

The logo for M-Lab, featuring the letters 'M', 'L', 'A', and 'B' in a bold, black, sans-serif font. The 'M' has a thick horizontal bar at its base. The letters are contained within a white oval with a thick black border.

# M LAB

M-Lab people here today:

**Peter Boothe** [pboothe@google.com](mailto:pboothe@google.com) (me!)

**Matt Mathis** [mattmathis@google.com](mailto:mattmathis@google.com)

**Stephen Stuart** [sstuart@google.com](mailto:sstuart@google.com)



**MLAB**

Measure the Internet, save the data,  
make it easy to analyze and understand

(all done in the open - open source, open data, open everything)



OPEN  
TECHNOLOGY  
INSTITUTE



**MLAB**



PLANETLAB

An open platform for developing, deploying, and accessing planetary-scale services

Since 2009!



# Measure the Internet

<https://mlab-ns.appspot.com>

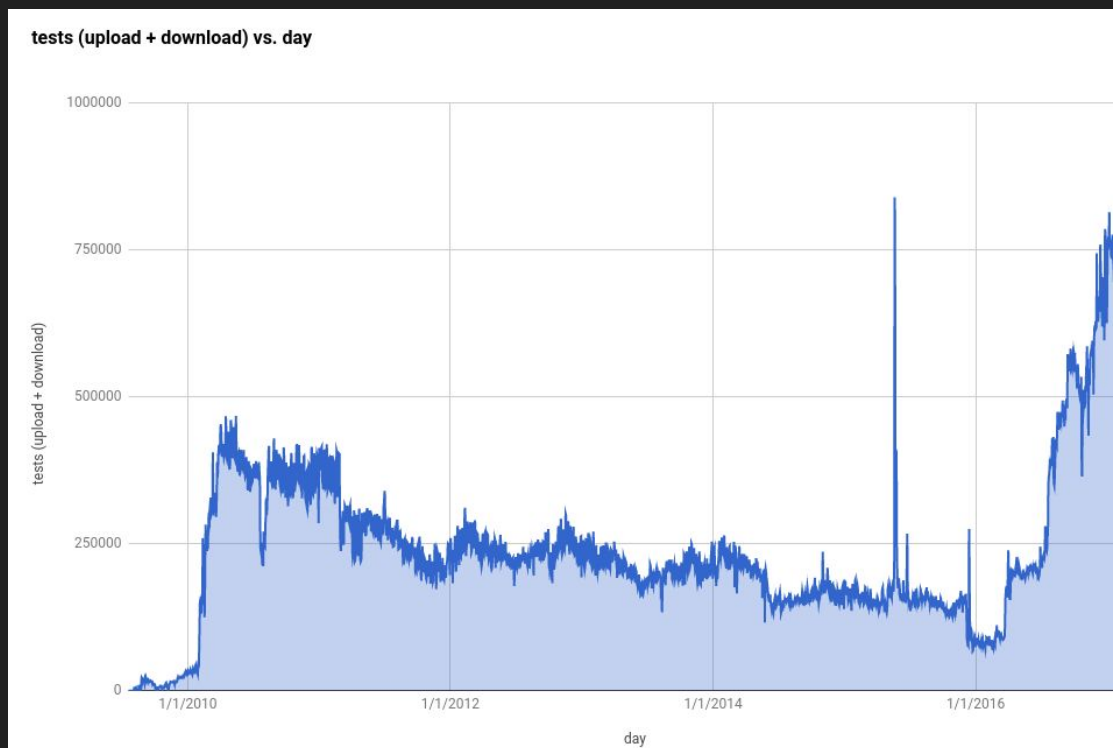
More than one hundred 1Gb connected sites worldwide, and more coming online in 2017 (and a fleet upgrade to 10Gb)

# Save the Data

Hundreds of thousands of TCP diagnostic tests each day, and growing

Multiple Petabytes in Google Storage

Multiple Terabyte Google Bigquery DBs



Daily counts from MLab's public BigQuery data.

# New York

02/01/2014 - 02/01/2016

Client ISPs

## Compare Providers

Select Client ISP to view

Time Warner Cable

Improved  
Visualization

COMING SOON!

Metric

Download Speed

Upload Speed

Round-trip Time

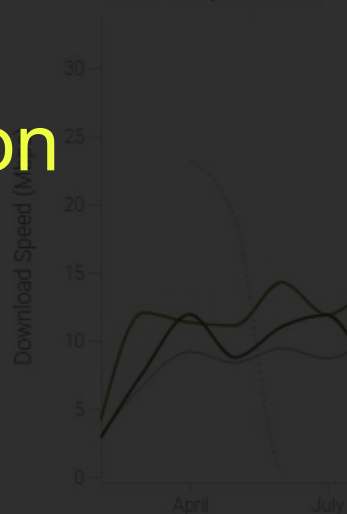
Retransmission Rate

Time Aggregation

Day

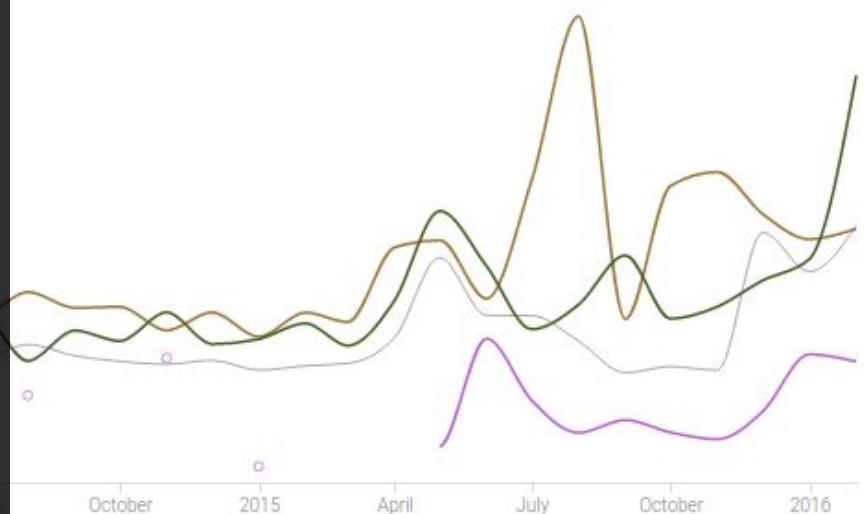
Month

Time Warner Cable  
New York, New York



Verizon

Hosting Services



# Why Google participates in MLab

- ❖ MLab measures the performance of the non-Google Internet
- ❖ Google sends people to non-Google websites and services
- ❖ When the other websites and services work better, Google users have a better user experience

# MLab in 2017

- ❖ Major upgrades to the SW, HW, and NW infrastructure
  - Modern virtualization (docker + kubernetes, instead of vservers + scripts)
  - Modern kernels (using netlink + TCP\_INFO instead of Web100)
  - HW refresh for both switches and hosts
  - 1Gb uplinks → 10Gb uplinks
  - New sites in the EU and elsewhere
- ❖ New visualization of speedtest data
  - Aid all stakeholders in understanding the data



# MLAB

- ❖ Since 2009: Measure the Internet, save the data, make it easy to analyze and understand
- ❖ Getting way, way better in 2017
- ❖ Our data is open (all 5 Pb of it!), please take it and use it
- ❖ Our experiment platform is becoming more manageable
  - Paving the way for new experiments and analyses

Thanks! Questions?