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

http://www.techark.org/noma



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

Google IPv6

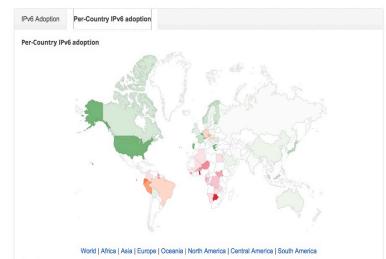
Statistics

Statistics

Overview

FAQs

Google collects statistics about IPv6 adoption in the Internet on an ongoing basis. We hope that publishing this information will help Internet providers, website owners, and policy makers as the industry rolls out IPv6.



The chart above shows the availability of IPv6 connectivity around the world.

Regions where IPv6 is more widely deployed (the darker the green, the greater the deployment) and users experience infrequent issues connecting to IPv6-enabled websites.

Regions where IPv6 is more widely deployed but users still experience significant reliability or latency issues connecting to IPv6-enabled websites.

Regions where IPv6 is not widely deployed and users experience significant reliability or latency issues connecting to IPv6-enabled websites.

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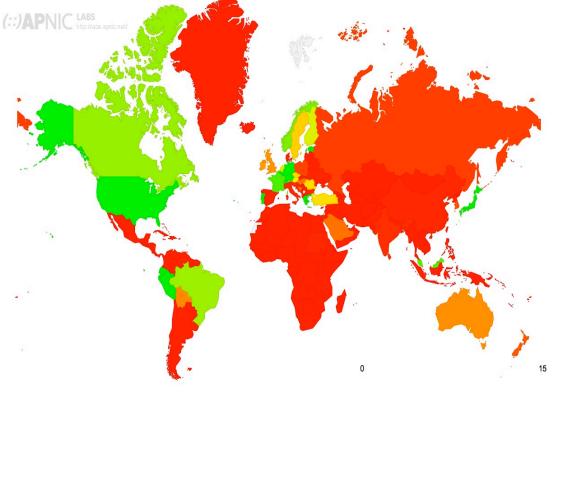
Embedded Tests

- 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 (%)



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

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What more could we achieve?

(that's useful)

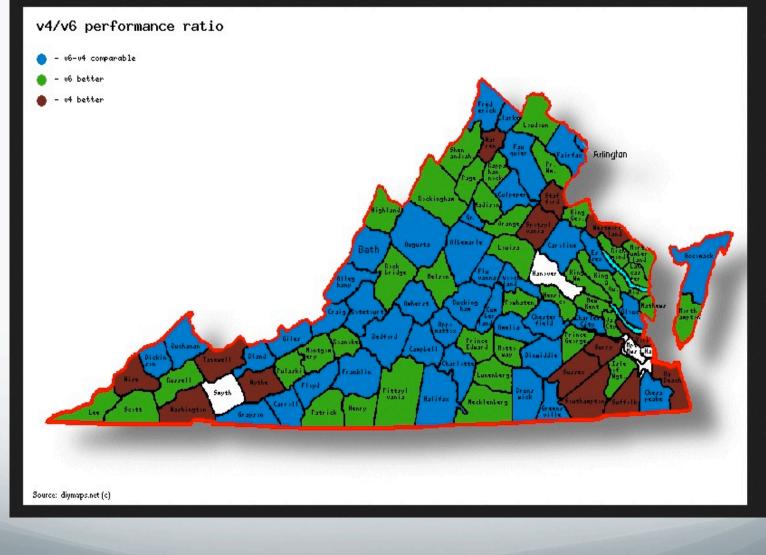
http://www.techark.org/noma



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



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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)

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• Other thoughts?

Extra material

http://www.techark.org/noma



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

