

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Inquiry Concerning the Deployment of) GN Docket No. 12-228
Advanced Telecommunications Capability)
to All Americans in a Reasonable and)
Timely Fashion, and Possible Steps To)
Accelerate Such Deployment Pursuant to)
Section 706 of the Telecommunications)
Act of 1996, as Amended by the)
Broadband Data Improvement Act)

REPLY COMMENTS OF THE MEASUREMENT LAB CONSORTIUM

The Measurement Lab Consortium (M-Lab) files these reply comments in response to the *Ninth Broadband Notice of Inquiry* released by the Federal Communications Commission.

M-Lab¹ is a research collaborative dedicated to providing open, scientifically sound information on network performance to academics, policy makers, and end users. M-Lab provides a broadly distributed server platform on which researchers can run open-source broadband measurement tools. The multiple tools running on M-Lab are user-facing, providing real-time information on broadband performance to consumers. Each time a consumer runs a test, data is collected by M-Lab. This data is put into the public domain, and comprises by far the largest open, disaggregated dataset of its kind, capturing broadband performance across the globe. The data collected on M-Lab and by M-Lab tools has been used by governments across the world, including by the Commission, whose Measuring Broadband America² program runs on M-Lab, and whose Consumer Broadband Test³, which produces data for the National Broadband Map⁴, runs on M-Lab as well. The researchers that comprise the M-Lab collaborative have been gratified over the course of these programs by the Commission's commitment to transparency and methodological openness. We look forward to working

¹ <http://measurementlab.net/>

² <http://www.fcc.gov/measuring-broadband-america>

³ <http://www.broadband.gov/qualitytest/about/>

⁴ <http://www.broadbandmap.gov/>

with the Commission to advise on continuing and growing a scientifically-sound national broadband measurement program.

We believe that the Commission's program, and others like it are crucial to the future of the Open Internet. Accurate, open data about the way networks are performing must form a key indicator on which any policy considering broadband availability is based. Measuring network performance is complex, and any attempt to map the condition of a dynamic, decentralized system impacted by staggering possible dependencies must proceed with an appreciation of the difficulty and magnitude of this task. It must, in short, adhere strictly to the principles of good scientific process. This is not trivial, and requires new approaches both from network scientists, and from regulators and policy makers.

M-Lab has been actively tackling this challenge since its founding, and has worked within the body of researchers that make up the M-Lab Consortium and beyond to provide an accurate and verifiable source of information on network performance to a broad range of constituencies. In light of this focus, we would like to offer in these comments an overview of the tenets of a scientifically sound broadband measurement program, which can serve as the foundation for growing and instantiating the Commission's measurement programs, and as a crucial source of sound data informing diverse policy efforts.

A commitment to openness and transparency must be at the core of any responsible broadband measurement program. Openness and transparency allows any researcher the ability to replicate achieved network performance results. Without knowing how the measurement results are achieved -- without being able to understand the way that the measurement servers are instrumented; without being able to look at the measurement code and understand its methodological assumptions; without being able to examine the raw, disaggregated data -- replicating and verifying the reported results is impossible. Replicating and verifying results is the linchpin, the definition even, of the scientific process. The necessity of this truly open, scientific approach is only heightened by the complexity of networks and the many different factors that influence the performance seen by the consumer.

As a consortium of network researchers, M-Lab works with this complexity daily, and has developed an approach to measurement that provides 360 degree openness and valid, verifiable data. We will here review the key components that must comprise the cornerstones of a credible, sustainable broadband measurement program.

- **Well-documented, open-source measurement tools**
The tools used to measure networks should be open source, publicly releasing their code accompanied by clear documentation explaining its efficacy and scope. This practice allows independent experts to understand exactly what's being measured and where.
- **Openly available data**
The raw, disaggregated data collected by participating measurement tools should be made broadly available in a timely manner. This allows independent analysis, peer- review, and an ecosystem of scientific rigor that builds on the work of others to produce a nuanced, accurate, and useful view of network performance.
- **Openly available analytic methodologies**
The analytic and statistical methodologies used to reach any published conclusion, or to translate the disaggregated data into a meaningful number suitable for end users, should be made public, along with the data used.
- **Openly documented measurement program framework**
The reasoning supporting a measurement program's choice of specific measurement strategies and methodologies should be openly documented and publicly available.
- **Consistently-deployed, consistently-managed, well-documented measurement platform**
The way in which a measurement platform is deployed can introduce many variables into the collected data. Holding the platform to standards of rigorous consistency including consistent management and detailed documentation of all aspects of the platform and its management can allow researchers to understand when and if allowances should be made in calculations and ensure that the data collected are truly robust.

We encourage the Commission to continue its adoption of these key components as it expands its Measuring Broadband America program, and its network performance measurement efforts overall. Similarly, we hope that this filing, and the efforts of M-Lab and many others working to establish scientifically-founded policy can lead to broader discussions focusing on the need for open, transparent, scientific processes as the foundation for policy making. Adapting and evolving policy in time with digital age requires new regulatory paradigms, founded on the principles of scientific inquiry. M-Lab looks forward to working with the Commission in the future to develop and evolve processes and protocol for sustainable, scientific data-based broadband policy.

Respectfully submitted,

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