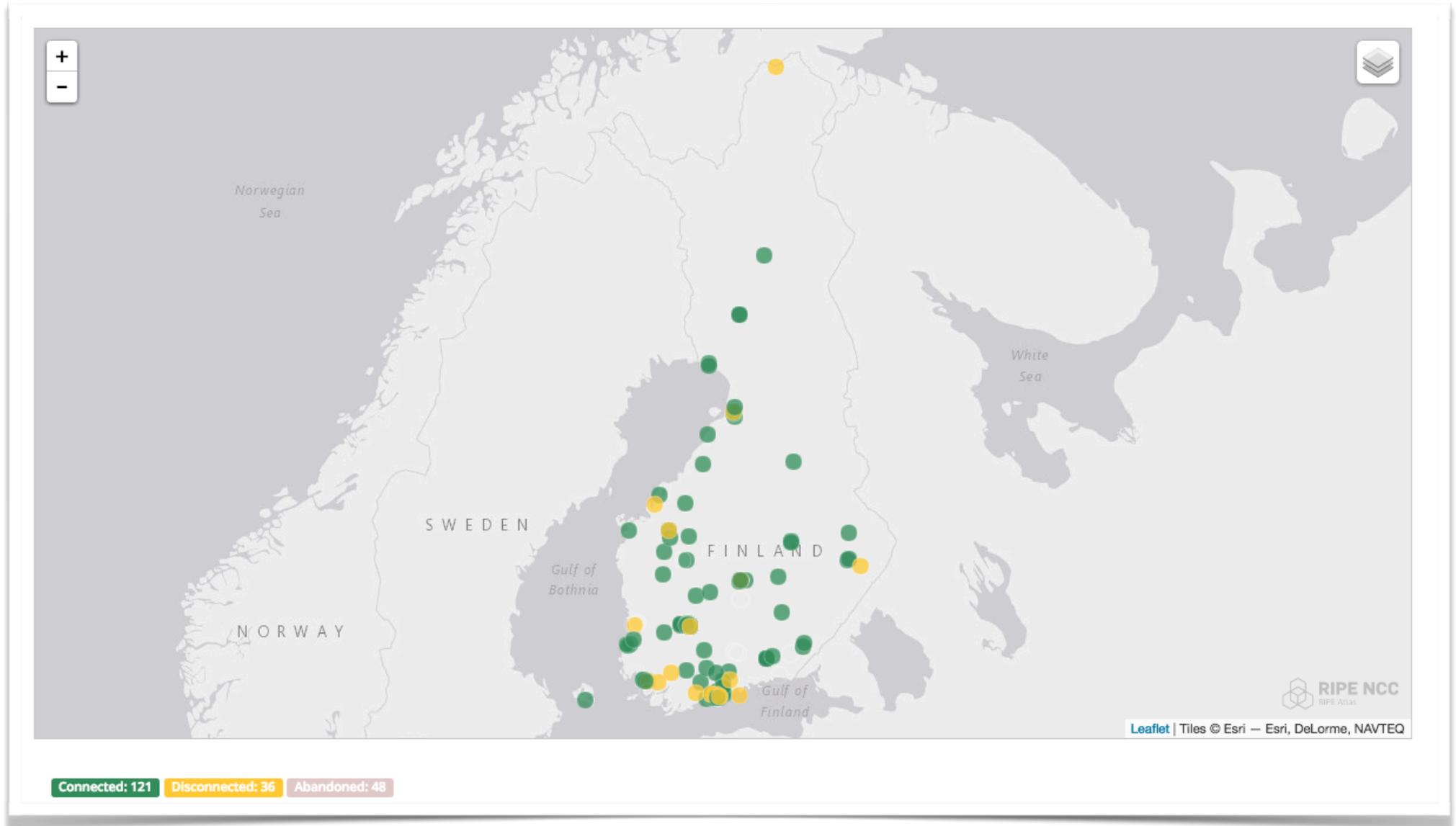




Some More Current Numbers

- 384 RIPE Atlas ambassadors
 - Including RIPE NCC staff acting as ambassadors
- 1,940 Twitter followers (@RIPE_Atlas)
- 33,000+ users total, 6,400+ active last quarter
- 1,000+ mailing list subscribers
- 2 RIPE Atlas sponsors in 2017 (+3 pending)
 - Let us know if you feel like sponsoring!

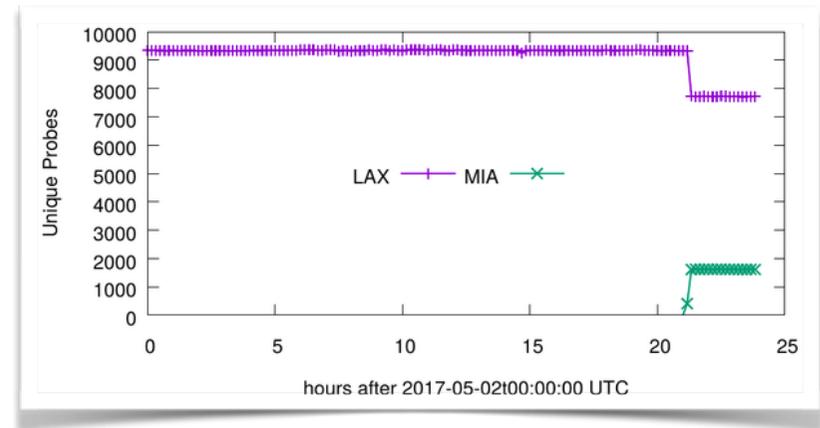
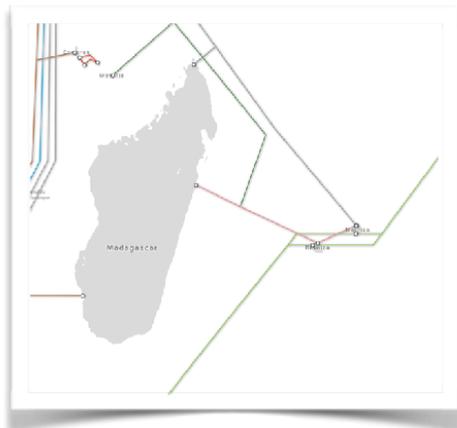
RIPE Atlas in Finland





Recent Use Cases

- Turning on Anycast on B-Root
 - https://labs.ripe.net/Members/giovane_moura/anycast-on-b-root-and-ripe-atlas-view
- Using RIPE Atlas to Measure Latency to Reunion Island
 - https://labs.ripe.net/Members/rehan_noordally/using-ripe-atlas-to-measure-latency-to-reunion-island
- Using RIPE Atlas to Validate International Routing Detours
 - https://labs.ripe.net/Members/anant_shah/using-ripe-atlas-to-validate-international-routing-detours





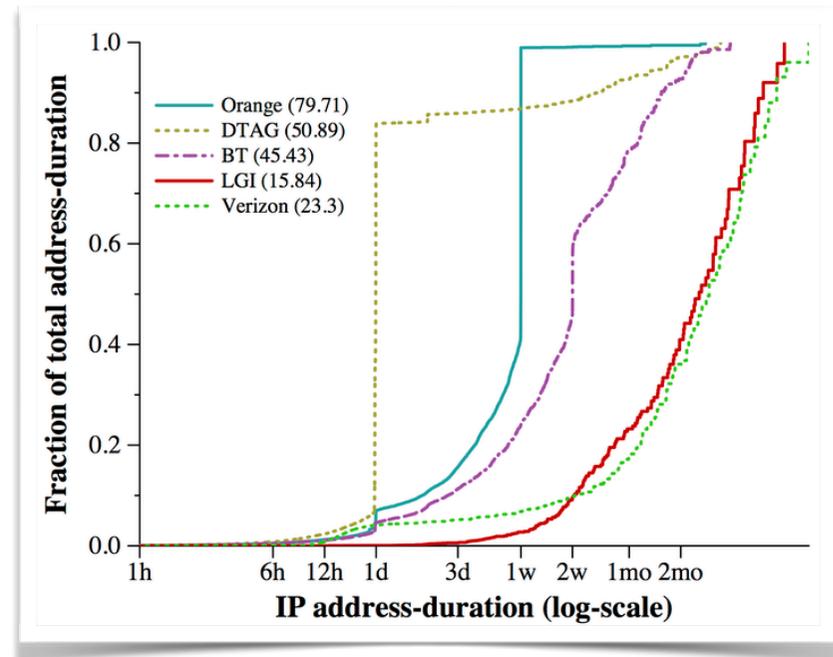
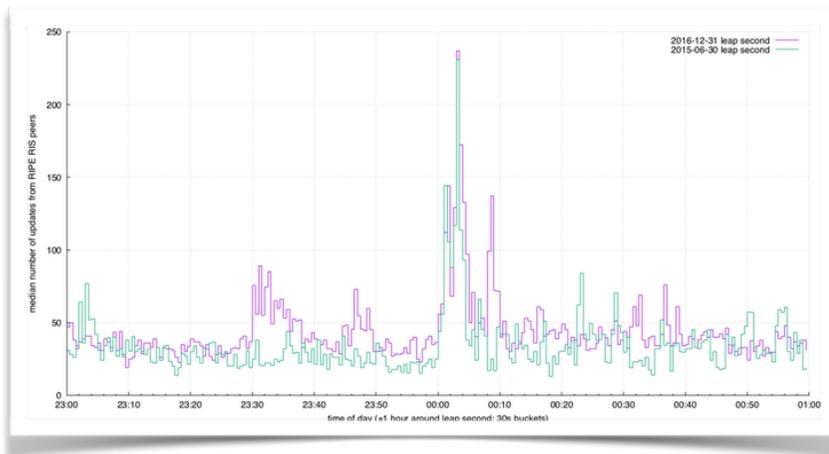
Recent Use Cases

- Reviewing the 2016 Leap Second

- https://labs.ripe.net/Members/stephen_strowes/reviewing-the-2016-leap-second

- Reasons Dynamic Addresses Change

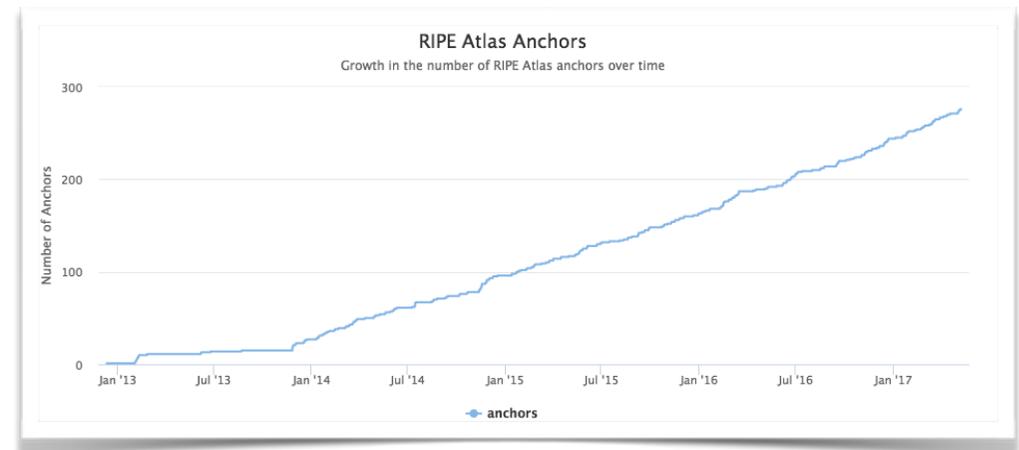
- https://labs.ripe.net/Members/ramakrishna_padmanabhan/reasons-dynamic-addresses-change





RIPE Atlas Anchors

- An anchor is a probe and a willing target
 - Automatically measured and generate more credits
- Number of anchors: 250+
- Thanks to APNIC, LACNIC, ISOC & AFRINIC who are sponsoring anchors in other regions
 - Let us know if you also want to sponsor these





RIPE Atlas Probes

- We're looking at candidates for “version 4” probes
 - Should be capable, stable, inexpensive and available
- Version 1 and 2 probes already lived beyond their foreseen life time
 - We still have ~600 + ~1,400 of these up and running
 - Version 1 probes approached their technical limits
 - We froze their firmware as per end May 2017 but otherwise continue supporting them for as long as possible (e.g. still do security updates if needed)



Going Virtual (?)

- We're evaluating the potential for virtual probes
 - Probes where the physical device is replaced by a Virtual Machine provided by the host
 - Could reach places that physical probes can't
 - The costs: higher risks and changes in operations, “noisy neighbours”, avoiding “fast flux” deployments, etc.
- Perhaps even virtual anchors, as a next step



In Other News

- New “probe stability” system tags
- New DNS root zone measurements
- May be coming: “Cloud Reachability”
 - Reachability measurements against servers “in the cloud”
- Held a DNS measurements hackathon in April 2017
 - https://labs.ripe.net/Members/alun_davies/dns-measurements-hackathon-2017

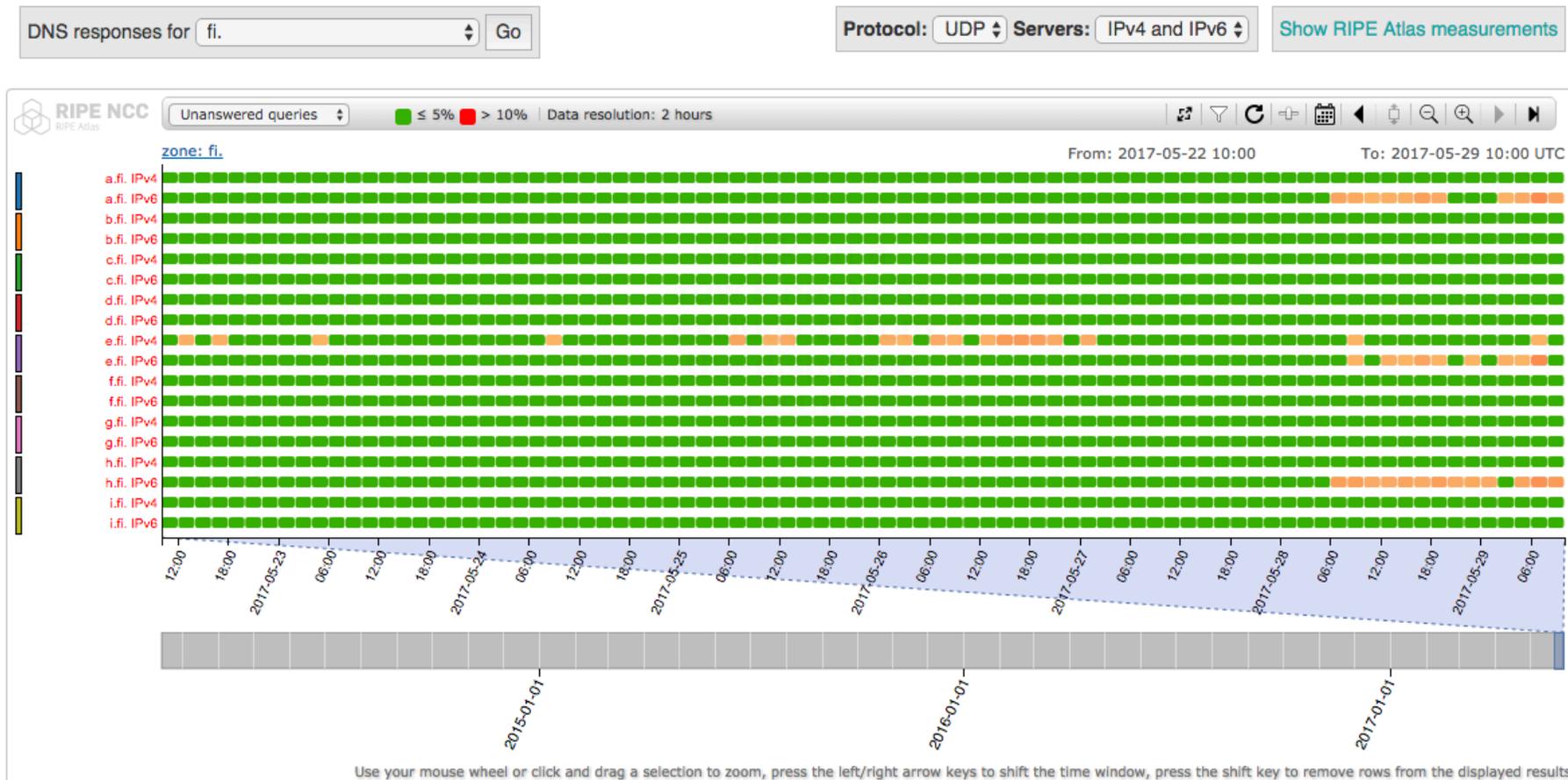


DNS Root Zone Monitor (DNSMON)



- Based on RIPE Atlas measurements

DNSMON





DomainMON: Measure Your Own

- Based on the same tools as DNSMON
- Test your own domains using RIPE Atlas
 - Specify your own set of nameservers
 - Configure and select a set of probes
 - RIPE Atlas credits deducted based on number of probes

RIPE Atlas LatencyMON



- Easy tool to combine and show latency trends
 - Select an arbitrary set of probes and measurements
 - Compare results even to different targets
 - Zoom and select on specific time periods
 - Streaming updates the charts in real time
- Multiple display options
 - Show absolute values or relative to each other
 - High, low and average or just the average

LatencyMON: Select Probes



General Information Probes Map **LatencyMON** Results

General Information

ID #1402318

Group ID #1402318

Select the probes you want to add to the group. NOTE: you can use only probes not participating in other charts

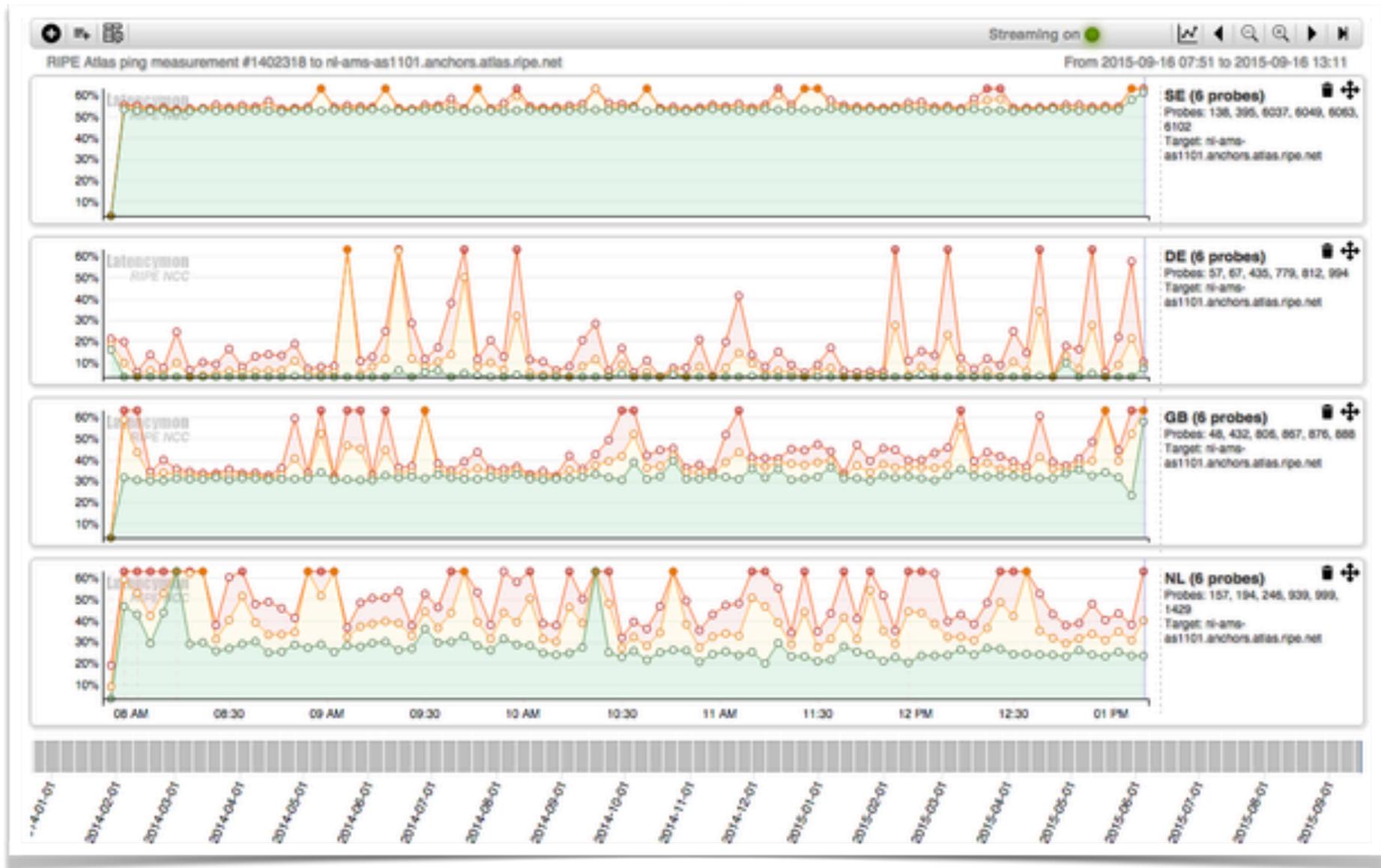
Search

<input type="checkbox"/>	Probe ID	Country	ASv4	ASv6	IPv4	IPv6	Measurement ID
<input type="checkbox"/>	57	DE	20621	20621	217.69.64.206	2001:aa8:ffe:3:220:4aff:fec8:2098	1402318
<input type="checkbox"/>	67	DE	31334	31334	95.90.204.77	2a02:8108:9e40:a0:220:4aff:fec8:249e	1402318
<input type="checkbox"/>	157	NL	3265	3265	82.95.106.192	2001:981:5e40:1:220:4aff:fec8:20b9	1402318
<input type="checkbox"/>	194	NL	39309	39309	88.159.164.218	2a01:670:6aa4:da00:220:4aff:fec8:2099	1402318
<input type="checkbox"/>	226	AU	4739	4739	203.16.208.142	2001:44b8:1121:1a00:220:4aff:fec8:245d	1402318
<input type="checkbox"/>	239	SN	8346	8346	196.1.95.16	2001:4278:1000:1::16	1402318
<input type="checkbox"/>	246	NL	6830	-	77.251.180.141	-	1402318
<input type="checkbox"/>	333	JP	17676	17676	126.72.61.194	2400:2410:20c0:4400:220:4aff:fec8:242e	1402318

Showing 1 to 8 of 426 rows

Group name:

LatencyMON: Example



LatencyMON: Example





The Next Step: TraceMON

- We have a huge collection of traceroutes
 - And of course you can create your own set
 - We also have access to similar third party data
- Visualise network topology
 - From a wide collection of vantage points
 - Time based just as the other tools
- Add other related information to nodes
 - Recognise and indicate known IXPs
 - Include geolocation data



TraceMON: Example



TraceMON: Node Details



France-IX (AS57734)

IP: 37.49.236.2
Located in: Paris, FR [Update](#)

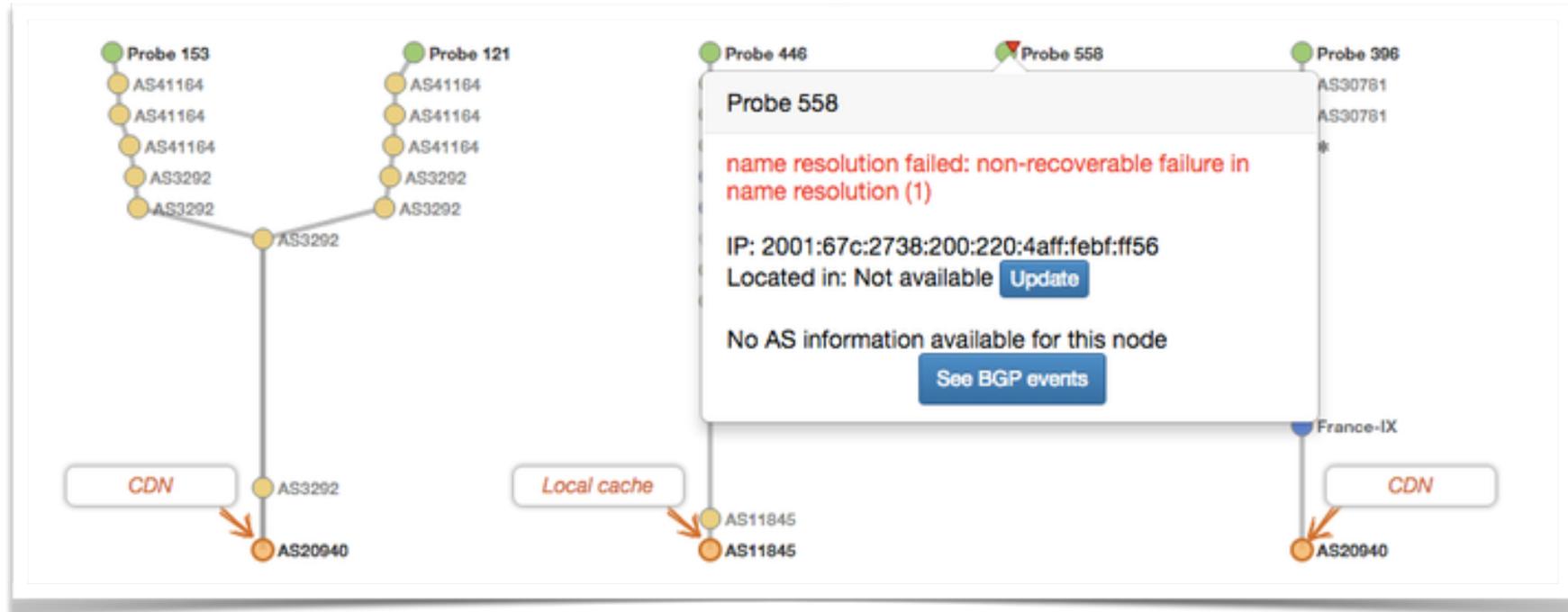
PeeringDB:
IXP: France-IX, Paris, FR
Lan: 37.49.236.0/23
[Update PeeringDB](#)

Routing Info:
57734 - FRANCEIX , FR
Announced: Yes

Registry info:
Resource: 57344-58367
Name: IANA 16-bit Autonomous System (AS)
Numbers Registry
Desc: Assigned by RIPE NCC

[Contact holder](#) [Whois](#) [See BGP events](#)

TraceMON: Network Annotations



Almost There: Wi-Fi Measurements



- Verifying if Wi-Fi connections work or not
 - Using regular, wired probes
- Not general purpose “is my home Wi-Fi ok?”
 - Targets specific WiFi networks; Eduroam first
- Probes/hosts will have to opt-in
- Main benefit for RIPE Atlas: potential wider coverage of networks



OpenIPMap

- First production release is imminent

The screenshot displays the OpenIPMap interface. On the left, a world map shows a traceroute path from the West Coast of North America to Europe and Africa. The right panel provides details for an Atlas measurement (ID: E345845). It lists a long sequence of IP addresses used as probes and the target host (72.21.80.200). Below this, it shows two loaded traceroutes with their respective AS paths: AS7922 AS7922 AS1299 AS15133 and AS7922 AS7922 AS1299 AS15133. A summary section shows a list of hops with their IP addresses, locations, and distances. A pop-up form is visible for editing the host location, showing fields for City, Country, and a list of cities that match the input (Seattle, US).

Home > Analysis > Internet Measurements > SIPE Atlas

OpenIPMap Collections Atlas Measurements Traceroutes GeIP View

Details atlas measurement E345845

GENERAL

all probes used as source: 24 32 304 1046 1058 1116 1134 1189 1193 1196 2567 2685 2769 3041 3444 3579 3644 4155 6061 6062 6065 6066 6072 6080 6122 6147 6223 10185 10334 10422 10423 10595 10770 10790 11171 11528 11687 11857 12105 12108 12115 12116 12134 12380 12452 12546 12685 12693 12802 12806 13128 13546 13614 14284 14641 14882 14933 15542 15958 17587 17797 17914 18275 18451 18512 18664 19096 19460 19761 19911 21195 22379 22382 22511 22710 22802 23017 23033 23036 23903 24899 25004 27647 27952 28529

target host: 72.21.80.200

start: 2017-05-01T08:00:24Z

stop: 2017-05-01T08:10:07Z

LOADED TRACEROUTES

probes used: 24 32 304 1046 1058 1116 1134 1189

timerange: 2017-05-01T08:00:24Z - 2017-05-01T08:00:27Z

TRACEROUTE: 72.254.190.25 → AS7922 AS7922 AS1299 AS15133

TRACEROUTE: 24.16.252.197 → AS7922 AS7922 AS1299 AS15133

SUMMARY

AS7922 → 1054 comcast.net Port Elizabeth, ZA
8ms (172.16.50.1)

AS7922 → 324167 (96.120.100.53) Kampala, UG
12ms 455029 comcast.net Casablanca, MA
13ms 813304 comcast.net New York City, US

AS1299 → 65.139.164.158

AS15133 → be-43-ar01.seattle.wa.seattle.comcast.net

EDIT HOST LOCATION

HOST
65.139.164.158

CURRENT LOCATION

City
sea

Country
United States

cities that match your input
Seattle, US

CANCEL SUBMIT

19ms 681756 comcast.net Boston, US
16ms comcast.net ADD A LOCATION

Current Collection aggregated by Atlas measurement and time

Results from May 1st 2017, 08:00:27 UTC

ATLAS MEASUREMENT

ID E345845
RAN 8 days ago

8 traceroutes from 8 probes loaded



Future Development

- These tools are still being developed
 - We rely on your feedback for improvement
 - Tell us what is good and what isn't
 - Suggest new features
- Help us to maintain our datasets
 - Keep PeeringDB records up-to-date
 - Add and maintain data to the OpenIPMap project
 - TraceMON contains a number of update buttons



More Reading

- Several RIPE Labs articles about these tools
 - See <http://labs.ripe.net>
- Documentation
 - <https://atlas.ripe.net/docs/tools-tracemon/>
 - <https://atlas.ripe.net/docs/tools-latencymon/>
 - <https://atlas.ripe.net/docs/domainmon/>
- Have a look at <http://atlas.ripe.net>
 - Sign up, request probes and configure measurements
 - Become a part of the community



Questions



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