

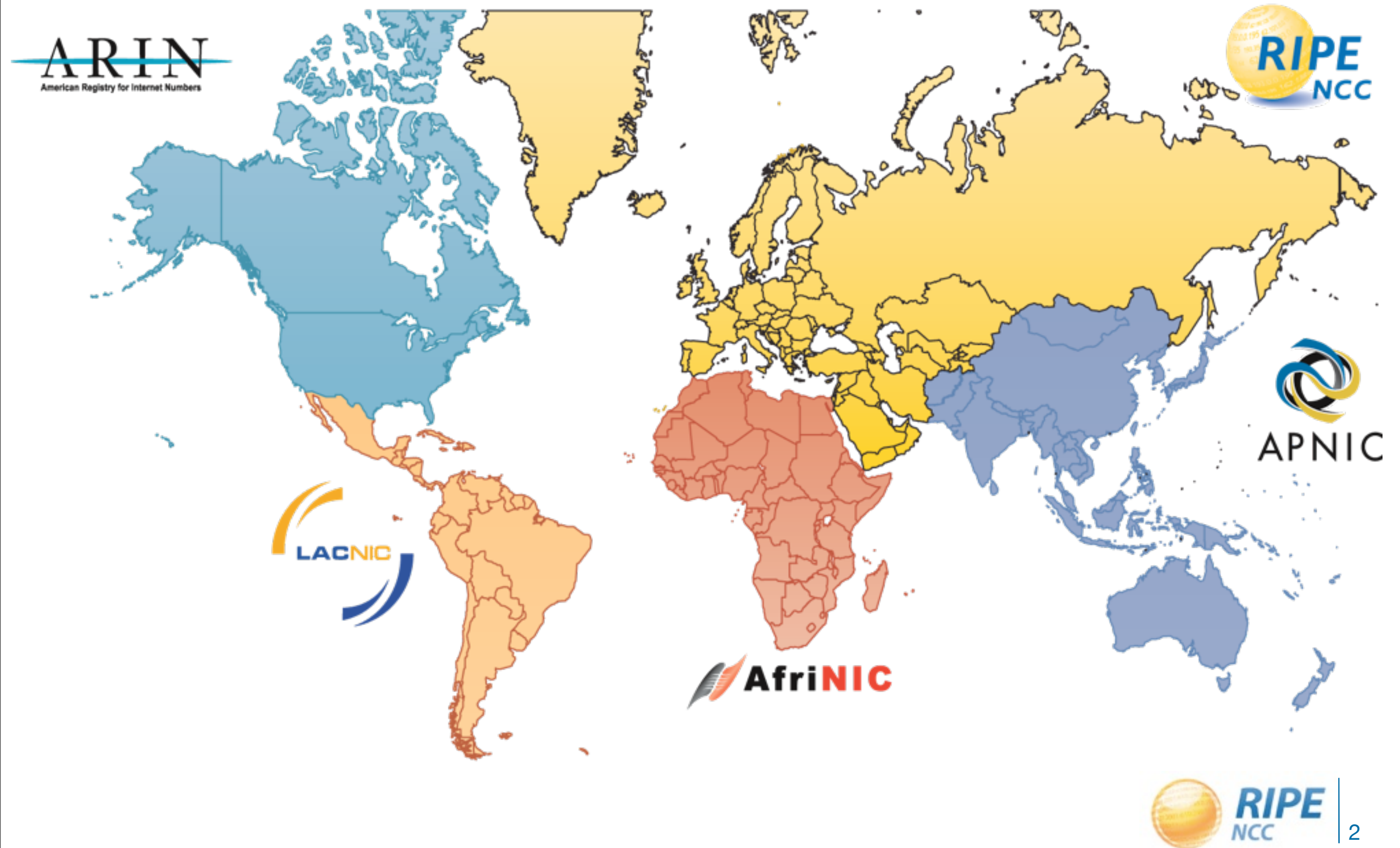
Measuring World IPv6 Day

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5th Slovenian IPv6 summit



The 5 RIRs



An aerial photograph of Amsterdam, showing the city's characteristic canal network, historic architecture, and a large public square with many people.

RIPE / RIPE NCC

RIPE

Network operator community

Develops addressing policies

Working groups + mailing lists

Upcoming meetings:

Dubrovnik 6-9 Sep 2011 (regional)

Vienna 31 Oct- 4 Nov 2011

RIPE NCC

In Amsterdam, since 1992

Not for profit membership organisation

One of five RIRs - distributes IP & ASN

RIPE NCC was already measuring IPv6

- IPv6 enabled networks
- IPv6 “RIPEness”
- and lots more ...
 - See RIPE Labs at <http://labs.ripe.net>

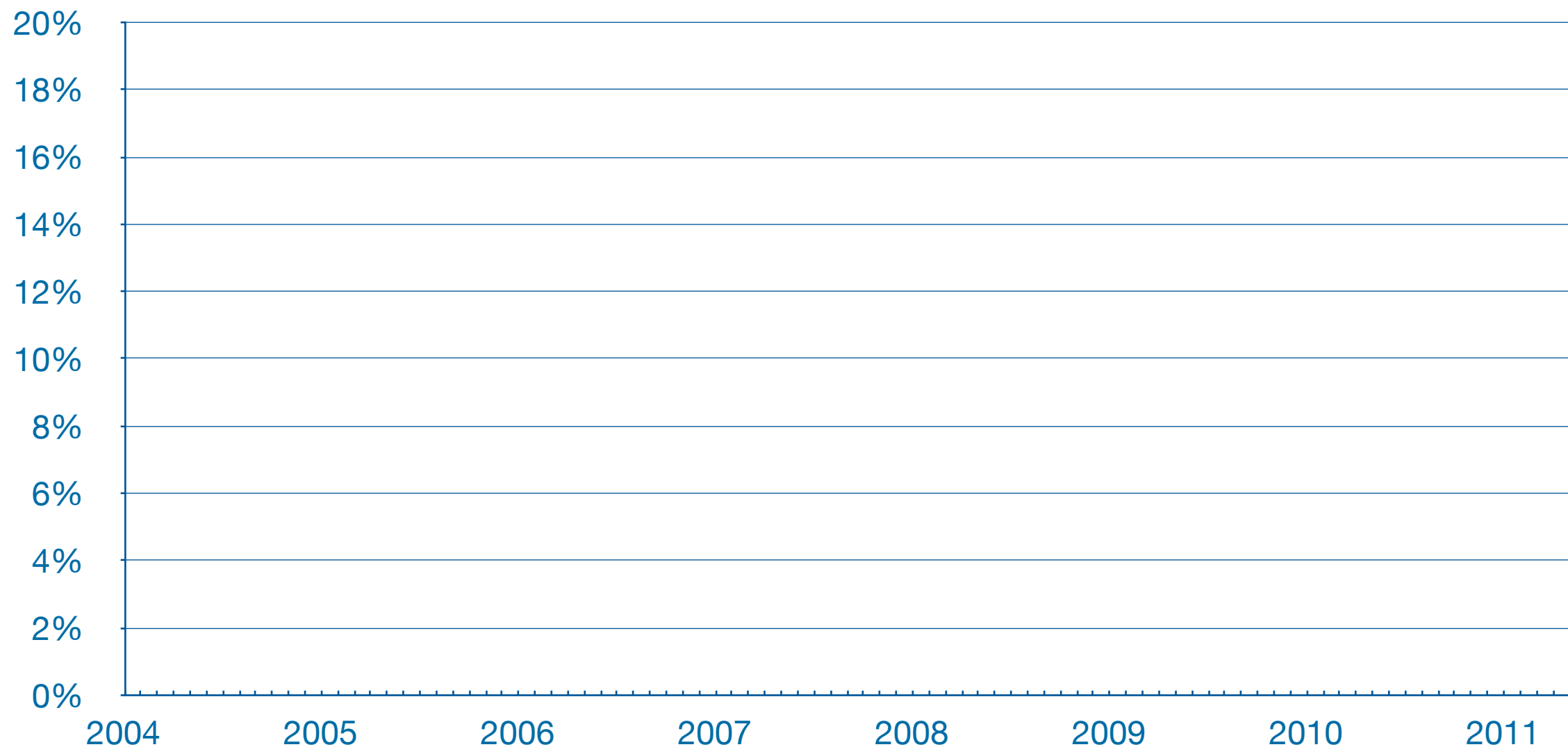
IPv6 enabled networks

— World

— RIPE NCC region

— Slovenia

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



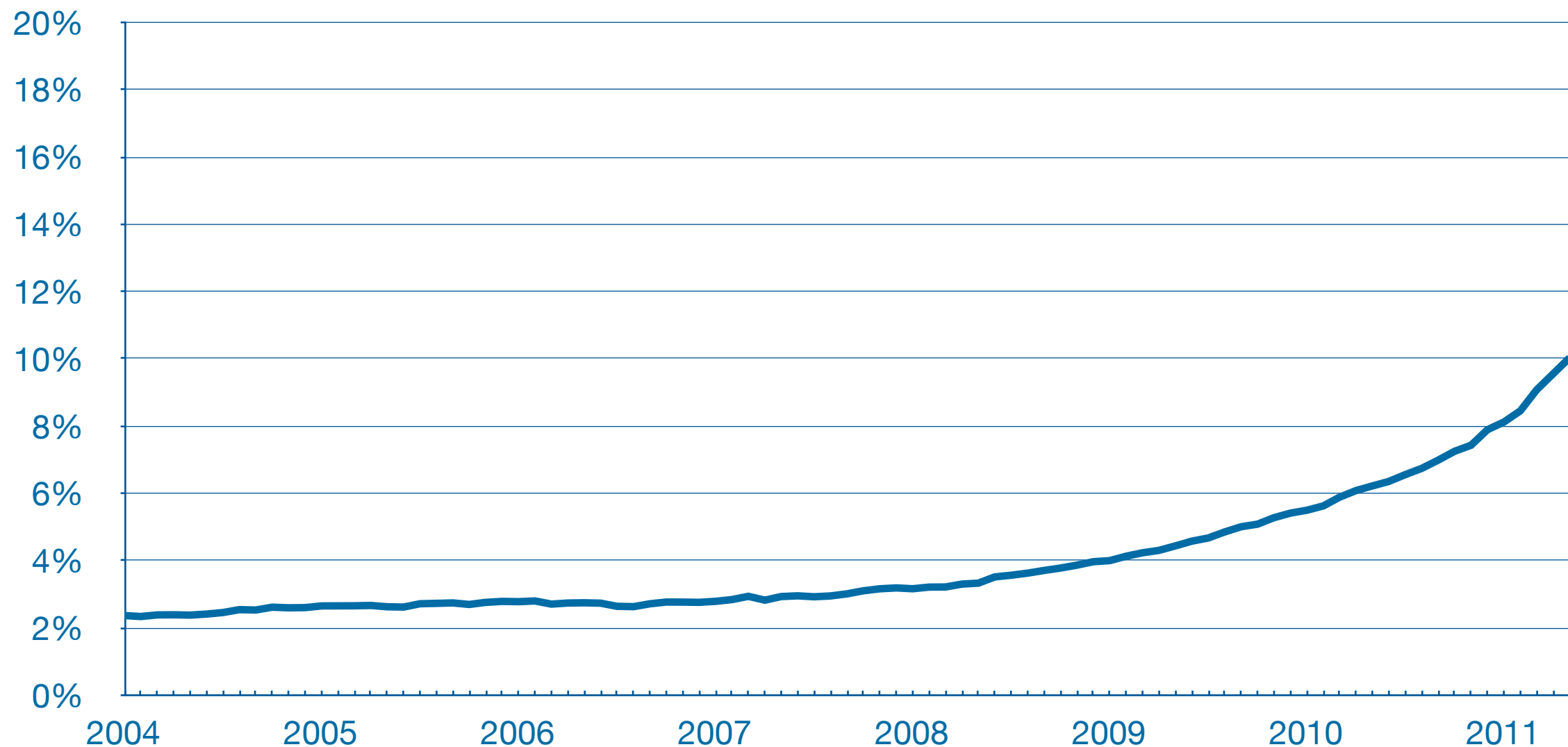
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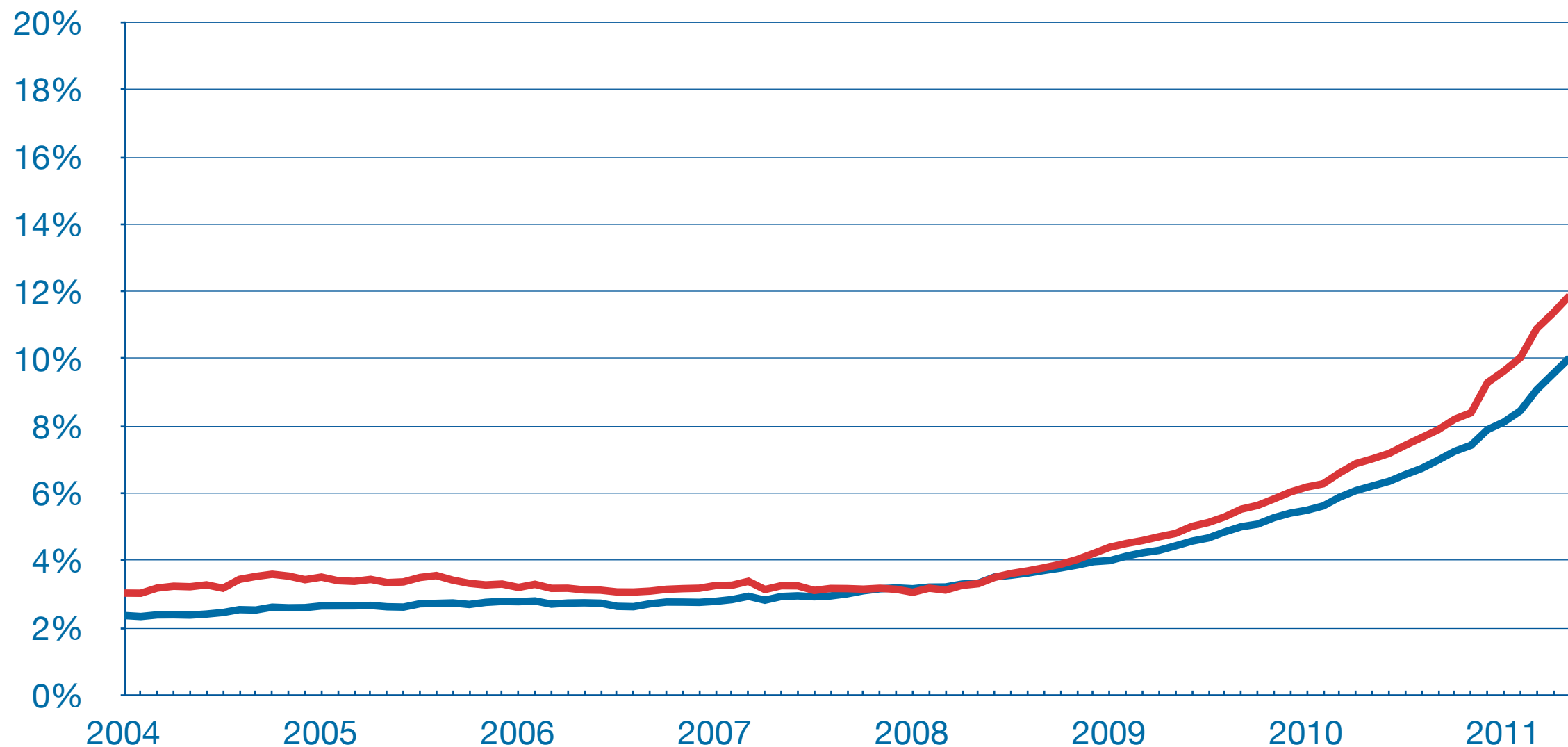
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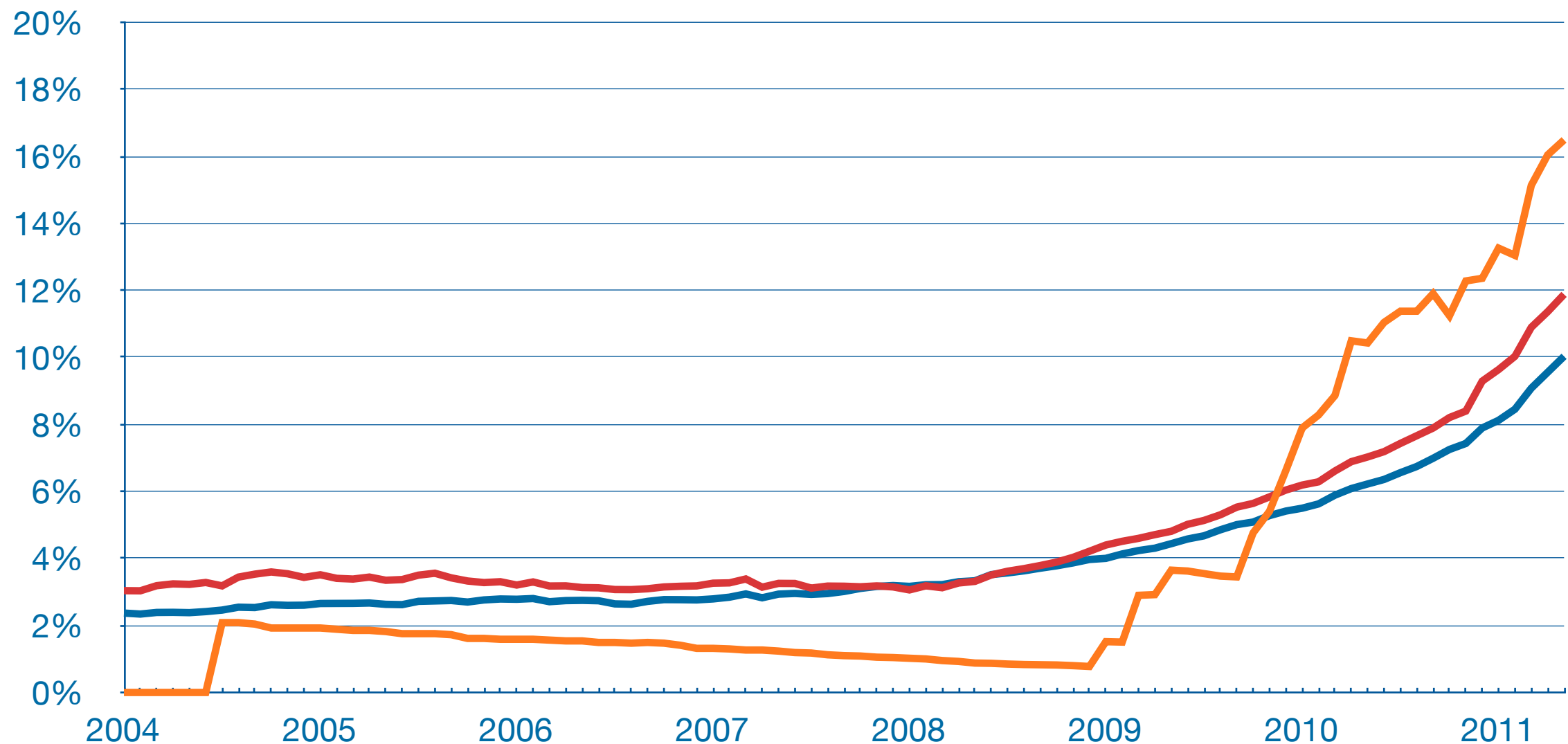
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IPv6 enabled networks

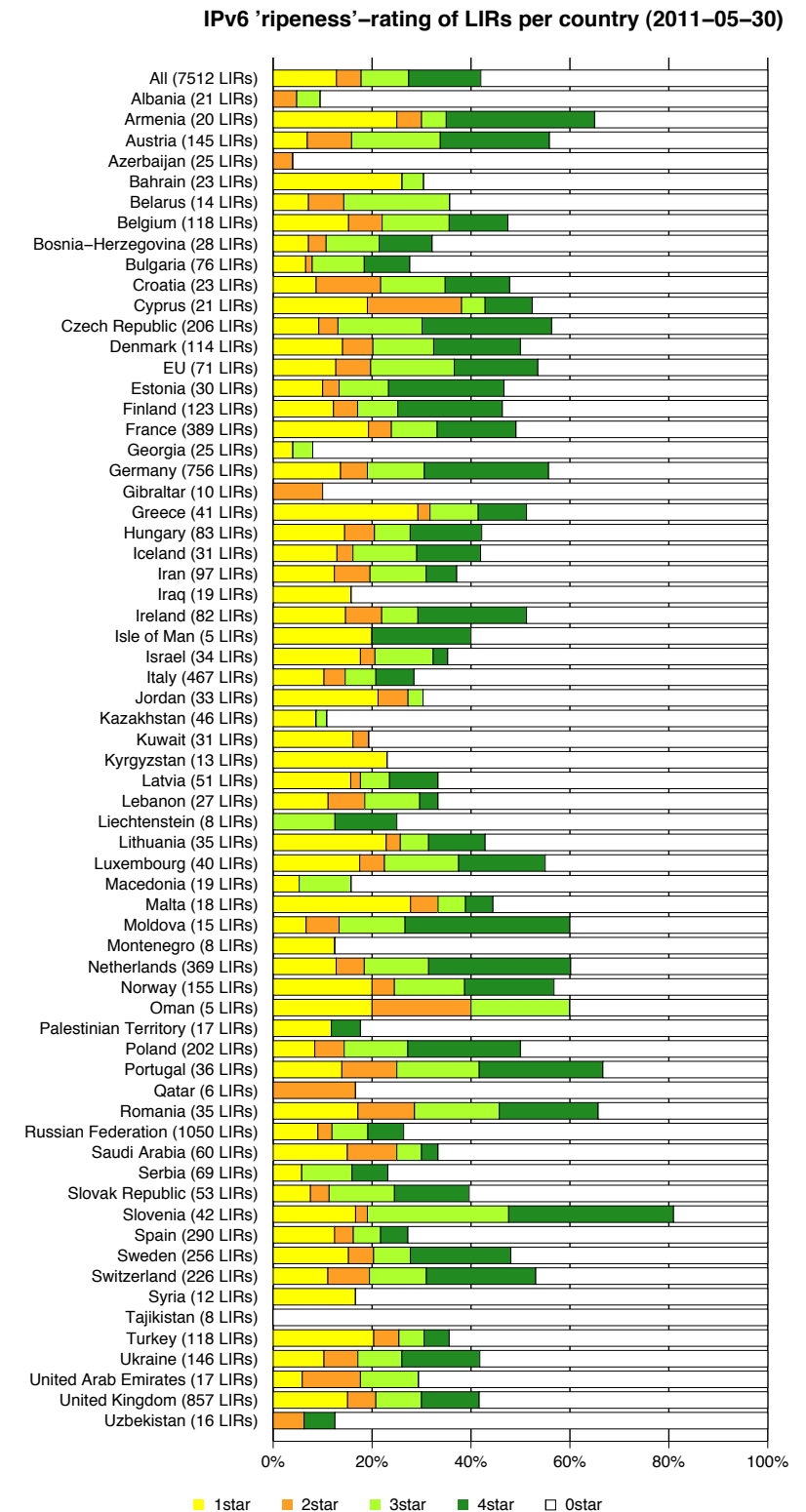
— World — RIPE NCC region — Slovenia

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



IPv6 RIPEness

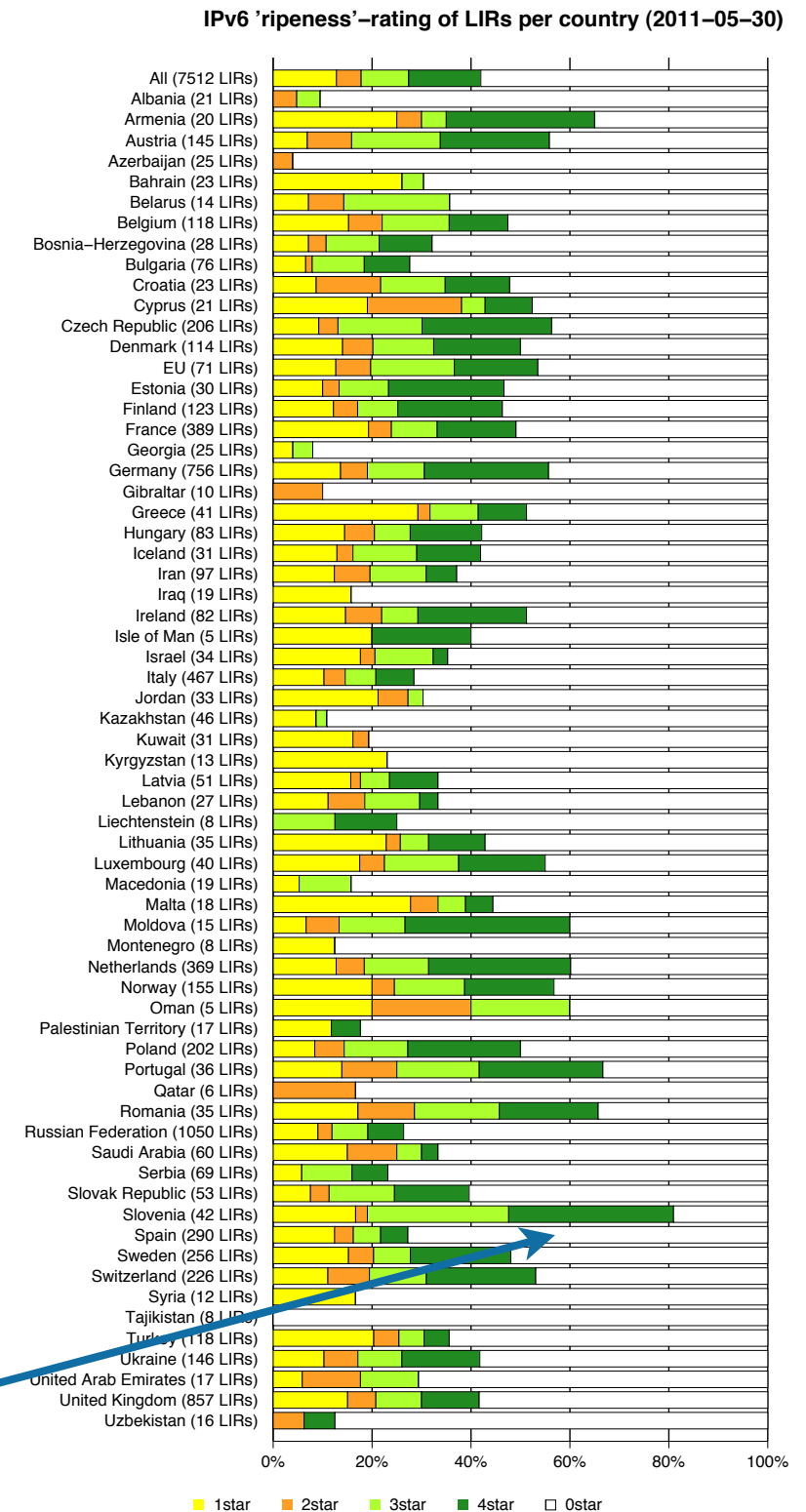
- Rates LIRs based on 4 IPv6 indicators
 - has address space
 - address space announced
 - route6 object in RIPE DB
 - reverse DNS
- <http://ripeness.ripe.net/>



IPv6 RIPEness

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You are here!



World IPv6 Day



World IPv6 Day

- When: 8 June 2011
- What: Content providers will dual-stack content for 24hrs
 - Including: Google, Yahoo, Facebook
- RIPE NCC measurement efforts:
 - IPv6 Eye Chart
 - Active monitoring of v6day participants
 - 6to4 performance

IPv6 Eye Chart

<http://ipv6eyechart.ripe.net/>

IPv6 Eye Chart

- Single webpage for end users to check connectivity before and during World IPv6 day
- Fetch content from WIPv6 participants, and from already dual-stacked websites (RIRs, others)
- Measure to multiple real targets
- Goal: Bring down ‘dual-stack brokenness’
 - 0.013% and falling (source: Google)
- Specific problem: partial reachability

IPv6 Eye-chart: all OK

- If everything OK before World IPv6 day:

Dual stacked websites (dual stack = accessible over both IPv4 and IPv6)

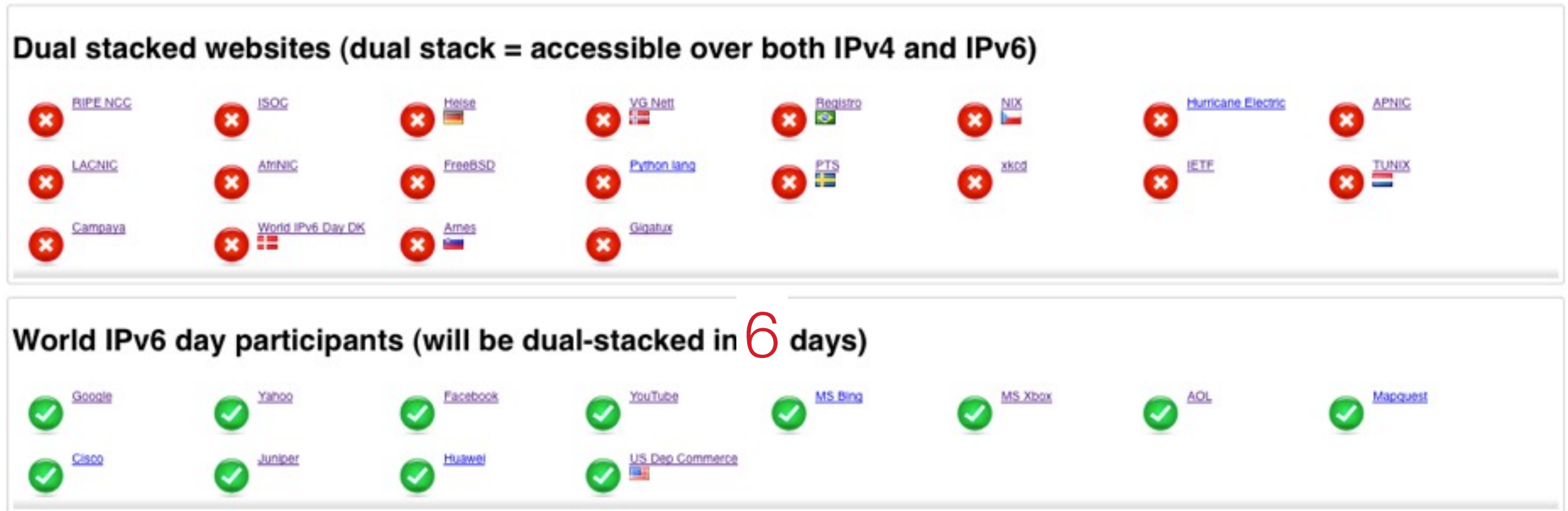


World IPv6 day participants (will be dual-stacked in 6 days)



IPv6 Eye-chart: Not OK

- Host with 'problematic' IPv6. Before World IPv6:



- Please fix before 8 June!
 - Otherwise no Google, Facebook, Yahoo, etc for you.

Partial reachability brokenness

Dual stacked websites (dual stack = accessible over both IPv4 and IPv6)

 RIPE NCC	 ISOC	 Heise	 VG Nett	 Registro	 NIX	 Hurricane Electric	 APNIC
 LACNIC	 AtrNIC	 FreeBSD	 Python lang	 PTS	 xkcd	 IETF	 TUNIX
 Campaya	 World IPv6 Day DK	 Arnes	 Gigatux				

World IPv6 day participants (will be dual-stacked in 6 days)

 Google	 Yahoo	 Facebook	 YouTube	 MS Bing	 MS Xbox	 AOL	 Mapquest
 Cisco	 Juniper	 Huawei	 US Dep Commerce				

- Network operator needs to fix (not end-user)
- Very rare, and also happens in IPv4

Active measurements on World IPv6 Day

(Soon to be on <http://labs.ripe.net>)



Active Measurements - How?

- Measurement infrastructure:
 - TTM: Test Traffic Measurement service
 - Infrastructure of 100+ machines distributed worldwide
 - 40+ are IPv6 enabled
 - High-precision measurements
 - CAIDA Ark
 - RIPE Atlas infrastructure (not probes)
 - Others



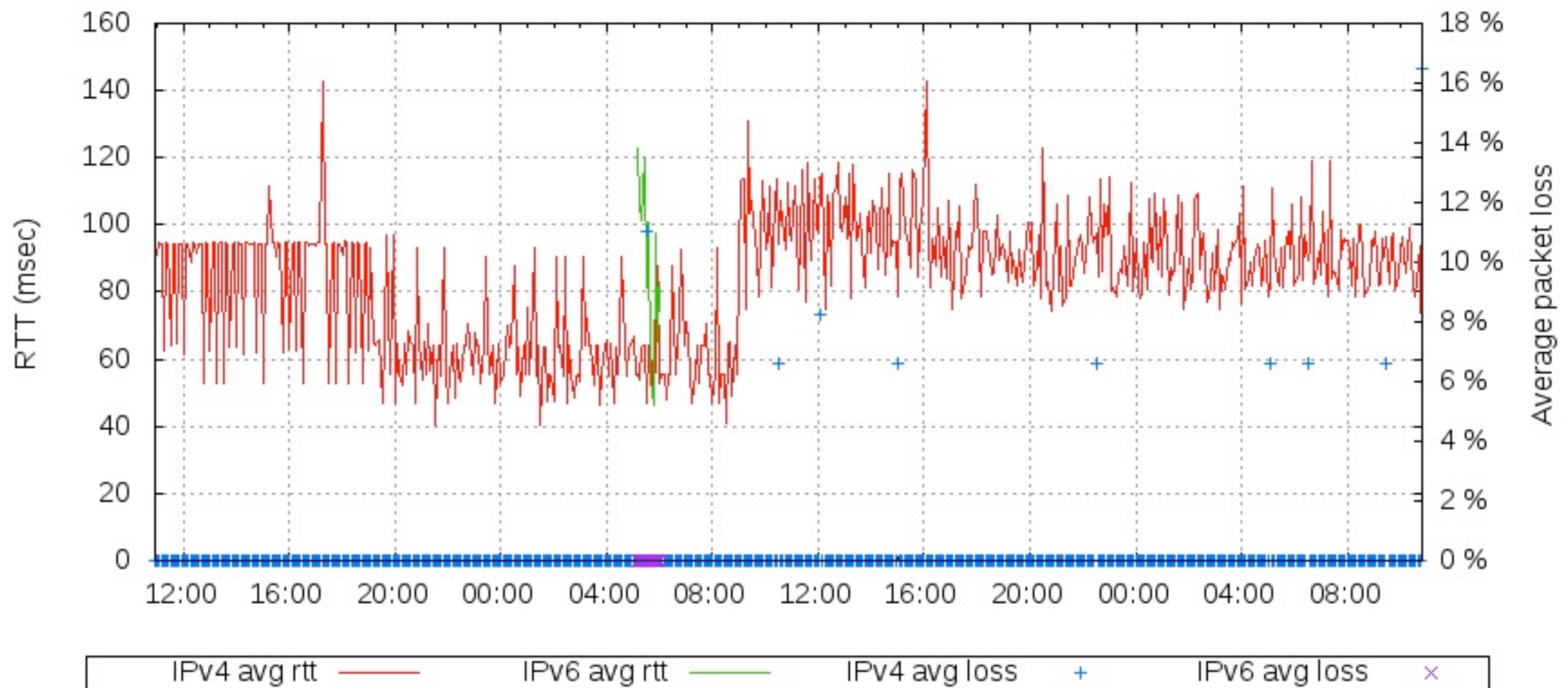
Active Measurements - What?

- Distributed World IPv6 day measurements:
 - Are participating sites AAAA-ed
 - Ping and ping6
 - Fetch content over A and AAAA
 - Traceroute and traceroute6

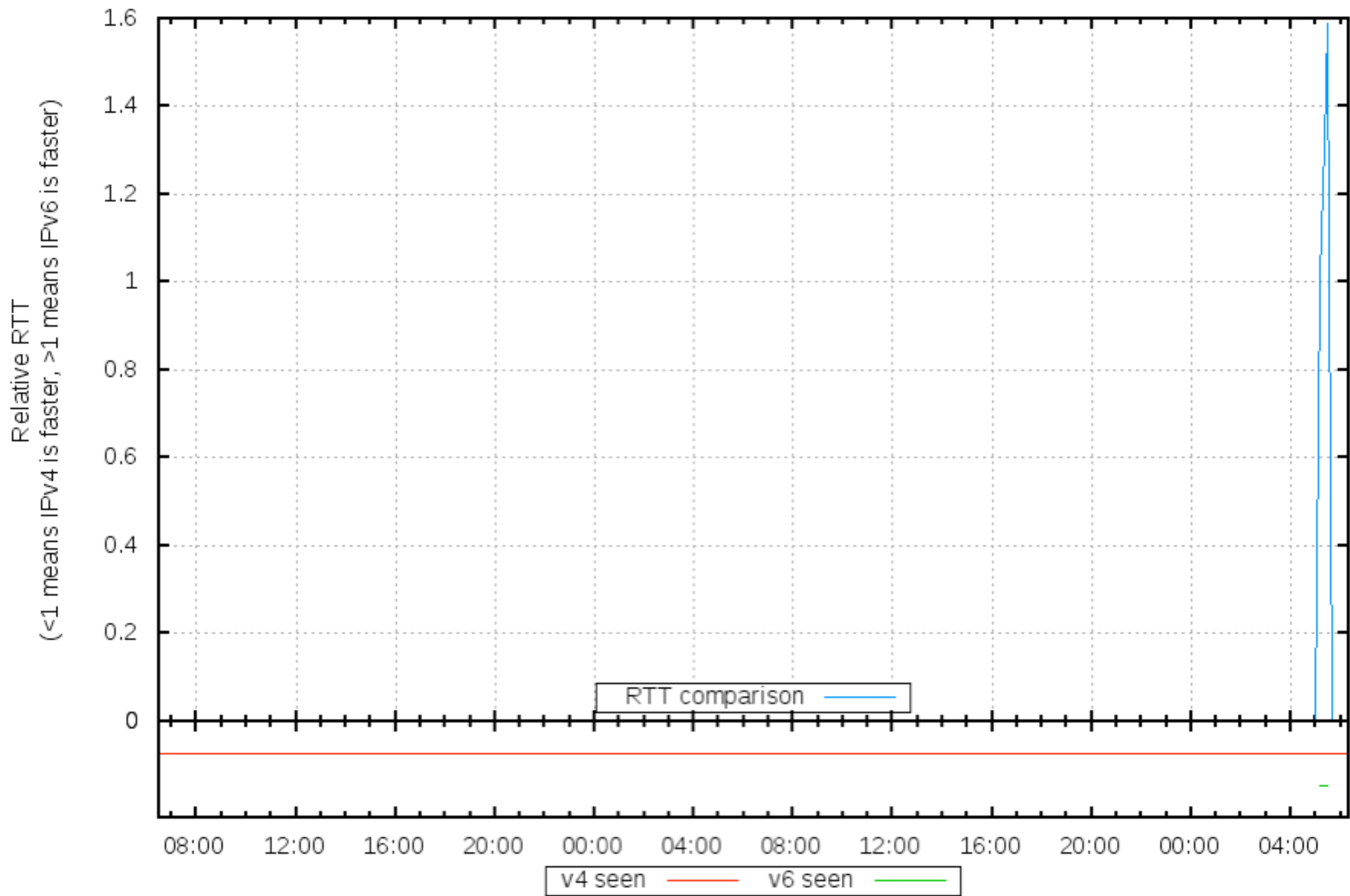
Some stuff we
already saw

Facebook doing a 'dual-stack' hour

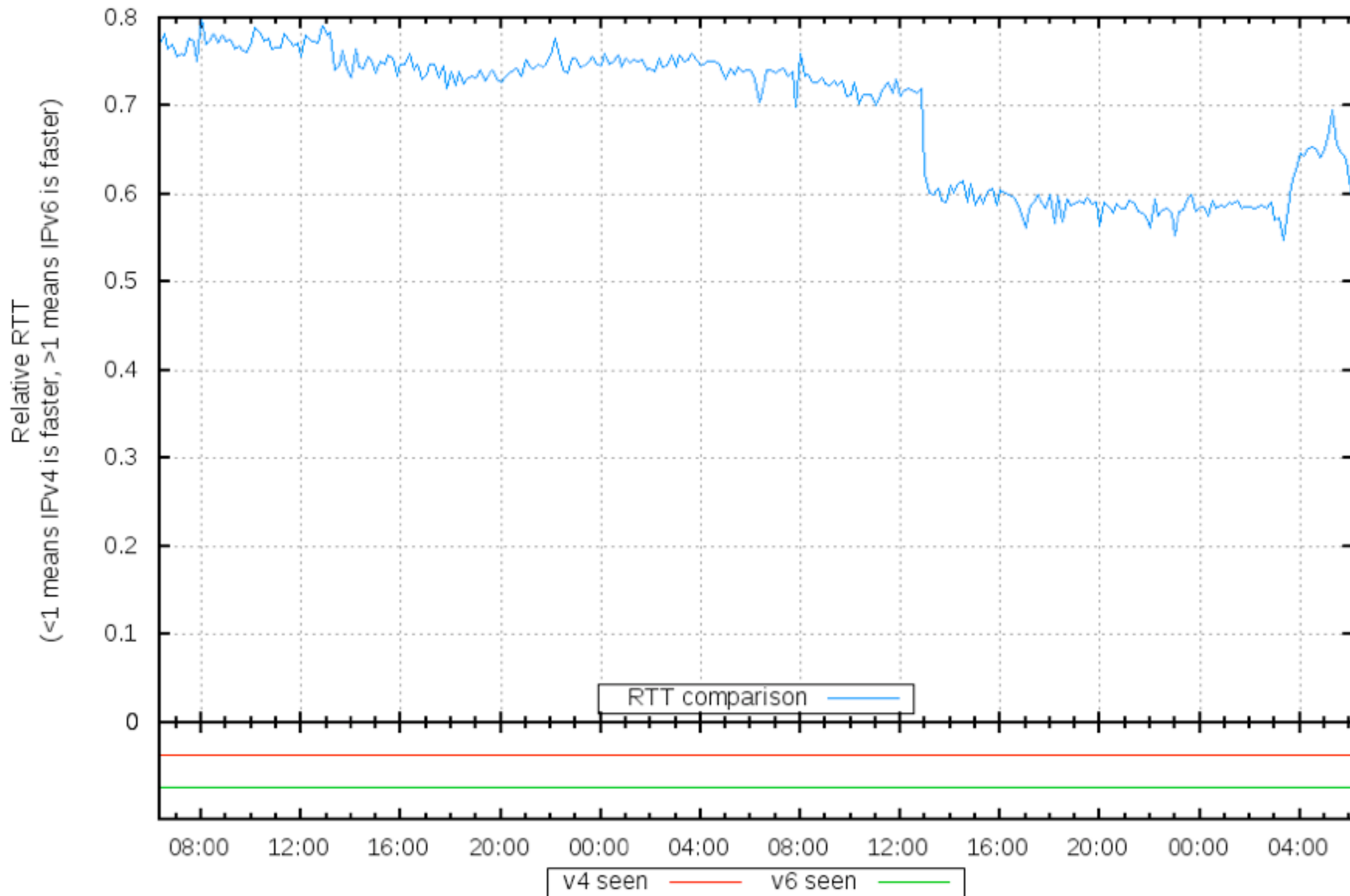
Ping (RTT) measurements in the last 48 hours, from all vantage points to Facebook
as of 2011-05-28 10:52:14 UTC



... and Yahoo testing too



Google relative RTT IPv6/IPv4



6to4 Relative Performance

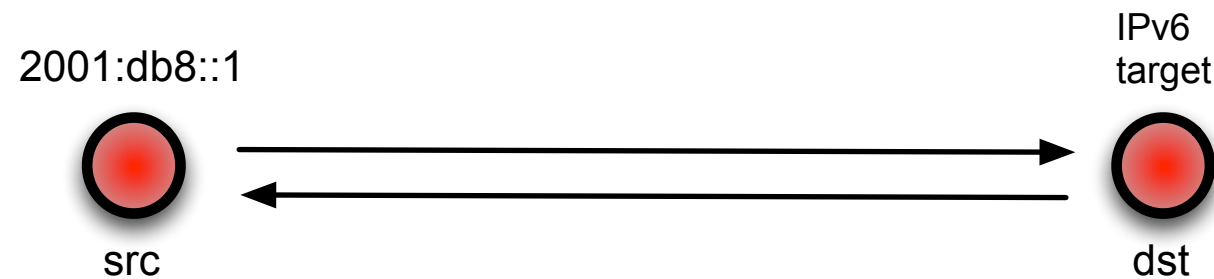
Bonus

6to4 Relative Performance

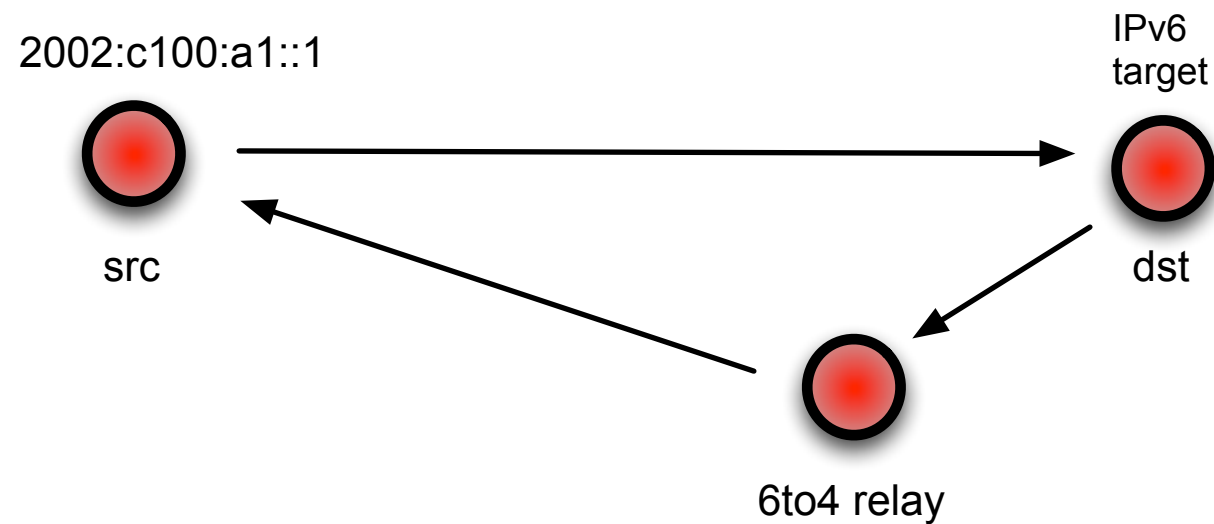
- 6to4 allows IPv4-hosts to talk to IPv6-hosts
- 6to4 is a concern for IPv4 to IPv6 transition
 - See <http://labs.ripe.net/Members/emileaben/6to4-how-bad-is-it-really>
 - Some worries that 6to4 relays may not cope with load during World IPv6 day
- Cooperate with BBN technologies, to measure performance of 6to4 relays in return paths

6to4 Relative Delay Measurement

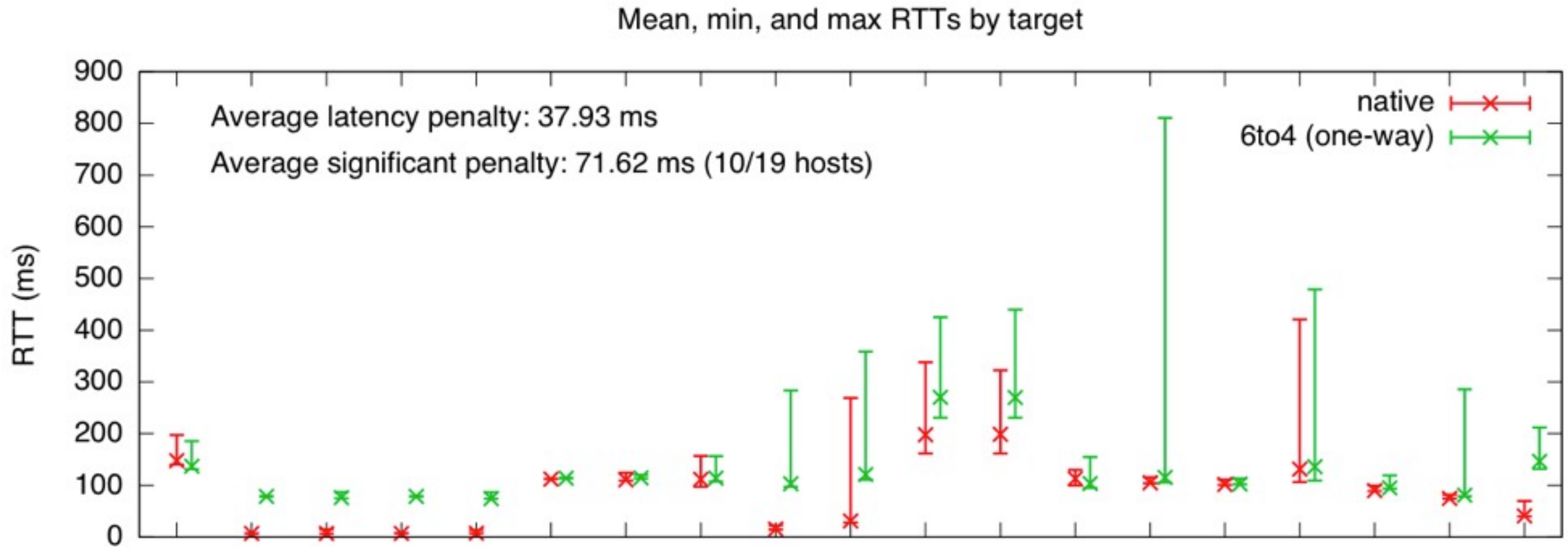
Native IPv6



6to4



Performance difference



Conclusion

Conclusion

- Hopefully it will be a very boring World IPv6 day, measurement-wise
- Expect experience and data will show
 - Internet IPv6 is (and has been) production ready
 - If not: know what to improve
- Keep an eye out on <http://labs.ripe.net> for the latest on measuring World IPv6 day

Questions?

