Measurement Lab

Internet Policy and Independent Network Performance Measurement

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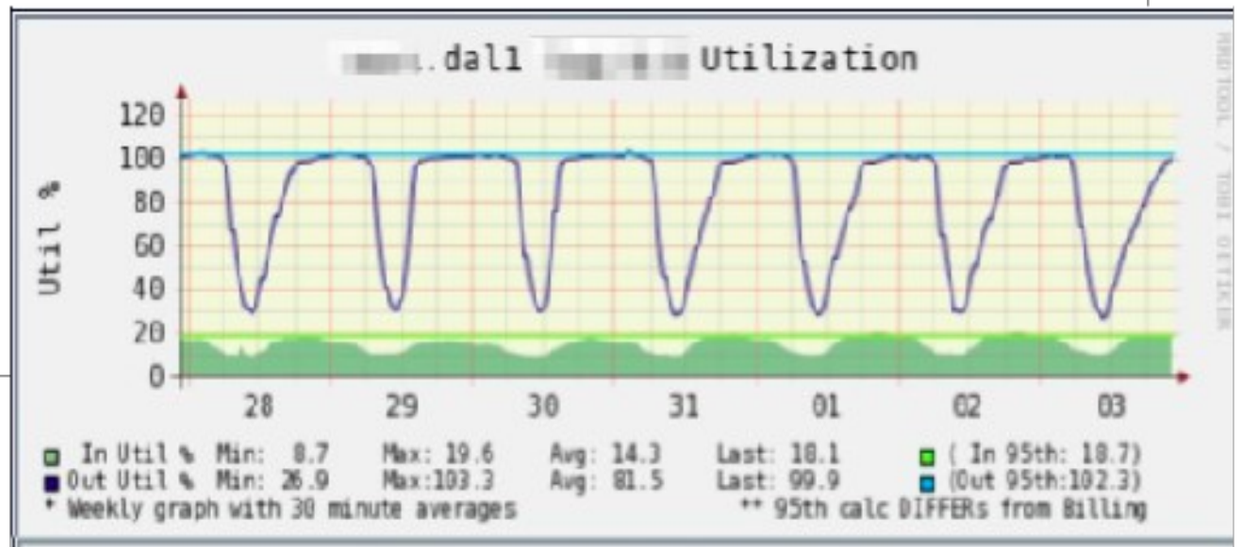
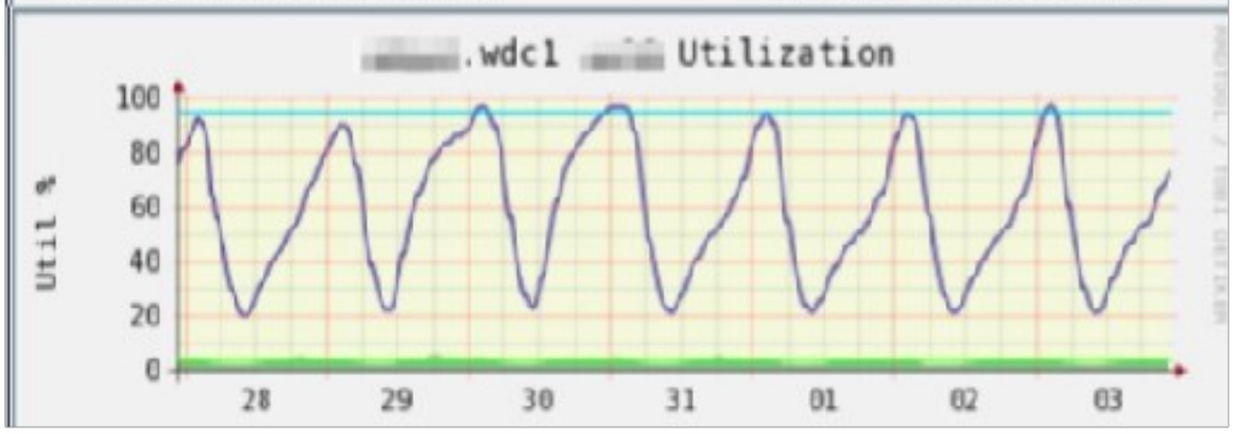
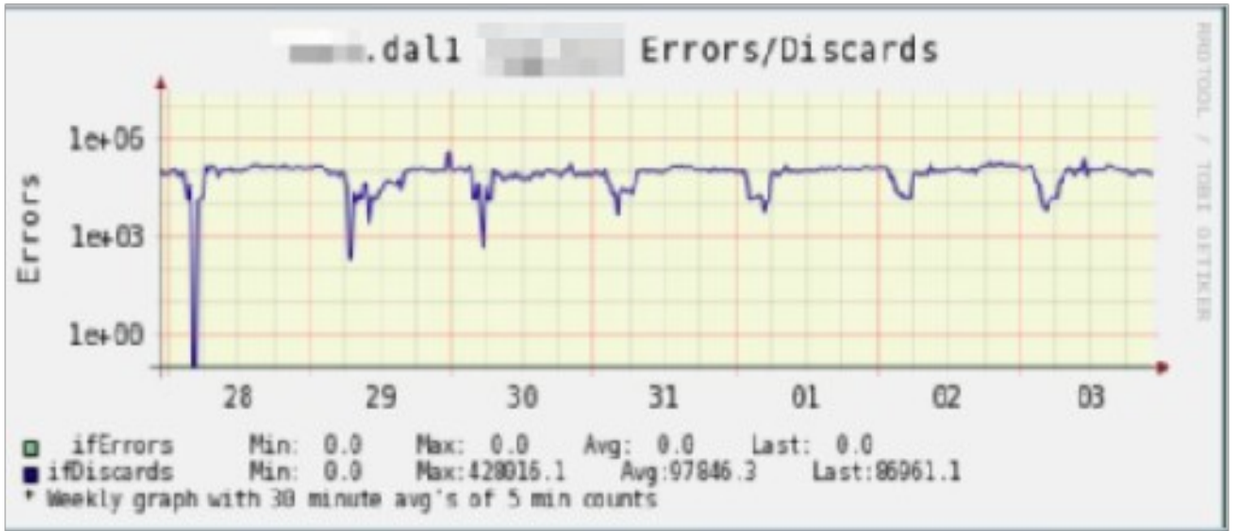
LACNIC 2015

The Regulator's Problem

- Utilization and Performance Data is Proprietary and Hidden from the Public.
- User Collected Information is Unreliable, Incomparable, Methodologically Unsound and Narrowly Scoped.
- Longitudinal Data is Rare, So Is Comparative Measurement.
- Independent Data is Expensive.







ptseng
New Member

Posts: 2
Registered: 02-25-2014

VPN speed issues

Options

02-25-2014 01:07 PM

Hello,

I am a Comcast Business user with a 50/10 connection in Charlottesville, Virginia.

My needs are simple - I work in a local university hospital, and sometimes need to connect from home overnight or on weekends for urgent patient cases. So when I'm not using the connection as a home internet connection, I primarily connect to a VPN with a Citrix server, which hosts some proprietary software that displays certain patient data and relevant video. Video is vital to what I do, so I require reasonable speed.

At certain times of the day I've managed to get 15mbit/s down, and video runs at a decent speed. At peak times, however, I rarely see speeds upward of 700kbit/s down from the VPN, and the video is so slow as to be unusable. I might as well hop in my car and drive to work.

I don't know that I'm checking the appropriate servers, but I ran a tracert to comcast.net from my work computer. I see 9 hops within the intranet, and 6 hops through different Cogent servers, then finally multiple Comcast servers across the country. Granted, I'm aware that (1) my work computer is not the Citrix server, and (2) comcast.net probably isn't the correct server to be pinging. Nevertheless, I think my questions are as follows:

1. How can I fix this?
2. How can I fix this?
3. How can I fix this?

Just kidding...

1. How can I locate the bottleneck? If I run speedtests on my comcast connection when the VPN connection is crazy slow, I'm still getting 50/10 down/up. The rest of the Internet seems to be working just fine, as well.
2. Supposing I can locate the bottleneck and it's distant from my Comcast connection, what are my options to fix the problem? What if it's at the university site? What if it's somewhere in between?

Any suggestions or information would be greatly appreciated. I have tried our local IT contacts, but they have been of limited assistance (of the "unplug and reboot your computer" variety).

Thanks!

Information Asymmetries Create are Public Issues

Service Providers Need Data

Overview of Measurement Lab

M-Lab's Global Footprint

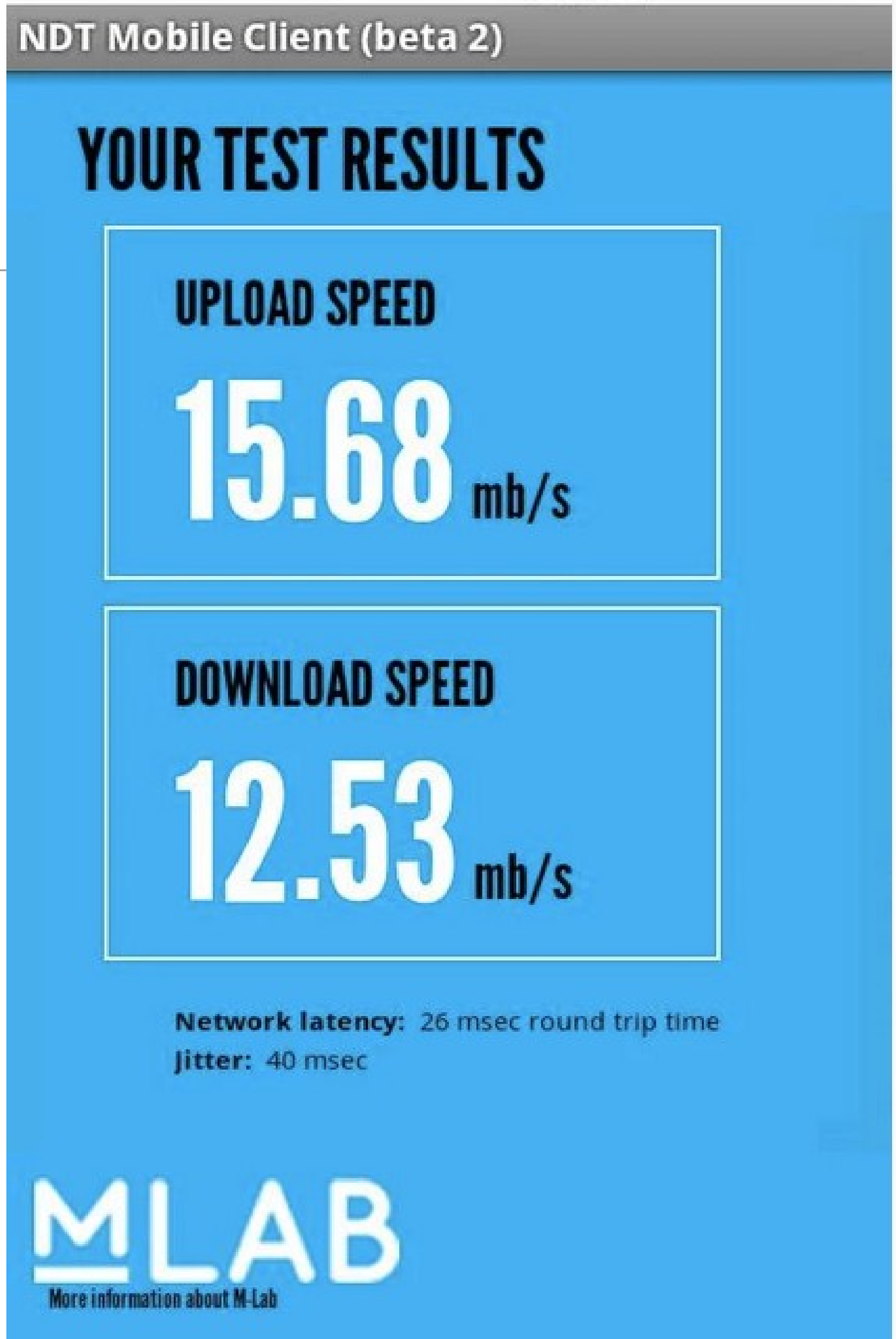
Servers on Every Continent and Growing

M-Lab's Global Footprint

Tests from Every Country

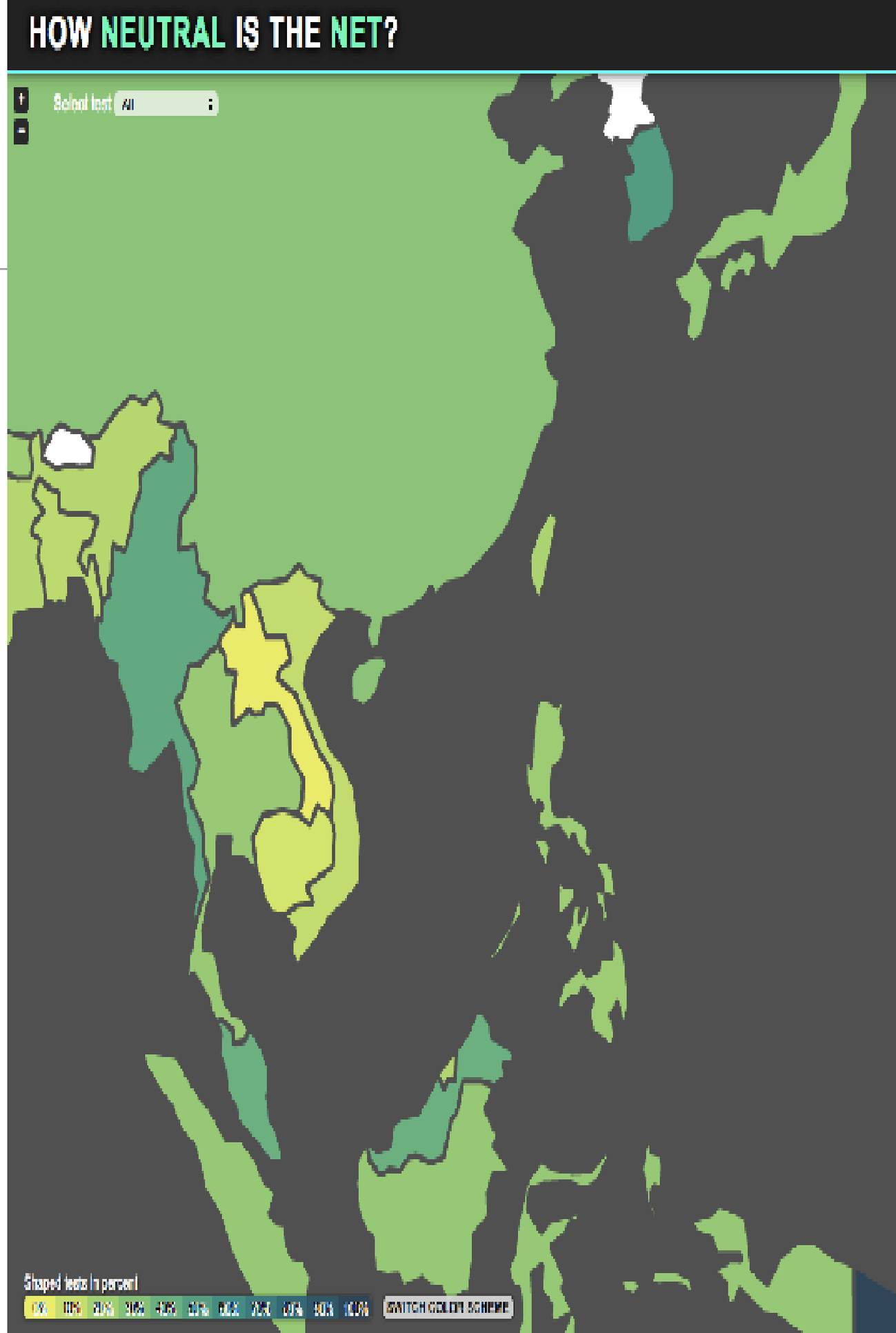
Throughput Measurements

- M-Lab hosts two active throughput measurements:
- Network Diagnostic Tool (NDT)
- BISmark
- NDT is integrated with numerous applications and receives 200,000 tests from 100,000 clients per day.
- Nearly every country is well-covered.



Transparency

- Three active tests:
  - Shaperprobe
  - Glasnost
  - Neubot
- Measure differential traffic performance and traffic classification regimes.



Path Information

- Measurement Lab collects paris-traceroutes for every attempt to connect to its sites.

connection_spec_server_ip	paris_traceroute_hop_src_ip	paris_traceroute_hop_dest_ip
217.163.1.89	217.163.1.35	195.219.83.101
217.163.1.89	195.219.83.101	80.231.130.129
217.163.1.89	80.231.130.129	80.231.154.17
217.163.1.89	80.231.154.17	80.231.153.58
217.163.1.89	80.231.153.58	5.23.24.6
217.163.1.89	5.23.24.6	195.154.1.71
217.163.1.89	195.154.1.71	62.210.74.143
217.163.1.102	5.23.24.6	195.154.1.71
217.163.1.102	195.154.1.71	62.210.74.143
217.163.1.102	80.231.153.58	5.23.24.6
217.163.1.102	80.231.154.17	80.231.153.58
217.163.1.102	80.231.130.129	80.231.130.86
217.163.1.102	195.219.83.101	80.231.130.129

Censorship and Interference

- M-Lab Deployed the ‘Open Observatory of Network Interference’ (OONI) Test
- First deployment of a censorship measurement tool to OONI
- Initial test of HTTP middle boxes

Open Observatory of Network Interference

ooni

Consumer Measurement and Policy

Methodologies from the Network Edge

STEP 1

A user, connected to the Internet by one or another access ISP, runs a test.

STEP 2

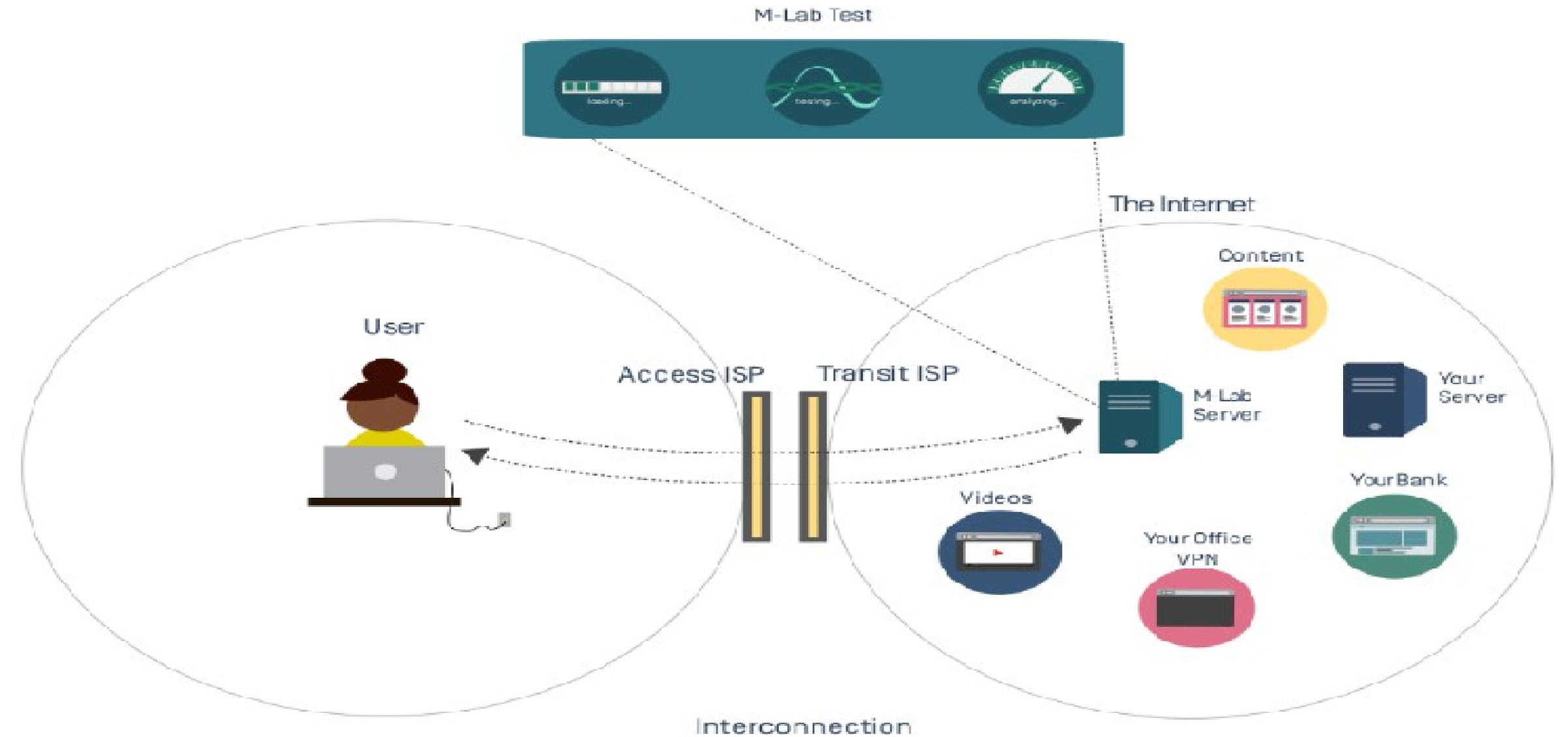
The test sends traffic from their device to the closest M-Lab measurement point, and back.

STEP 3

This measures performance from the access ISP into the Internet (not just within the access ISP's network).

STEP 4

The measurements generated by a given test are shown to the user, and put into the public domain.



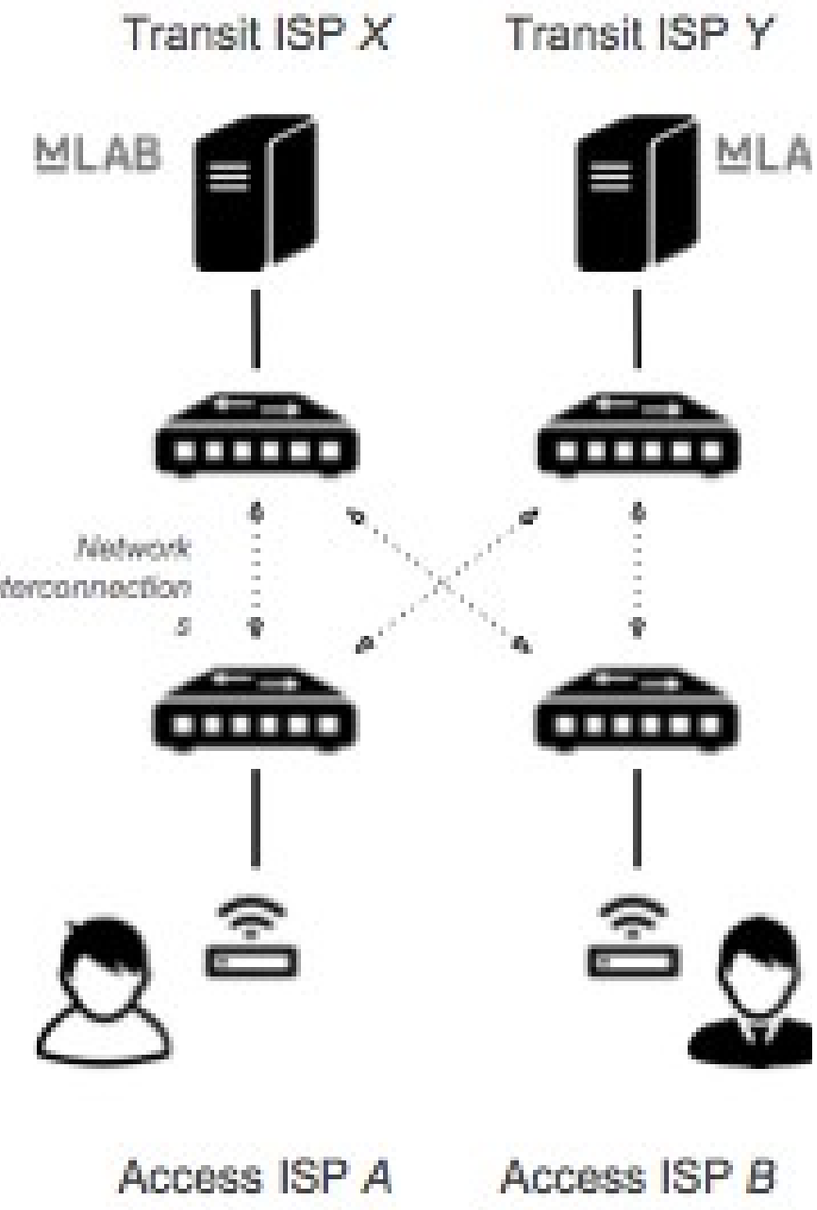
How Measurement Lab Collects Information

Measurements From Everyone

Methodology

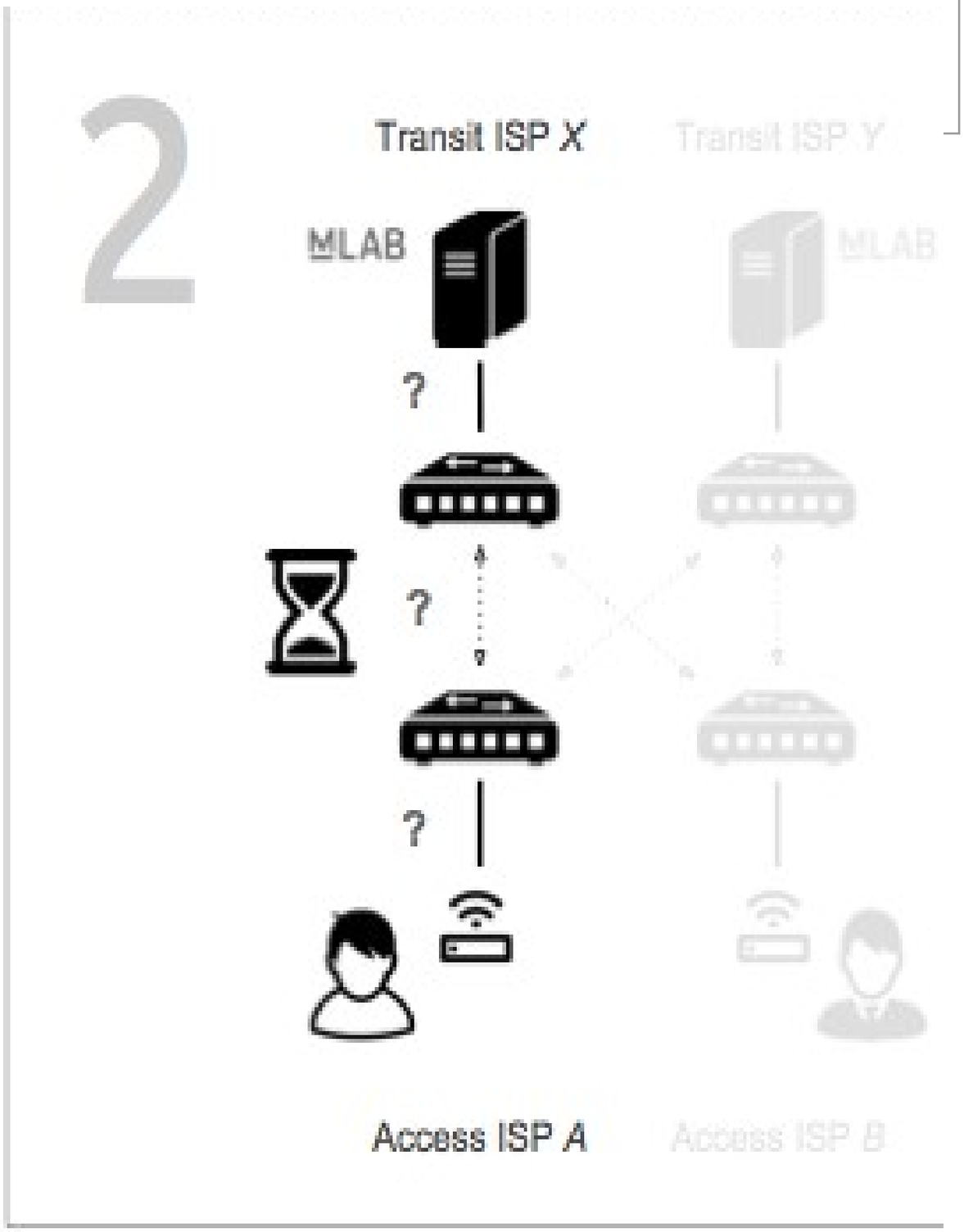
Inferring the Source of Congestion

1



Methodology

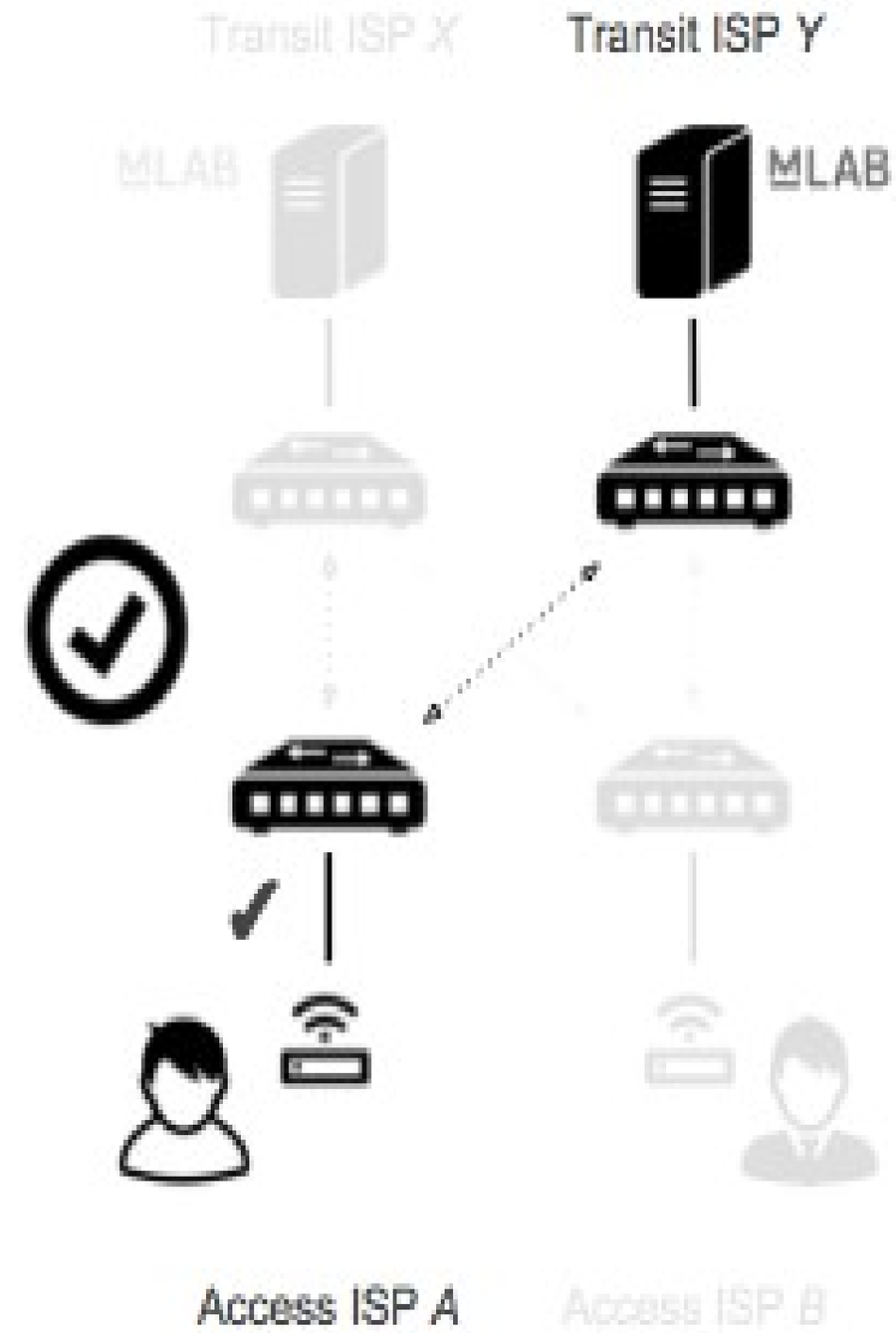
Inferring the Source of Congestion



3

Methodology

Inferring the Source of Congestion



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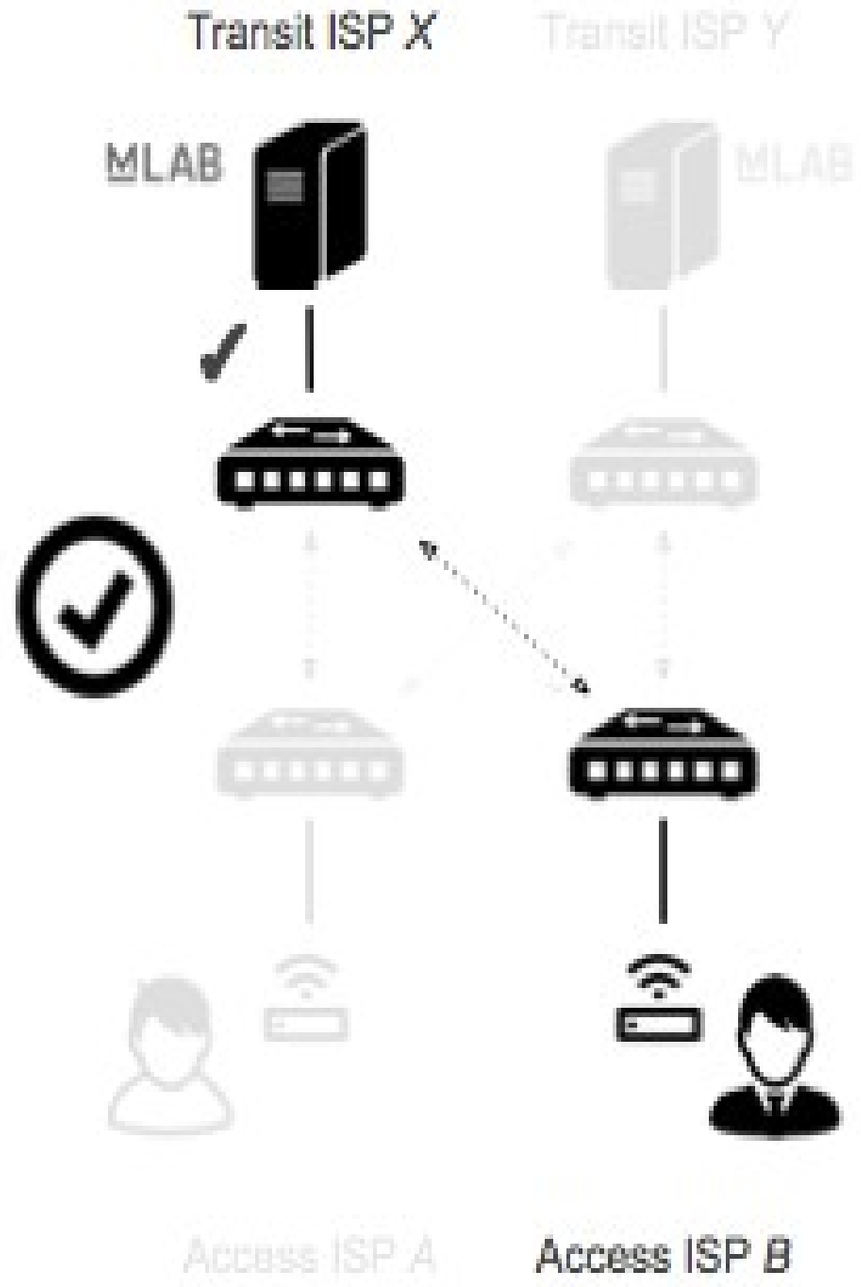
Methodology

Inferring the Source of Congestion



Methodology

Inferring the Source of Congestion

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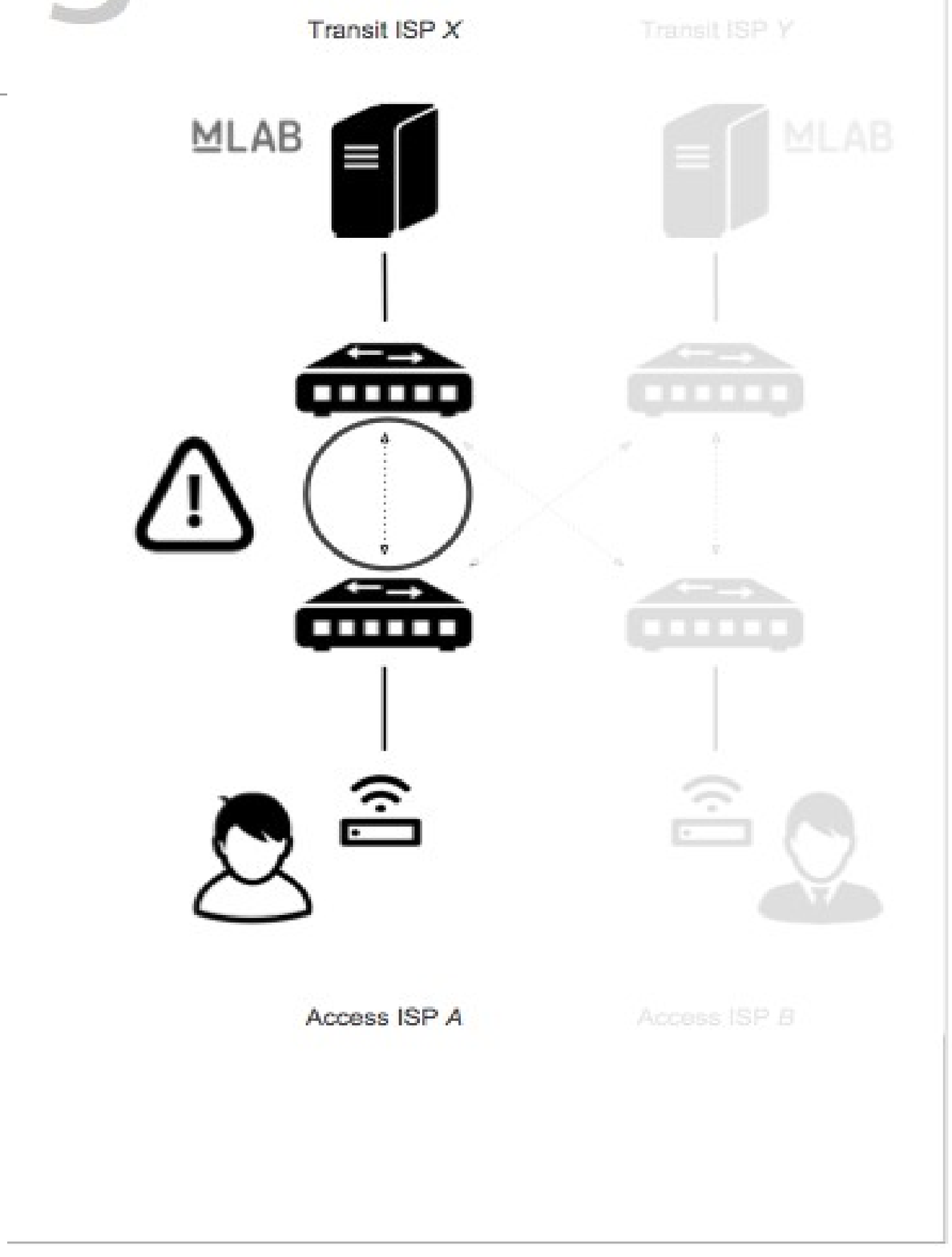
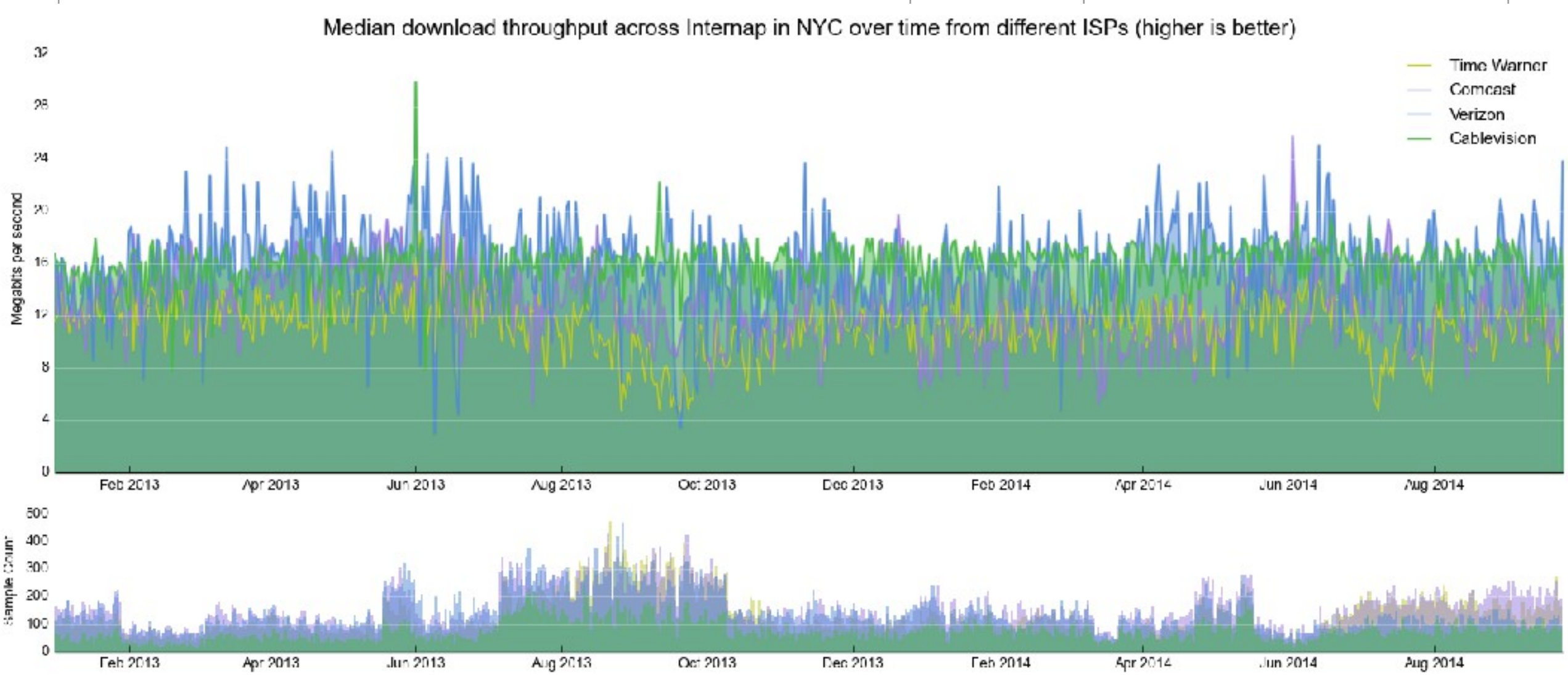


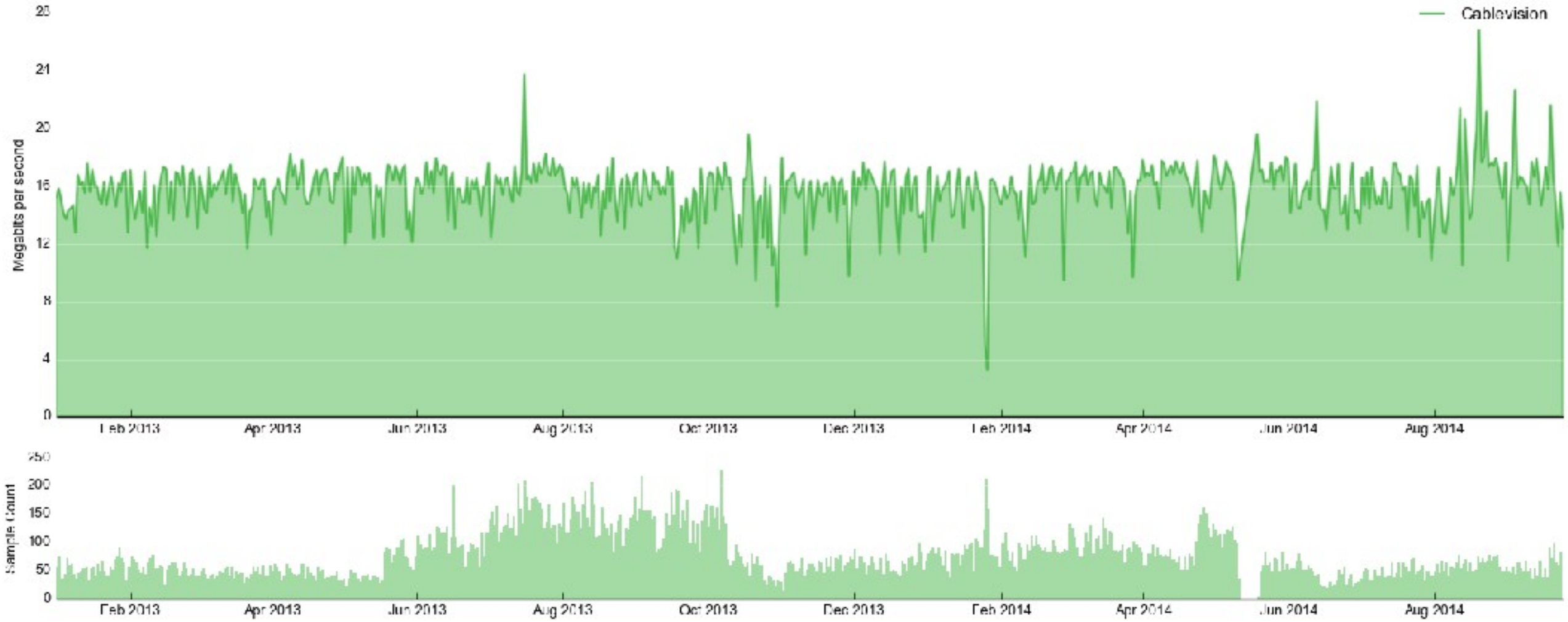
Consumer Internet Measurement Case Study

Interconnection Disputes in the United States



Inferring Sources of Congestion in Practice

US Access ISPs and Cogent (2013-2014)



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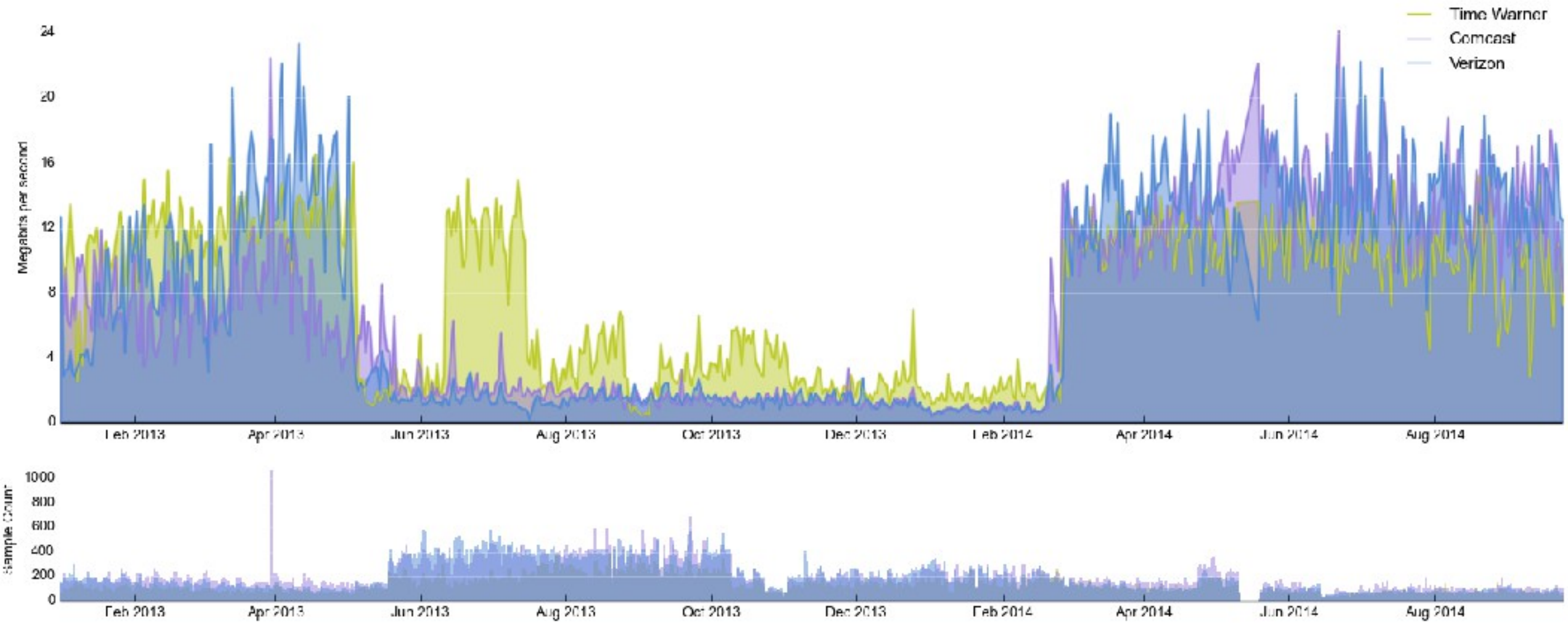

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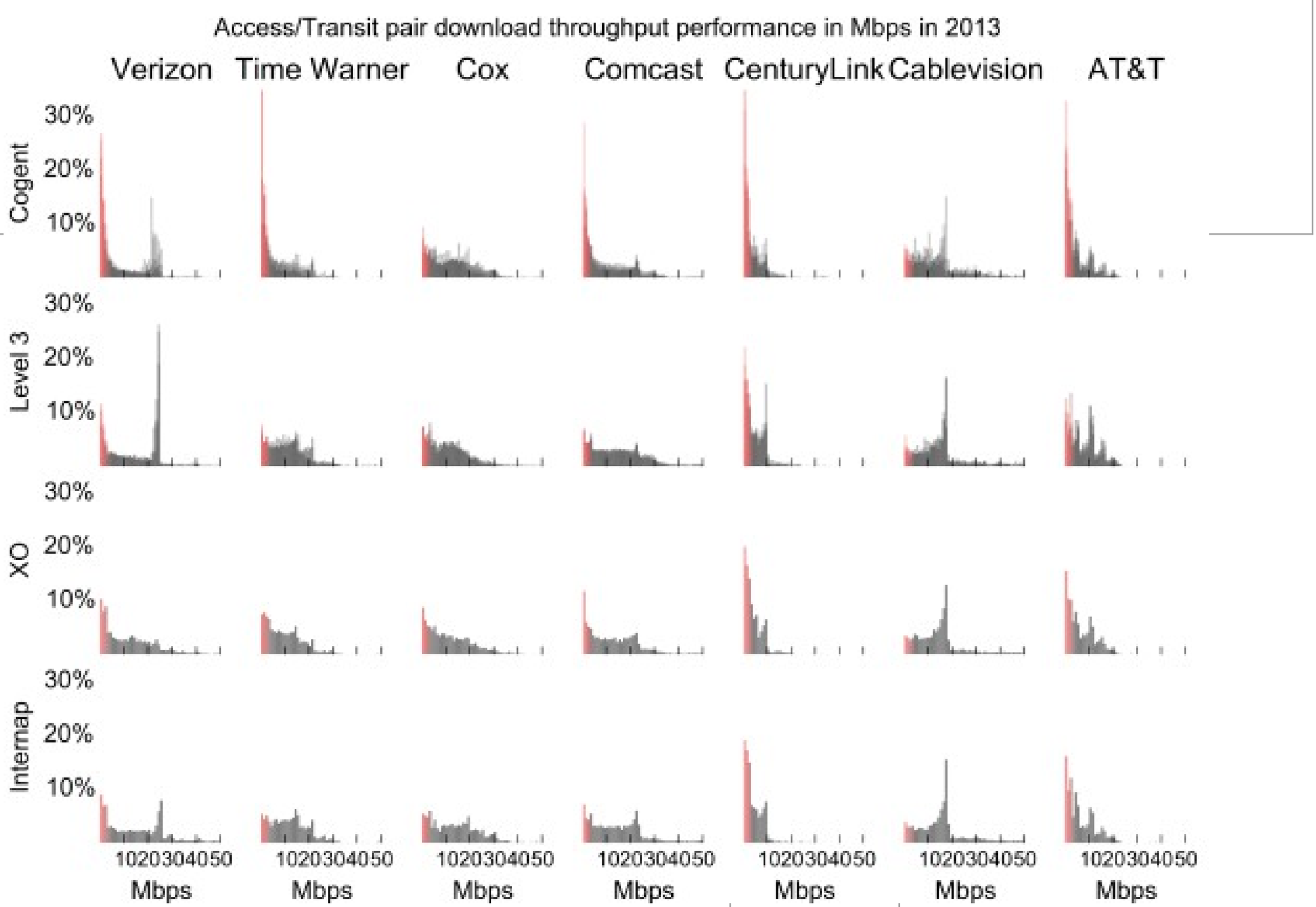
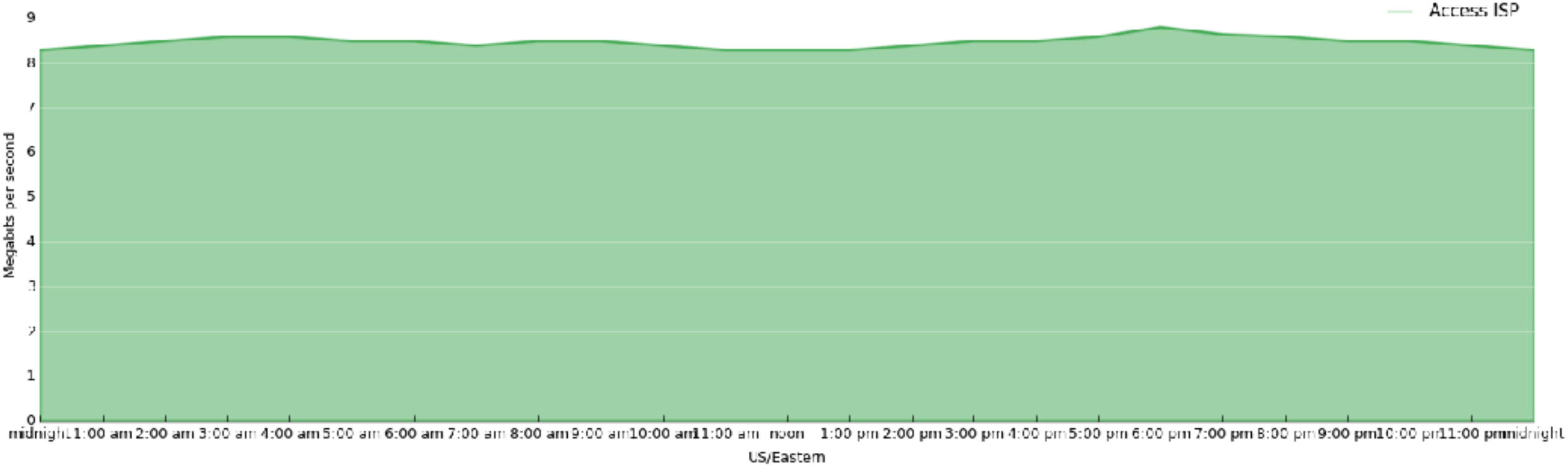


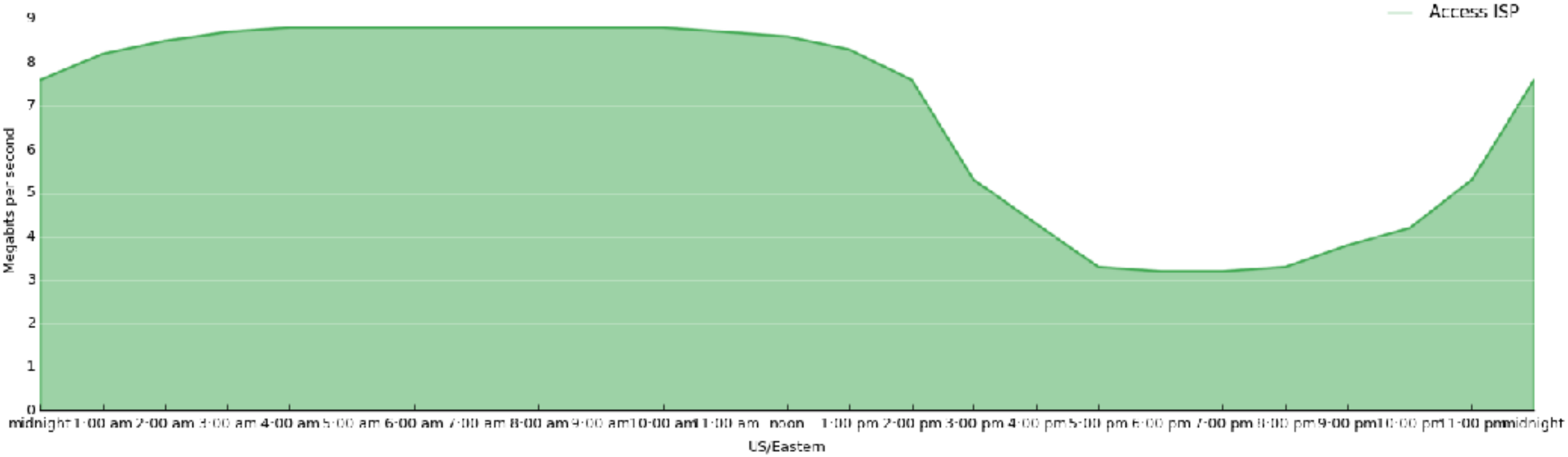
Comparative Performance across ISPs

No Access ISPs or Transit ISPs Universally Underperforming



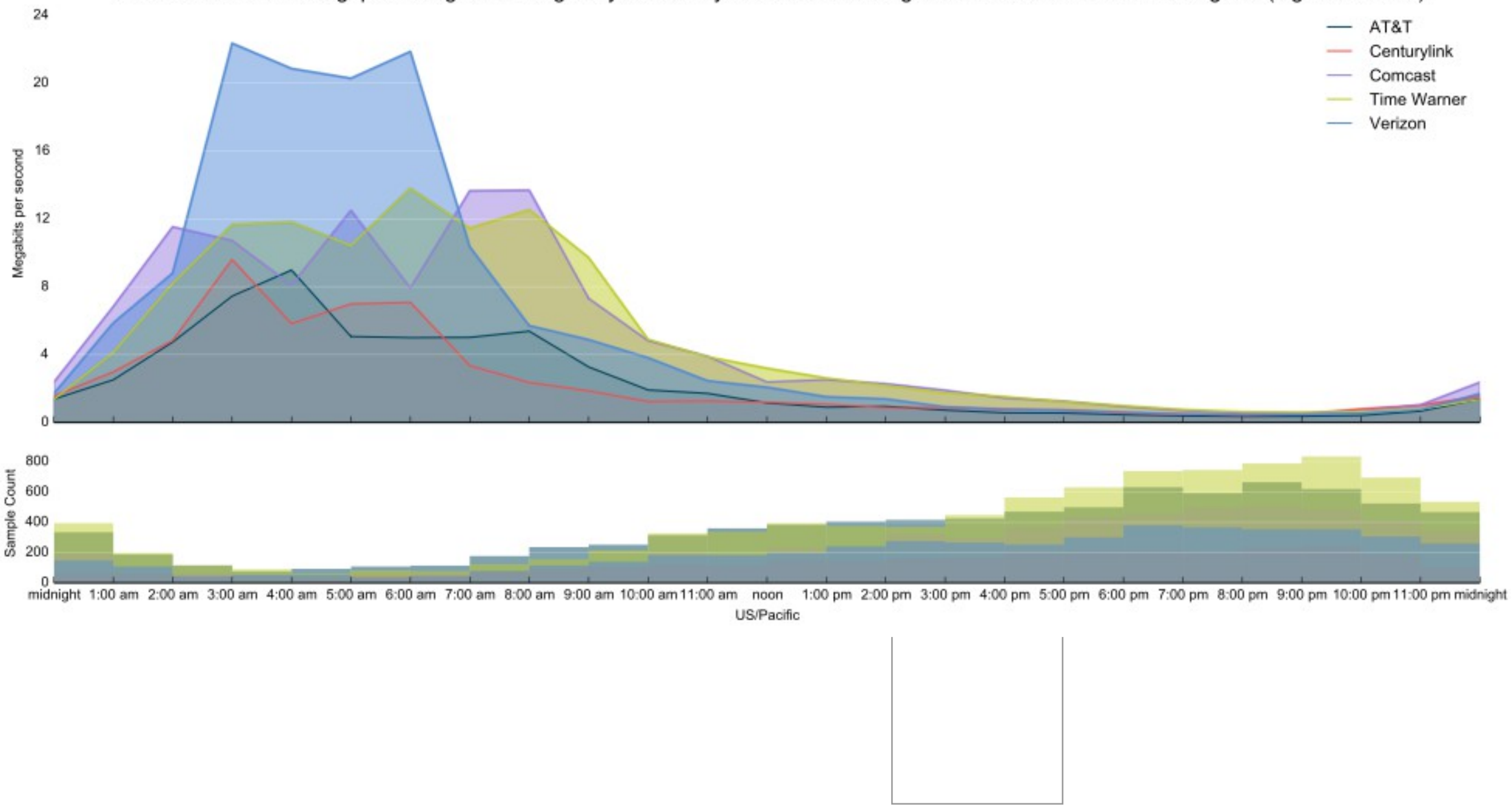
Diurnal Patterns Are Instructive

Expectations of Normal Performance

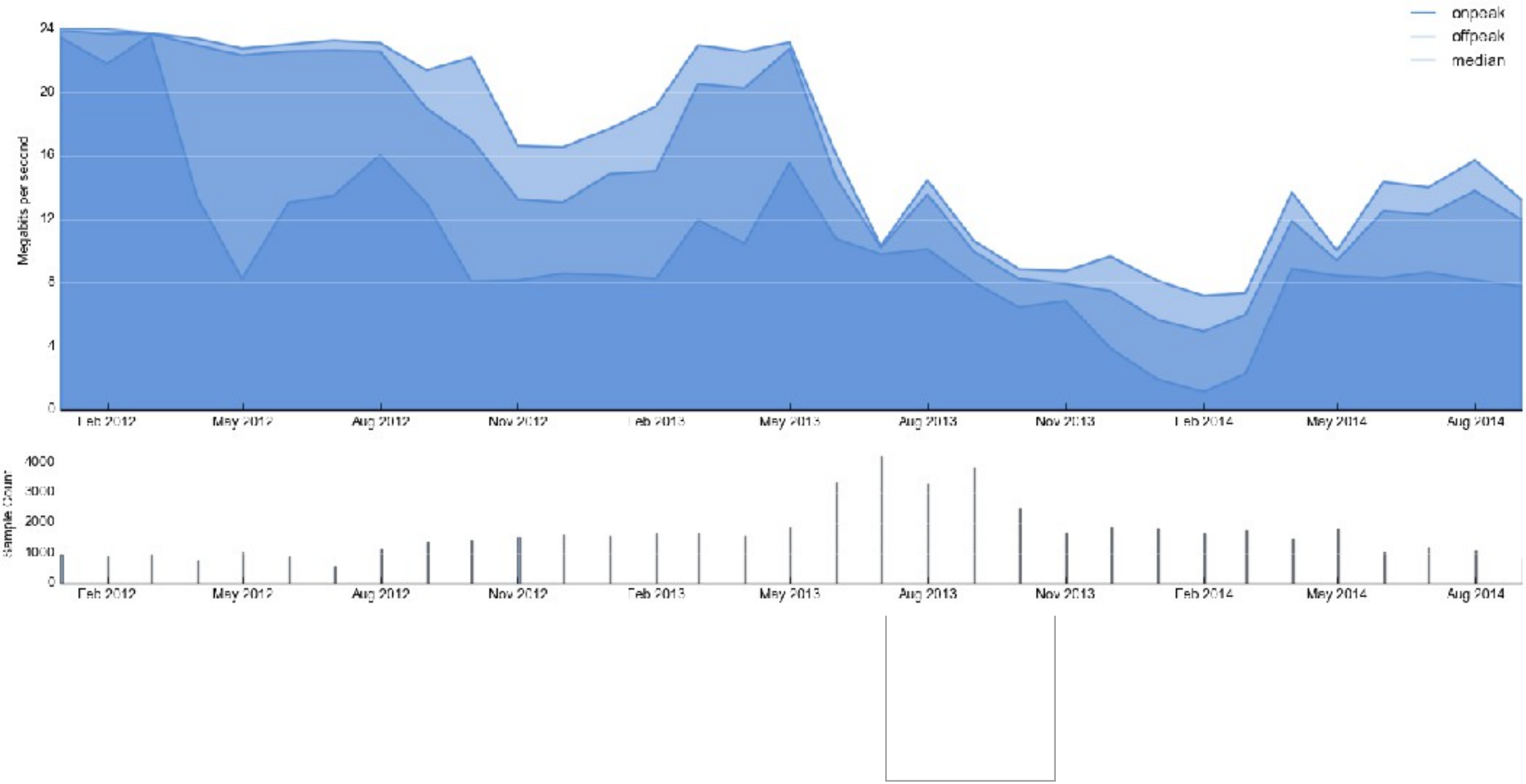


Diurnal Patterns Are Instructive

Expectations of Congested Performance



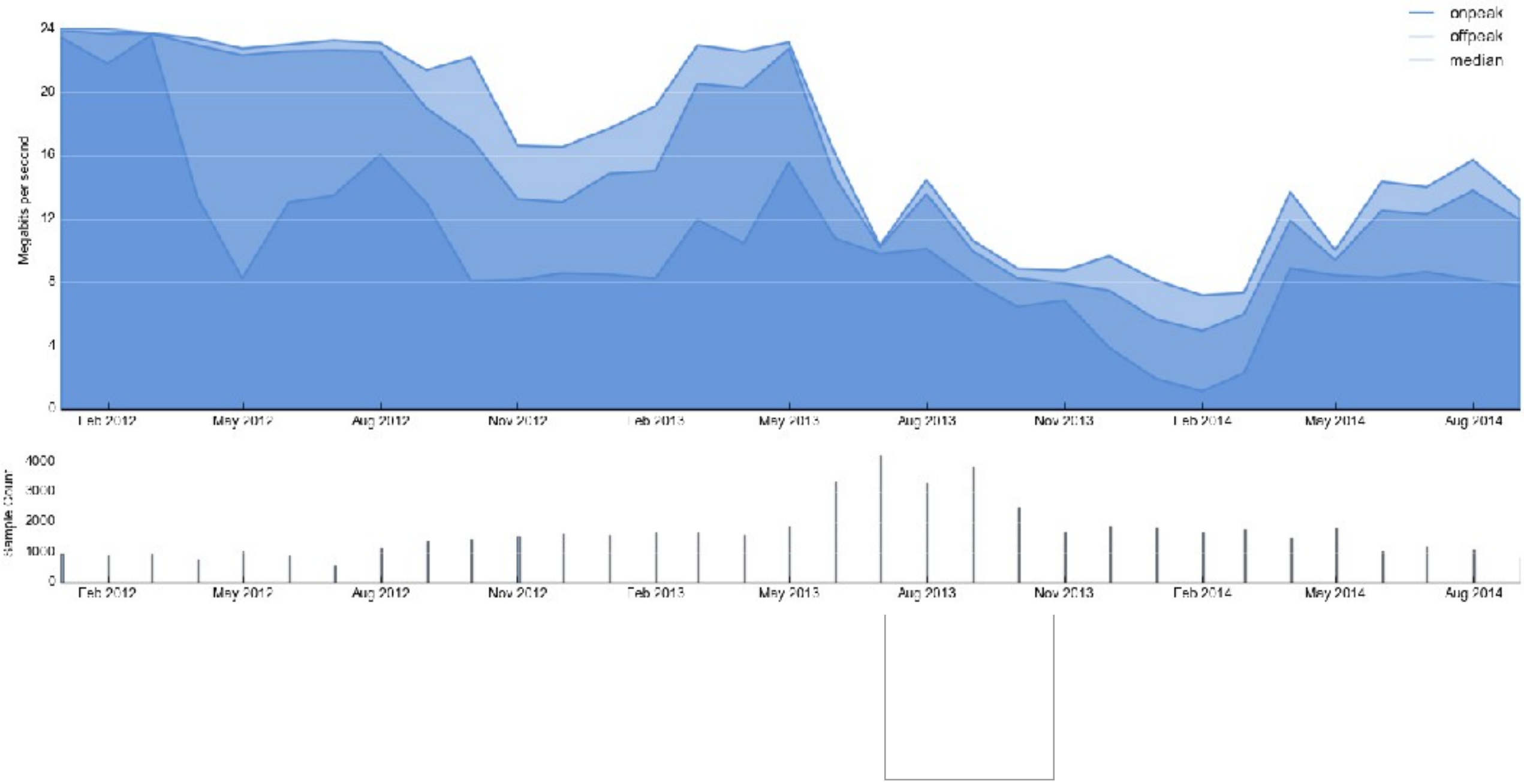
Diurnal Cycles In Practice



Diurnal Patterns Are Instructive

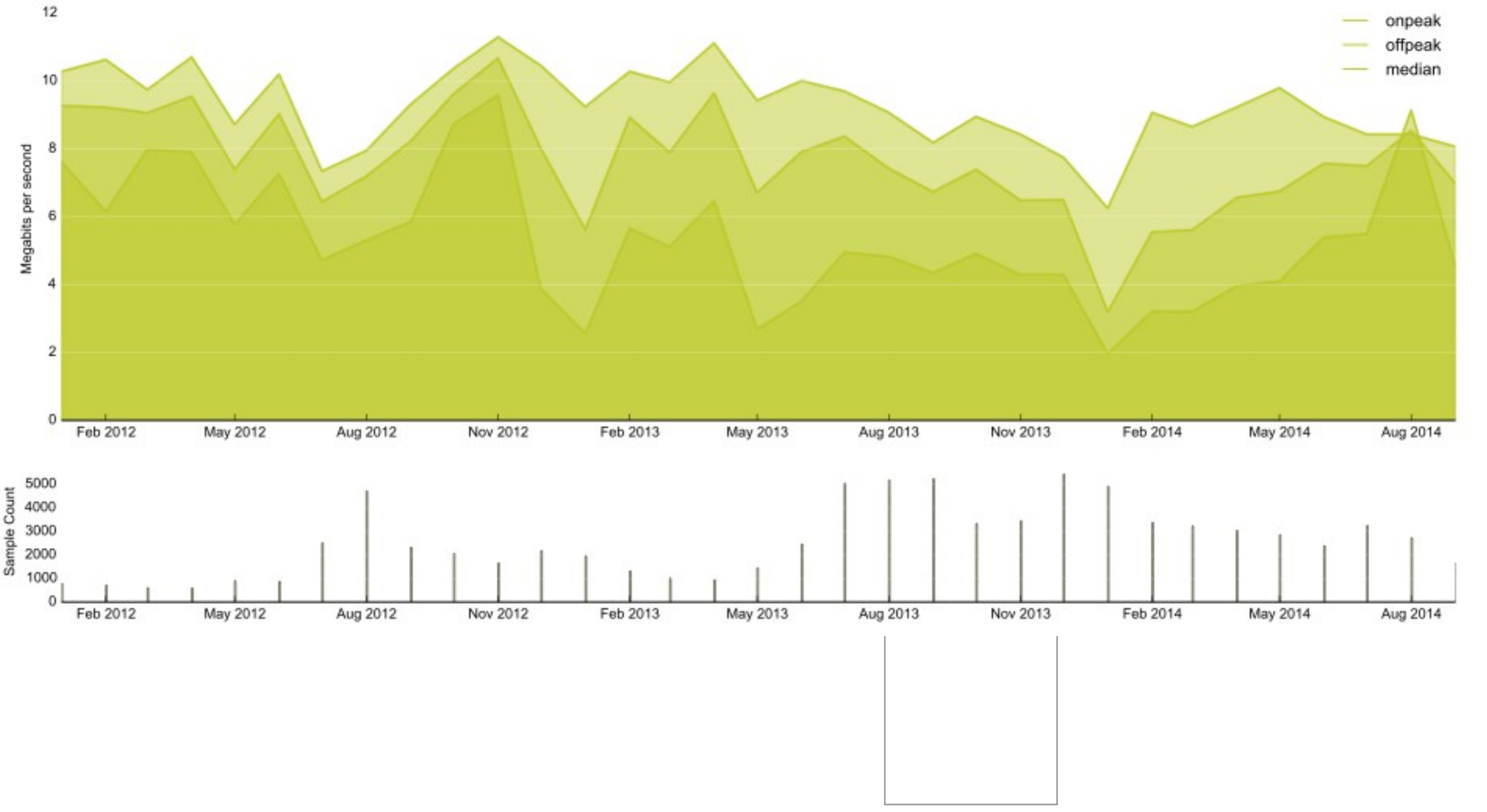
Peak Congestion Can Augur Future Degradation

Congestion affecting consumers has not been limited to interconnections with Cogent



Level 3 and Verizon

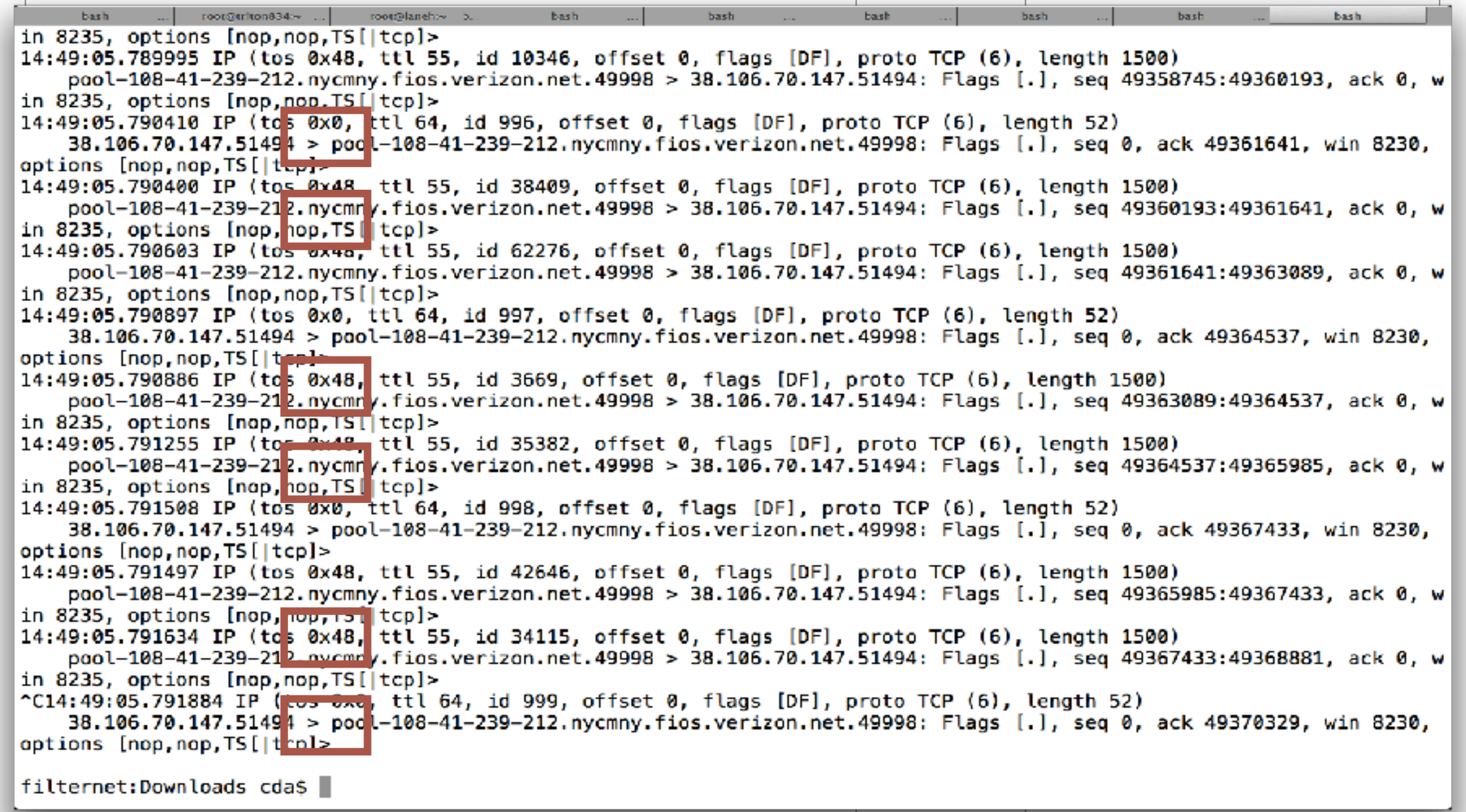
Ongoing



XO and Time Warner Cable

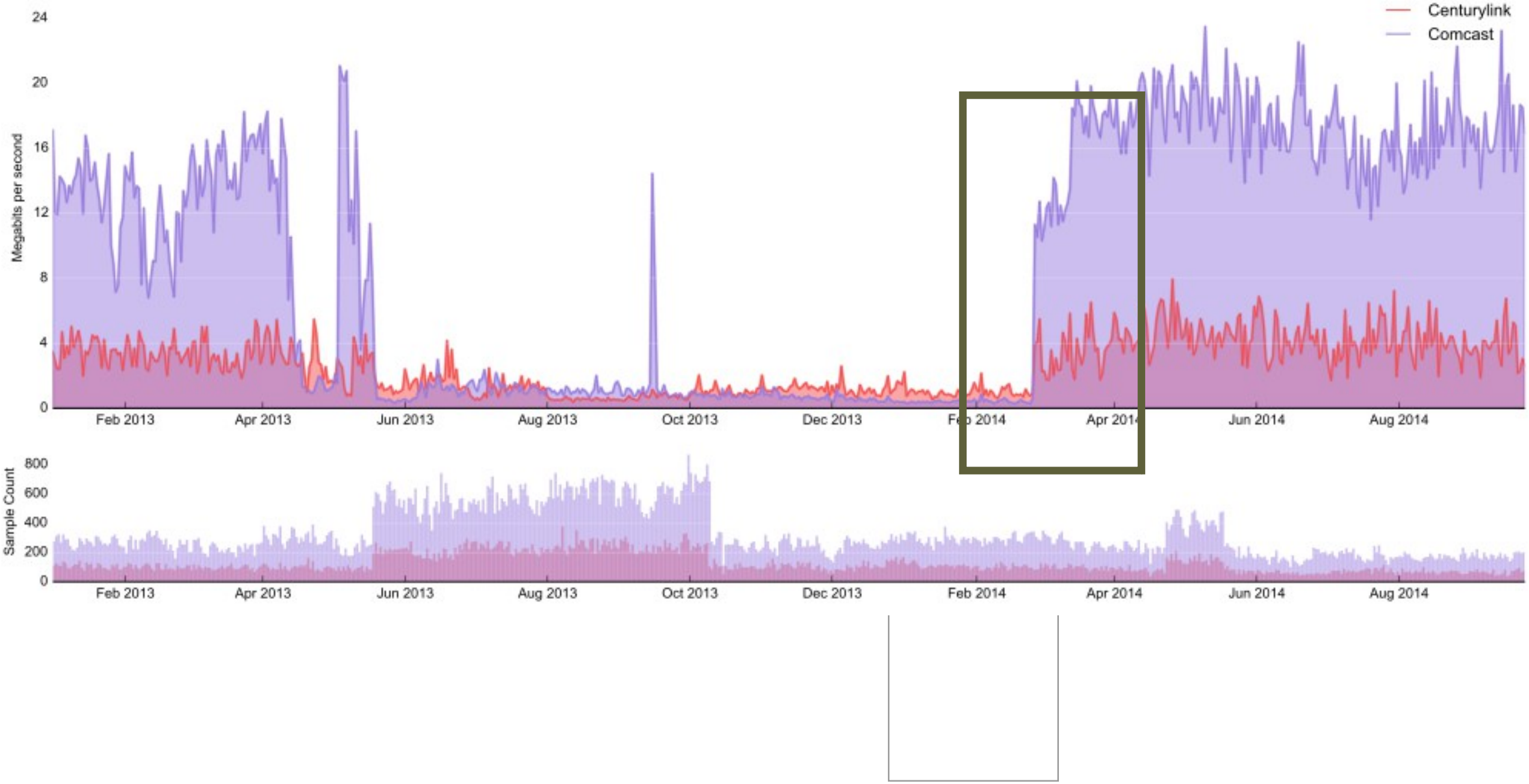
Ongoing

Our data shows that traffic from specific Access ISP customers across interconnections with specific Transit ISPs experienced degraded performance, and that this degradation forms a pattern wherever specific Access ISPs and Transit ISPs exchange traffic.



Assessment of Prioritization

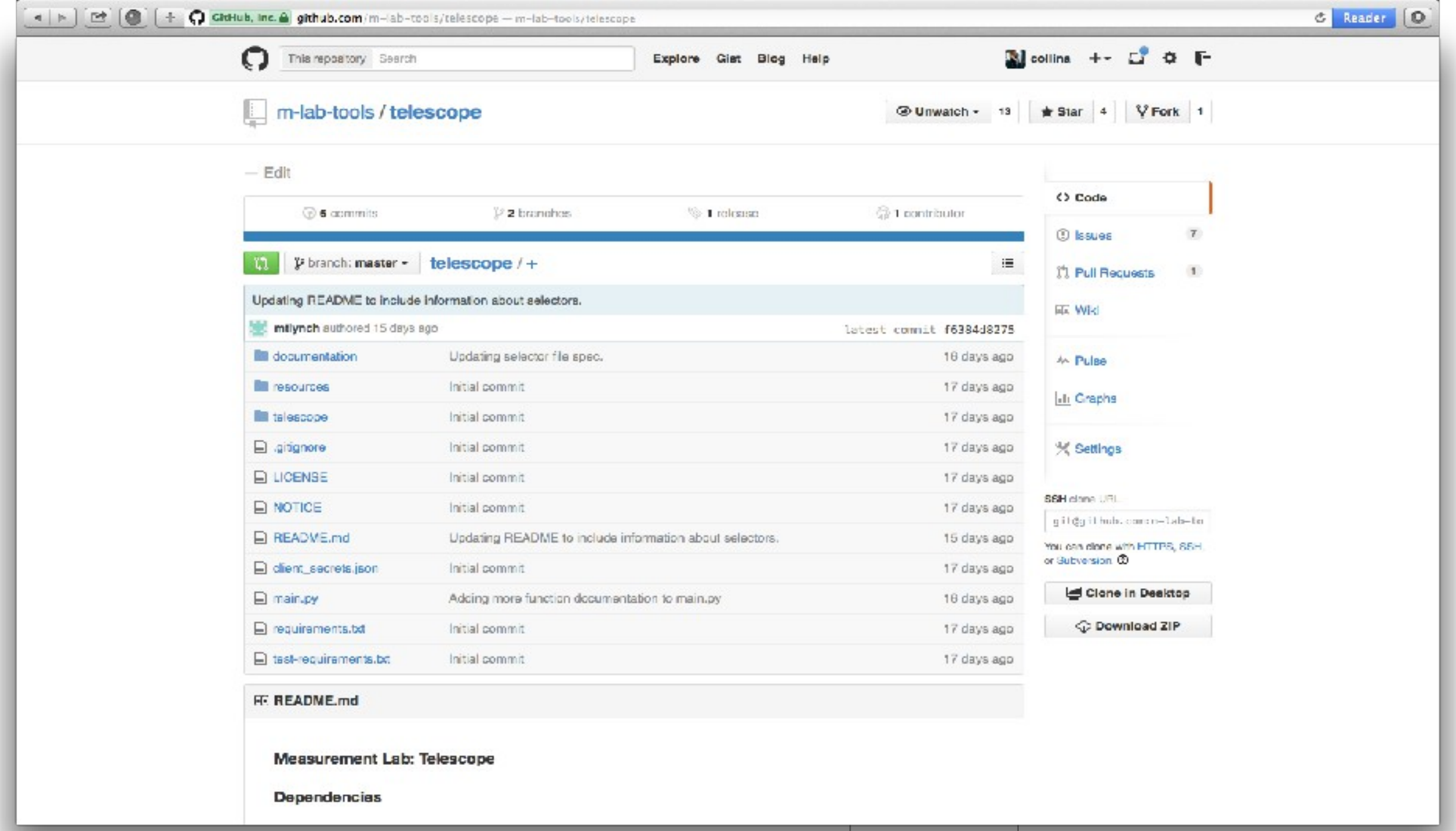
Cross the Board Increases



Assessment of Prioritization

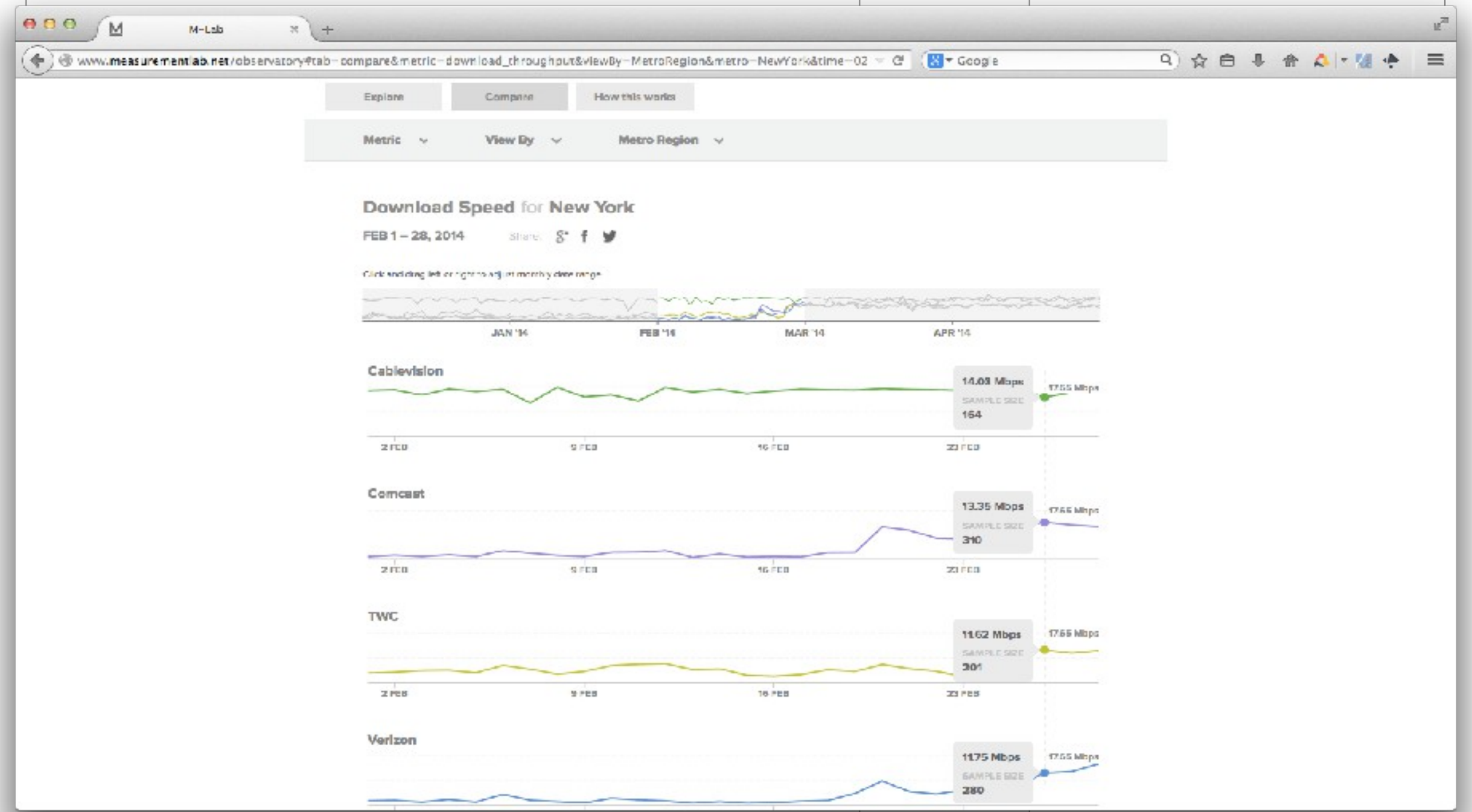
Cross the Board Increases

Raw Data Access and Processed Data Extraction Tools



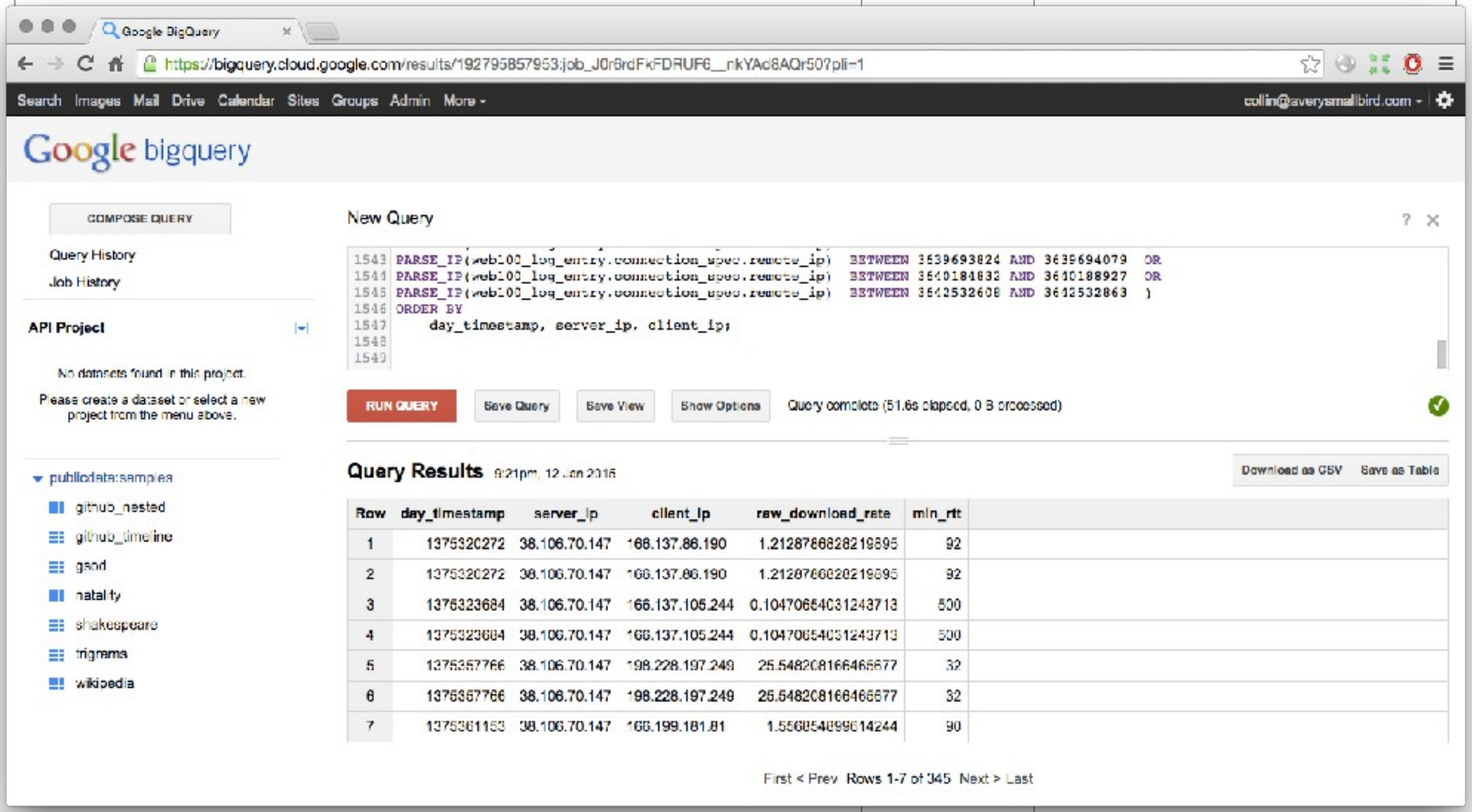
Measurement Lab Telescope

Python to extract M-Lab data



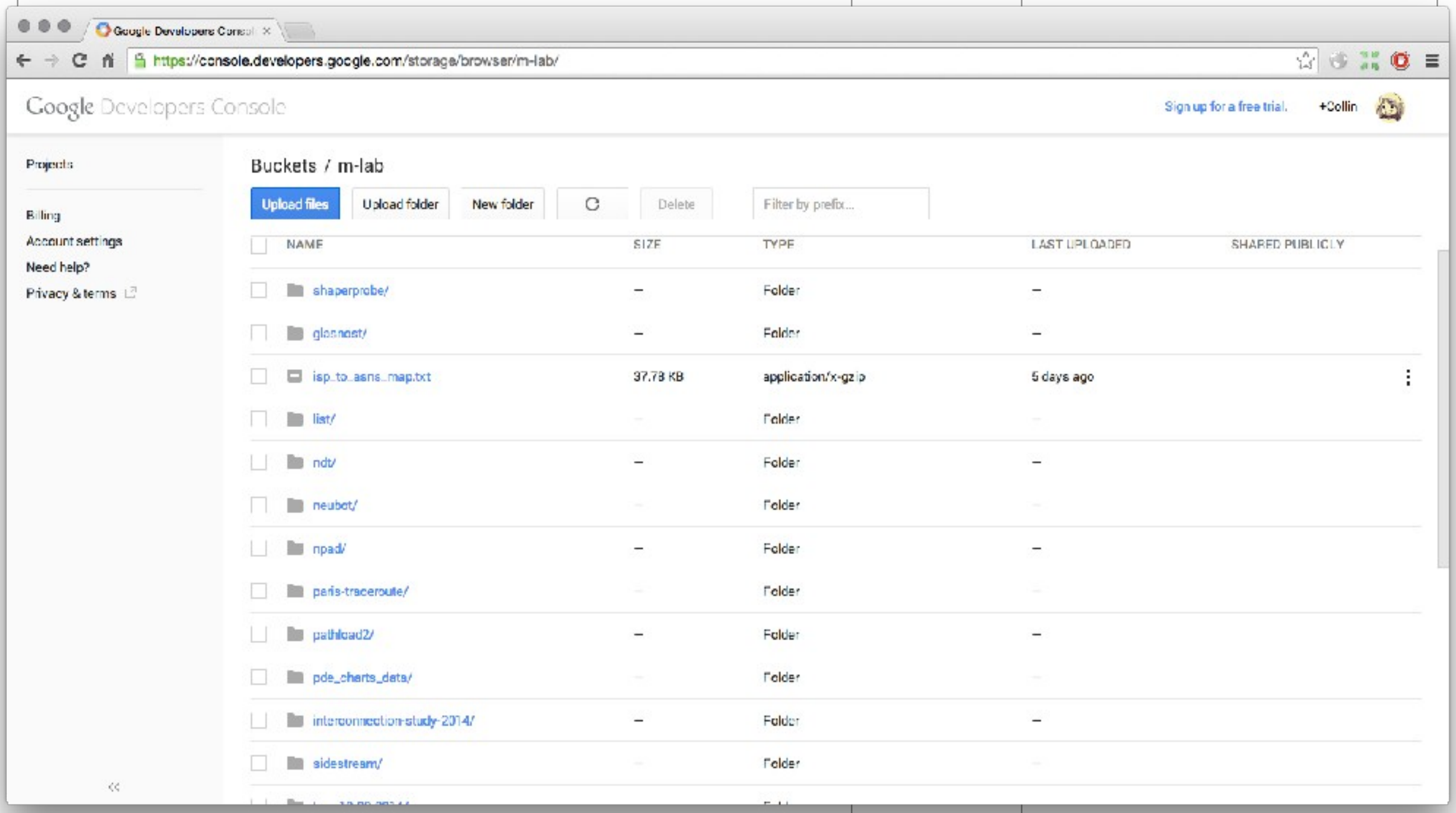
Measurement Lab Observatory

Currently US Only



Raw Data: BigQuery

Structured Database Access



Raw Data: Cloud Storage

Raw Datafile Access

Growing the Network

- Infrastructure Update: Expansion of Server Coverage in Asia, North America and Africa.
- Deployment of M-Lab sites to locations in:
  - Canada (Calgary, Montreal, Toronto)
  - Africa (Tunisia)
  - Asia (Singapore, Thailand)
- Deployment to Transit ISPs:
  - Cogent
  - Level 3
    - NTT

There is still much more in Measurement Lab’s dataset. Please explore.

measurementlab.net