



RIPE NCC
RIPE NETWORK COORDINATION CENTRE

RIPE Atlas

Measuring the Internet

Victor Naumov | May 2017 | ENOG13

What is RIPE Atlas?

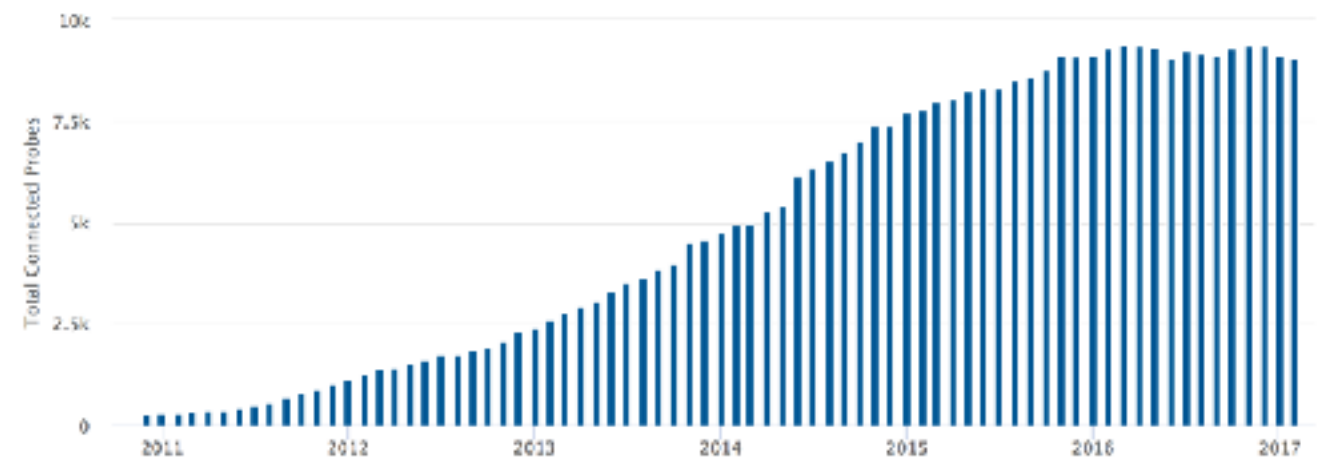


Composed by: **Probes**



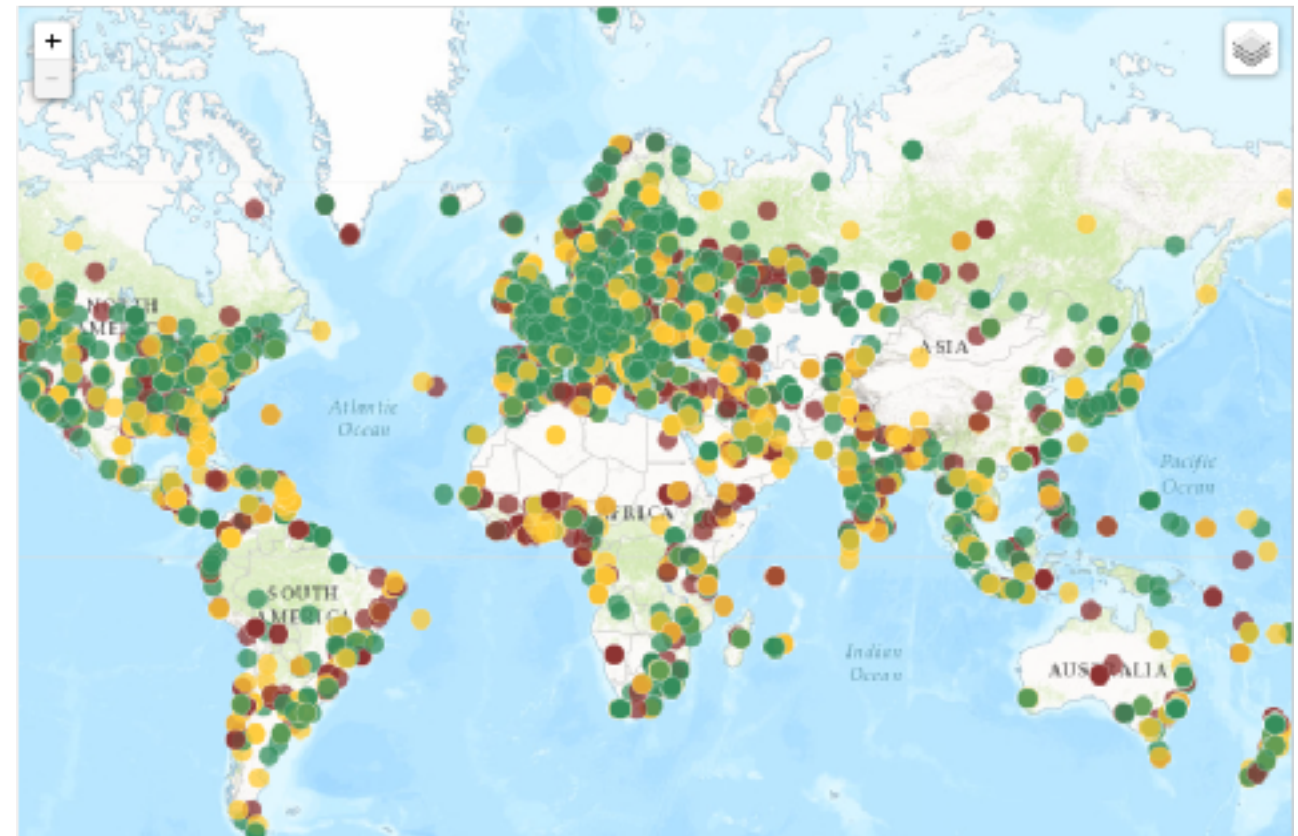
Probes

The number of connected probes



- 9700+

- Around the world



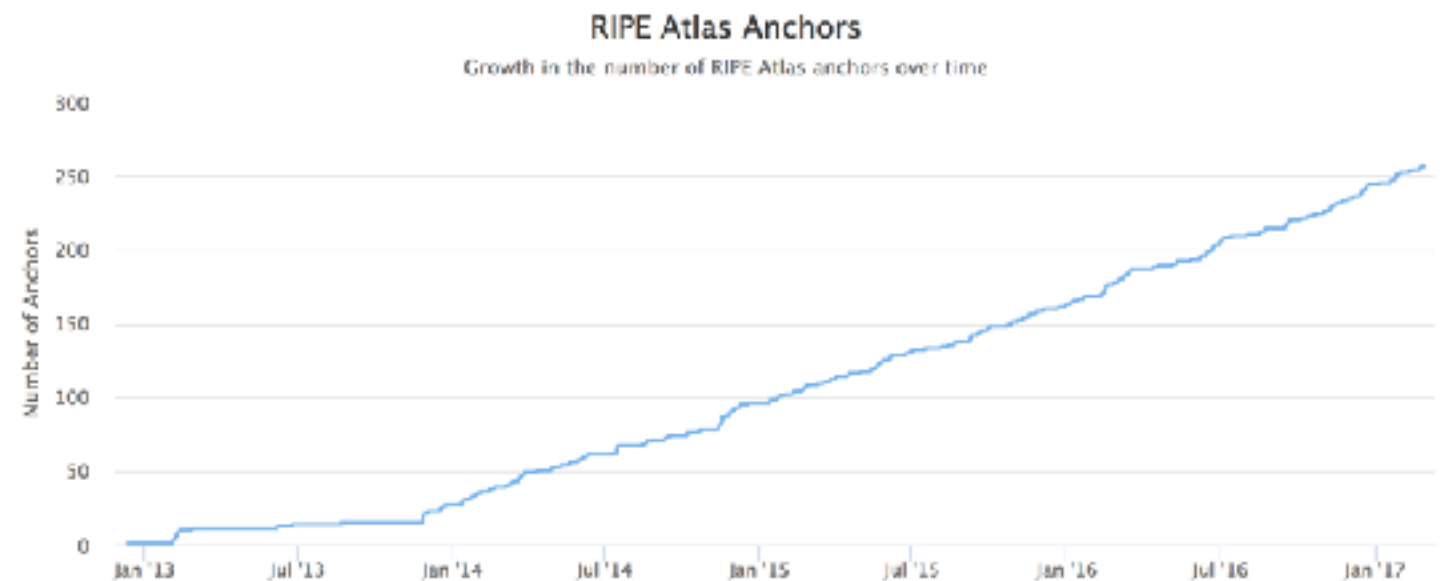
What is RIPE Atlas?



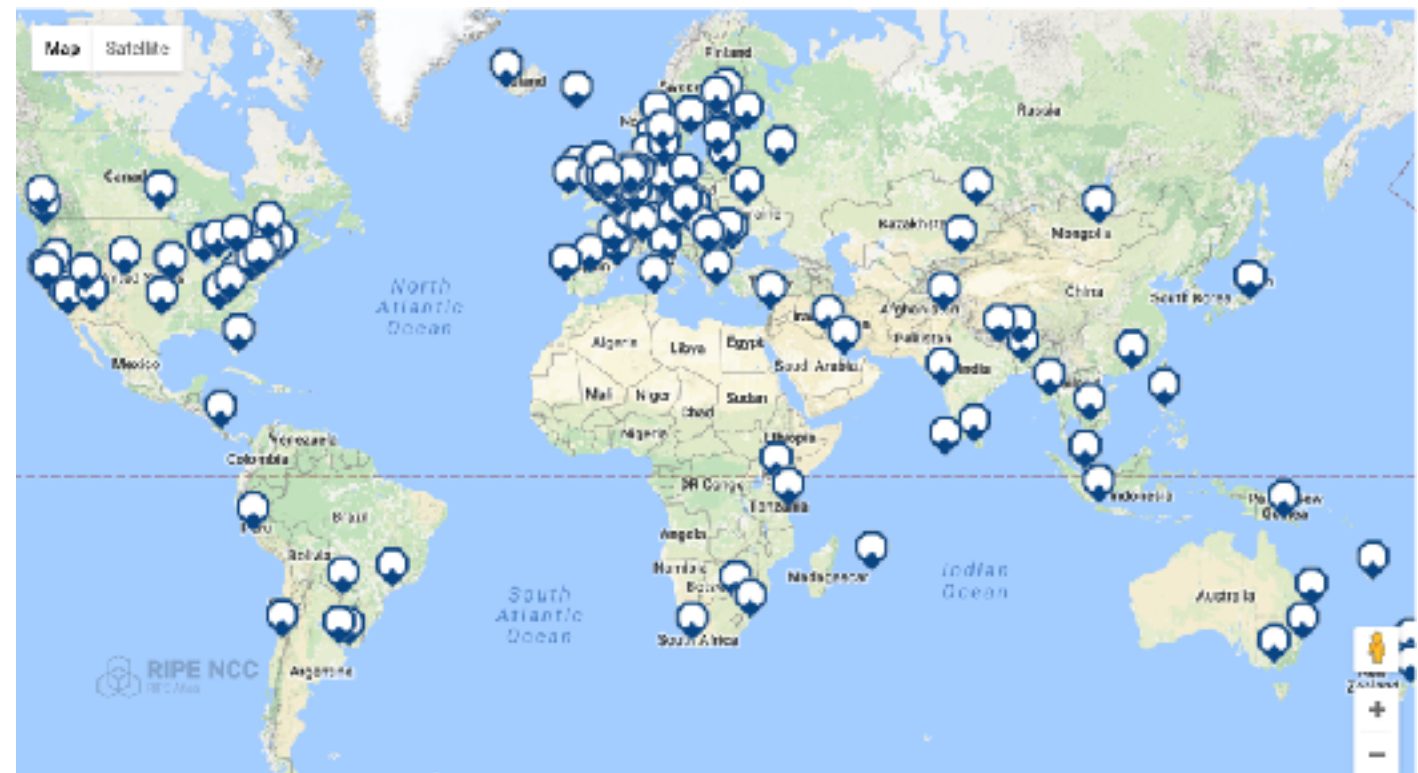
Composed by: **Anchors**



- 250+



- Around the world



What is RIPE Atlas?



Goals:

- Internet wide measurement system
 - Internet infrastructure, not all applications
- Real time & historical info
- Outbound and inbound measurements
- Collaborative effort
- Open and free
- IPv4 and IPv6 capable

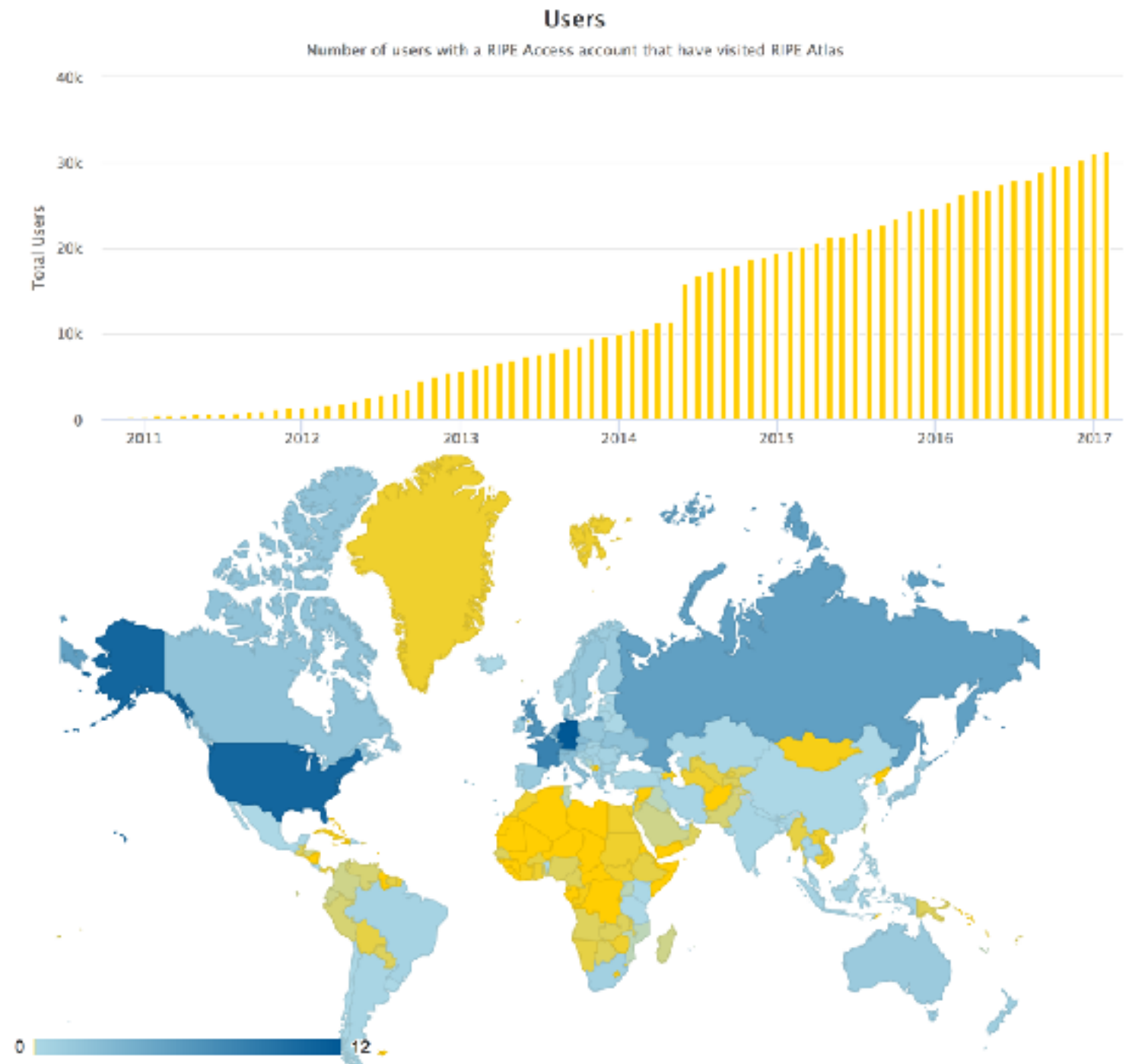


What is RIPE Atlas



Composed by: **RIPE Atlas Community**

- Users
- Hosts
 - Probes
 - Anchors
- Sponsors
- Ambassadors



What is RIPE Atlas

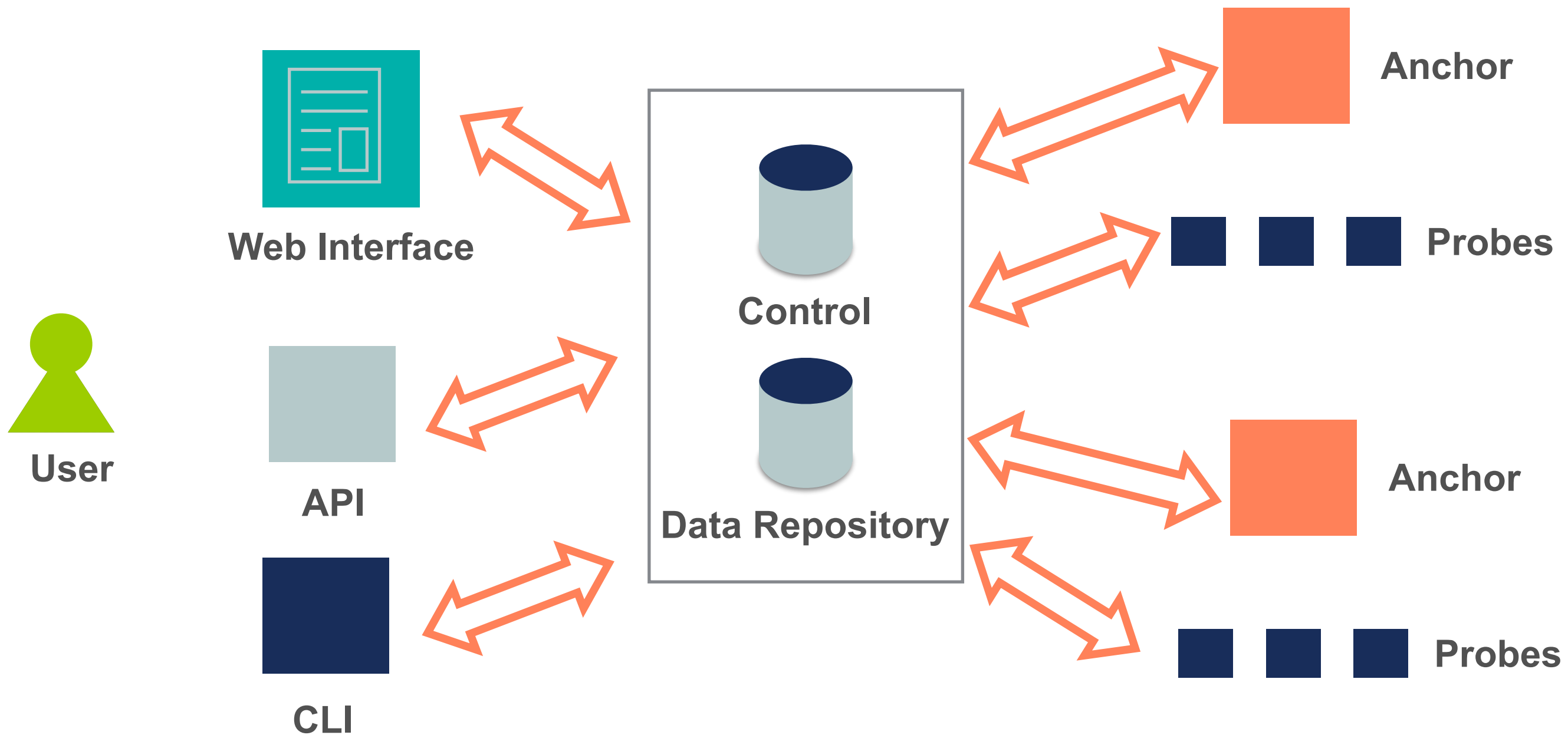


Composed by: Measurements

Measurements currently running

	Built-in	User-defined			
		Total UDM	Anchoring	DNSMON	Other
Ping	41	4363	505	0	3858
Traceroute	45	3303	507	817	1979
DNS	158	4869	0	3268	1601
SSL/TLS Certificate	4	225	0	0	225
NTP	0	44	0	0	44
HTTP	4	540	506	0	34

RIPE Atlas Overview



How to use RIPE Atlas



- User friendly web interface, API or CLI
- System based on credits
- Create measurements (ping, trace route, etc.)
- Access (historical) data

RIPE Atlas measurements



- **Built-in** global measurements towards root nameservers
 - Visualised as Internet traffic maps
- **Built-in** regional measurements towards “anchors”
- **Users** can run customised measurements

Highlights



- Six types of measurements: ping, traceroute, DNS, SSL/TLS, NTP and HTTP (to anchors)
- APIs and CLI tools to start measurements and get results
- Streaming data for real-time results
- Status checks (Icinga & Nagios)

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
 - Automatic FW updates
- Measurements triggered by “command servers”
 - Inverse ssh tunnels
- Source code published



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RIPE Atlas News

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Current Numbers



- Number of connected probes: ~9700
 - Was ~9350 during RIPE 73
 - Recovered from the previous slow-down/dip
- Covered ASes: ~3400 (IPv4), ~1250 (IPv6)
- Collecting ~4500 results/sec (~390M/day)



Some More Current Numbers



- 384 RIPE Atlas ambassadors
 - Including RIPE NCC staff acting as ambassadors
- 1940 Twitter followers (@RIPE_Atlas)
- 33000+ users total, 6400+ active last quarter
- 1000+ mailing list subscribers
- 2 RIPE Atlas sponsors in 2017 (+3 pending)
 - Let us know if you feel like sponsoring!

Recent Use Cases

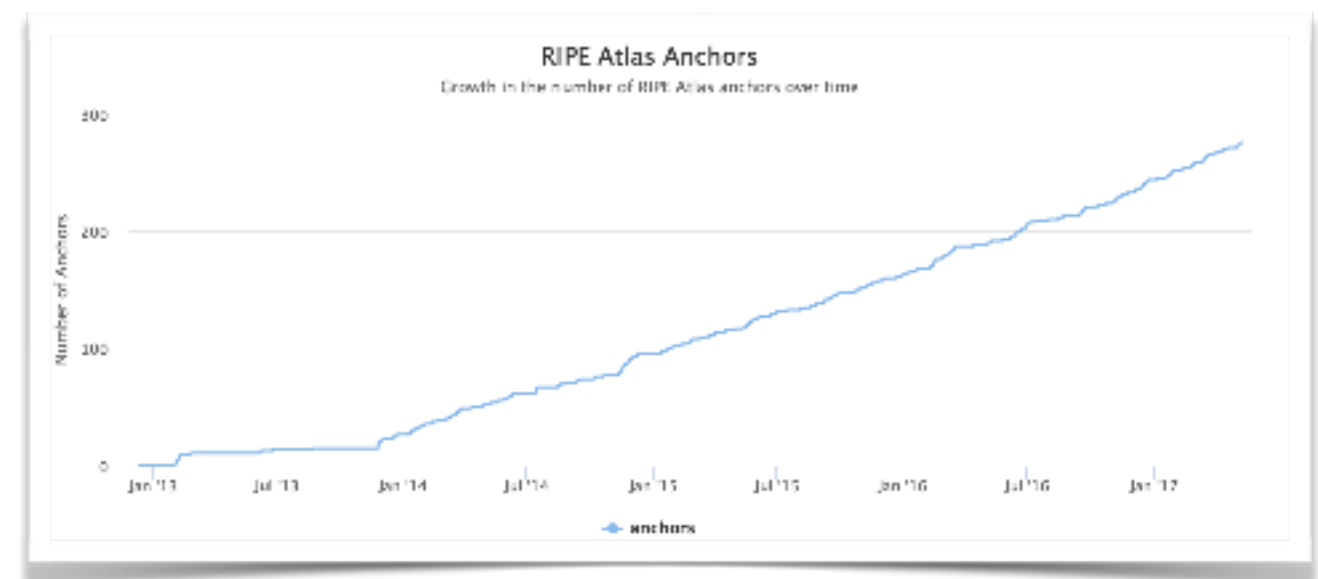
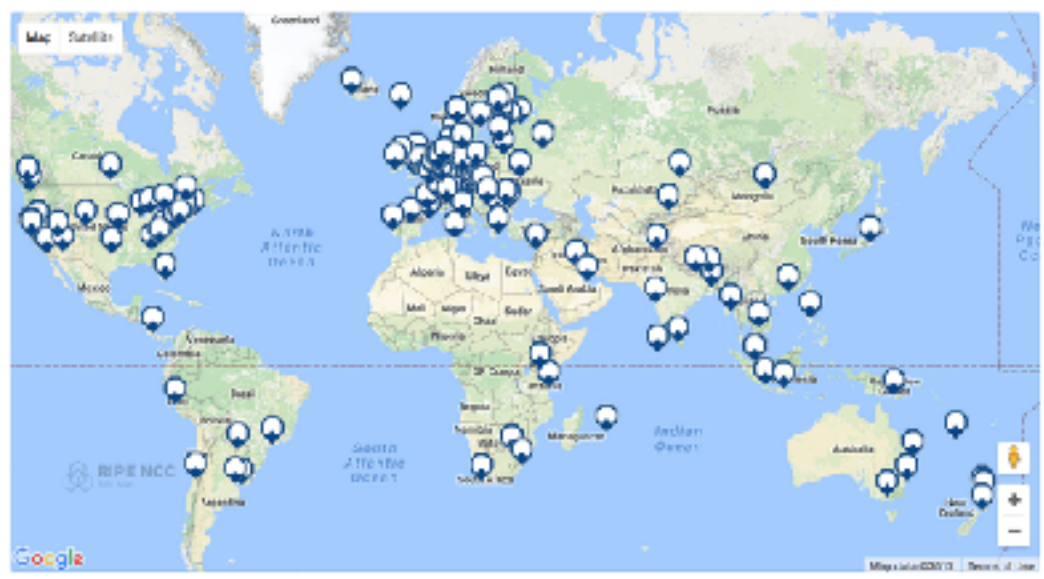


- Turning on Anycast on B-Root
 - https://labs.ripe.net/Members/giovane_moura/anycast-on-b-root-and-ripe-atlas-view
- Using RIPE Atlas to Measure Latency to Reunion Island
 - https://labs.ripe.net/Members/rehan_noordally/using-ripe-atlas-to-measure-latency-to-reunion-island
- Using RIPE Atlas to Validate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

Anchors



- An anchor is a probe and a willing target
 - Automatically measured and generate more credits
- Number of anchors: 250+ (224 last time)
- Thanks to APNIC, LACNIC, ISOC & AFRINIC who are sponsoring anchors in other regions
 - Let us know if you also want to sponsor these



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 + ~1400 of these up and running
 - Version 1 probes approached their technical limits
 - We'll freeze their firmware soon but otherwise continue supporting them for as long as possible (e.g. still do security updates if needed)

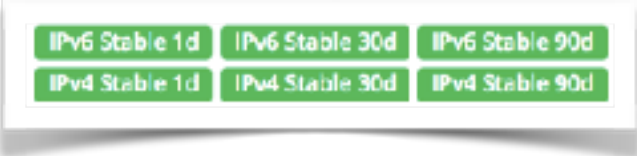
Going Virtual (?)



- 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

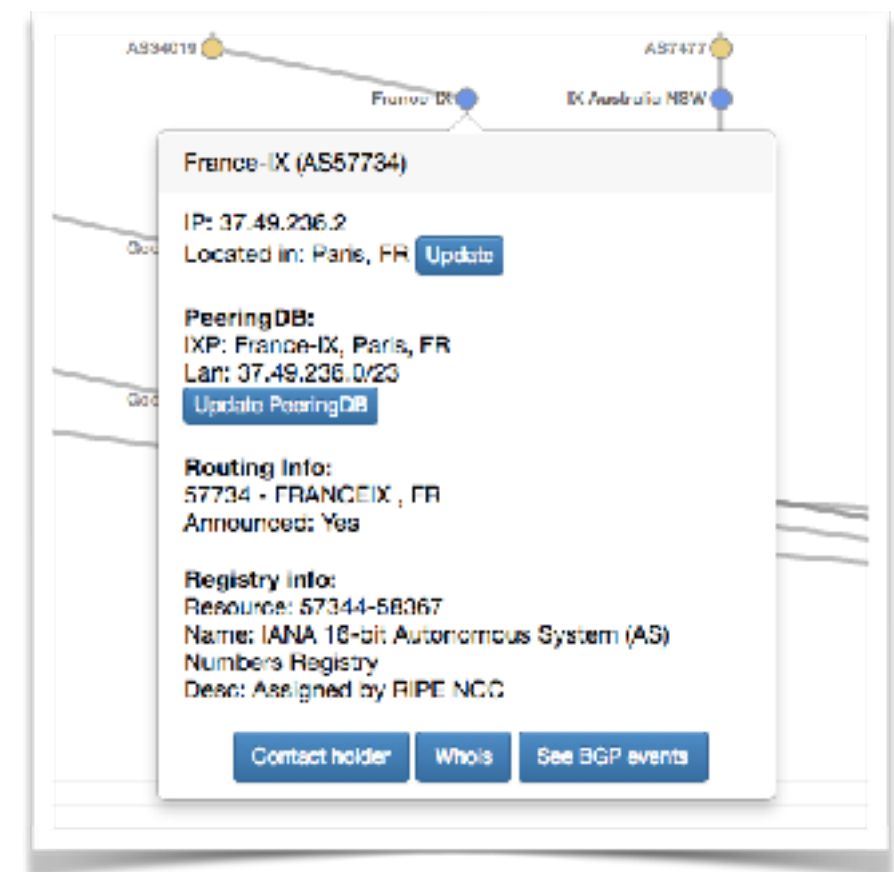


- New “probe stability” system tags A small graphic showing six green rectangular tags arranged in two rows. The top row contains 'IPv6 Stable 1d', 'IPv6 Stable 30d', and 'IPv6 Stable 90d'. The bottom row contains 'IPv4 Stable 1d', 'IPv4 Stable 30d', and 'IPv4 Stable 90d'.
- New DNS root zone measurements
- 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

Out Now: TraceMON



- Our newest traceroute visualisation tool
 - Watch Massimo's presentation for details



Almost There: Wi-Fi Measurements

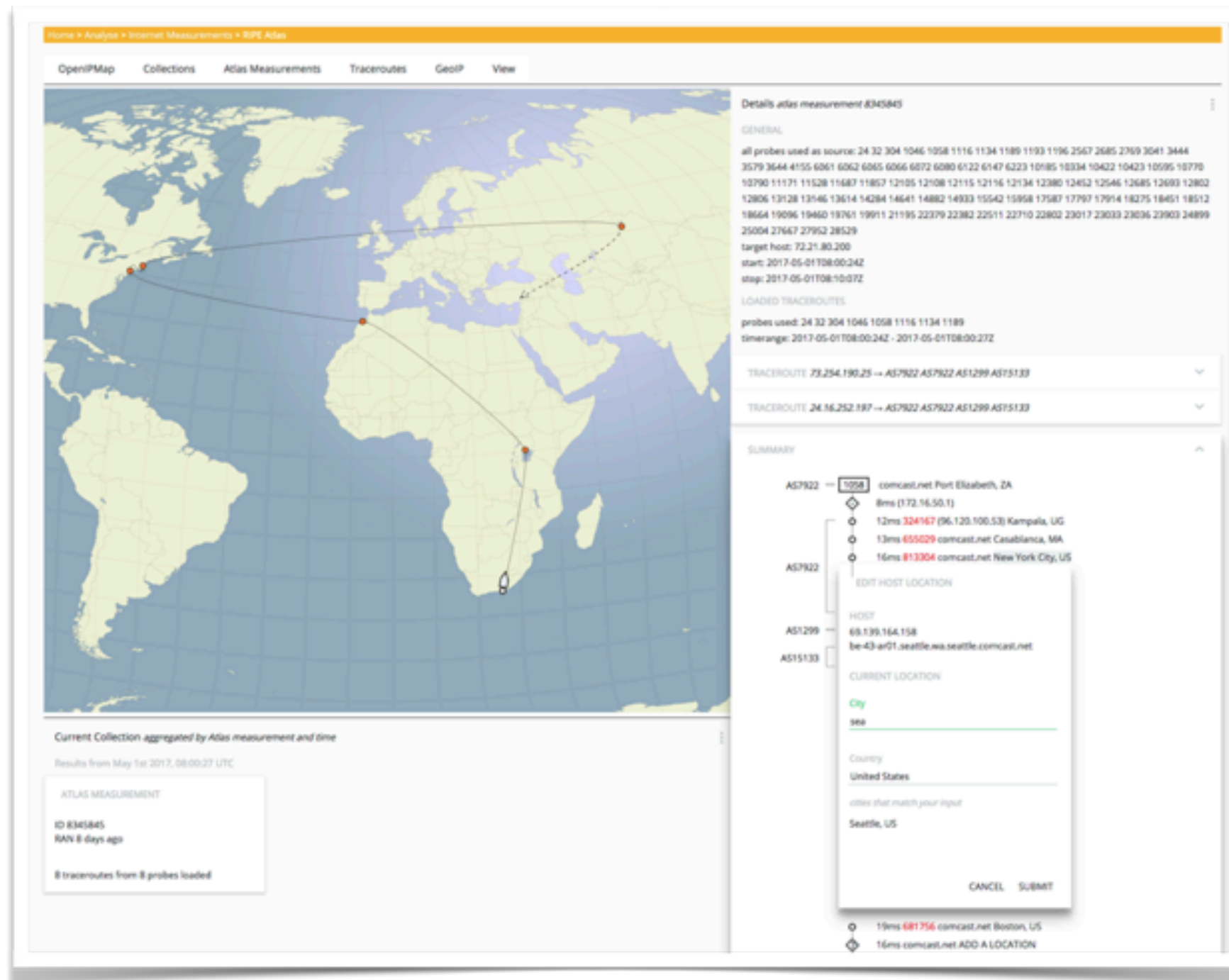


- Verifying if Wi-Fi connections work or not
 - Using regular, wired probes
- Not general purpose “is my home Wi-Fi ok?”
 - Targets specific WiFi networks; Eduroam first
- Probes/hosts will have to opt-in
- Main benefit for RIPE Atlas: potential wider coverage of networks

OpenIPMap



- First production release is imminent





Questions

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