Internet Policy and Independent Network Performance Measurement

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BEREC Expert Workshop on IP Interconnection

Overview of Measurement Lab

International Collaboration, Modern Research

Interdisciplinary, Open, Reviewed

M-Lab's Global Footprint

Servers on Every Continent, Infrastructure Diversity

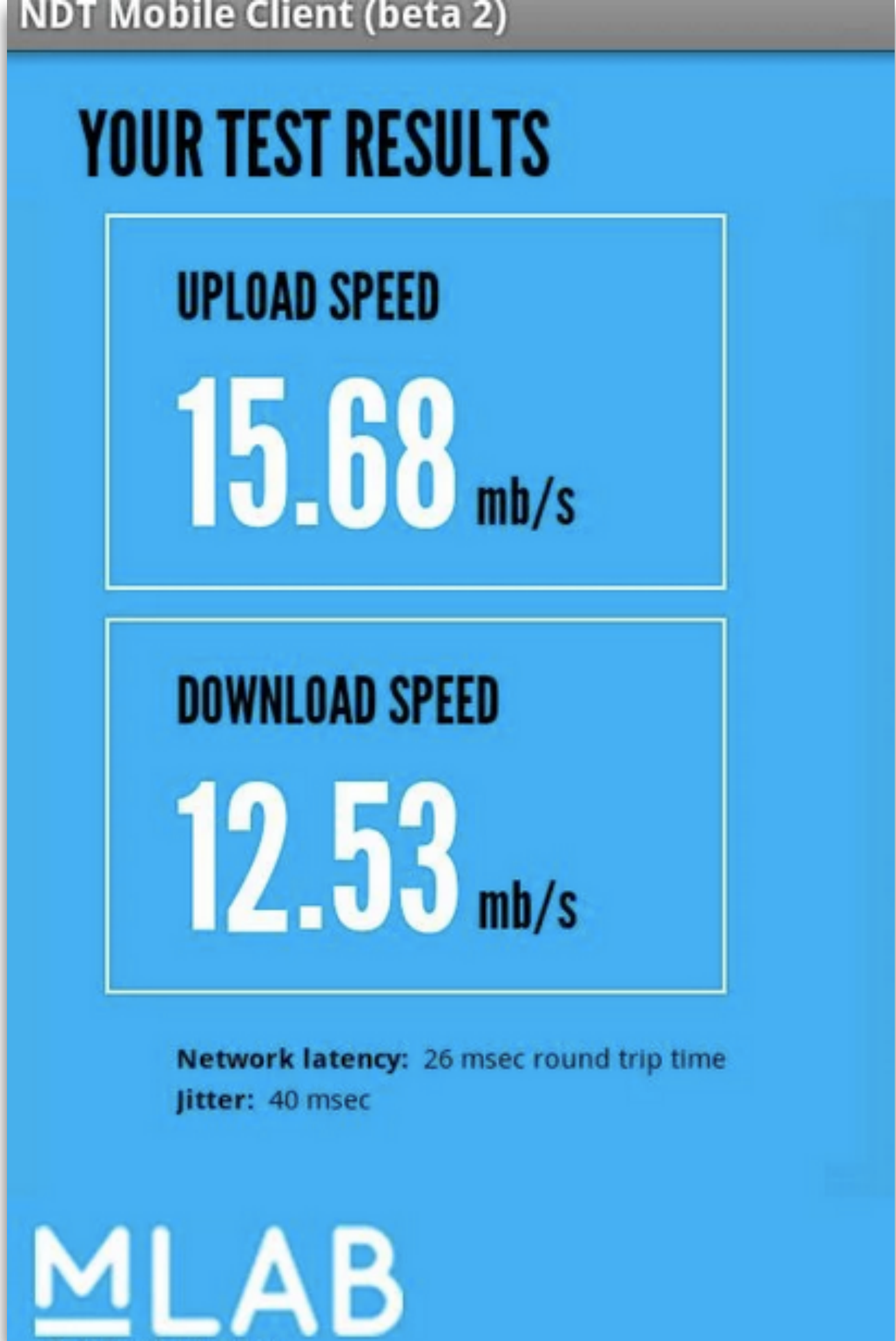
Throughput Measurements

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

How Does M-Lab Collect Its Data?

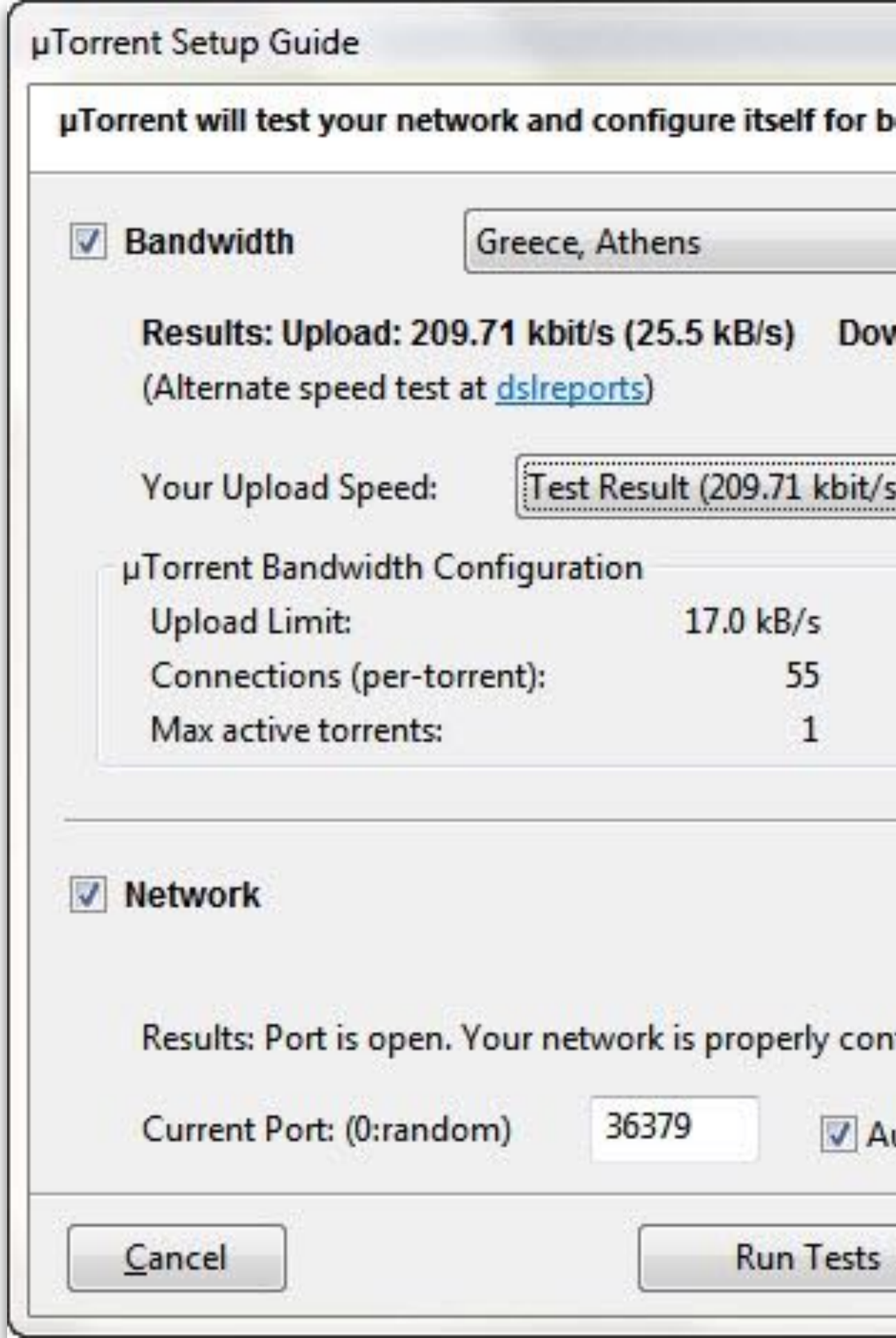
Measurement Clients

Performance measurement clients for informing users of their network capacity.



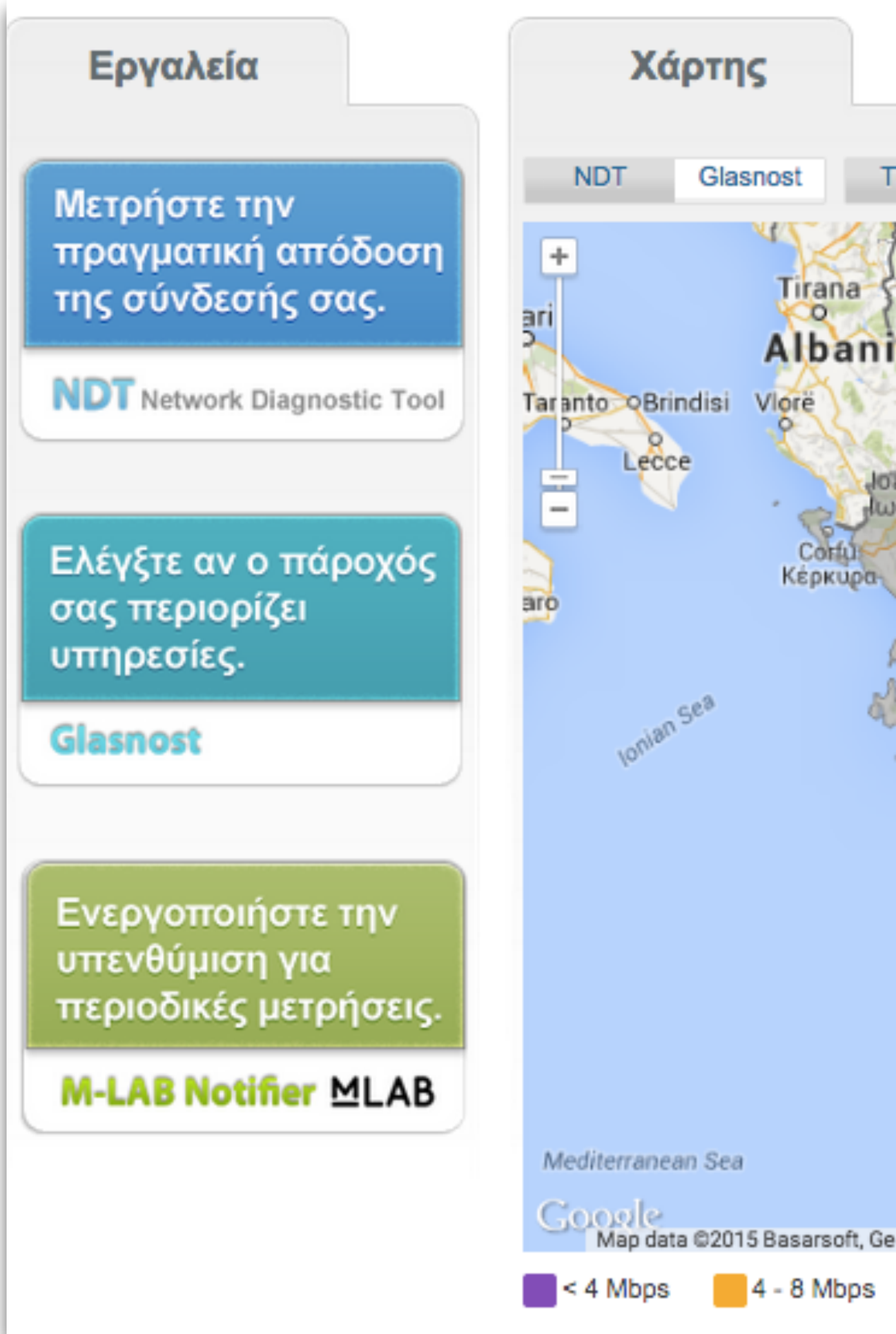
Software Integrations

Providing network information to software to enable better user experience.



Partnerships with Regulatory Agencies

Monitoring the progress of broadband deployment for policy-making.

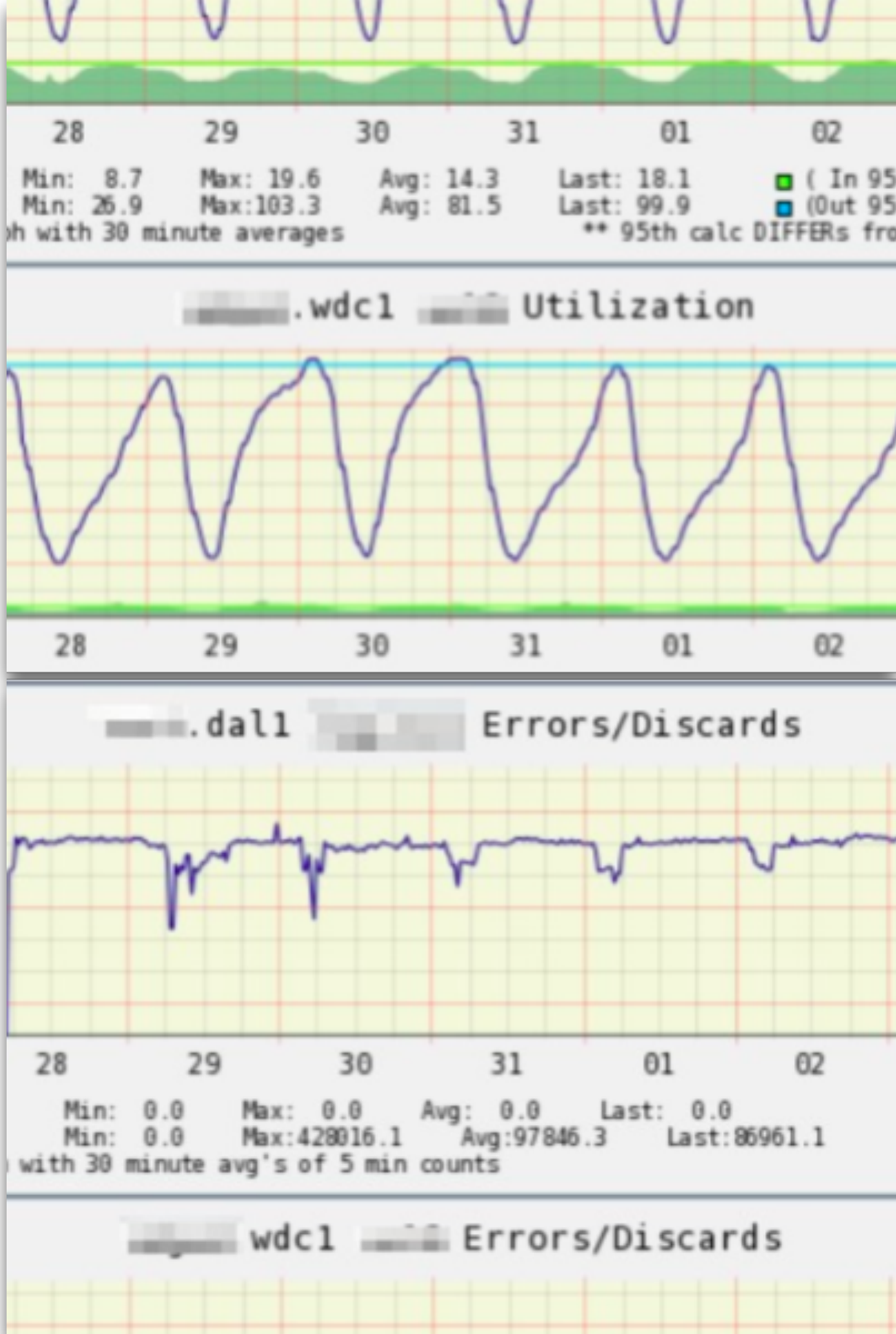


Consumer Measurement and Policy Case Study

Interconnection Disputes in the United States

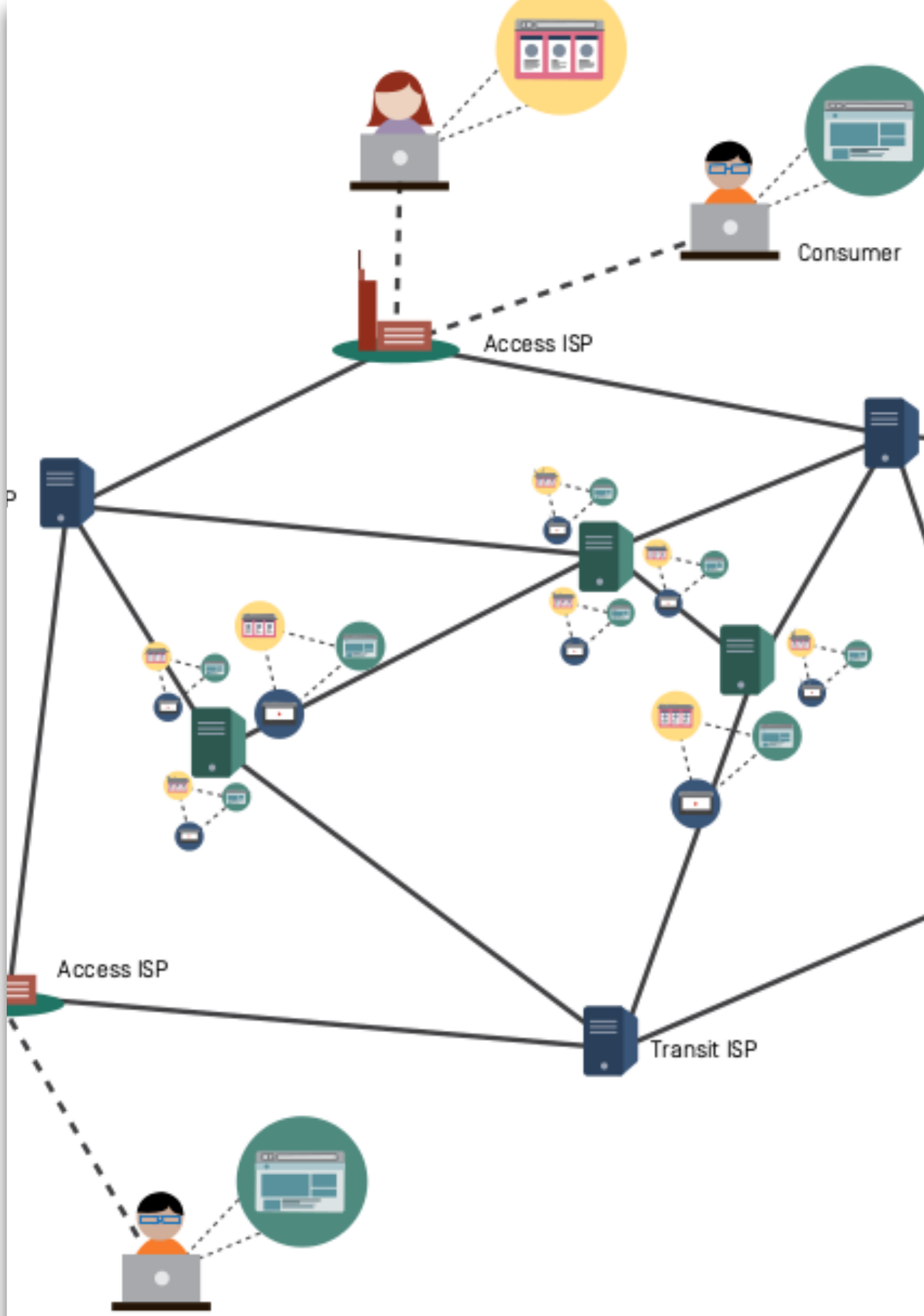
The Regulator's Problem

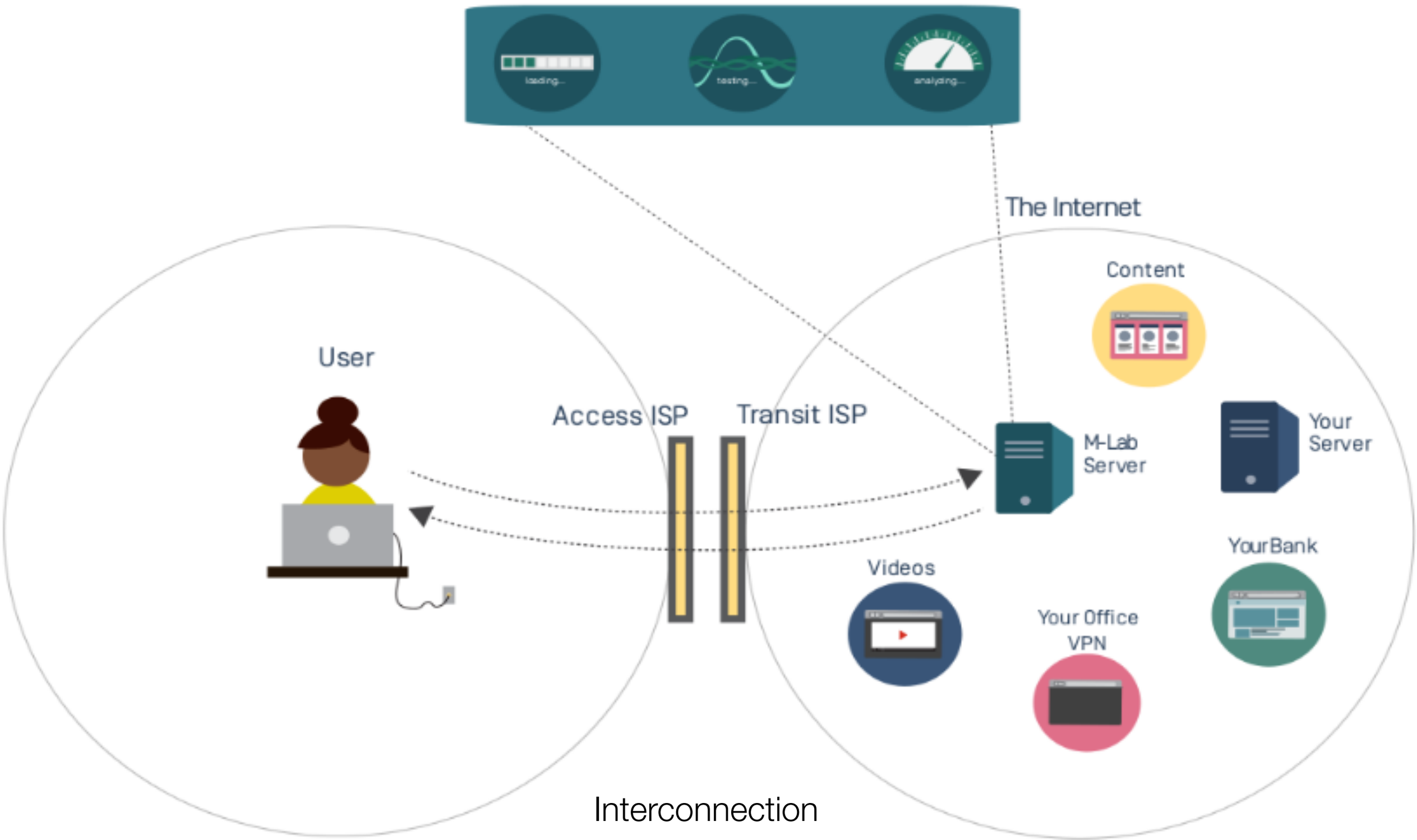
- Utilization and performance data is proprietary and hidden from the public.
- User collected information is often unreliable, incomparable, methodologically inconsistent and narrowly scoped.
- Longitudinal data is rare, so is comparative measurement.
- Independent data is expensive, collection efforts are burdensome.



Network Diagnostic Tool

- M-Lab's most popular hosted test, tens of thousands of measurements daily.
- Simple test of bulk transfer capacity.
- Multiple NDT implementations available, across different languages and for diversity of purposes.
- All implementations share the same methodology and are inter compatible.



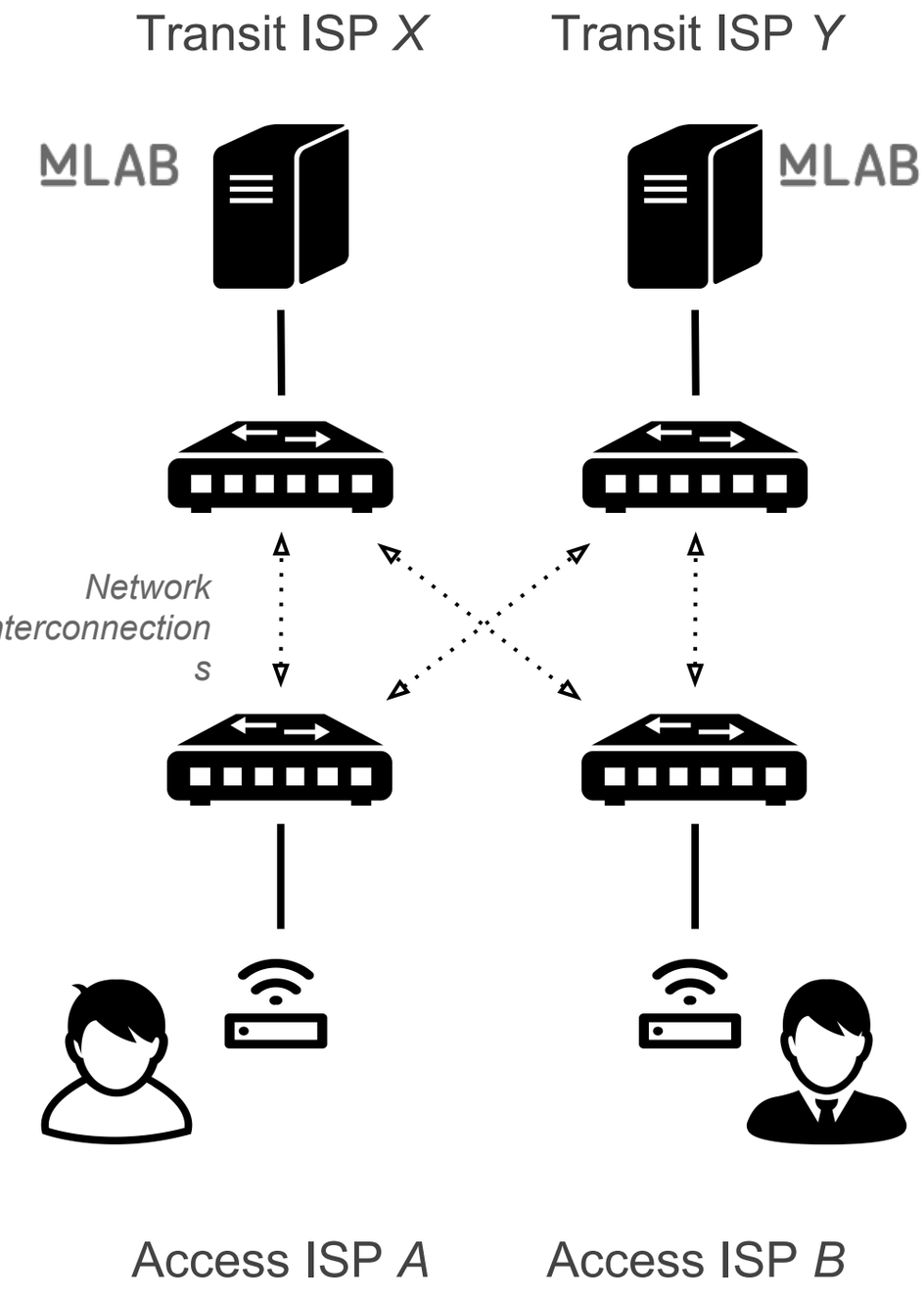


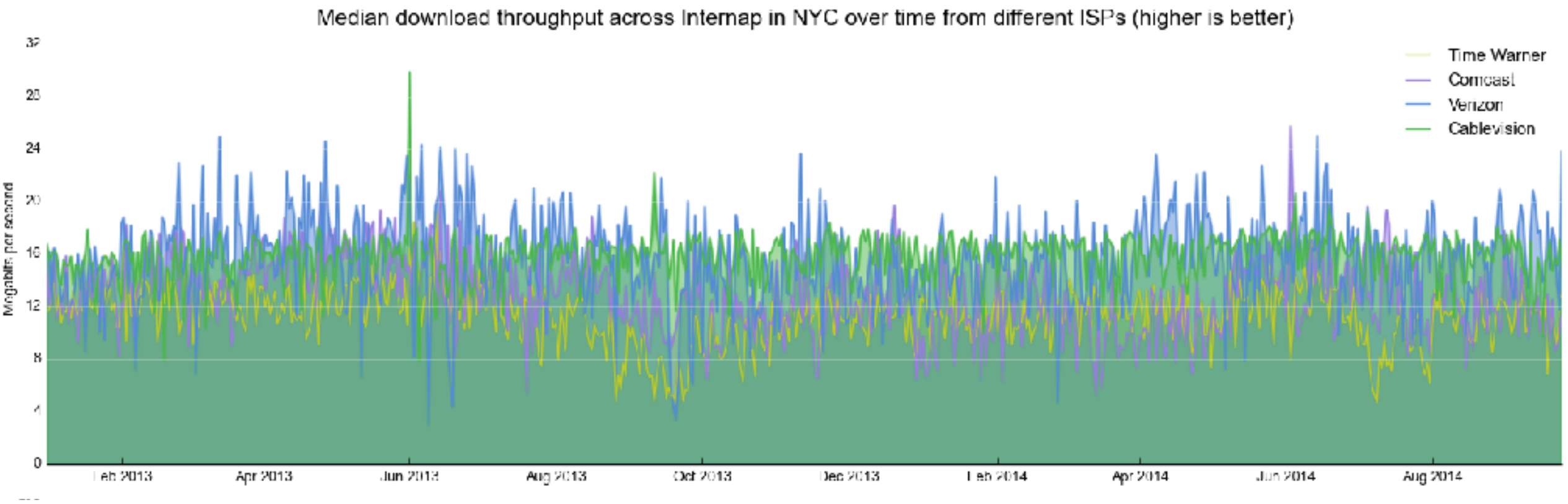
Measuring Performance

Bulk Transfer Capacity

Methodology

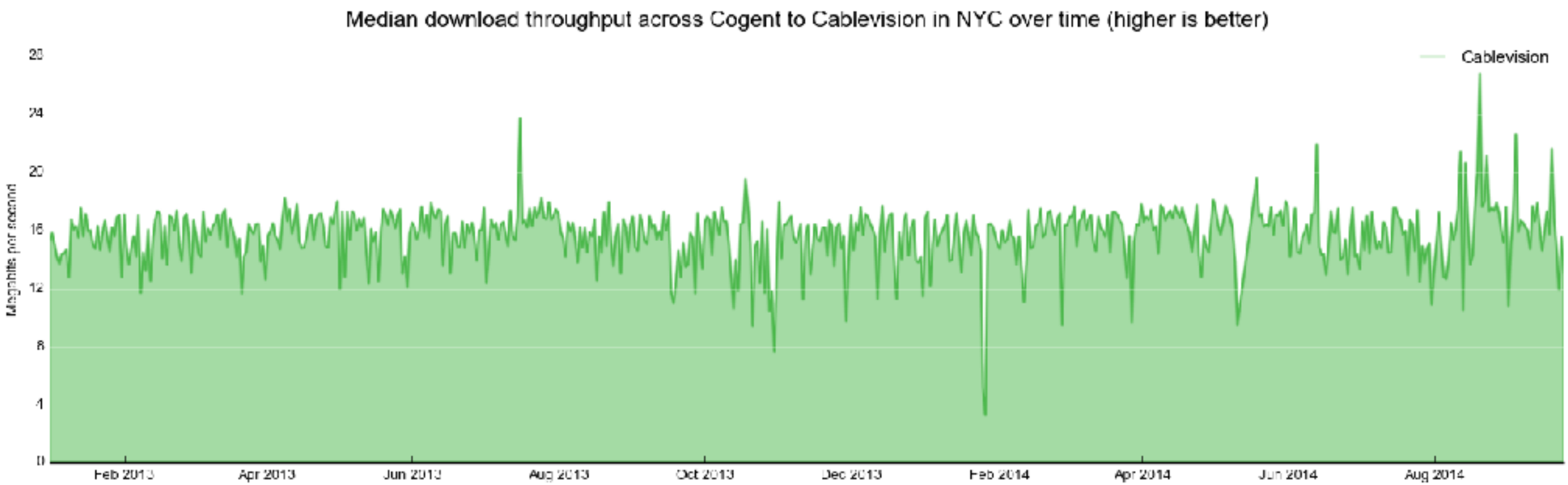
Inferring the Source of Congestion





Inferring Sources of Congestion in Practice

Using New York's Comparison



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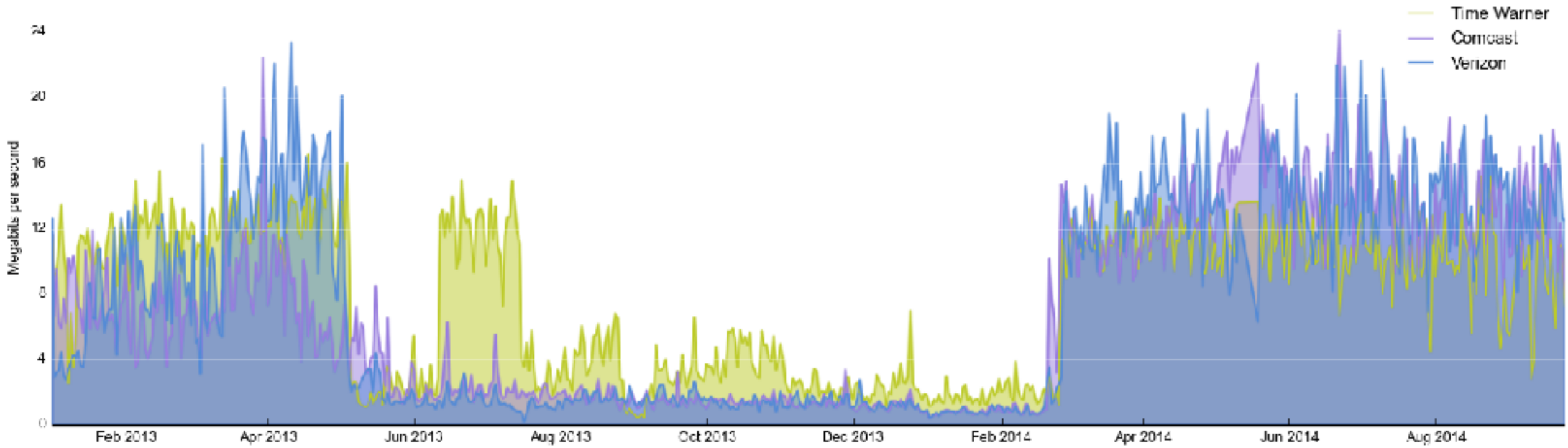
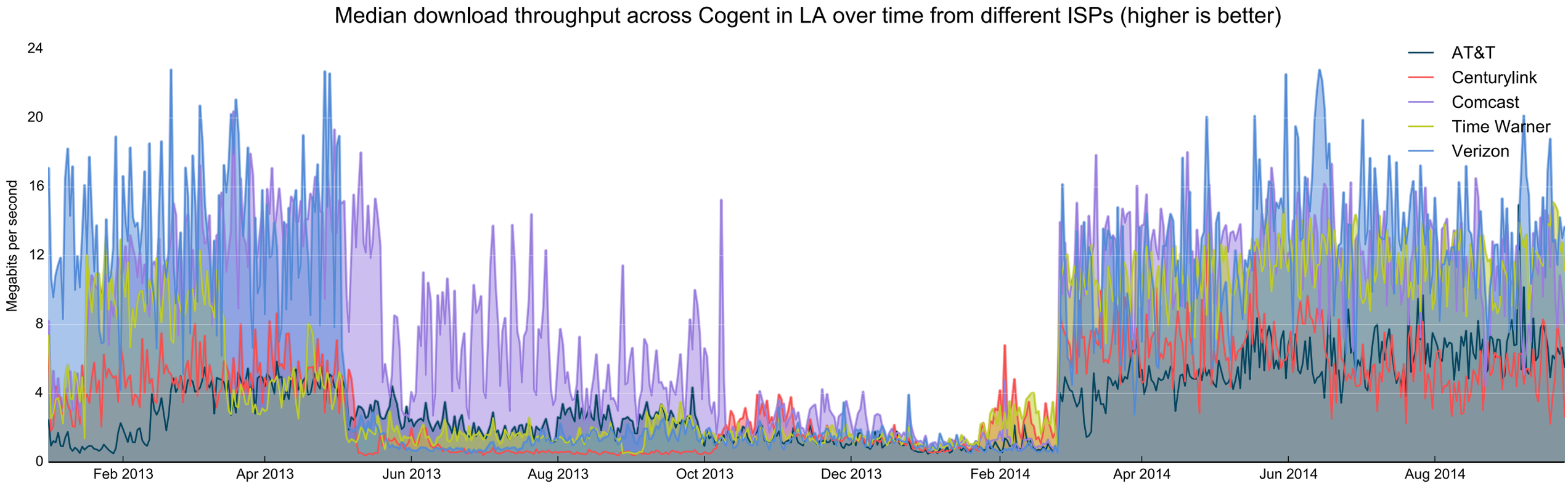


Inferring Sources of Congestion in Practice

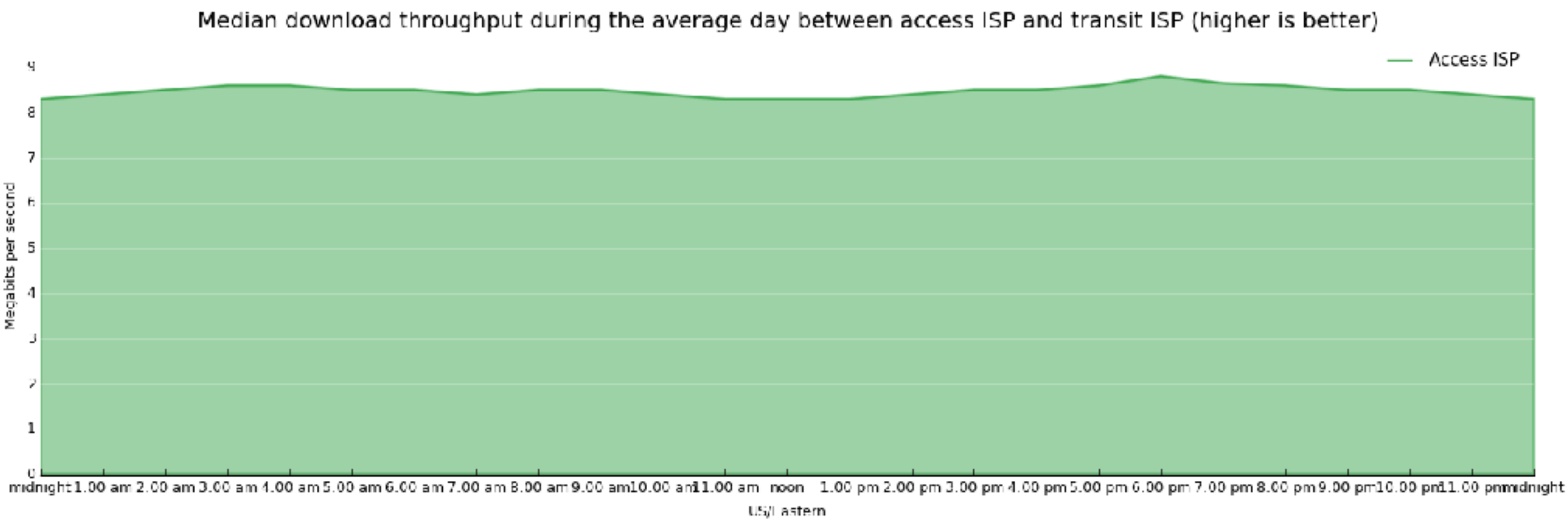
US Access ISPs and Cogent (2013-2014)



Inferring Sources of Congestion in Practice

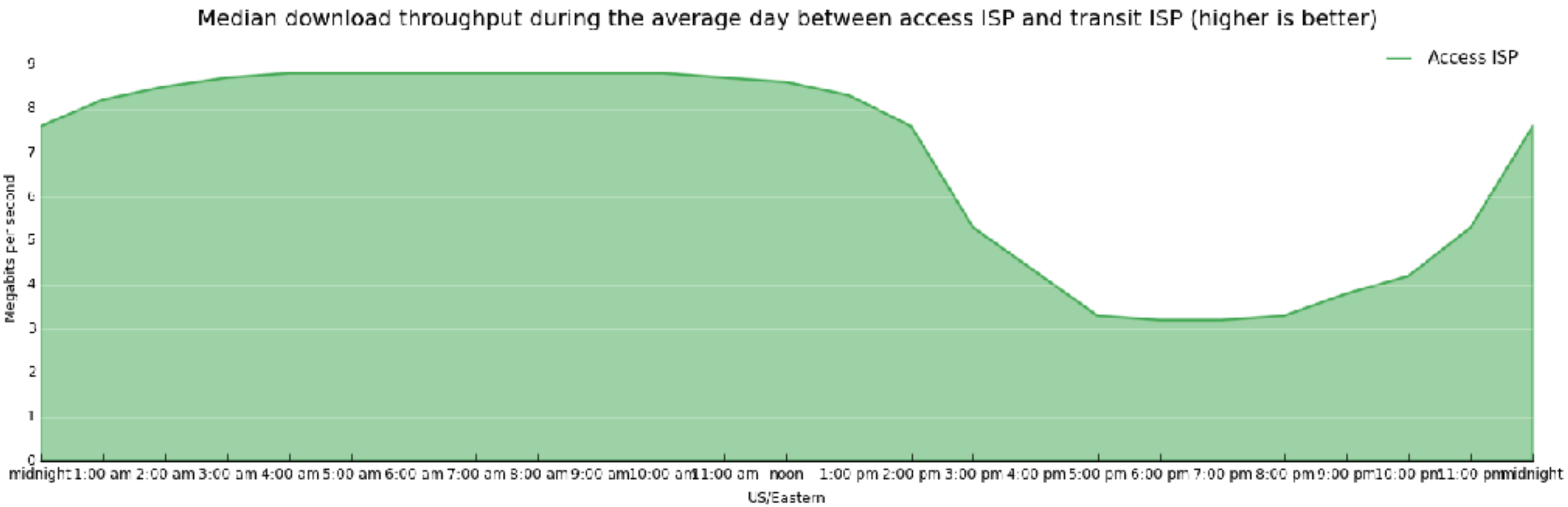
US Access ISPs and Cogent (2013-2014)

Internet Performance Varies Significantly Throughout the Day and Across Interconnections



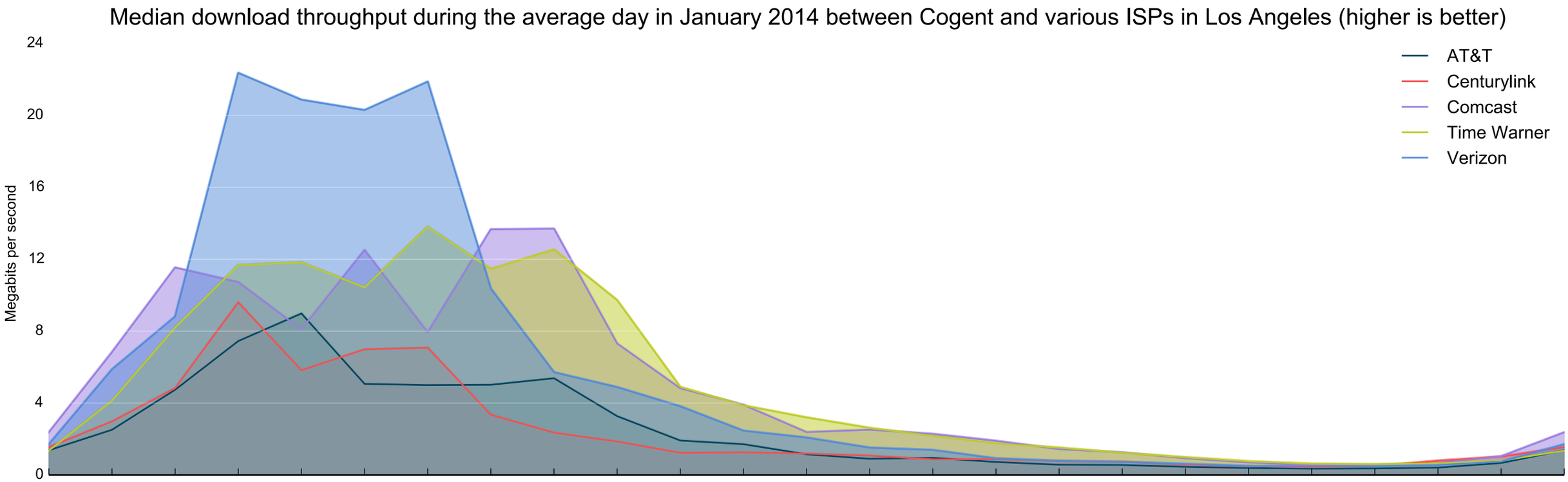
Diurnal Patterns Are Instructive

Expectations of Normal Performance



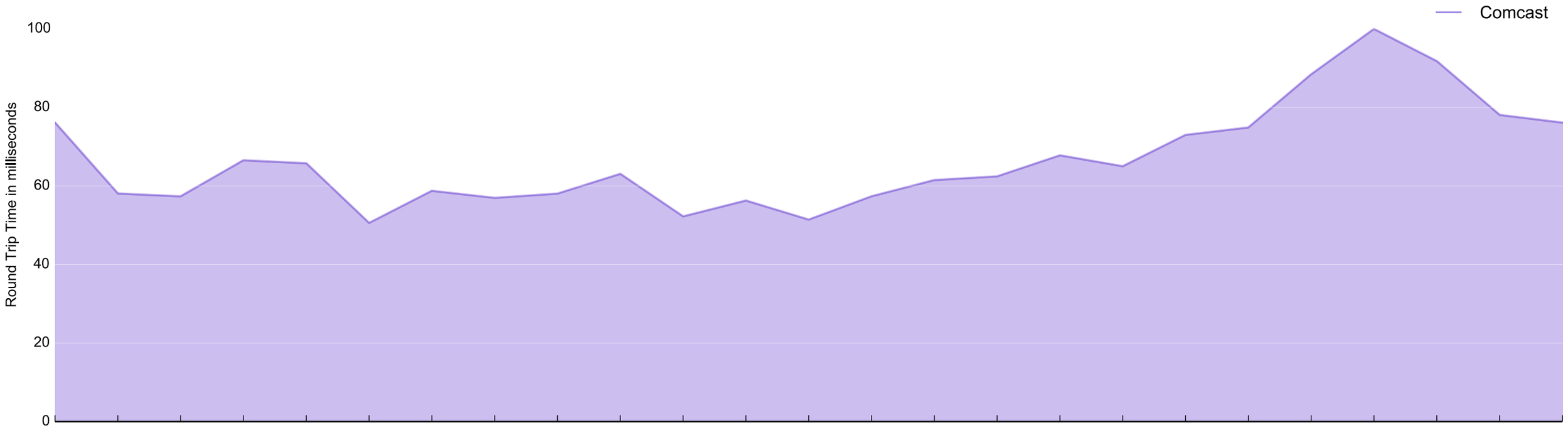
Diurnal Patterns Are Instructive

Expectations of Congested Performance



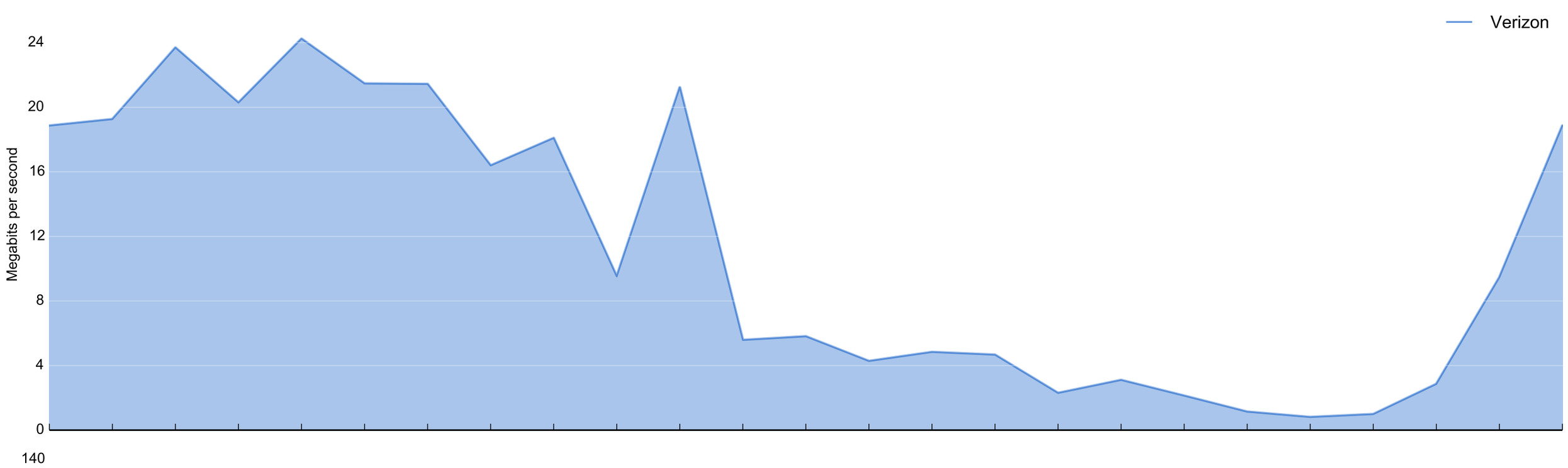
Diurnal Cycles In Practice

Peak Hours, Peak Disruption



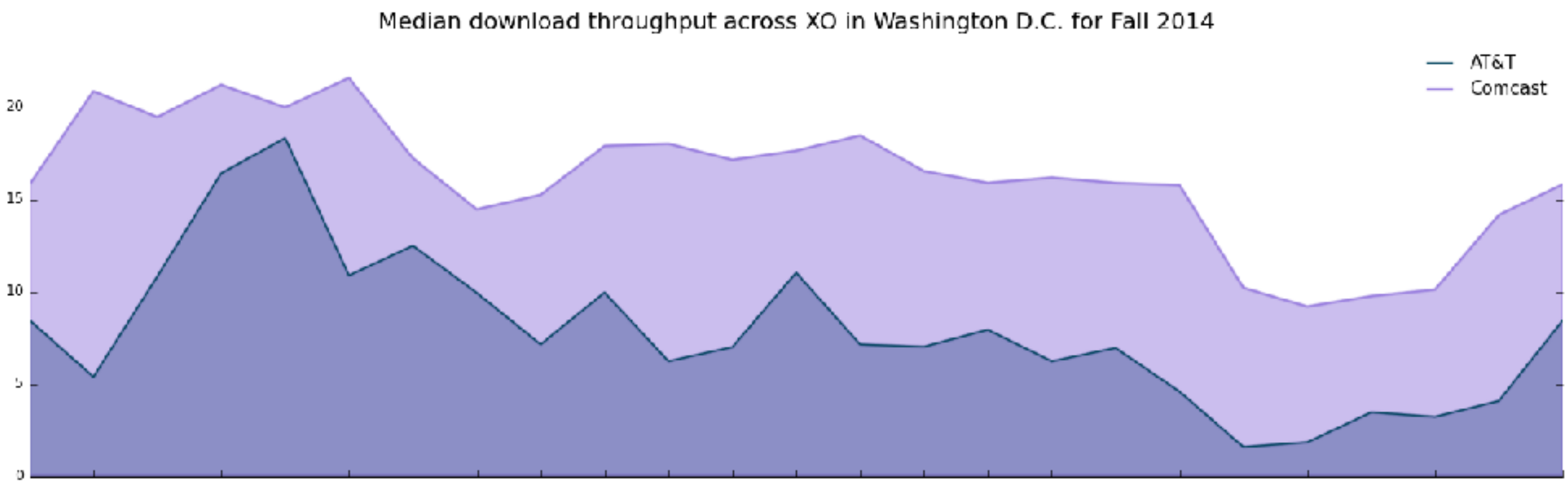
Not Limited to Throughput

Latency Sensitive Applications Affected



Not Limited to One Transit Provider

Level 3 and Verizon



Congestion is Continuing

Congestion as of Q4 2014

Public Interest Data

- Interconnection Study results were referred to in filings to United States regulator agency since the start of this year alone.
- M-Lab data has been used by public interest organizations, private companies and individual citizens representing all sides of the debate.
- Cited in dozens of media articles in interconnection.

378 results (0.115 seconds)
Turn Highlighting On

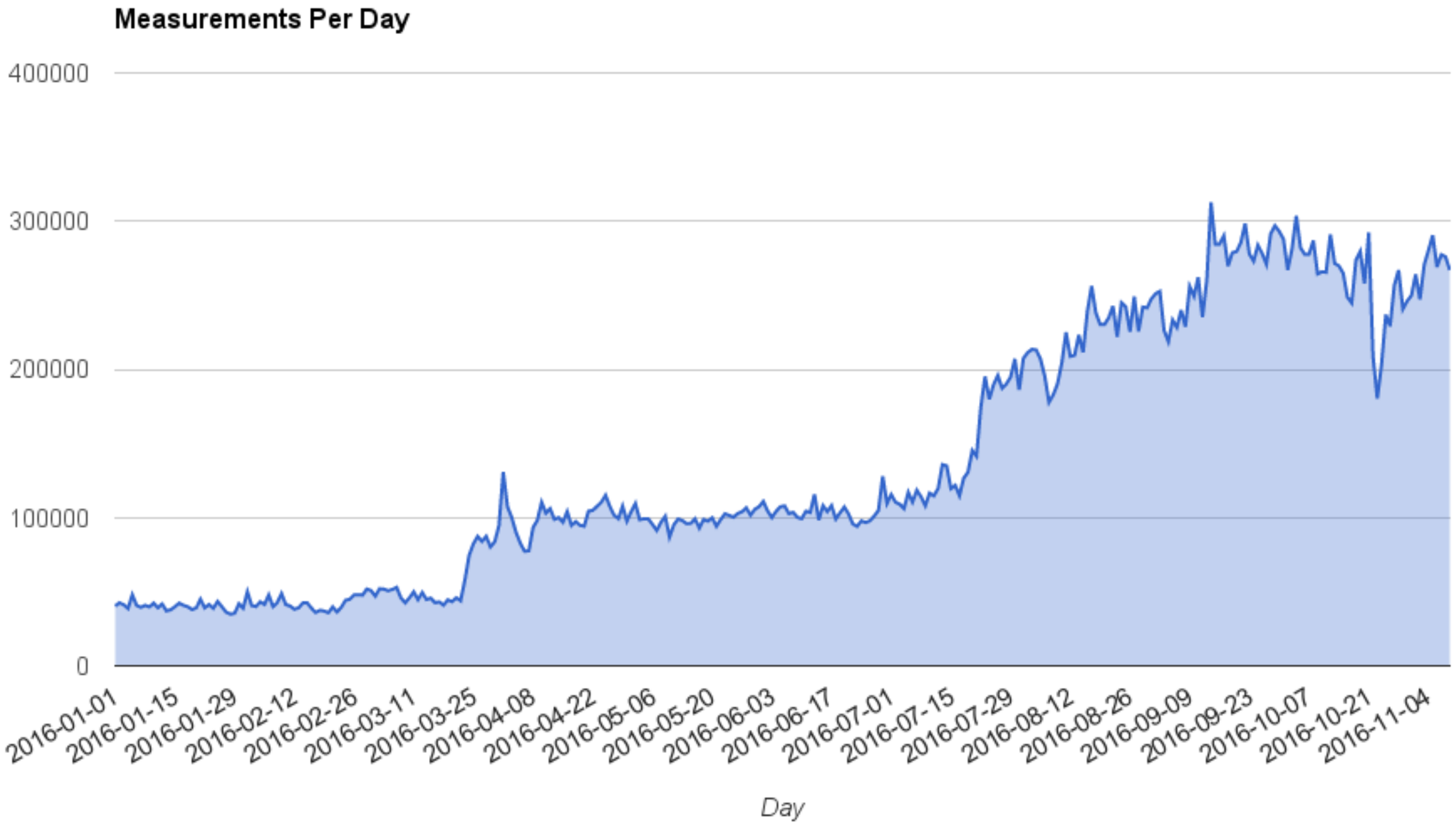
Proceeding	Number	Type
09-158	63	NOTICE OF EXPA
98-170	57	COMMENT
04-36	55	LETTER
12-264	27	SUBMISSION FO
09-51	26	REPLY TO COMME

Proceeding	Name of Filer
14-28	Open Technology Institute | New America
10-127	Open Technology Institute | New America
14-28	Larry Downes
09-191	Larry Downes
10-127	Larry Downes
14-28	Computer & Communications Industry Associatio
10-127	Computer & Communications Industry Associatio
10-127	Open Technology Institue and Measurement-Lab
14-28	Open Technology Institute and Measurement-Lab
14-57	Open Technology Institue and Measurement-Lab
14-57	Cogent Communications Group, Inc.
14-57	Rosemary Williams
14-28	Christopher Henry
14-28	Clay Hansen
14-28	Open Technology Institute - New America
10-127	Open Technology Institute - New America
14-107	Wireless Telecommunications Bureau
14-126	Open Technology Institute - New America
12-268	GE Healthcare
10-127	New America - Open Technology Institute

Showing results 21 through 40 of 378

Next Steps for Measurement Lab

Measurement Volume and Site Expansion



Partners and Integrations

Increased Test Volume

New Sites in Europe

Increased Test Volume

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