IPv4 and IPv6

with RIPE Atlas

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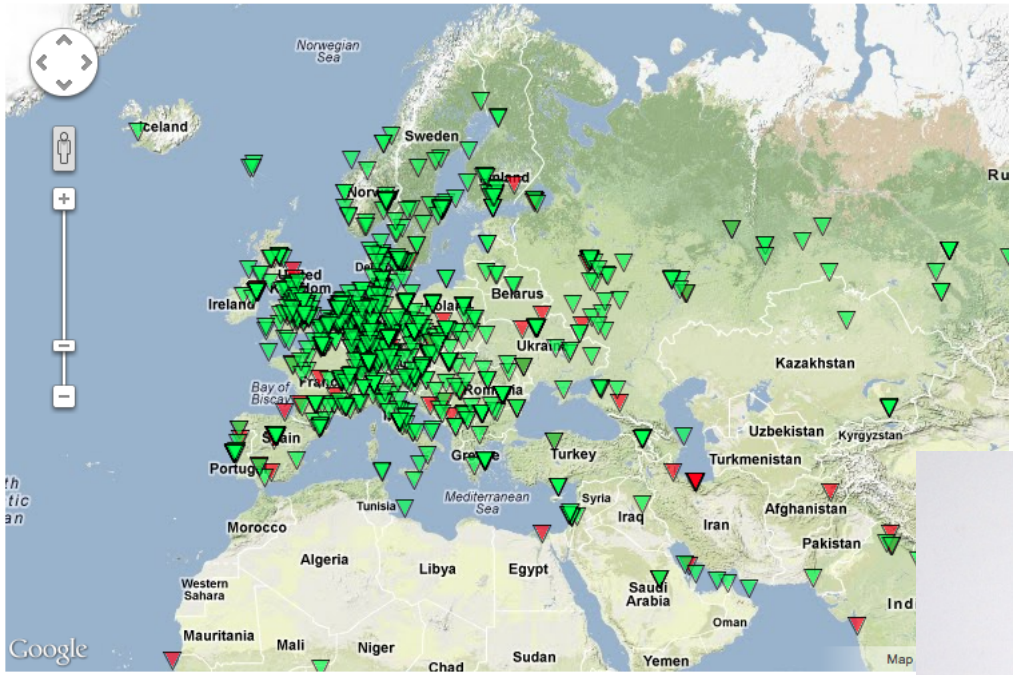
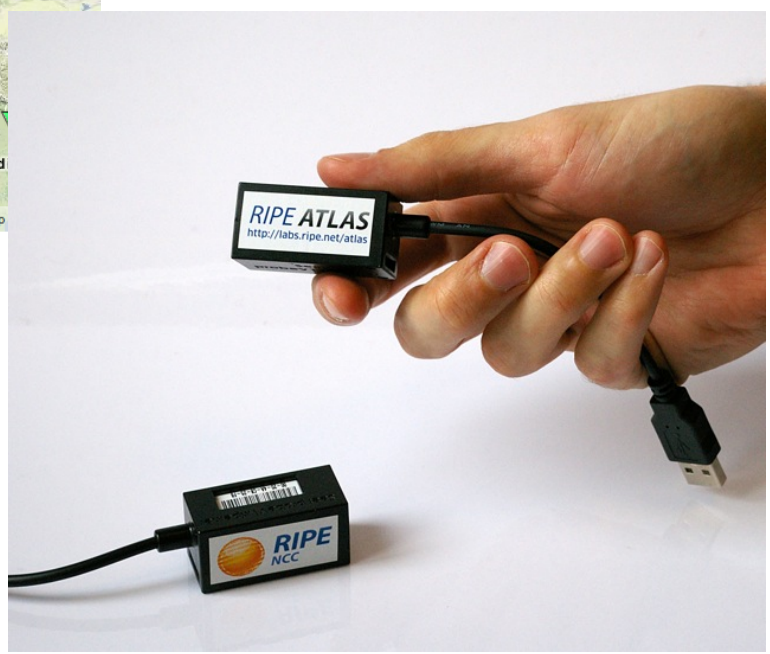
“You are here”

Host	IPv4 DNS entry	IPv6 DNS entry
www.caida.org	✔	✖
www.ripe.net	✔	✔
www.bbn.com	✔	✔
www.mit.edu	✔	✖
www.nps.edu	✔	✖
www.samknows.com	✔	✖
www.ugov.gov	✔	✖
www.simula.no	✔	✖
www.freedesktop.org	✔	✖
www.apnic.net	✔	✔
www.cc.gatech.edu	✔	✖
www.icir.org	✔	✖
www.cs.colostate.edu	✔	✖
www.dhs.gov	✔	✖*
www.eecs.northwestern.edu	✔	✖
www.google.com	✔	✔**
www.cs.umd.edu	✔	✖
www.lip6.fr	✔	✖
www.icsi.berkeley.edu	✔	✖
www.isc.org	✔	✔

What is RIPE Atlas?





Measuring IPv6

"96 more bits, no magic"

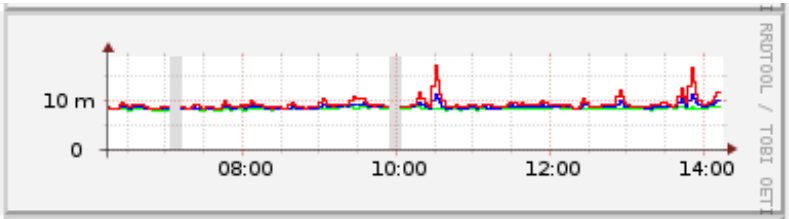
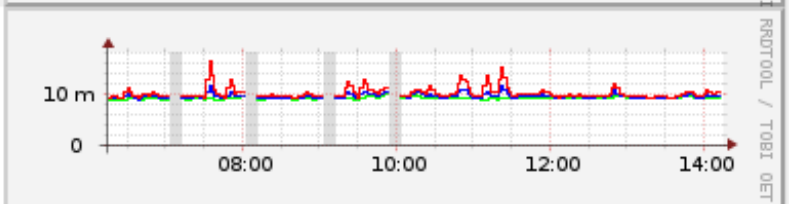
- For us, almost everything is symmetrical in IPv4/IPv6 sense, with very few exceptions:
  - in the controlling infrastructure
  - about how a probe configures itself
  - and of course, in some of the results…

Configuration and built-in measurements

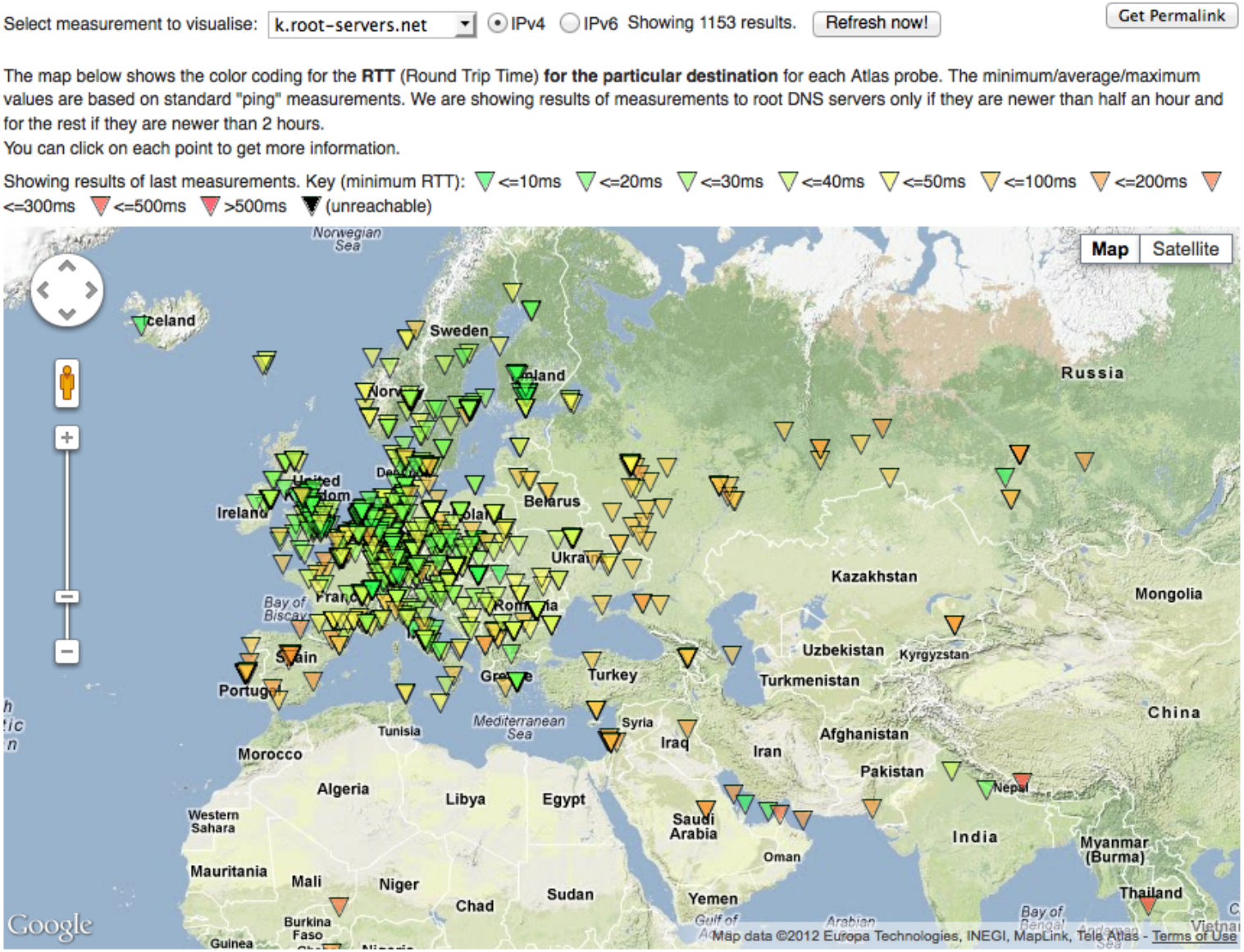
Sponsor: atlas@ripe.net
Firmware Version: 4280
MAC Address: 00:20:4A:C8:27:19

	IPv4	IPv6
Internet Address:	217.146.112.1	2a00:1940:100:1:220:4aff:fec8:2719
Local Address:	192.168.1.100	2a00:1940:100:1:220:4aff:fec8:2719/64
Gateway:	192.168.1.1	Undetermined/Unknown
DNS Resolver:	217.146.105.2, 217.146.97.10	Undetermined/Unknown
AS Number:	AS16353	AS16353

Your probe is configured dynamically
Your probe does not have a public DNS entry

Ping (IPv4)	k.root-servers.net 193.0.14.129	8.678 ms / 10.340 ms / 12.287 ms 2012-02-06 14:13:48 UTC	
Ping (IPv6)	k.root-servers.net 2001:7fd::1	9.260 ms / 9.629 ms / 10.279 ms 2012-02-06 14:13:41 UTC	

Results – some differences between v4/v6

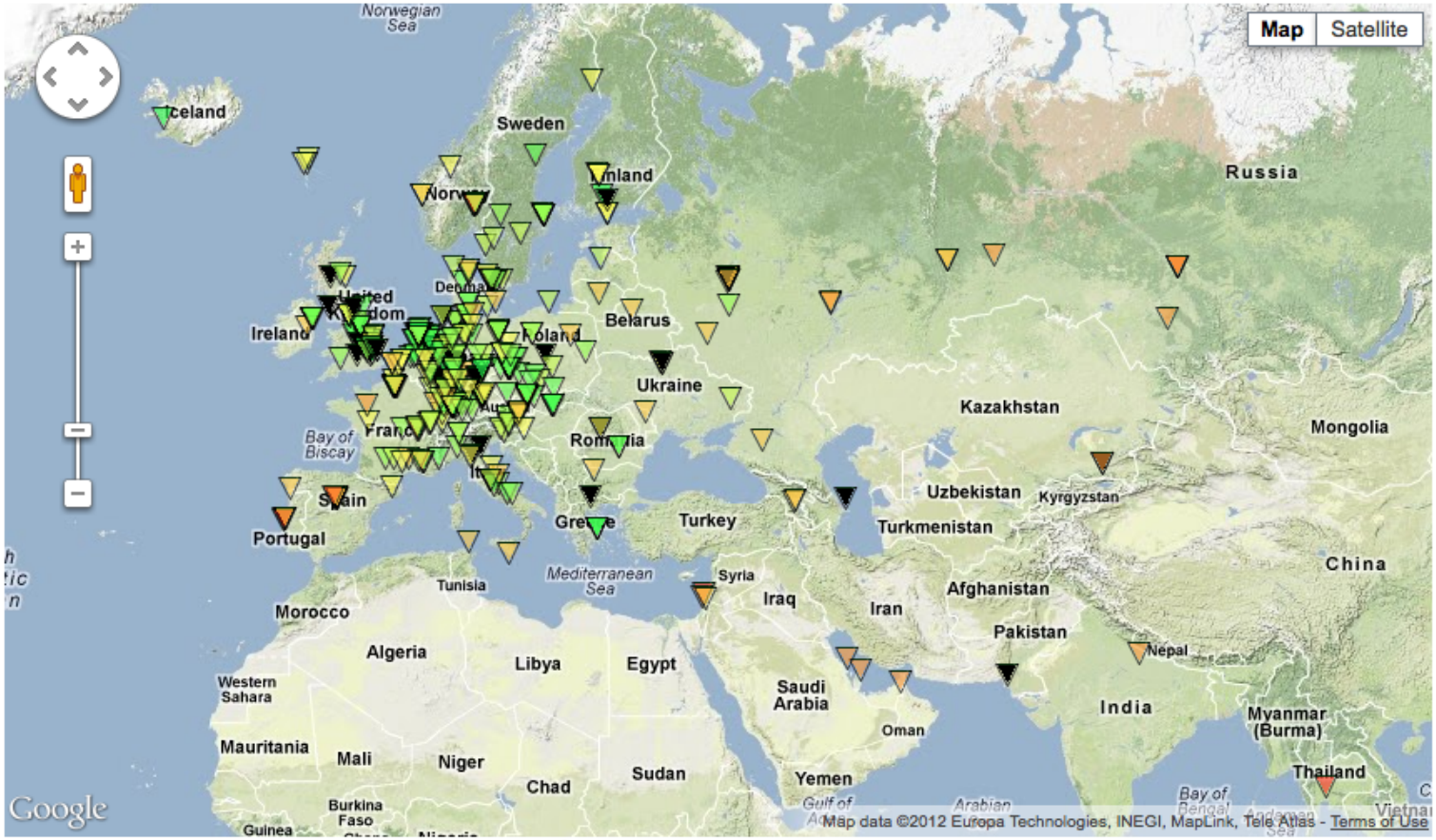


Results – some differences between v4/v6

Select measurement to visualise: k.root-servers.net ○ IPv4 ◉ IPv6 Showing 476 results. Refresh now! Get Permalink

The map below shows the color coding for the **RTT** (Round Trip Time) **for the particular destination** for each Atlas probe. The minimum/average/maximum values are based on standard "ping" measurements. We are showing results of measurements to root DNS servers only if they are newer than half an hour and for the rest if they are newer than 2 hours.
You can click on each point to get more information.

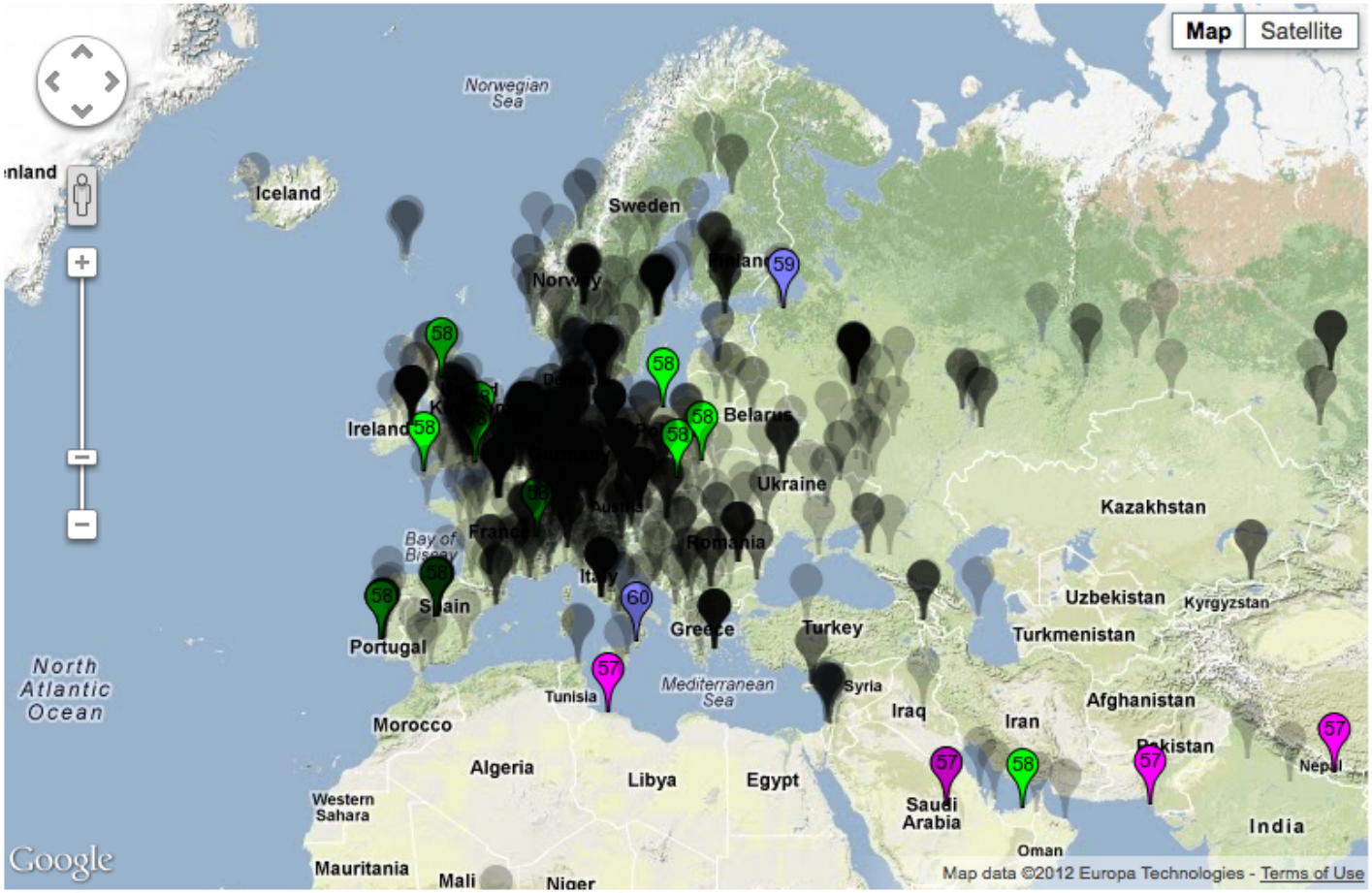
Showing results of last measurements. Key (minimum RTT): <=10ms <=20ms <=30ms <=40ms <=50ms <=100ms <=200ms <=300ms <=500ms >500ms (unreachable)



Results – some differences between v4/v6

Select root DNS server to visualise: a.root-servers.net ◉ IPv4 or ○ IPv6. Showing 1196 results. Refresh now! Get Permalink

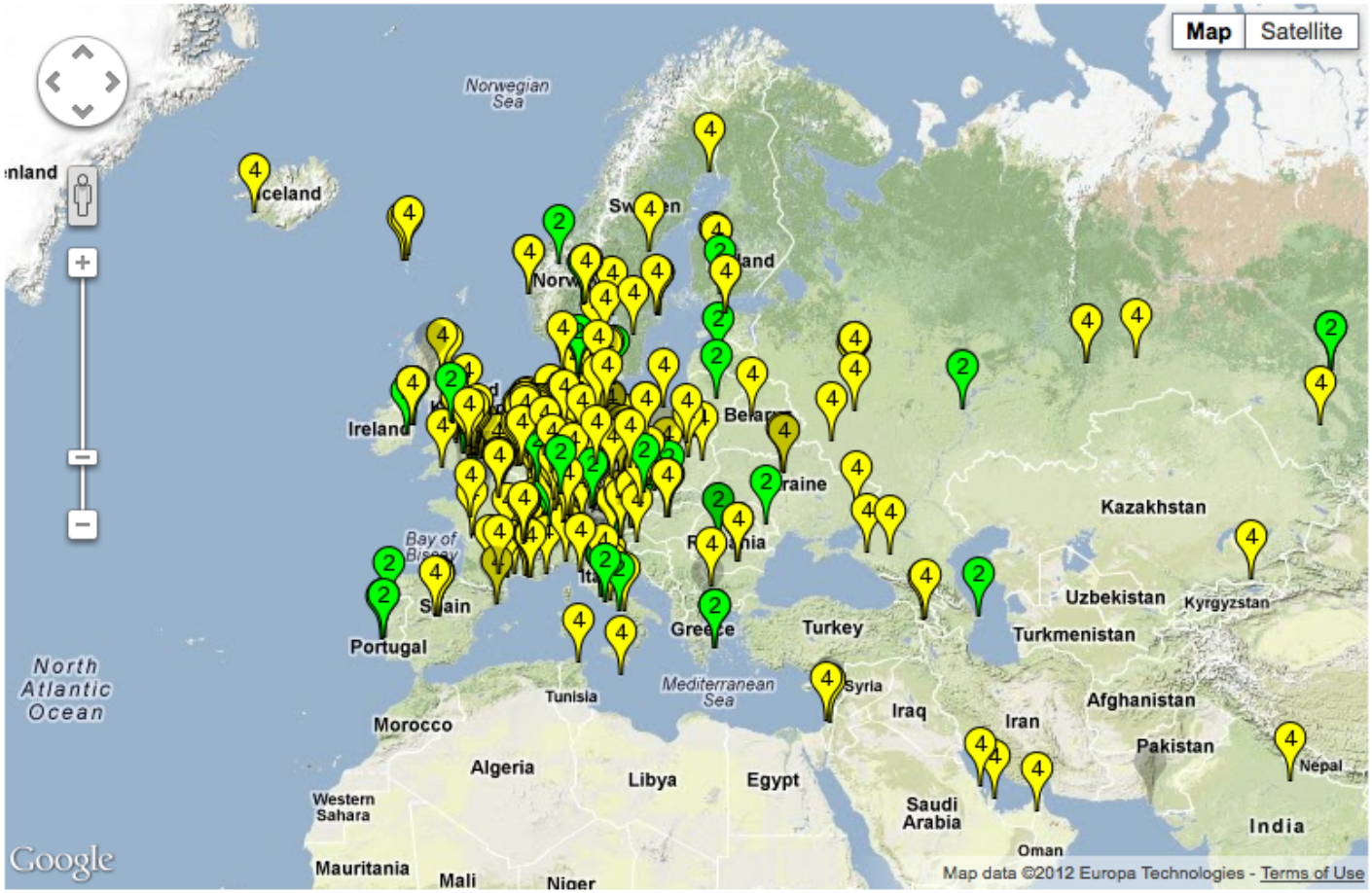
The map below shows, for each Atlas probe, **which root DNS server instance** the probe ends up querying, when they ask a particular root server. This is most useful for servers which use anycasting. In other words, it shows the "gravitational radius" for root DNS server instances. The coloring is used either to highlight significant (e.g. global) nodes, or to group nodes in the same region (Europe, North America, Asia, etc.). You can find the key below the map.
We are showing results of measurements only if they are newer than a day. You can click on each point to get more information.



Results – some differences between v4/v6

Select root DNS server to visualise: a.root-servers.net ○ IPv4 or ◉ IPv6. Showing 495 results. Refresh now! Get Permalink

The map below shows, for each Atlas probe, **which root DNS server instance** the probe ends up querying, when they ask a particular root server. This is most useful for servers which use anycasting. In other words, it shows the "gravitational radius" for root DNS server instances. The coloring is used either to highlight significant (e.g. global) nodes, or to group nodes in the same region (Europe, North America, Asia, etc.). You can find the key below the map.
We are showing results of measurements only if they are newer than a day. You can click on each point to get more information.



Results – by-products

Resource coverage of RIPE Atlas probes

The following tables show how many Atlas probes there are in different ASNs (separately for IPv4/IPv6 connections), IPv4/IPv6 prefixes, and countries. The location is based on the geolocation data provided by the probe hosts.

You can click on ASNs and prefixes to get their explanation from RIPEstat. Clicking on the number of probes show where those probes are on a map. The tables are also reorderable by clicking on the header.

ASN coverage for IPv4:

ASN ⇵	Number of up probes ⇵
3320	54
6830	25
12322	25
3265	17
31334	15
5089	12
2119	12
20712	11
20825	11
3209	10
9143	9
2856	9
3292	9
4739	8
6805	8
3215	6
24923	6
4802	6
3269	6
21502	6
15557	5

ASN coverage for IPv6:

ASN ⇵	Number of up probes ⇵
6939	38
1103	29
4589	14
12322	14
3265	11
20712	7
8422	6
3333	5
39326	5
16150	5
30781	4
3292	4
51827	4
12989	3
1213	3
786	3
37105	3
15389	3
13030	3
34225	3
29134	3

Prefix coverage for IPv4:

IPv4 prefix ⇵	Number of up probes ⇵
79.192.0.0/10	15
84.128.0.0/10	10
83.160.0.0/14	8
193.0.10.0/23	7
81.187.0.0/16	7
82.224.0.0/12	7
91.0.0.0/10	7
80.100.0.0/15	6
82.240.0.0/12	5
178.200.0.0/15	5
78.192.0.0/10	5
95.96.0.0/15	5
85.240.0.0/13	5
93.192.0.0/10	5
217.80.0.0/12	4
81.56.0.0/15	3
62.194.0.0/16	3
95.112.0.0/13	3
82.197.160.0/19	3
41.216.192.0/24	3
80.56.0.0/16	3

Prefix coverage for IPv6:

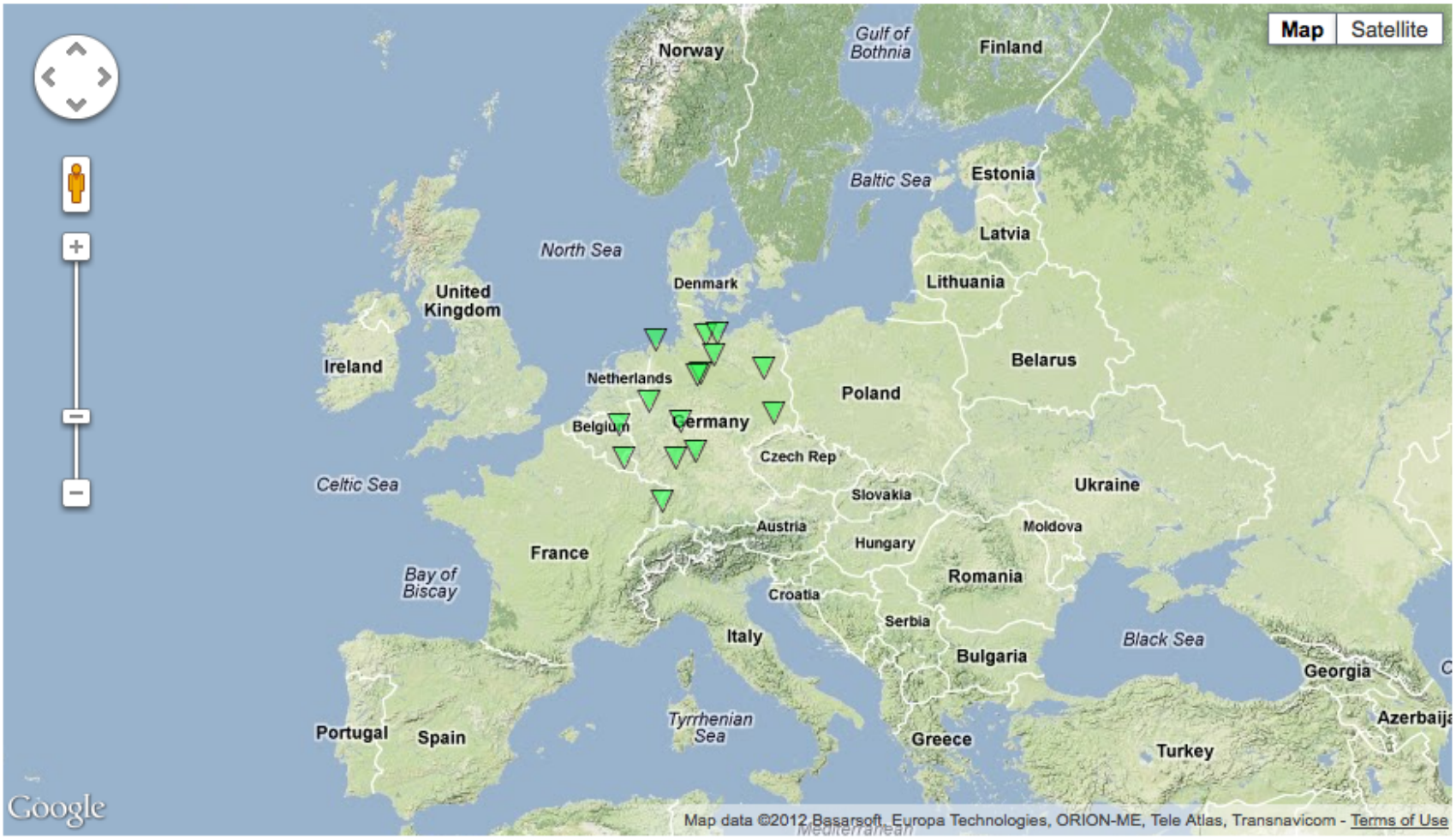
IPv6 prefix ⇵	Number of up probes ⇵
2001:470::/32	53
2002::/16	36
2001:6f8::/32	15
2001:980::/32	14
2a01:e00::/26	14
2001:4dd0::/32	8
2001:8b0::/32	7
2001:16d8::/32	7
2001:610::/32	7
2001:67c:2e8::/48	6
2001:1418::/32	5
2a01:348::/32	5
2a02:2918::/32	4
2001:630::/32	4
2a01:198::/32	4
2001:5c0:1400::/39	4
2001:1620::/32	3
2a02:e90::/32	3
2001:43e8::/32	3
2001:690::/32	3
2a01:630::/32	3

Country coverage:

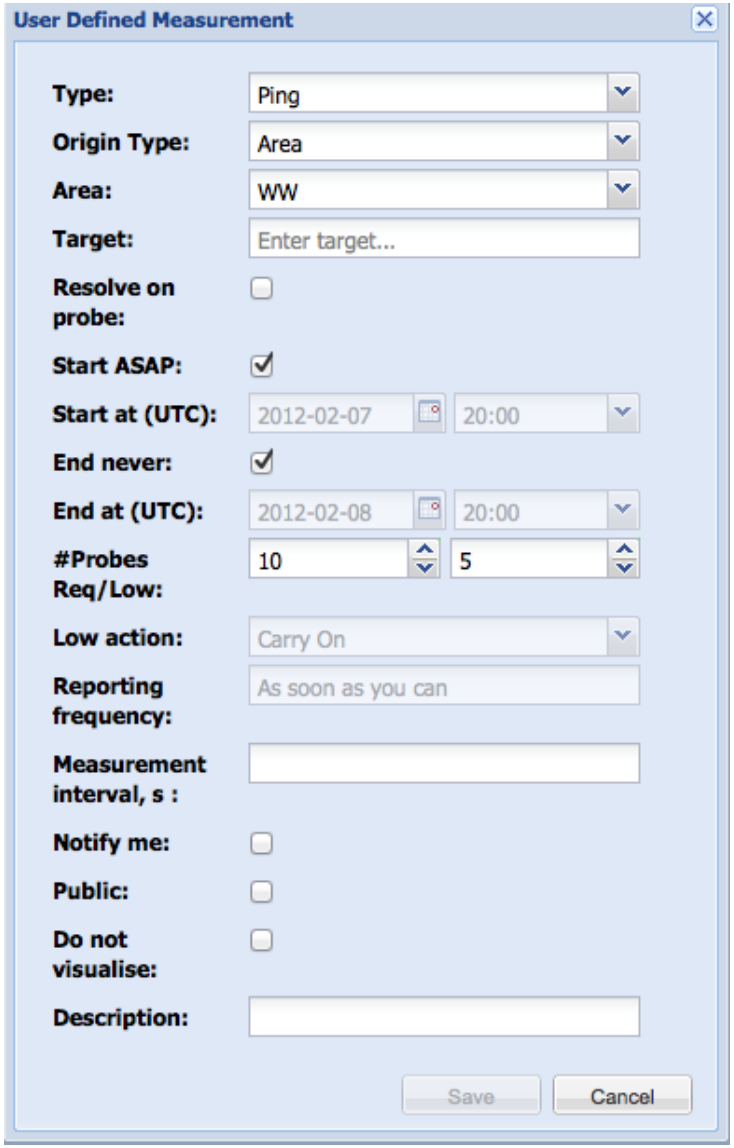
Country code ⇵	Number of up probes ⇵
DE	192
GB	113
FR	94
NL	71
US	61
RU	56
IT	48
SE	38
DK	33
CH	32
AU	30
CZ	28
AT	28
NO	27
ES	25
PL	24
PT	21
BE	21
FI	19
UA	17
RO	16

Results – by-products

Up Probes for prefix_v6: 2001:6f8::/32

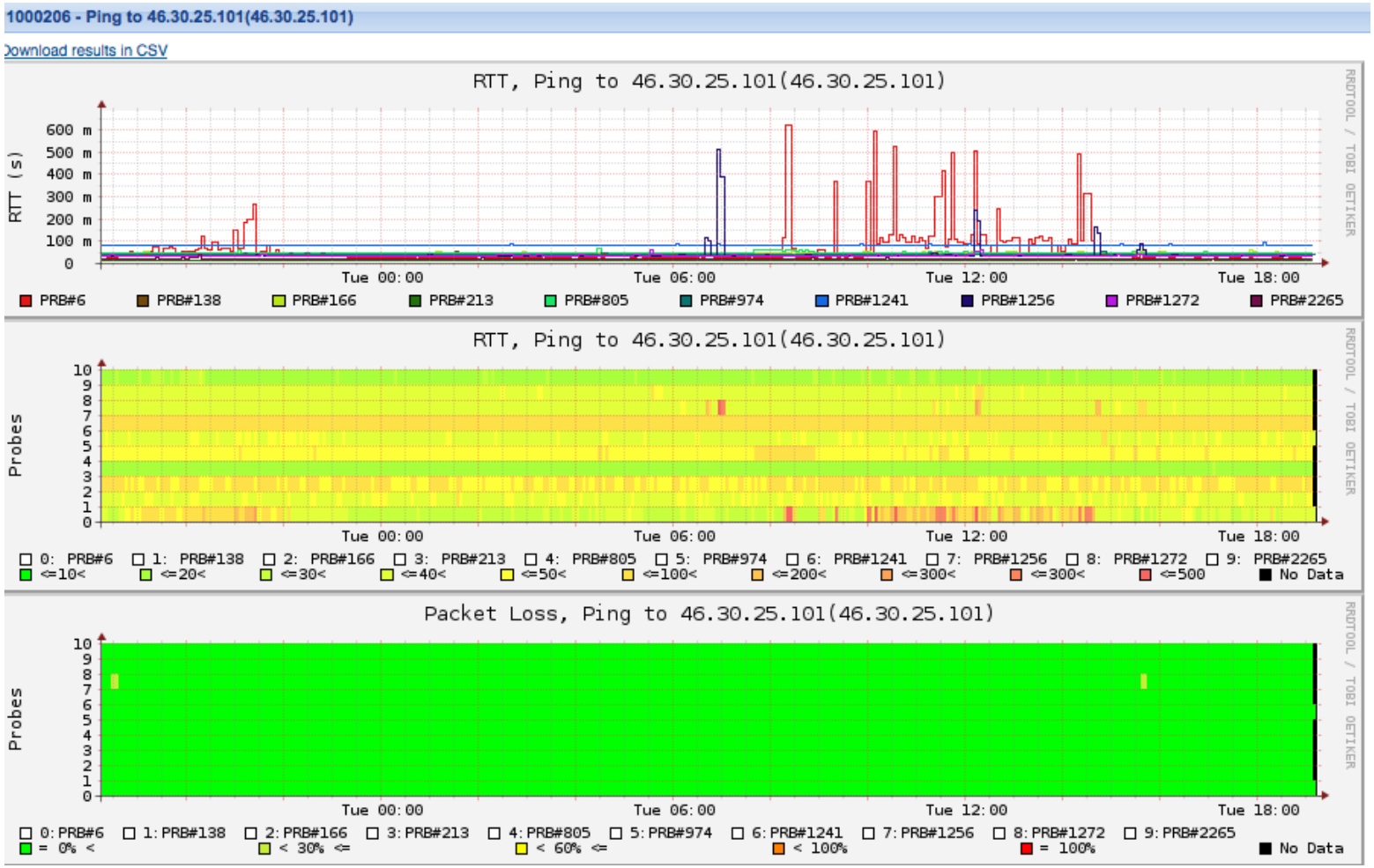


Next step: “User Defined Measurements”



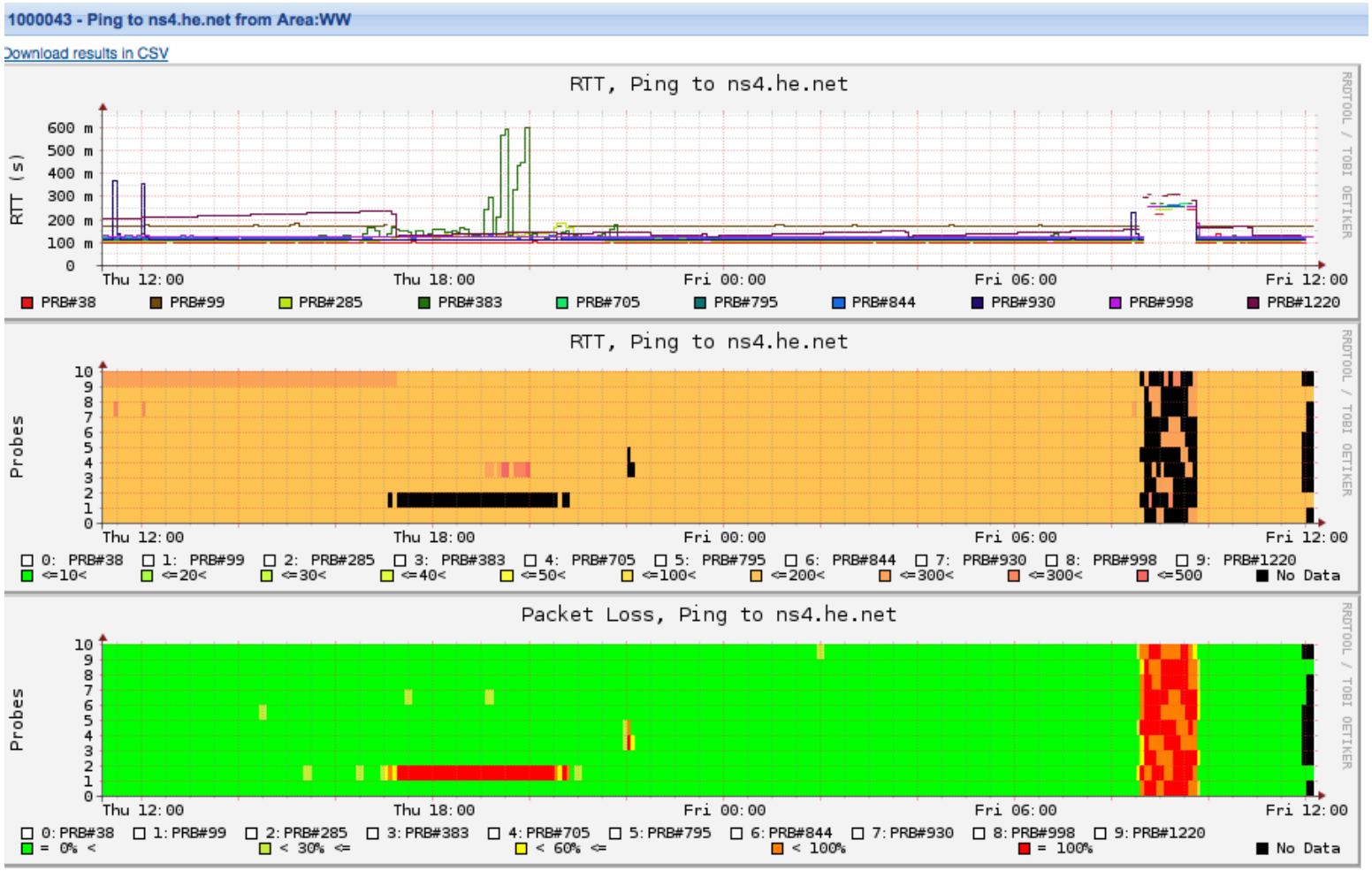
Next step: “User Defined Measurements”

This is all fine:



Next step: “User Defined Measurements”

This is not so fine:



Data sharing

- We intend to share all this data with the community
  - Caveat: some data protection / privacy concerns
- We'll also document APIs that we build:
  - To get access to the data
  - To get access to some metadata
  - To be able to control your measurements

Questions?

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