NOMA
Network Operator Measurement Activity

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http://www.techark.org

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Comcast
NOMA Objective

• Network Operator Measurement Activity
  – http://www.techark.org/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
Desired outcome for the Internet

• 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
Operators – what’s in it for them

• Self-instrumentation is feasible
  – In-network measurement software
  – RTT against fixed sites

• Gives concrete operational guidance
  – Gives a clear indication when there are issues
    • E.g., service is failing to properly serve from “near”
Sharing?

• World IPv6 Launch continues to show “IPv6 user uptake” in participating networks
  – http://www.worldipv6launch.org/measurements/

• Source of the data
  – Google, Facebook & Yahoo! were main content provider participants
  – They were already measuring traffic over v6 versus v4
  – Could not share the data directly (business sensitive)

• By collaborating and contributing to a neutral 3rd party that can merge the data, the world gets a view into IPv6 uptake that would otherwise be known only to large content providers
Complementary perspectives

GETTING A GRIP ON IPV6 DEPLOYMENT
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 service
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
Basic IPv6/IPv4 Measurements

John Jason Brzozowski
Objective

• Implement and deploy a base measurement

• High-level goals
  – Verify that IPv6 is working as intended
  – Compare performance of IPv6 versus IPv4 over time

• Develop approach that can be used from different points in the network
  – Core, Access, Home, etc.
Implementation

• Centralized database of test targets
• Storage of test results
• Example measurement using HTTP/S over IPv6 and IPv4
  – DNS lookup times
  – TCP connect times
  – Download or transfer times
Scope

• Initially measurements originate from the core network
• Extendable to include:
  – Access and home networks
• Same base code, designed for small form factor devices
  – Extensible to include more robust functionality
Deployment

• Measurement system deployed since before World IPv6 Launch
  – Data collection has been running for over 4 years
  – Largely at 5 minute intervals

• Other data elements are also being captured
  – Traceroutes, pings, etc.
So far and upcoming

• Held an invitational workshop in June 2016
  – Half a dozen operators
  – Interest – for themselves, sharing
  – There will be a published report

• Looking forward
  – Leverage and share the Comcast experience
  – Getting some agreement on an initial set of internal targets (template) and sharing