

Update on RIPE NCC R&D Activities

And how they can be useful for the global
Internet community

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RIPE NCC

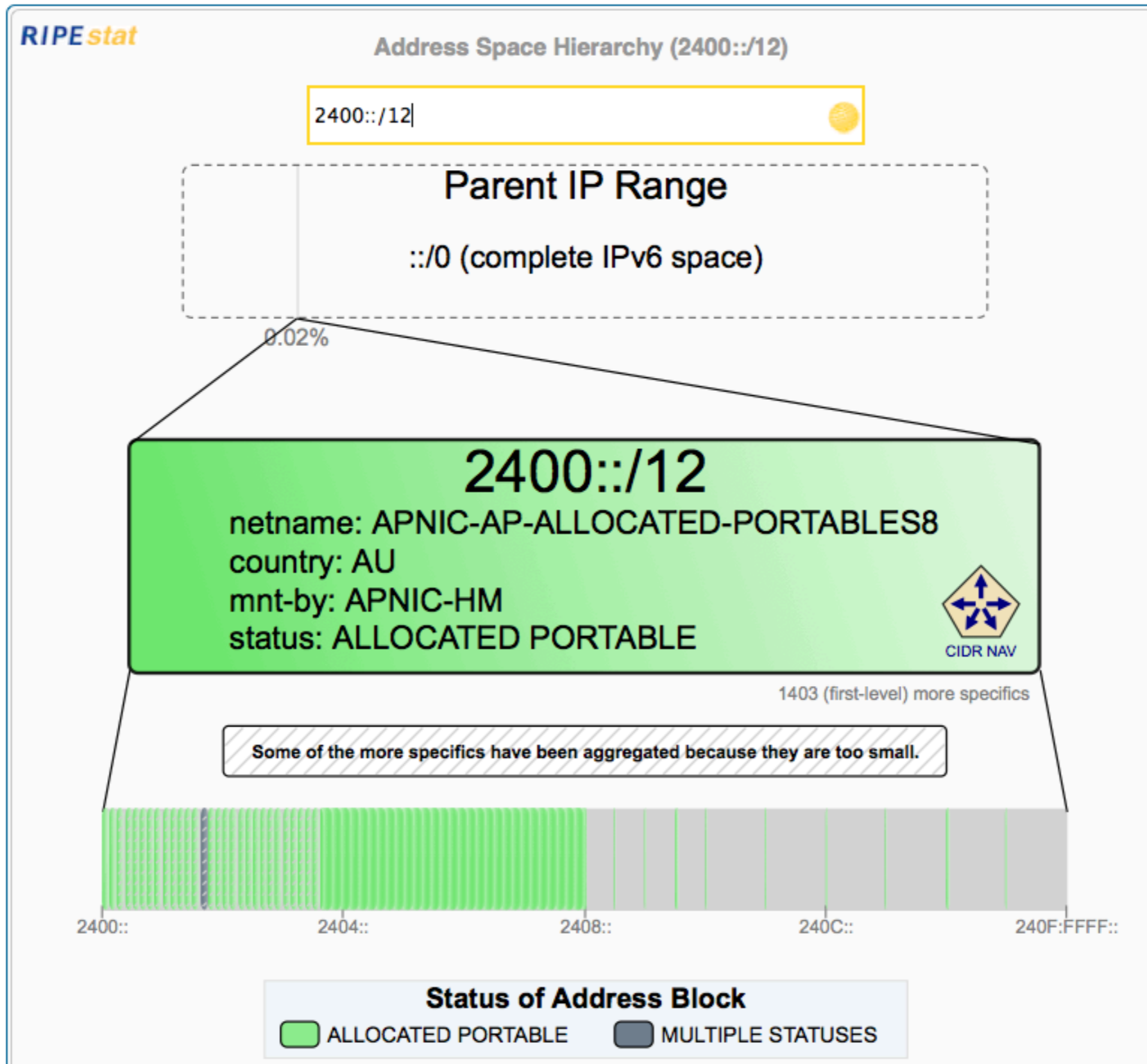


RIPEstat

RIPEstat

- “anything you every wanted to know about an Internet resource”
- <http://stat.ripe.net/>
- Recently included: APNIC database
- Planned (for members): database history

Ex: 2400::/12 (RIPEstat object browser)



World IPv6 Launch



Pre-Jun IPv6 Enabled Networks vs. Edge

- IPv6 ASes : 13.6%

source: <http://v6asns.ripe.net>

- IPv6 end-users : 0.6%

source: <http://www.google.com/intl/en/ipv6/statistics/>

- IPv6 content : 1.3%

<http://banjo.employees.org/~dwing/aaaa-stats.html>

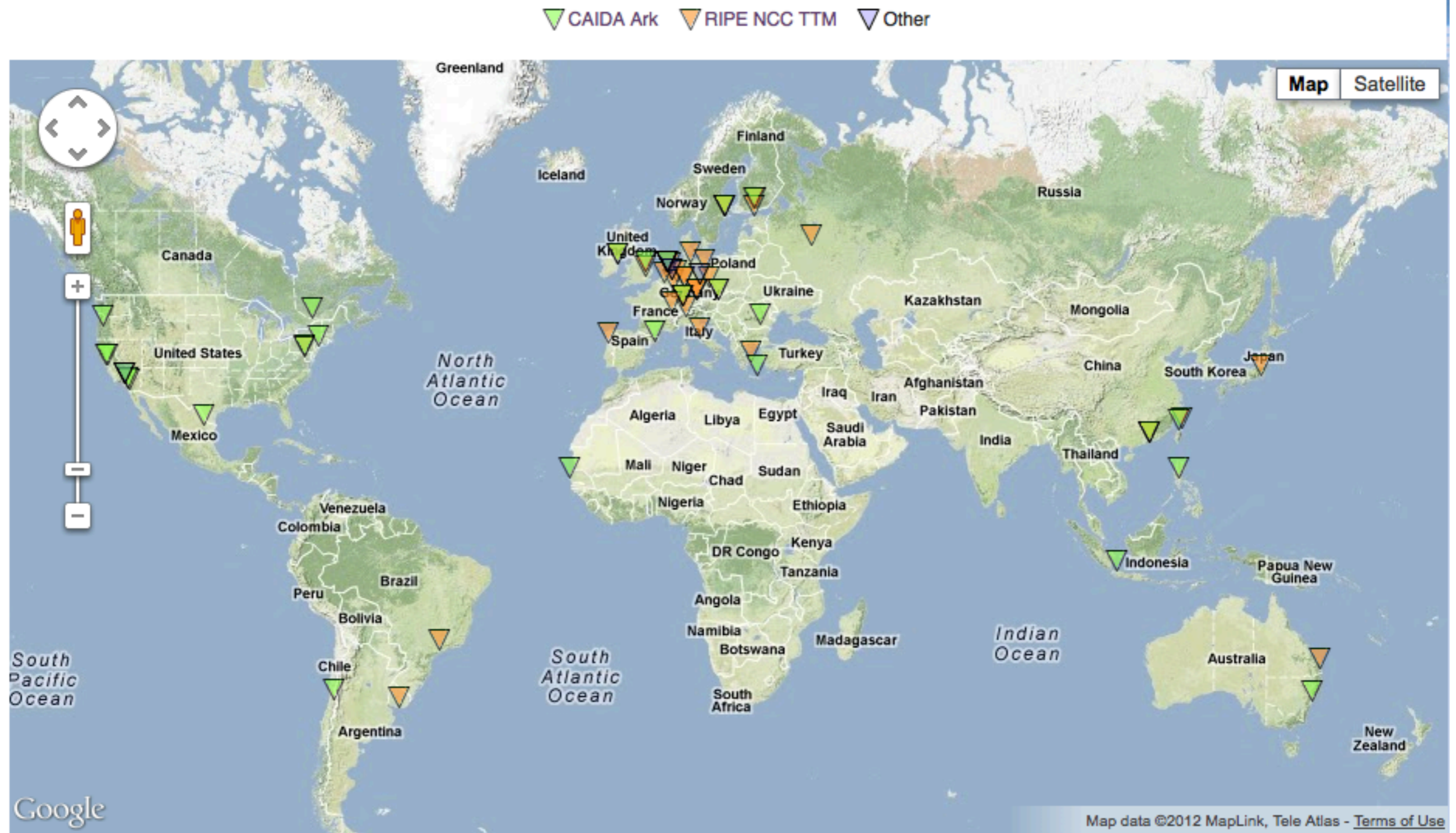
- IPv6 not getting to the edges enough yet,
 - World IPv6 Day (last year) helped
 - World IPv6 Launch (this year) helped even more

IPv6 Dashboard

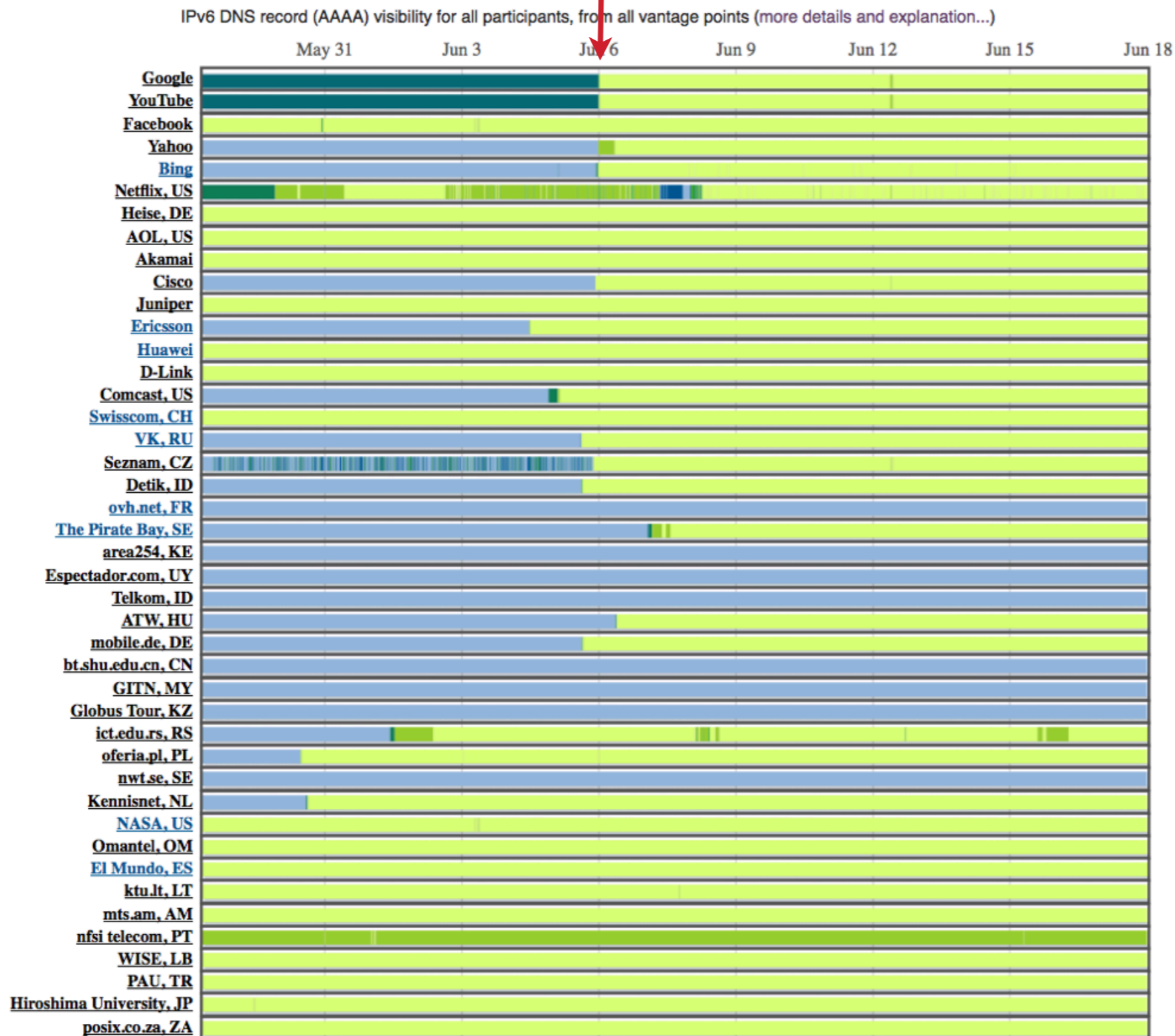
- Measuring a selection of World IPv6 Launch participants (web sites)
- 50+ vantage points to 50+ participants
- Measurements:
 - DNS A/AAAA
 - Round trip time (ping)
 - Forward path (traceroute)
 - HTTP page fetch

<http://ipv6launch.ripe.net>

Vantage points (CAIDA, RIPE NCC, others)



What Did We See?

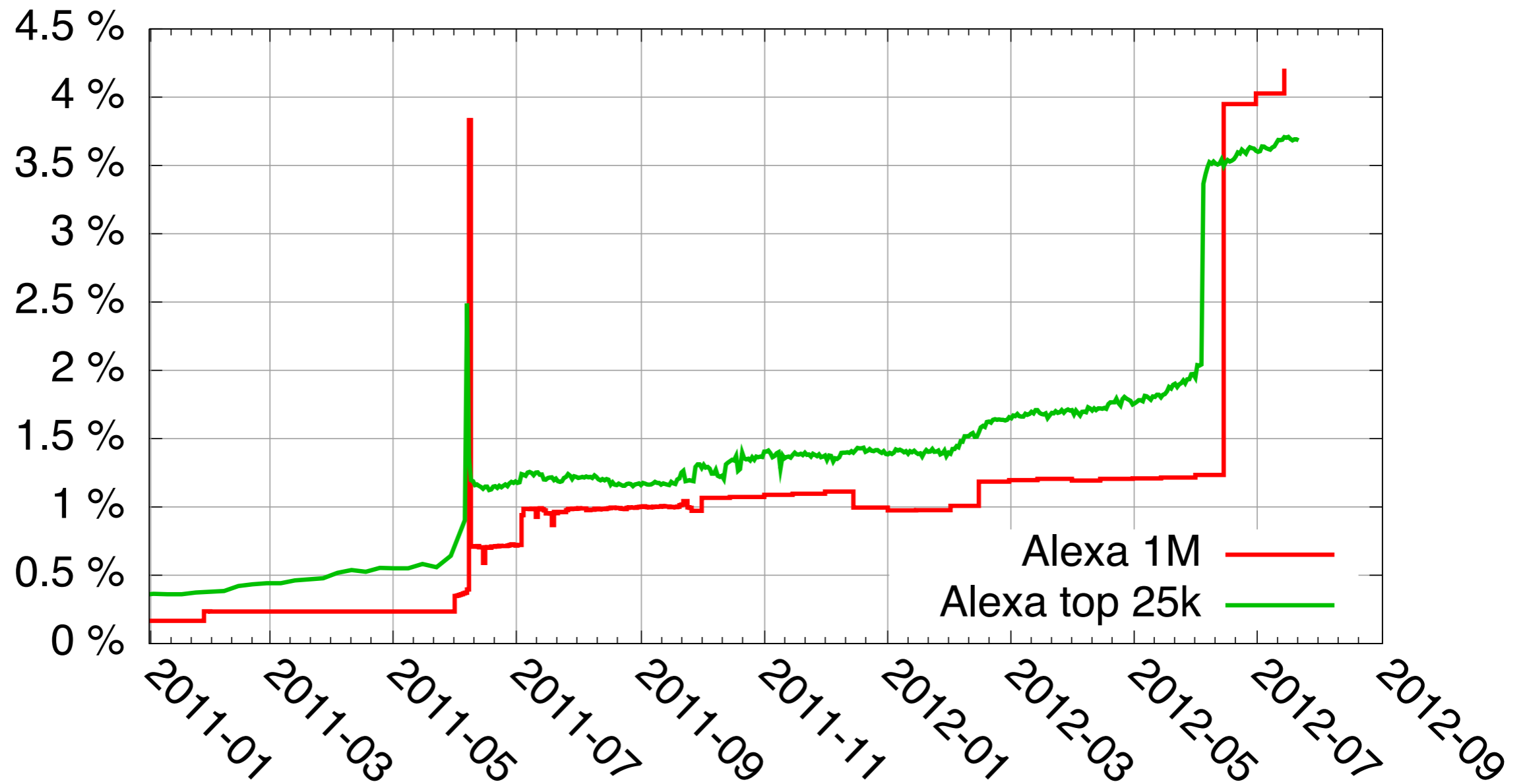


What did we see?

- Most people “turned up” IPv6 on websites
 - quite often even earlier (confidence)
 - and kept it up after 2012-06-06
- Tried to contact those that didn't
 - Hard! Keep RIR database contact info up to date (these are not only spam-traps!)

The Bigger Picture: Alexa 1M (hosting)

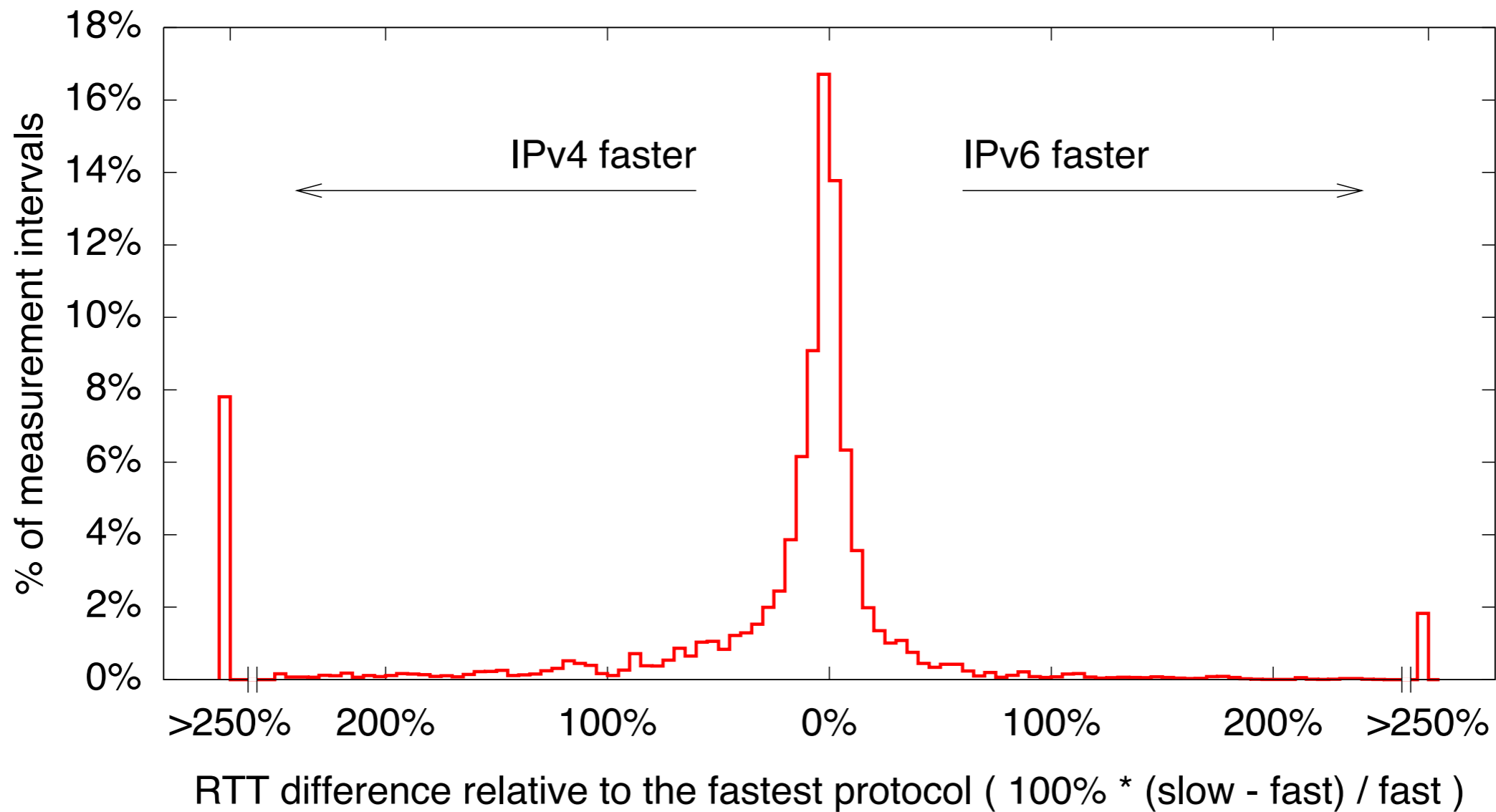
Percentage of web sites in Alexa 1M that can be reached over IPv6



Raw data: Dan Wing

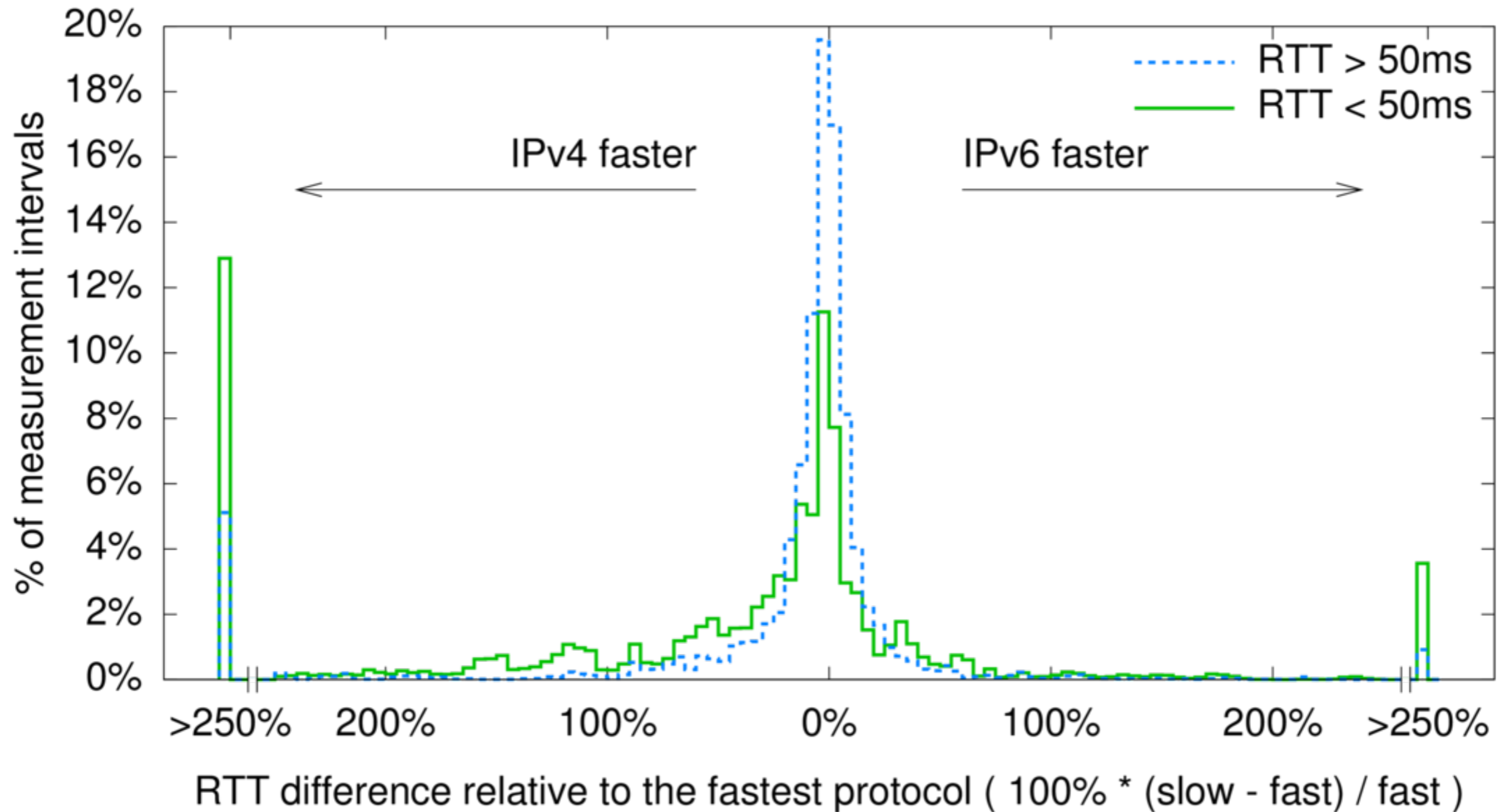
Performance during World IPv6 Launch

Relative performance of IPv4/IPv6



Performance split out

Relative performance of IPv4/IPv6

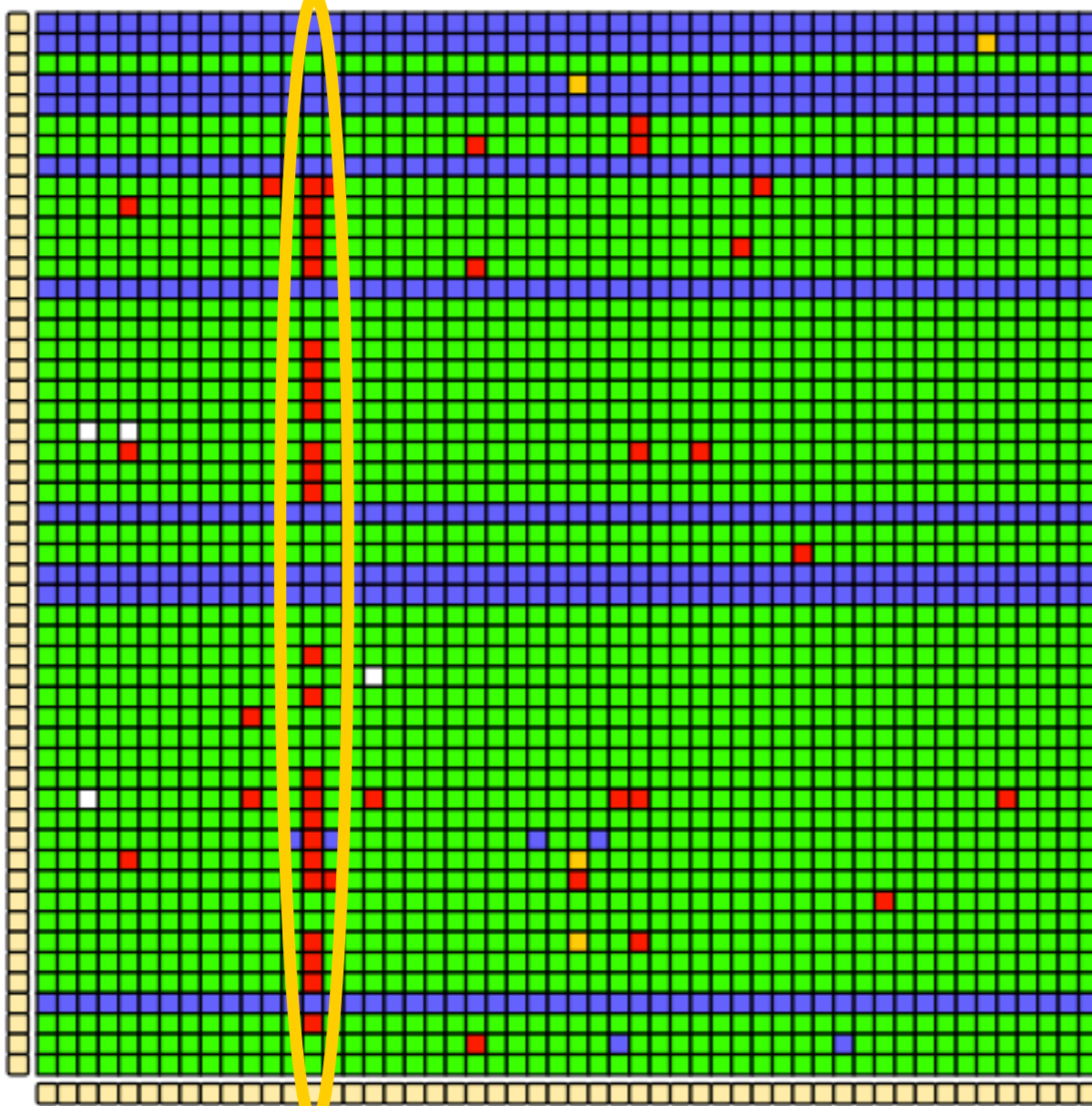


Performance conclusion

- For the src/dest pairs we measured:
 - 10%/62%/28% (v6-faster/equal/v4-faster)
- “Happy Eyeballs” can take care of the extremes
- Dual-stack: 2 chances for best performance
 - In 10% of cases we measured, hosts are significantly better of on IPv6 already currently

IPv6 HTTP Measurements (4:30 AM 6 Jun)

IPv6 Launch Participants



vantage points

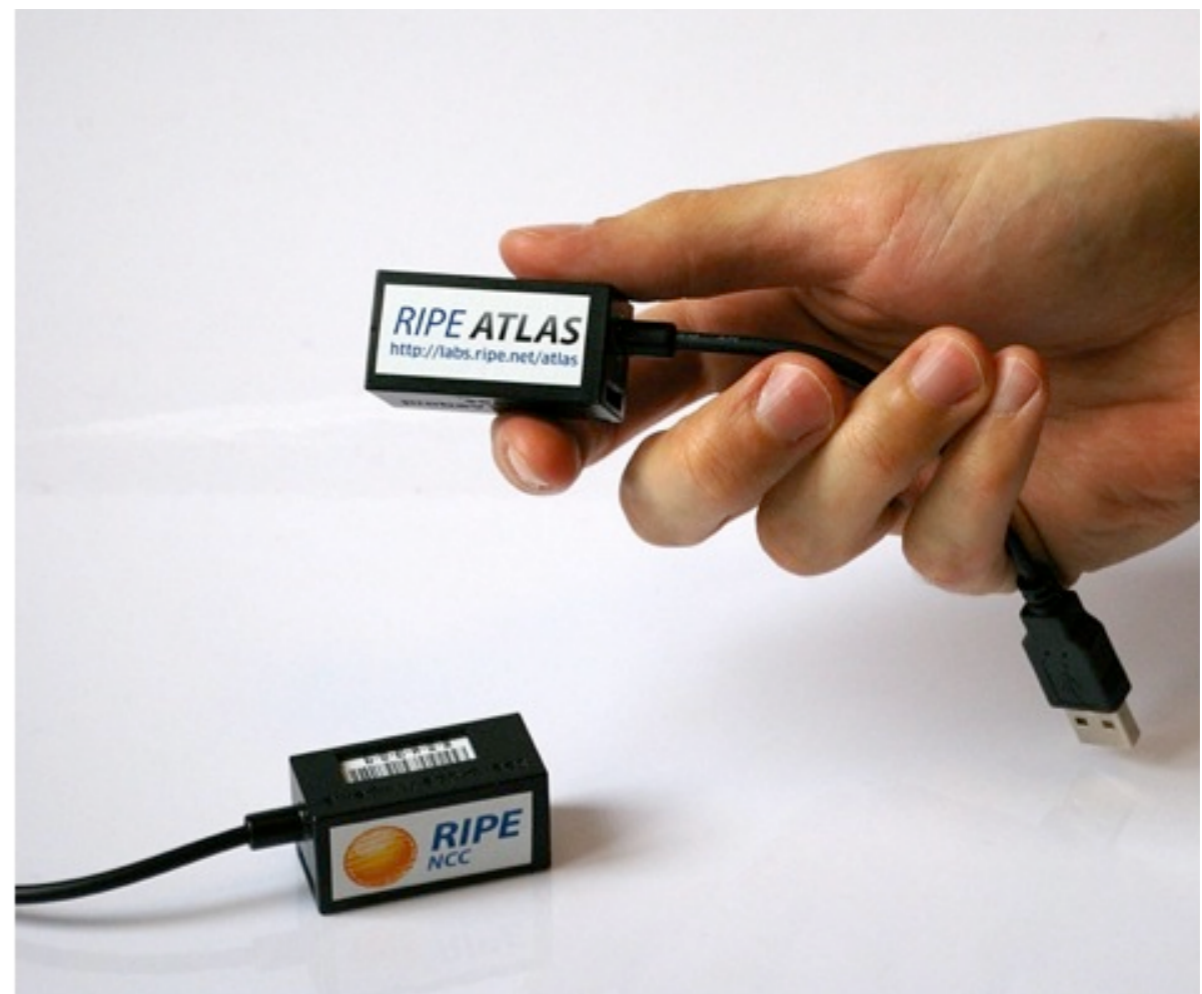
- green: ok
 - red: failed
 - blue: no IPv6
 - orange: DNS error
-
- One vantage point with limited IPv6
 - Slightly more failures in IPv6 than in IPv4

<http://v6launch.ripe.net/cgi-bin/http.cgi>
<http://www.youtube.com/watch?v=a-sv0JLLbCw>

IPv6 has slightly more reachability problems

- How does the outside world see you?
 - Less than 1% of end-users uses IPv6:
 - Hardly any complaints if IPv6 breaks

- RIPE Atlas can help
 - <https://atlas.ripe.net>



Traceroute6 with RIPE Atlas

<https://labs.ripe.net/Members/becha/test-your-ipv6-reachability-using-ripe-atlas>



Traceroute6 From 600+ Vantage Points

- In preparation for World IPv6 Launch
 - LIRs (RIPE NCC members) can traceroute6 to their website from all IPv6 enabled RIPE Atlas probes
 - APNIC members?
 - Unprocessed traceroute6 output available after ~1 hr
 - Analyse 600+ traceroutes and make data easy to navigate

IPv6 Enabled RIPE Atlas Nodes



Traceroute6 Data Reduction

- Raw traceroute6 output (> 600x):

```
Traceroute from Probe 1050 to 2001:67c:e0::6 (Tue Jul 10 12:37:32 2012 UTC)
 1      2404:2000:3000:80::1 23905                4.121 4.552 4.6
 2      2001:7fa:3:ca07::55          vuw.wix.net.nz.    1.994 2.279 2.329
 3      2406:e000:8400::1 23655                2.231 2.345 2.559
 4      2001:4403:0:103::101 9901 cust-ge-0-1-0-969.xcore2.telstraclear.net. 10.637 10.883 18.417
 5      2001:4403:0:103::1 9901 ge-0-1-0-969.xcore2.telstraclear.net. 11.136 11.231 11.235
 6      2001:550:2:58::5:1 174                140.007 140.099 140.112
 7      2001:550:3::1c6 174                141.875 142.579 190.228
 8      2001:41a8:400::20 6762 lo0.londra32.lon.seabone.net. 290.346 292.018 292.664
 9      2001:67c:e0::6 197000 ns.ripe.net.      283.168 284.325 284.572
```

- Summarise to probable AS-path:

23905 23655 9901 174 6762 197000

- Make pretty picture!

<https://labs.ripe.net/Members/emileaben/visualise-your-ipv6-connectivity-using-ripe-atlas>

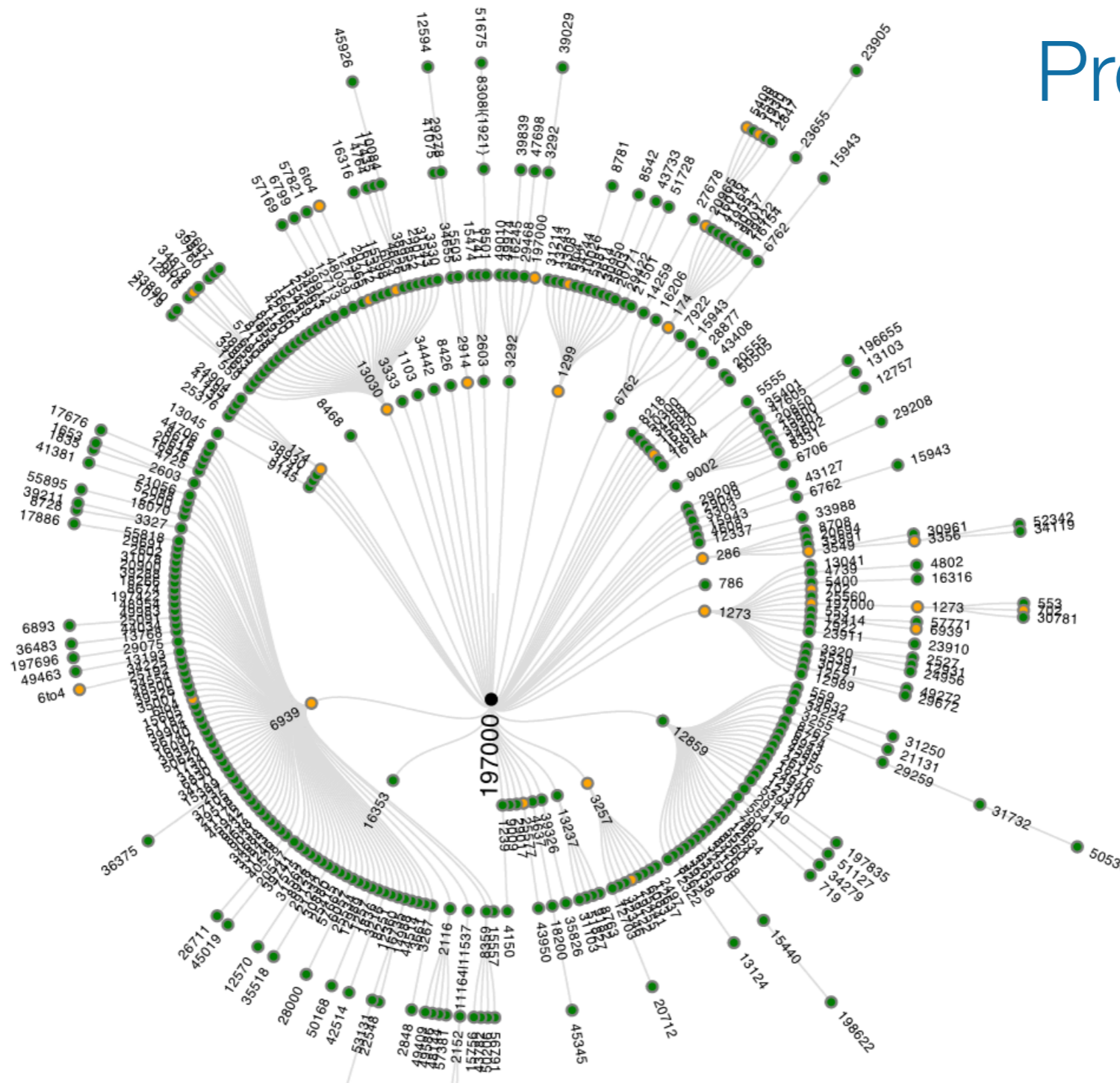
<http://albatross.ripe.net/cgi-bin/demo-area/v6reach.cgi?>

[msm_id=1002799;nonce=2bb398946c5513d966e84182027fc20eaa941e6a204812c3349b76](http://albatross.ripe.net/cgi-bin/demo-area/v6reach.cgi?msm_id=1002799;nonce=2bb398946c5513d966e84182027fc20eaa941e6a204812c3349b76)

[9fb55ec503;no_embed=1](http://albatross.ripe.net/cgi-bin/demo-area/v6reach.cgi?msm_id=1002799;nonce=2bb398946c5513d966e84182027fc20eaa941e6a204812c3349b769fb55ec503;no_embed=1) (or <http://tinyurl.com/v6tracerouteviz>)

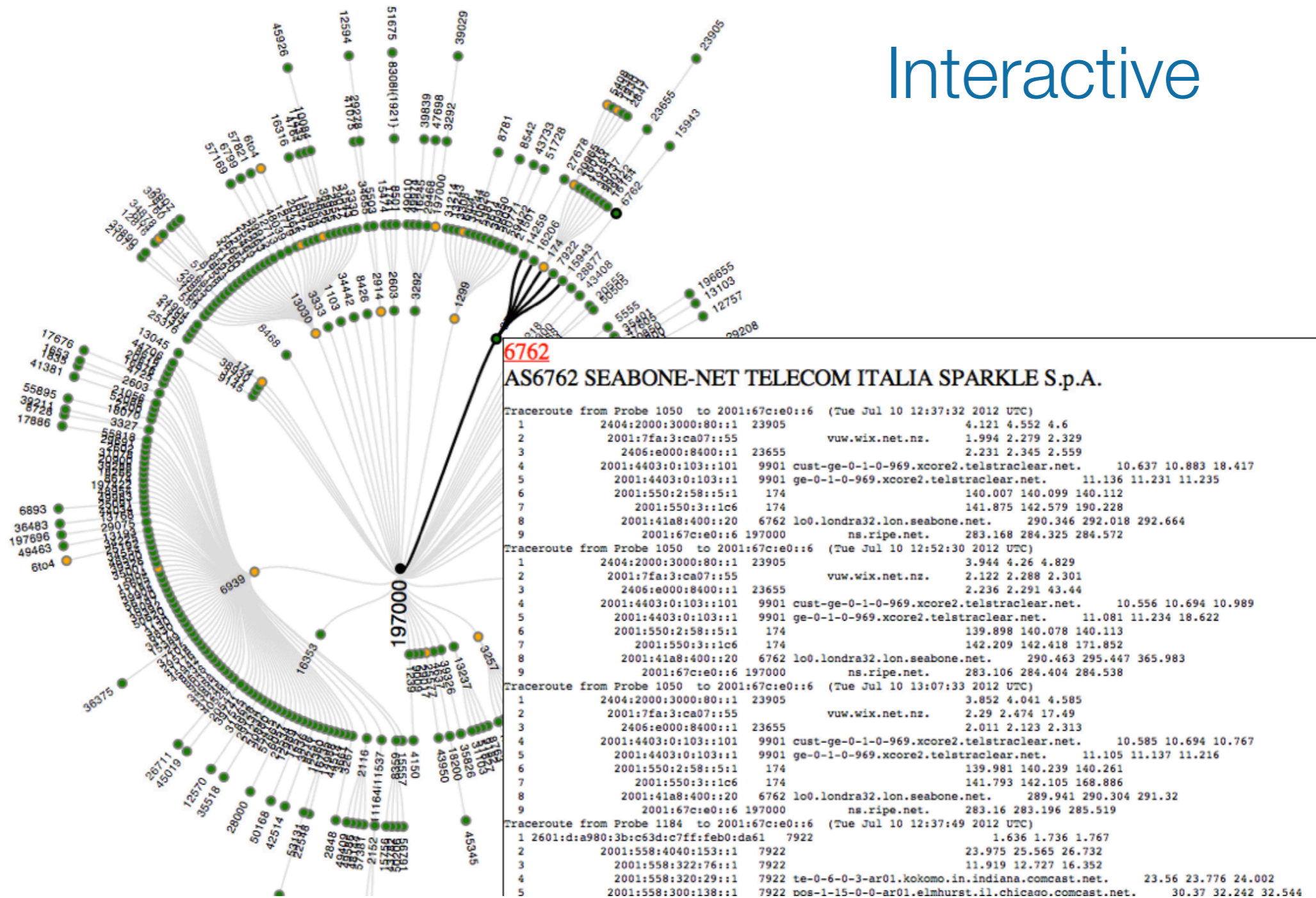
AS-Path Viz: traceroute6 to ns.ripe.net

Prototype!



AS-Path Viz: traceroute6 to ns.ripe.net

Interactive



AS-Path Viz: traceroute6-fail to ns.ripe.net

- Traceroute6 failures can inform about IPv6 reachability problems

RIPE NCC



Problem: False positives

Conclusion

- We are trying to provide useful tools, measurements and analysis for the Internet community, both in our region and beyond
- Let us know what you think,
 - we need your feedback!
- Keep an eye out on RIPE labs
 - <http://labs.ripe.net/>



Questions?

