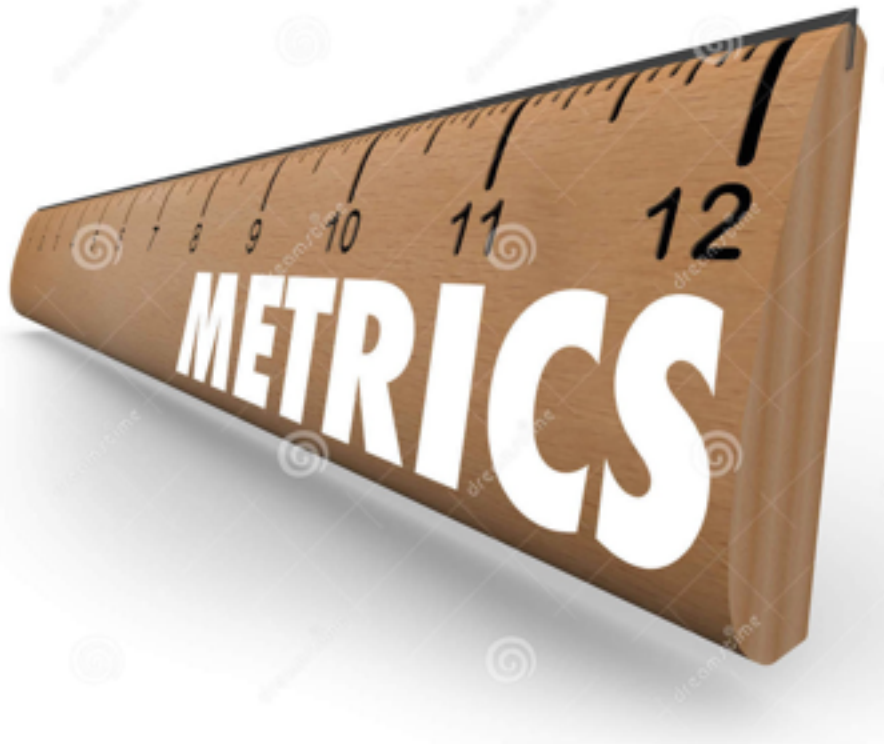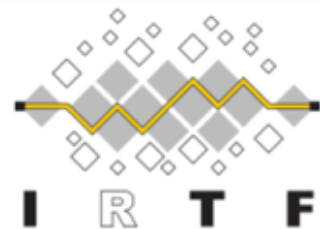# Rethinking ISP broadband performance comparison by using M-Lab big data

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Nov. 13 2016

MAPRG IRTF

Overview

Who we **Are?**

What we have done so far...

1— 3 Millions of measurement data per country (AU, UK, US), since 2015;

1.5 millions data per month since July 2016, US;

Understanding multidimensional measurement data characteristics
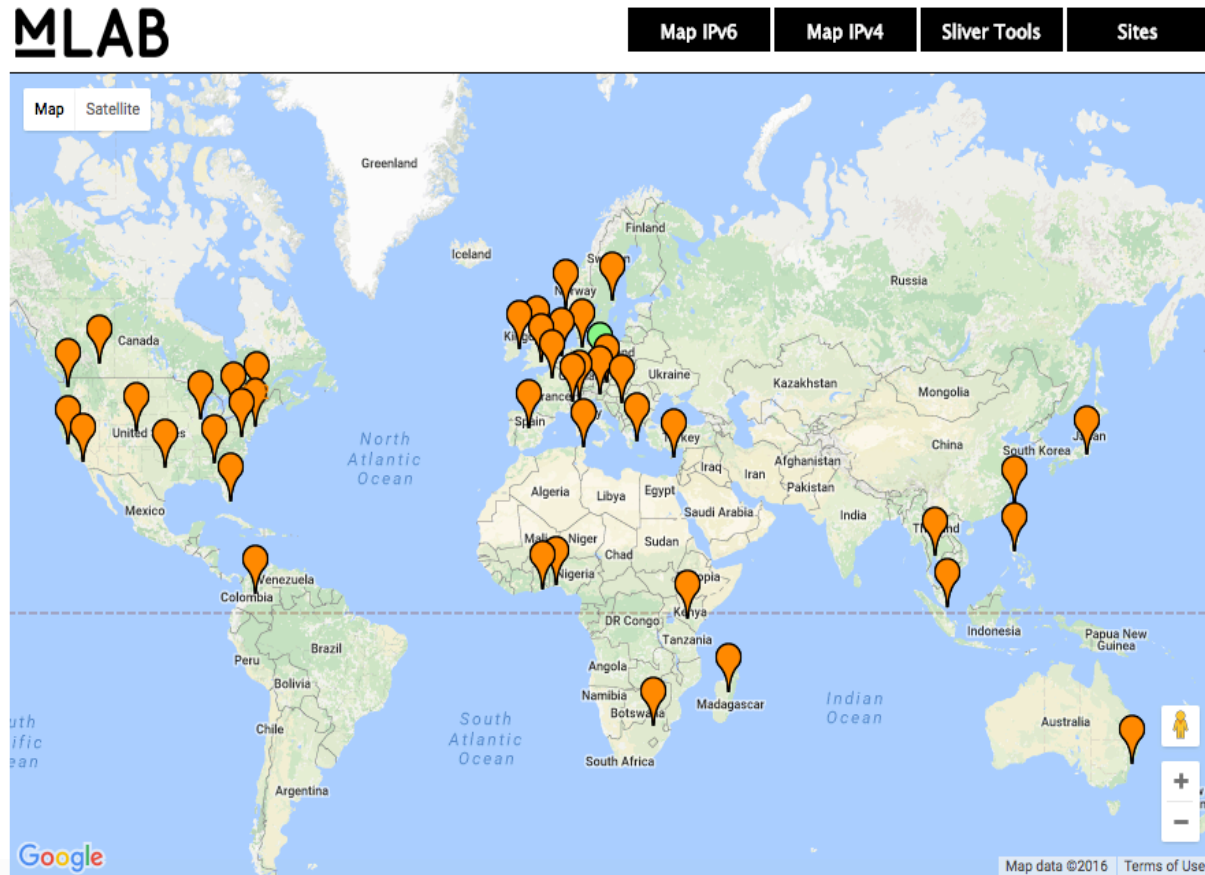
Sound & Fair ISP comparison

Measurement Platform- MLab & Data characteristics

- Measurement Labs (MLab) deployment scale: Global

- Size: Millions per month in U.S, rapid growth since July 2016.

- Passive TCP throughput measurement

- Raw data with rich meta info for each test : time, location , OS, TCP parameters etc.,

- Server port number:38970

Data characteristics cont.

- Abundant features including many Web100 variables such as Receiving & sending buffer size, congestion signal counts during TCP session, etc., defined in RFC 4898, apart from other performance metrics: loss, rtt etc..
- Accessble via BigQuery - A query tool compatible with SQL format to access the data

Allows: USER BEHAVIORS study

Off peak (Hour 8)
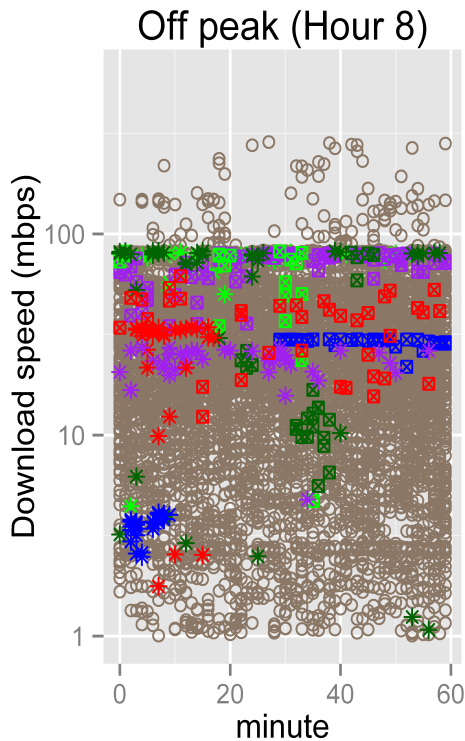
IP address
- 108.41.184.161 (20 tests)
- 108.51.193.79 (37 tests)
- 108.53.36.26 (26 tests)
- 173.62.186.69 (33 tests)
- 173.64.216.148 (79 tests)
- 71.102.60.230 (24 tests)
- 71.173.136.27 (35 tests)
- 71.187.61.61 (46 tests)
- 71.240.222.193 (28 tests)
- 72.69.218.34 (42 tests)
- others (3682)

Peak (Hour 21)
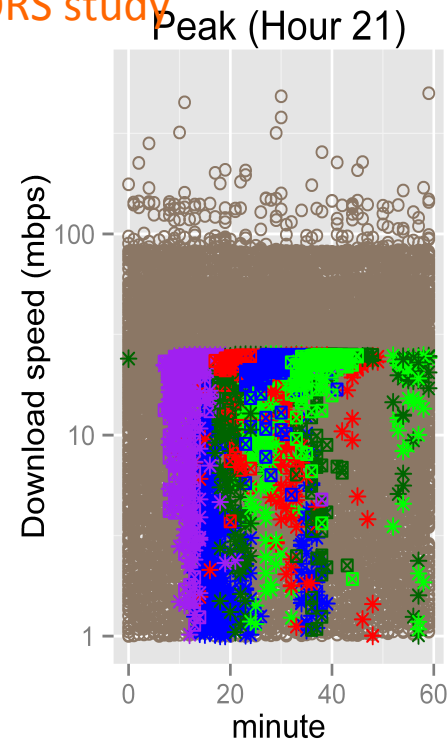
IP address
- 100.2.204.154 (583 tests)
- 100.7.6.222 (942 tests)
- 108.29.174.169 (687 tests)
- 108.35.83.174 (441 tests)
- 108.36.239.164 (1292 tests)
- 108.5.97.27 (925 tests)
- 173.61.92.67 (1082 tests)
- 173.68.137.30 (1273 tests)
- 96.226.159.106 (648 tests)
- 96.245.129.56 (1394 tests)
- others (9344)

Matching: find a sound set of comparison metrics
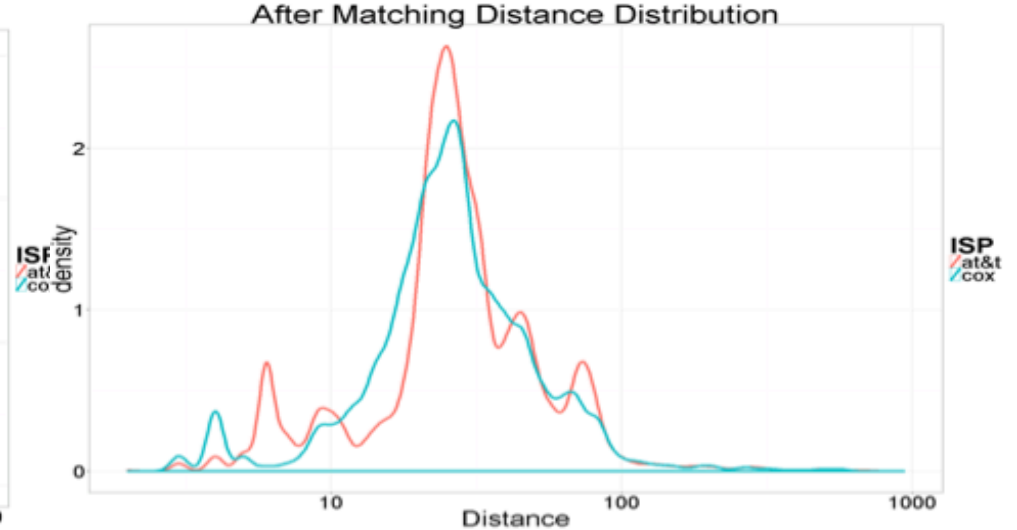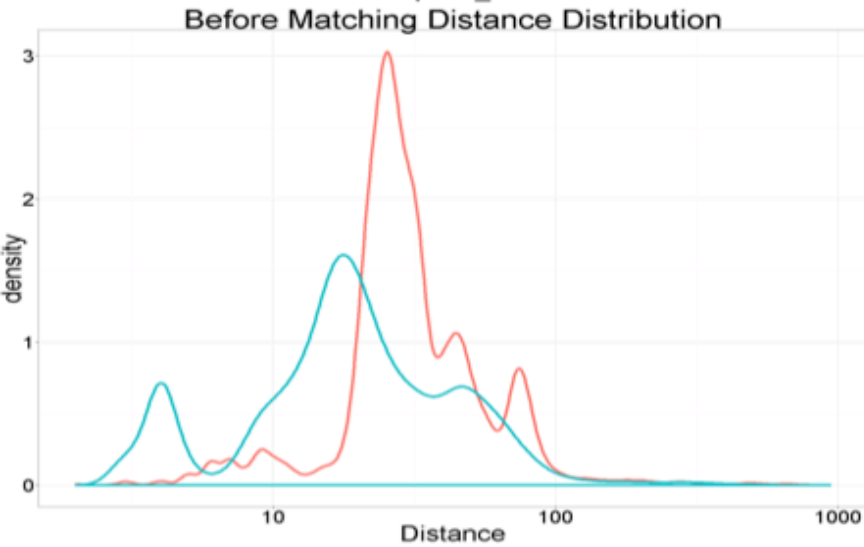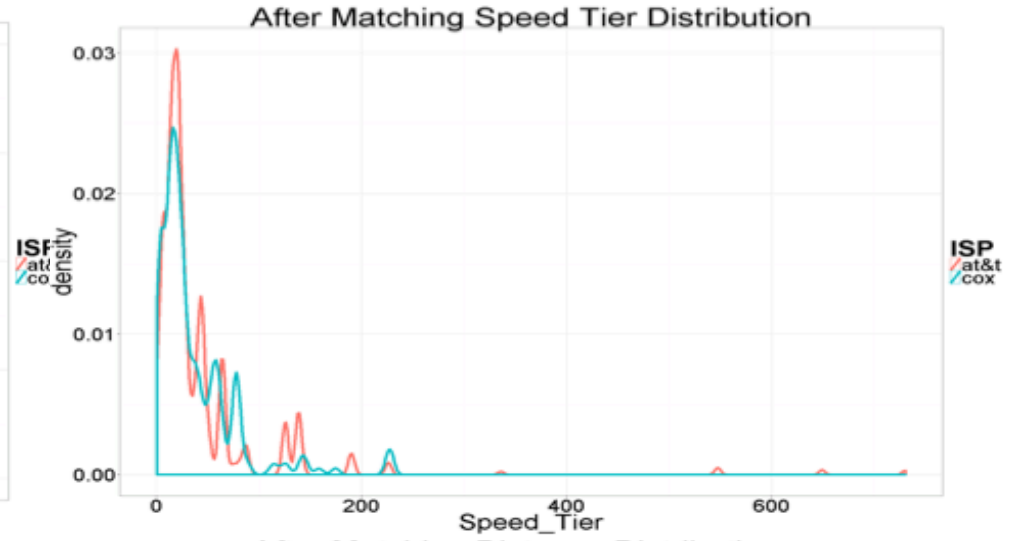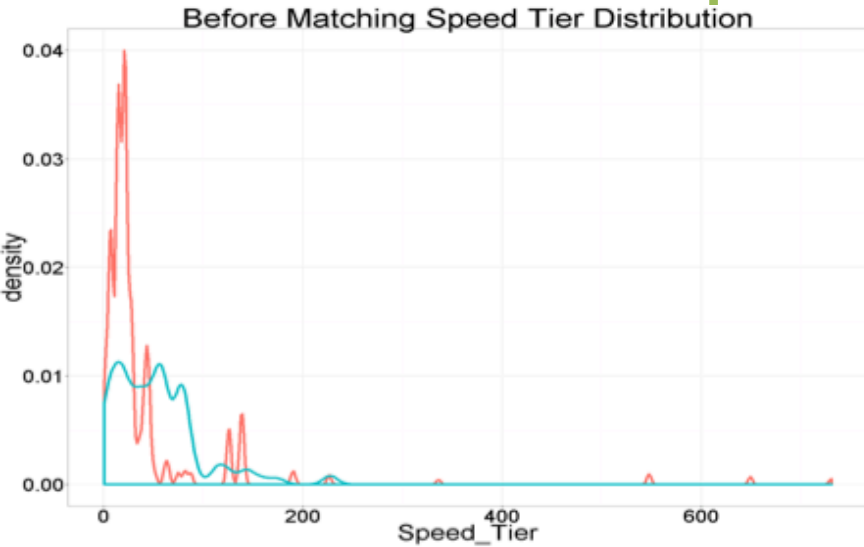
Shared Tool & online Analytic report

M-Lab Web Interface

[Visulization Tool URL](http://vis-mlab.internet-measurement.com/)   http://vis-mlab.internet-measurement.com/

[2015 Data analytic report](http://fair-isp-compari.internet-measurement.com/) http://fair-isp-compari.internet-measurement.com/

This tool was created using NDT data obtained by Measurement Lab. The tool was created at the University of New South Wales Australia, School of Electrical Engineering and Telecommunications

1. SELECT CHART TYPE:

Aggregated Plot
Scatter Plot
ISP Monthly Distribution Plot
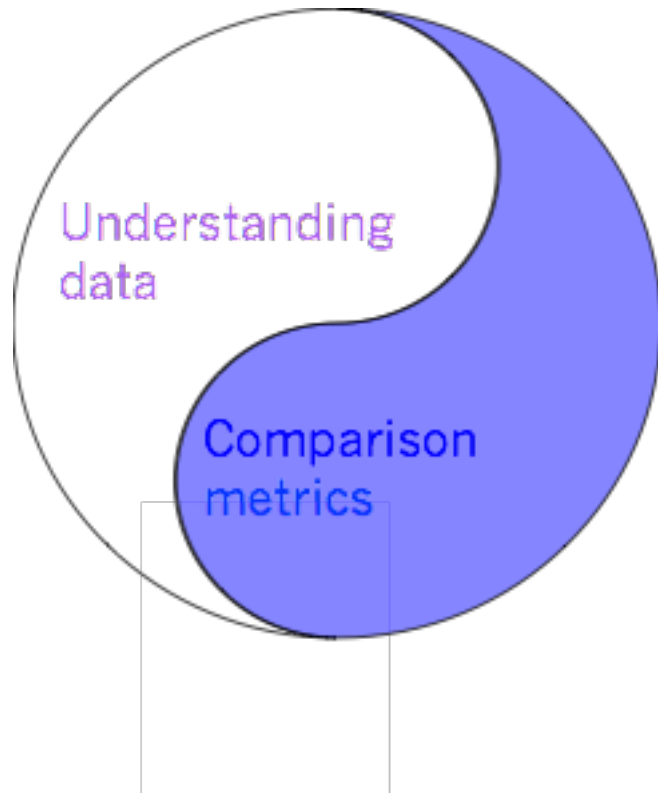**Country Correlation Plot**

2. SELECT COUNTRY:

US

3. SELECT TIME PERIOD:

Year:

2015

Visualise

Wrap-up, Q&A

Insight gained:

Aggregated average speed can be impacted by user testing behaviours.

There are multiple input factors affect speeds, and these factors are not ISP's fault;

Variation of input factors temporally can cause ISP monthly fluctuation.

Comparison metrics in NEED to take account of various input factors

Measuring broadband performance using M-Lab: Why averages tell a poor tale

ITNAC '15 Proceedings of the 2015 International Telecommunication Networks and Applications Conference (ITNAC)