

Improving IPv6

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Introduction

- IPv6 deployment has suffered from a cycle of inaction
 - Prisoner's Dilemma: Danger of ubiquitous NAT444/CGN/LSN with no alternative IPv6 fast path – bad for everyone
 - Wanted to break it by leading by example
- We host and maintain Norway's largest and 4th largest web sites
- Measuring their readers to gauge impact of publishing AAAAs
 - Very large sample size
 - Content and audience almost exclusively Norwegian

Measuring brokenness



Tip: Want to try this on your own site? Check out Éric Vyncke's <http://www.vyncke.org/testv6/> !

- Invisible IFRAME embedded in customer's HTML templates
- Single stack IPv4 only
- IMG links in random order

- 1x1.png
- IPv4-only

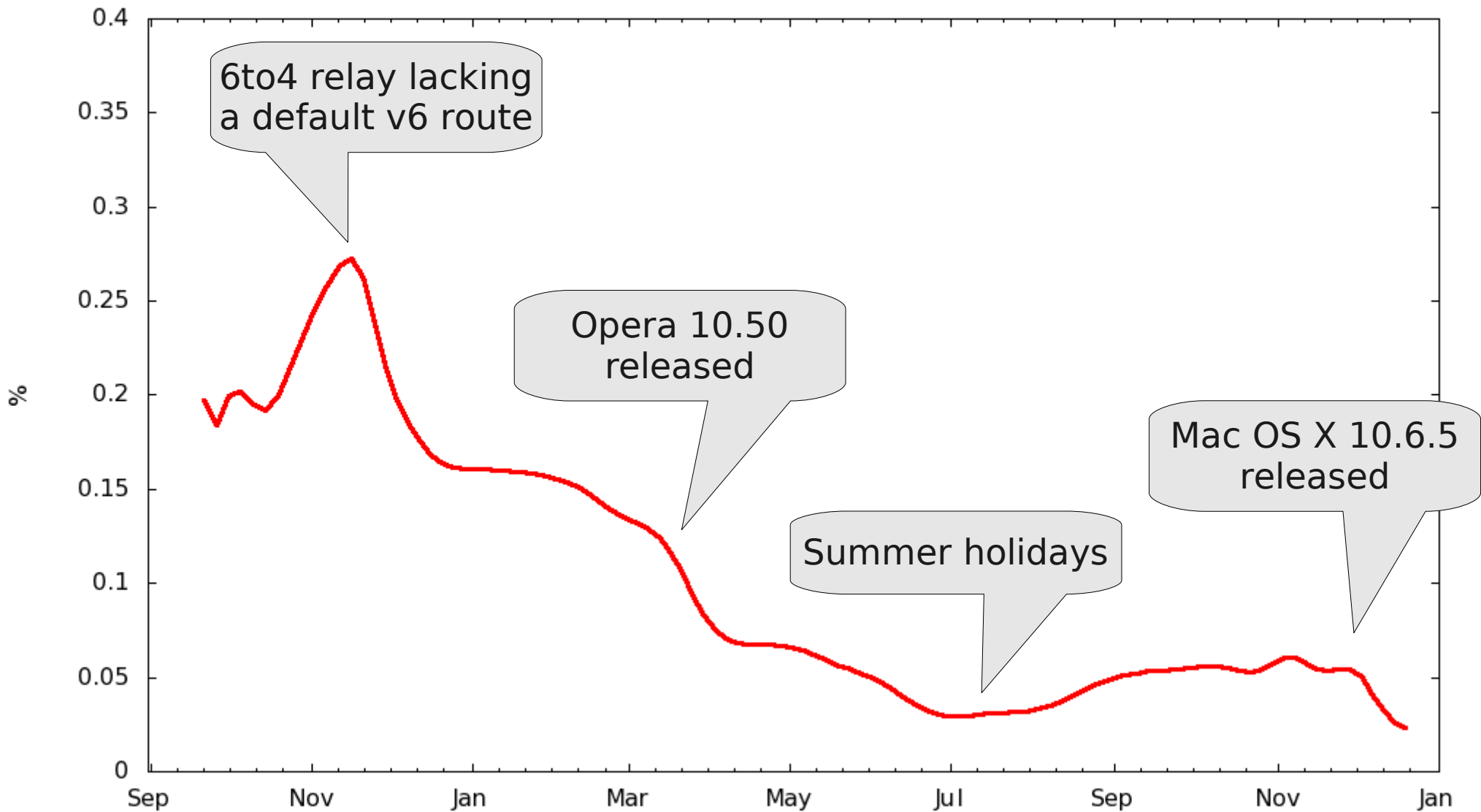
- 1x1.png
- Dual-stack

Basic assumption: We should see the same amount of hits to the two 1x1 PNGs. If not, we're seeing brokenness.

Findings and reactions

- Significant amounts of broken users, more than 1 in 500
- We could infer some major contributors from our logs:
 - Overzealous use of transitional IPv6, especially 6to4
 - 6to4-hostile eyeball networks
 - Bugs/weaknesses in various operating systems
 - Bugs/weaknesses in various web browsers
 - Enterprise/governmental/government overrepresented
- Reported all issues found
 - Considerable amounts of nagging sometimes required
- The situation has definitively improved!

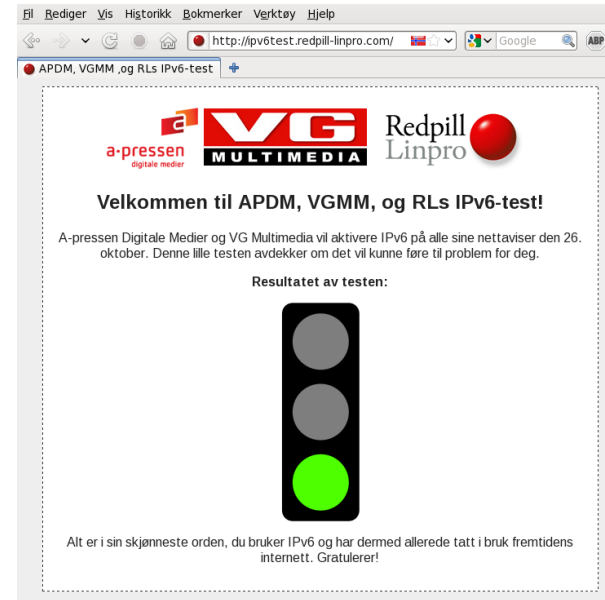
Brokenness levels over time



One-week brokenness average as of 2010-12-20: **0.024%**

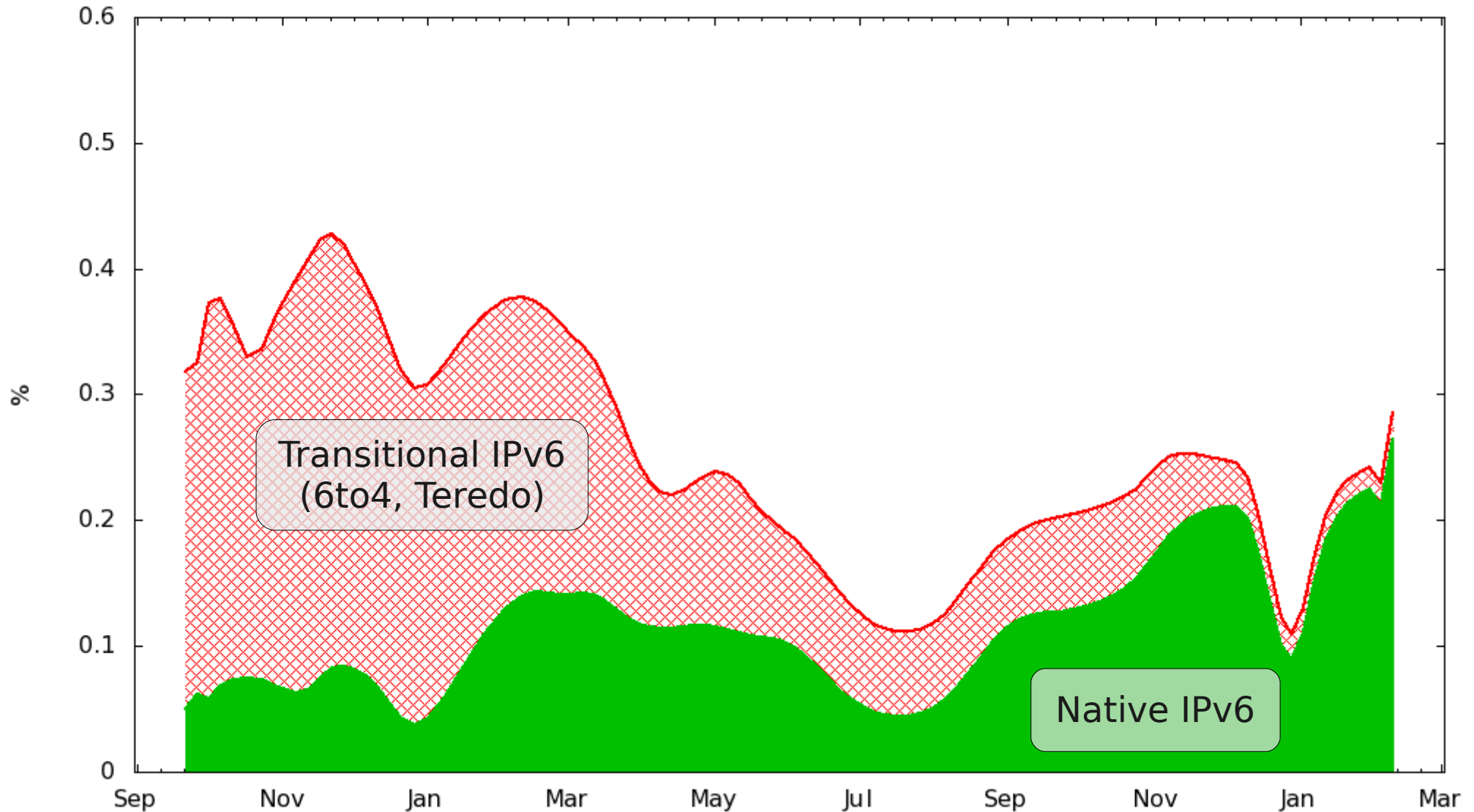
Production ready!

- In December we published AAAs for both sites
- Broken users are warned and sent to a test/help/feedback site



- Still remaining issues, but appears to affect fewer and fewer users
- http://getipv6.info/index.php/Customer_problems_that_could_occur

IPv6 preference and type



IPv6 preference last week: **0.025%** (of which **93%** is native)