

NOMA

Network Operator Measurements Activity
Thinking Cat Enterprises LLC

What is NOMA

- Collaborative industry activity to share measurements of network function
 - Measured by the network operator itself
 - Contributed to share a collective picture of the Internet's health

Intended Outcome

- An actual measure of the Internet's stability and health.
 - Starting with v6 performance (as a ratio with IPv4)
- A target for new operators (e.g., in developing economies) to shoot for, in terms of performance and “what good looks like”
- Promoting more networks to be objectively introspective

Noteworthy

- Operator-owned
 - Operators know their own networks and can measure their length and breadth — much more effective than any external instrumenting
- NOMA can complement existing measurement efforts
- Operator Motivation
 - Contribution to the Internet
 - yes, some still do that
 - Measure themselves against others
 - For internal purposes — monitoring their own networks and figuring out where they have strengths and weaknesses

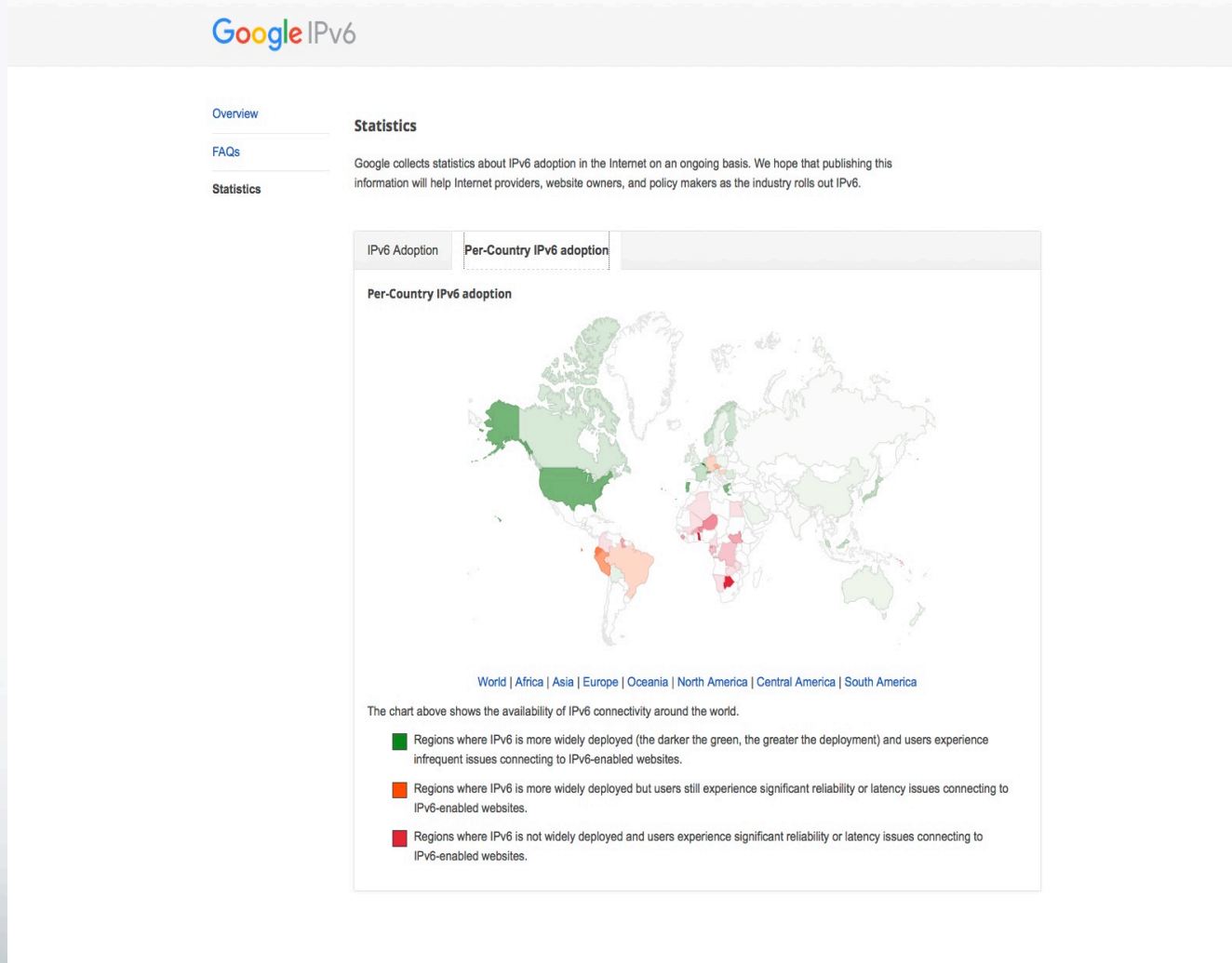
Getting a grip on IPv6 Deployment

Useful stuff we have today

The Content Provider Perspective

- Sees origin IP address and can map back to origin AS
- Can measure how much of their service is being accessed over which protocol
 - From those customers using their service
- Pluses
 - Complete picture of use of the content provider service
- Minus
 - Doesn't give an indication of how much capability there is for IPv6 in a given AS – non-users of the content provider

Google IPv6 by Country



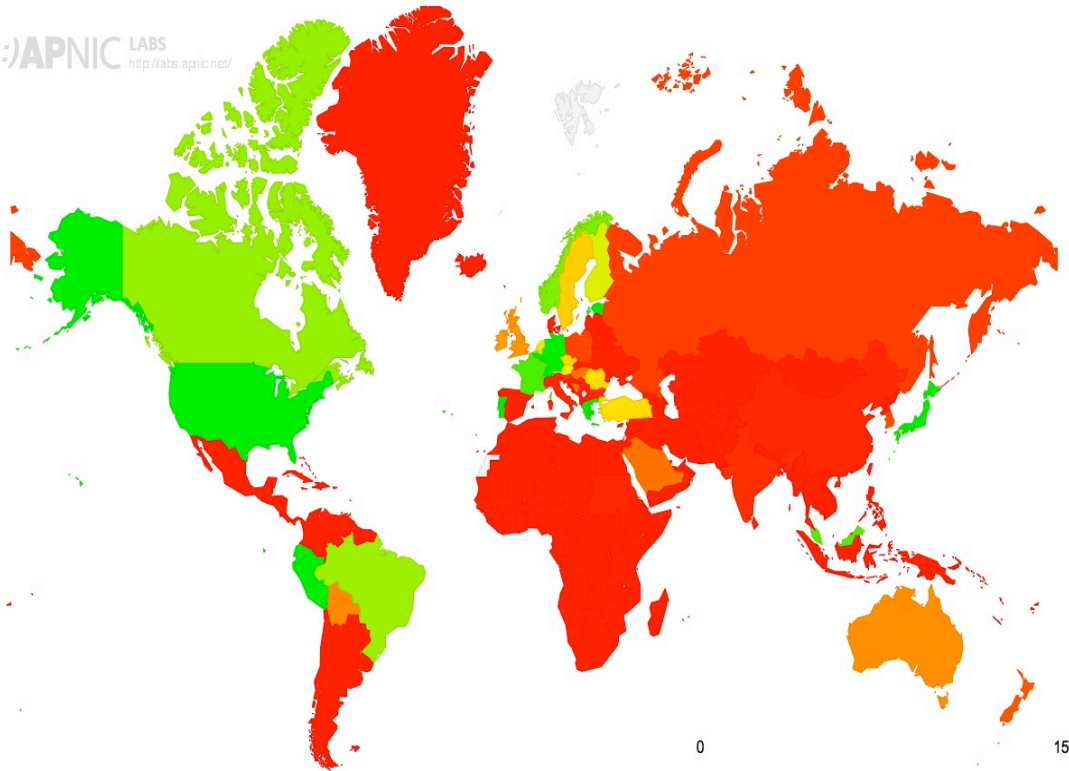
Embedded Tests

- Embedding test code on web pages enables direct testing of client capability
- Pluses
 - More detail than just queries
 - Can actively query for v6 capability from v4 pages, for eg
- Minuses
 - Not the complete user base (even of the service in which the test is embedded)

APNIC IPv6 by Country

IPv6 Capable Rate by country (%)

(::)APNIC LABS
<http://abs.apnic.net/>



7 day average (24/03/2016 - 30/03/2016)

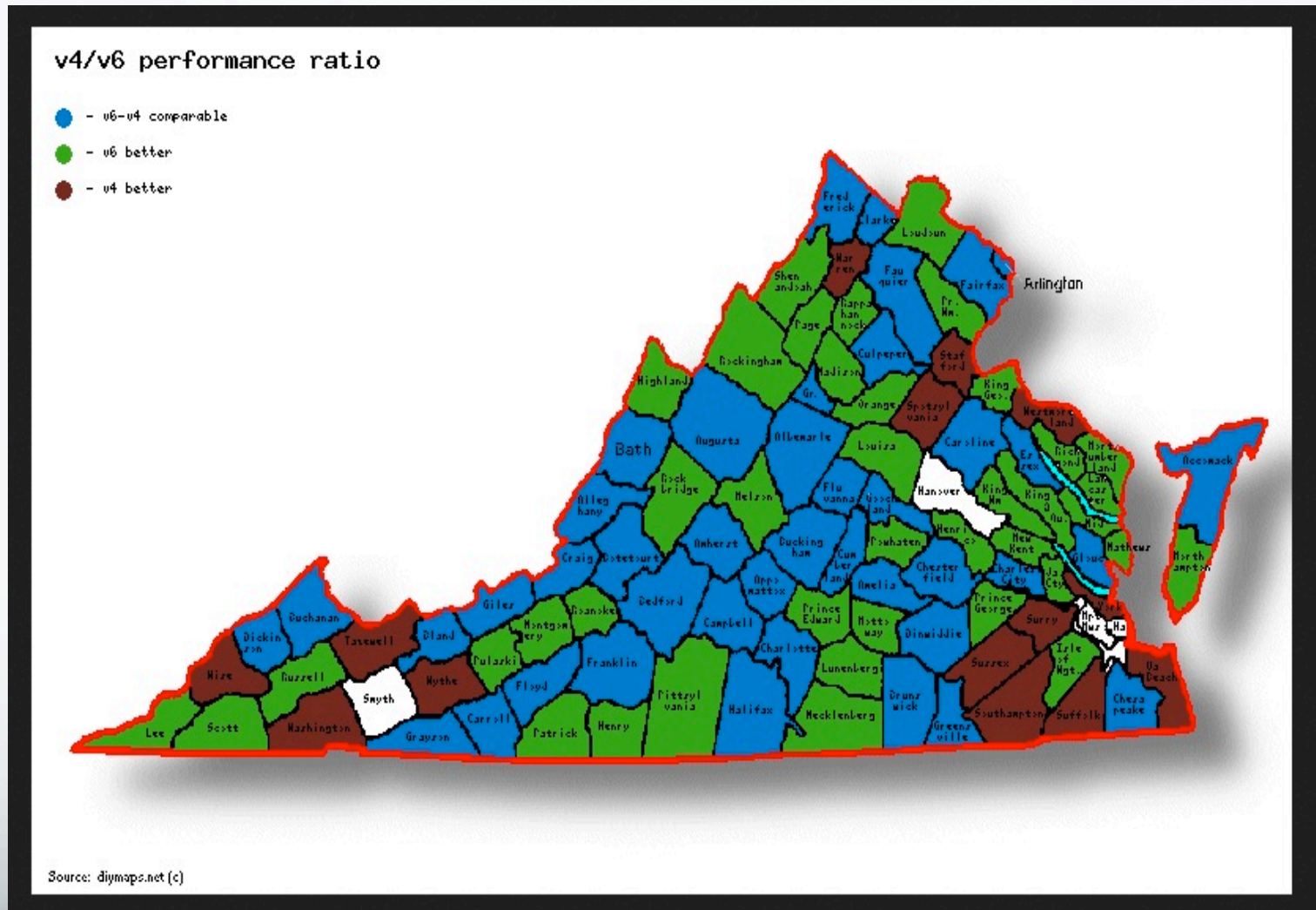
What more could we achieve?

(that's useful)

Network Owners See the Other Side

- Network operators see all the traffic originated in their networks
- Can reach out from any point in the network to external services to measure
- Have the detail to map individual (origin) IP addresses to neighbourhoods

A hypothetical – by county



Questions

- Doable?
 - Geo is determined by provider, not AS/IP mappings
 - Is there consistency in geo demarcation?
 - Counties, neighbourhoods, states, provinces, canton...
- Useful?
 - Comparing your experience in regions
 - Considering whether or how to deploy services (over v4 or v6)
- Other thoughts?

Extra material

TechArk Activities

- Elicit collaborative development of the measurements framework and culture of collecting and sharing
- Provide a platform to collect and share basic benchmarking metrics across participating networks
- Publish a baseline of public metrics for network operators
- Publicize the Activity and its outcome
- Encourage broader participation in the Activity