RIPE Atlas

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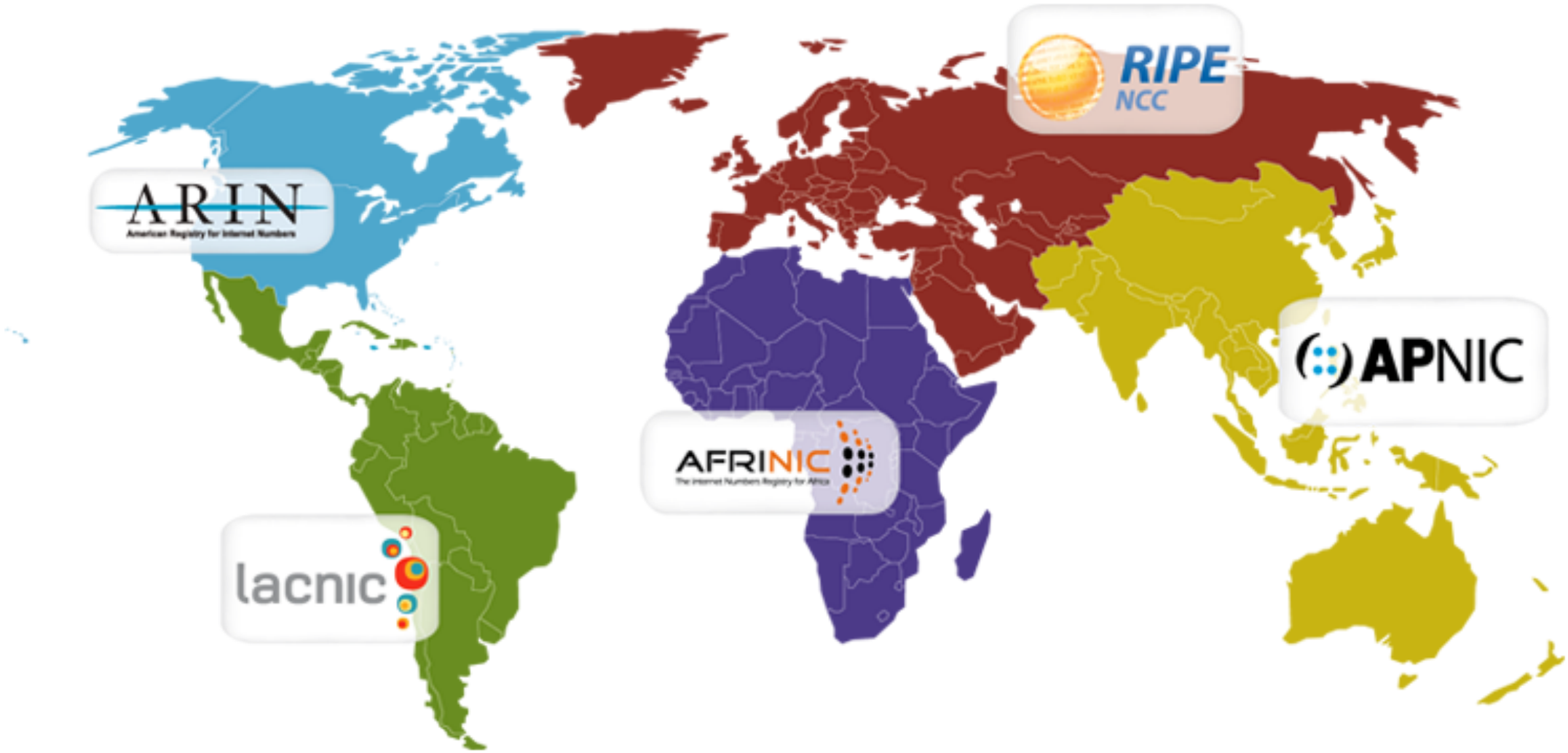
AfPIF 2013

RIPE NCC

5 RIRs - distribute IP & ASN



RIPE NCC Measurement Projects

- Control plane: Routing (RIS)
- Data plane: RIPE Atlas https://atlas.ripe.net

- Unified interface: RIPEstat https://stat.ripe.net
- Analysis: RIPE Labs https://labs.ripe.net

- What we measure typically is **global**

Why Do We Measure?

- "That which is measured improves. That which is measured and reported improves exponentially."
  -- Karl Pearson

- Do we want the Internet to improve?

RIPE Atlas

RIPE NCC

RIPE Atlas

A measurement network of 3800+ devices
For the community, **by** the community

Connected Disconnected Abandonned

RIPE Atlas Participation and Benefits

- Anyone can host a RIPE Atlas probe:
  - apply online: https://atlas.ripe.net/apply
  - ... or just come talk with me

- Major benefit: look at your network from the outside!
  - Have at your fingertips 3800+ external vantage points to do pings & traceroutes towards you

Measurement Device: RIPE Atlas probe

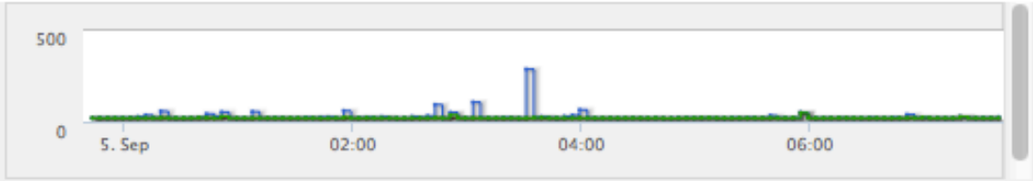
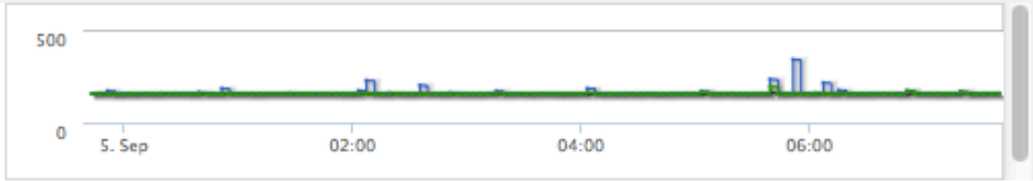
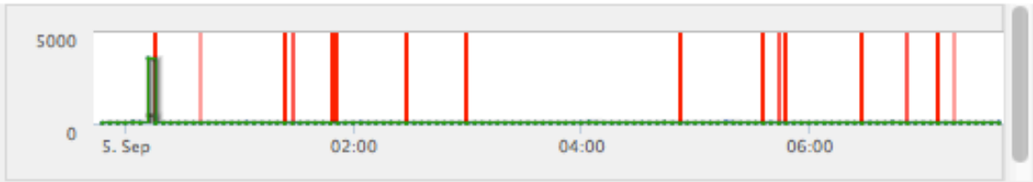
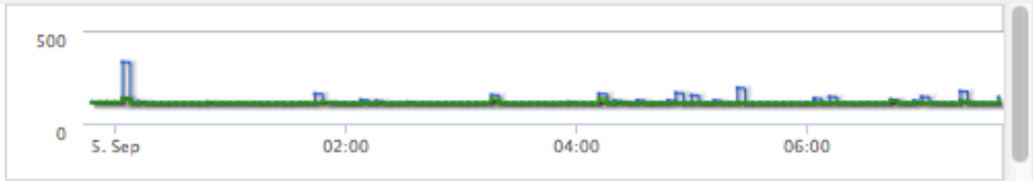
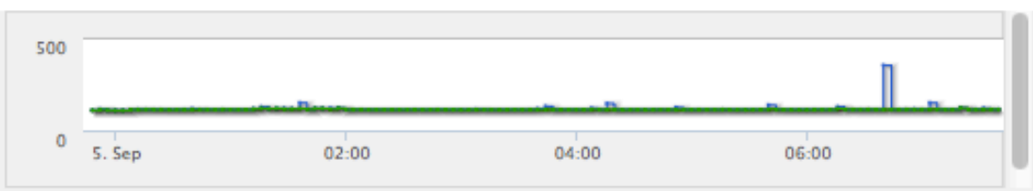
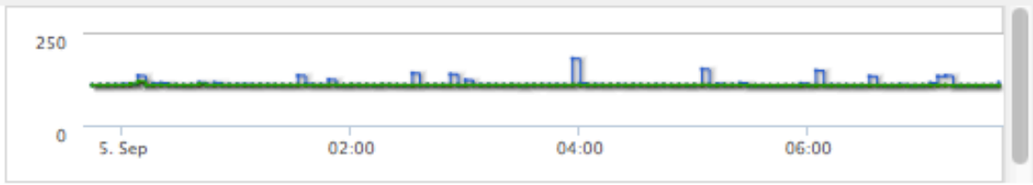
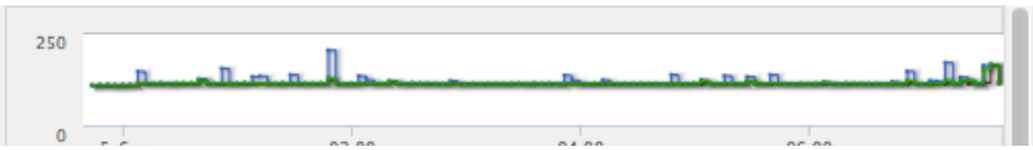
- Install-and-forget, USB powered
- Hosted and sponsored by organisations and end users
  - ISPs, Internet Exchange Points, individuals...
  - Free of charge if you host individual probes

What is measured?

- “built-in” measurements
  - From all the probes, towards root name servers and RIPE Atlas infrastructure
  - Pings, traceroutes, SSLcert and DNS queries
  - Results available to everyone!
  - https://atlas.ripe.net/results/

My Probes | Public Probes | **xs4all adsl 16/2 IPv6**

xs4all adsl 16/2 IPv6 — Logs | Probe's Setting

Ping (IPv6)	a.root-servers.net 2001:503:ba3e::2:30	18.811 ms / 18.983 ms / 19.099 ms 2013-09-05 07:42:54 UTC	
Ping (IPv4)	b.root-servers.net 192.228.79.201	154.532 ms / 154.856 ms / 155.283 ms 2013-09-05 07:43:20 UTC	
Ping (IPv4)	c.root-servers.net 192.33.4.12	23.710 ms / 24.428 ms / 25.225 ms 2013-09-05 07:43:37 UTC	
Ping (IPv4)	d.root-servers.net 128.8.10.90	107.830 ms / 116.311 ms / 132.824 ms 2013-09-05 07:43:47 UTC	
Ping (IPv6)	d.root-servers.net 2001:500:2d::d	111.263 ms / 111.657 ms / 112.084 ms 2013-09-05 07:43:09 UTC	
Ping (IPv4)	h.root-servers.net 128.63.2.53	106.770 ms / 106.965 ms / 107.246 ms 2013-09-05 07:43:50 UTC	
Ping (IPv6)	h.root-servers.net 2001:500:1::803f:235	191.583 ms / 198.637 ms / 212.276 ms 2013-09-05 07:43:18 UTC	

[...continued]

- Customised (user defined) measurements (UDM) using the targets of their choice and desired frequency.
  - You need “credits” to do this
- Anchoring measurements coming soon
  - Each probe will measure 4-5 “anchors” as a regional baseline
  - RIPE Atlas anchors placed at well-connected locations

Credit System

- By hosting a probe, each host earns credits
  - As a reward for making probe available to other users, for performing measurements from that probe towards any target
  - Hosts earn 21,000+ credits per full day
- In order to schedule customised measurements, users spend credits
  - Ping costs 3 credits/result, traceroute 30, etc.

[...continued]

- Credits system introduced to ensure fairness and protect system from overload
- Extra credits can be earned by:
  - Hosting a RIPE Atlas anchor
  - Sponsoring multiple probes
- More details: https://atlas.ripe.net/doc/credits

RIPE Atlas 2013 Sponsors

RIPE Atlas - Security Aspects

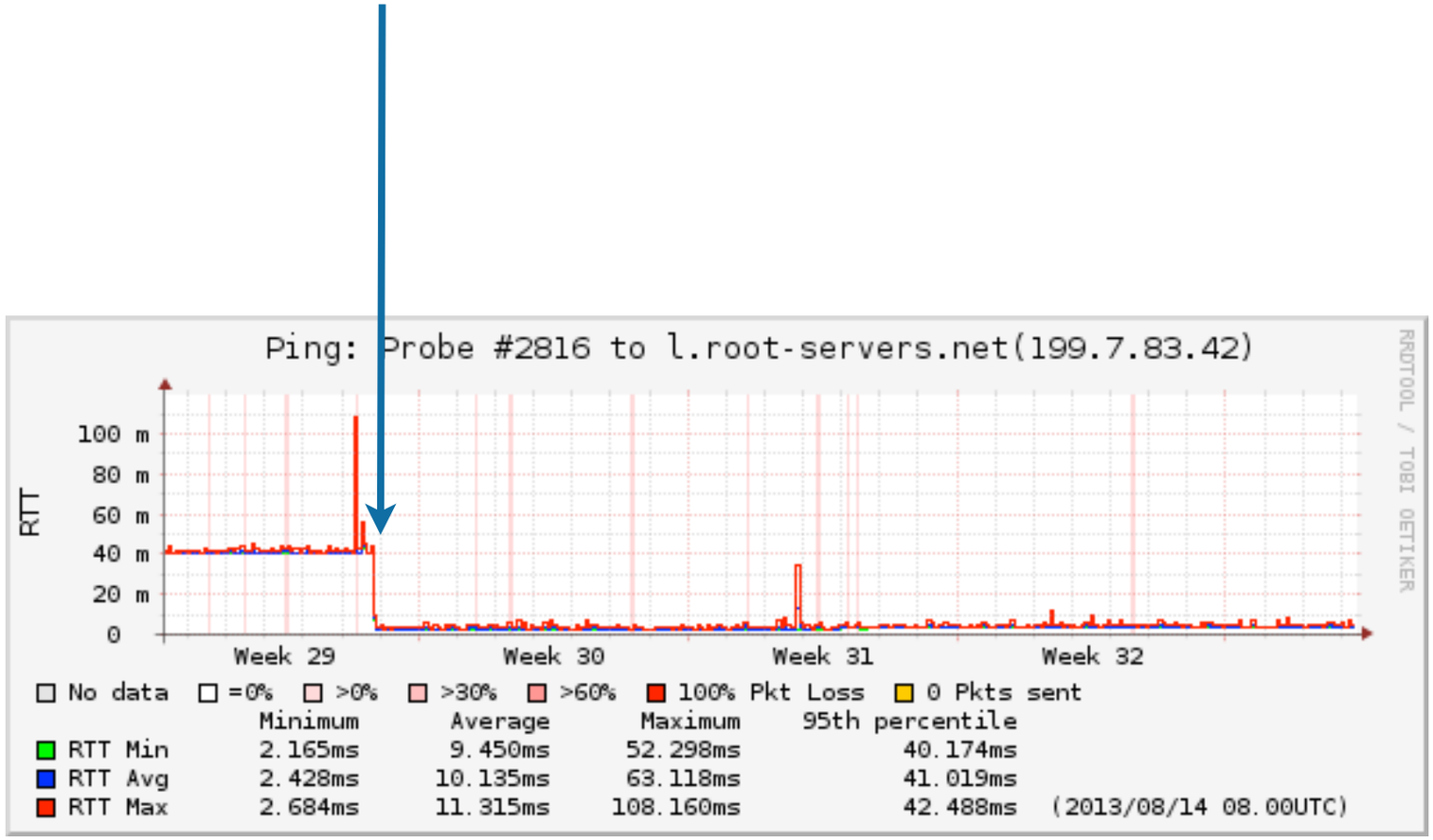
- Probes have hardwired trust material (registration server addresses / keys)
- The probes don't have any open ports, they only initiate connections
- Measurements are scheduled by centralized "command servers" via reverse ssh tunnels over TCP/443
- Probes don't listen to local traffic, there are no passive measurements running
  - There's no snooping around
- Source code for probe software published

Latency to b-root (where is it?)

Latency to i-root

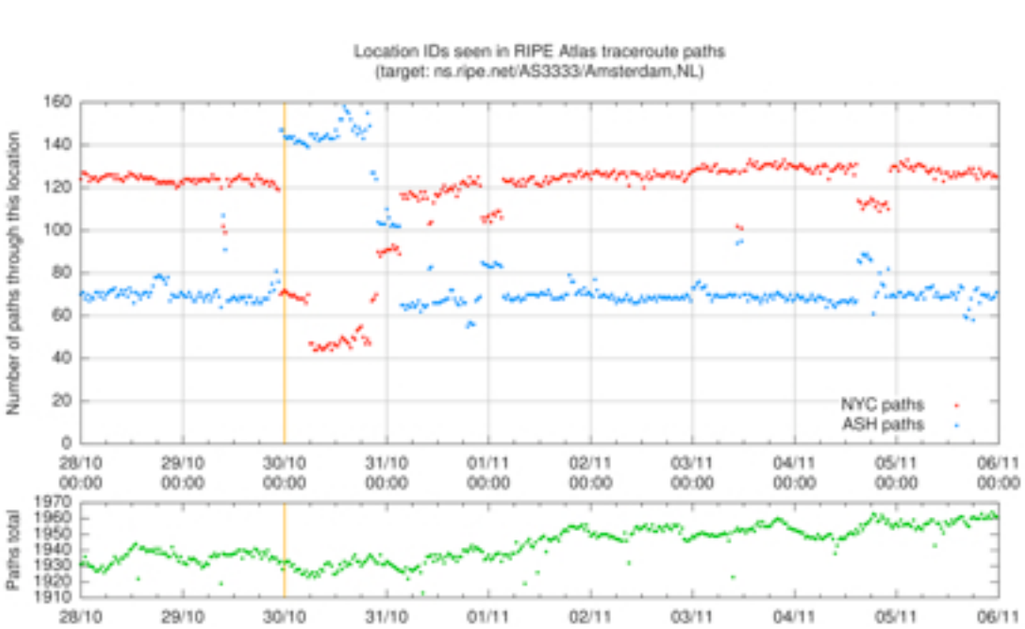
Case Study: SOX and L-Root DNS

- Deployment of an L-Root instance at Serbian Open eXchange



Case Study: Measuring Hurricane Sandy

- Most RIPE Atlas probes in affected area unavailable during Hurricane Sandy
- Traffic partially shifted away from NYC as a transit hub



https://labs.ripe.net/sandy-2012

Atlas Anchors

RIPE NCC

Anchors: Rocks in the Sea of Atlas Probes

RIPE Atlas Anchors

- Well-known targets and more powerful measurement devices
  - 14 deployed
  - Goal: ~50 deployed in 2013, 10 in Africa?
  - Benefit: regional baseline & “future history”

RIPE Atlas deployment

RIPE NCC

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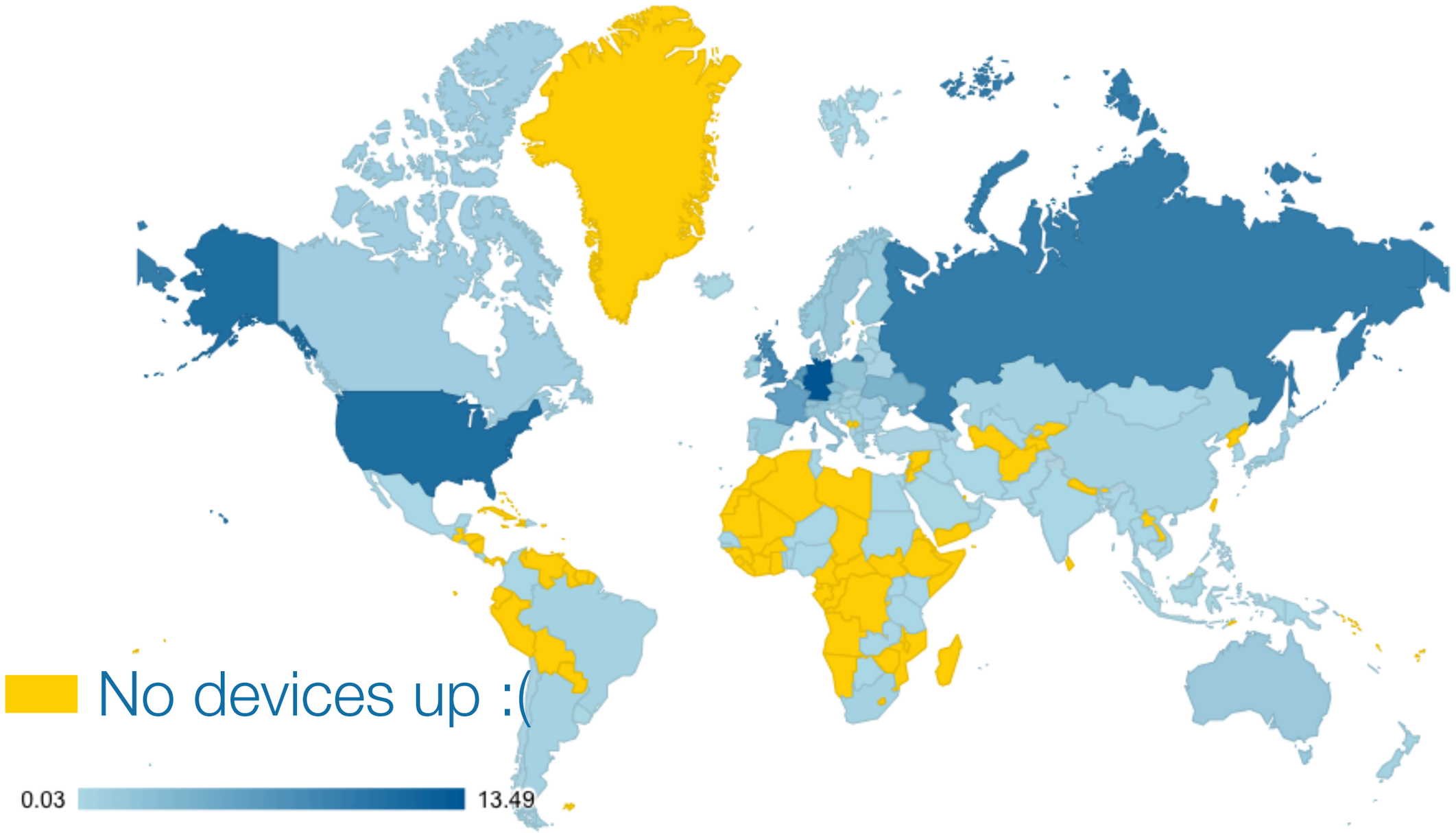
RIPE Atlas by Country



We are underserving Africa :(

Questions?