



Measurement Lab
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February 19, 2015

Via Electronic Submission

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

**Re: Protecting and Promoting the Open Internet, GN Docket No. 14-28;
Framework for Broadband Internet Services, GN Docket No. 10-127;**

Dear Ms. Dortch:

Measurement Lab (“M-Lab”) submits this letter in order to reaffirm its support for the Federal Communications Commission’s (the “Commission”) efforts to promote public transparency on broadband access through open performance measurement. M-Lab is a consortium of research, industry, and public interest partners dedicated to providing an ecosystem for the open, verifiable measurement of global network performance. This infrastructure supports the SamKnows platform used in the Commission’s Measuring Broadband America program and is relied on by an increasing number of regulators around the world for accurate and open data on their citizens’ broadband access.

On October 28, 2014, Measurement Lab released a report entitled “ISP Interconnection and its Impact on Consumer Internet Performance,” the product of a two-year collaborative research effort using our extensive measurement dataset to understand how interconnection impacts end-user access in the United States.¹ In the Interconnection Study we document that problems with the network interconnection between major access ISPs (AT&T, Comcast, CenturyLink, Time Warner Cable, and Verizon) and transit ISPs (Cogent, Level 3, and XO) resulted in highly-degraded consumer broadband performance over two years. This degraded performance was most pronounced during peak use hours,²

¹ “ISP Interconnection and its Impact on Consumer Internet Performance,” Measurement Lab, http://www.measurementlab.net/static/observatory/M-Lab_Interconnection_Study_US.pdf

² “Download Speed for AT&T on Level3 in Chicago,” M-Lab Internet Observatory, http://www.measurementlab.net/observatory#tab=explore&metric=download_throughput&metro=Chicago&combos=ord01_att&time=03012014-04012014&timeView=hourly&; “Download Speed for Centurylink, Comcast on Cogent in Pacific Northwest,” M-Lab Internet Observatory,

a symptom that points to insufficient capacity and congestion as a causal factor. Through comparative analysis across the country and other providers, we were able to conclude that degradation was not the result of major infrastructure failures at any specific point in a network, but rather connected with the business relationships between ISPs. This report and subsequent M-Lab research has since contributed to a stronger public discourse on the business relationships at the core of the Internet, and has been cited in filings to the Commission by a diversity of parties.³

Since the release of the Interconnection Study, we have aggressively increased our national infrastructure footprint to cover multiple transit networks per city across the country, including new transit providers. M-Lab aspires for reliability in operations and redundancy in infrastructure in order to provide an unparalleled platform to conduct at-scale measurements of interconnection performance that meets the requirements of researchers, regulators and policy makers. To achieve this lofty objective, M-Lab maintains thirty-four measurement points with a total of 128 servers in the United States within the networks of transit ISPs Cogent, GTT, Level 3, Tata, Internap, XO, and Zayo. For example, in Miami, M-Lab now maintains five sites (Level3, Cogent, Tata, GTT, and Zayo) for a total of nineteen local servers capable of measuring performance between consumer access ISPs and major transit networks in the region. In Seattle, M-Lab offers similarly comprehensive coverage, with measurement points hosted in five transit networks (Cogent, Tata, GTT, Level 3, and XO). M-Lab's presence in diverse networks and geographies allows researchers and regulators using our data to differentiate between congestion as a symptom of interconnection agreements between ISPs, and network issues specific to a given local market. This perspective is necessary to identify nationwide trends in consumer connectivity. We will continue to grow our infrastructure in the coming months, to an anticipated fifty sites incorporating more transit networks in more locations.

Each month, M-Lab receives hundred of thousands of performance measurements from consumers across the United States. In order to make this extensive dataset more accessible and educate the public on interconnection, we developed the Internet Observatory,⁴ a data visualization tool showing network performance compared across different providers and cities. Earlier in February, the Observatory was updated to reflect our infrastructure buildout and new measurements since the release of the Interconnection Study, the beginning of what we anticipate to be weekly updates of the platform.

Included in this update is data that describes similar congestion trends to what we described in detail in the Interconnection Study, on different network operators than previously analyzed.⁵ The episodes

http://www.measurementlab.net/observatory#tab=explore&metric=download_throughput&metro=PacificNorthwest&ombos=sea01_centurylink,sea01_comcast&time=01012014-02012014&timeView=hourly&

³ See: Letter of National Cable & Telecommunications Association in GN Docket No. 14-28. Page 3, January 21, 2015, <http://apps.fcc.gov/ecfs/document/view?id=60001014982>; Letter of COMPTTEL, Level 3, Cogent and Netflix in GN Docket No. 14-28. Page 3, January 13, 2015, <http://apps.fcc.gov/ecfs/comment/view?id=60001008405>

⁴ M-Lab Internet Observatory, <http://www.measurementlab.net/observatory>

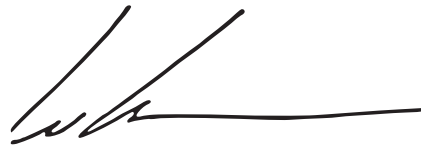
⁵ "Download Speed for AT&T on Zayo in Dallas," M-Lab Internet Observatory, http://www.measurementlab.net/observatory#tab=explore&metric=download_throughput&metro=Dallas&ombos=dfw05_att&time=11022014-12022014&timeView=hourly&; "Download Speed for AT&T on Tata, TWC on GTT in Southern California," M-Lab Internet Observatory,

described in the Observatory update appear to exceed the level of degradation witnessed last year, across other transit providers and involving more than one access ISP. While these are preliminary research findings, their clear presence in the M-Lab data does show that a large population of consumers continue to experience highly-degraded performance over the interconnections between tier 1 transit ISPs and the major access ISPs. Interconnection degradation does not appear to be an issue tied to only business disputes with a specific content provider or service, and continues to affect access in the United States.

The Interconnection Study, and subsequent research, affirms that network management practices and congestion associated with interconnection relationships can be independently measured by an objective third-party. We believe that the FCC was correct in its previous determination under the MBA program that measurements should traverse the full path of access ISPs, including points of interconnection with transit providers.⁶ Performance measurements that take into account congestion between access ISPs and transit providers promises to be the most thorough and extendable approach to interconnection transparency in the long term, providing data that covers a broader set of potentially unforeseen issues, rather than developing tests for specific over-the-top services.

Through Measurement Lab, and other open performance measurement efforts, the Commission already has the tools available to conduct continuous, independent assessment of interconnection health with objective methodologies and tested platforms. The decision to update the standard definition of broadband and consideration on including interconnection issues within the authority of the agency will require trusted data for regulatory accountability. We believe that only through the transparency provided by open measurement will the Commission achieve its objectives to promote greater access for all Americans.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Collin Anderson', with a long horizontal stroke extending to the right.

Collin Anderson
Researcher
Measurement Lab

http://www.measurementlab.net/observatory#tab=explore&metric=download_throughput&metro=SouthernCalifornia&combos=lax02_att,lax03_twc&time=12022014-01022015&timeView=hourly&

⁶ Letter from Walter Johnson, Chief, Electromagnetic Compatibility Division, Federal Communications Commission to Marlene Dortch, Secretary, Federal Communications Commission, CG Docket No. 09-158, CC Docket No. 98-170, WC Docket No. 04-36, Attachment 1, July 26, 2012, <http://apps.fcc.gov/ecfs/comment/view?id=6017098077>.