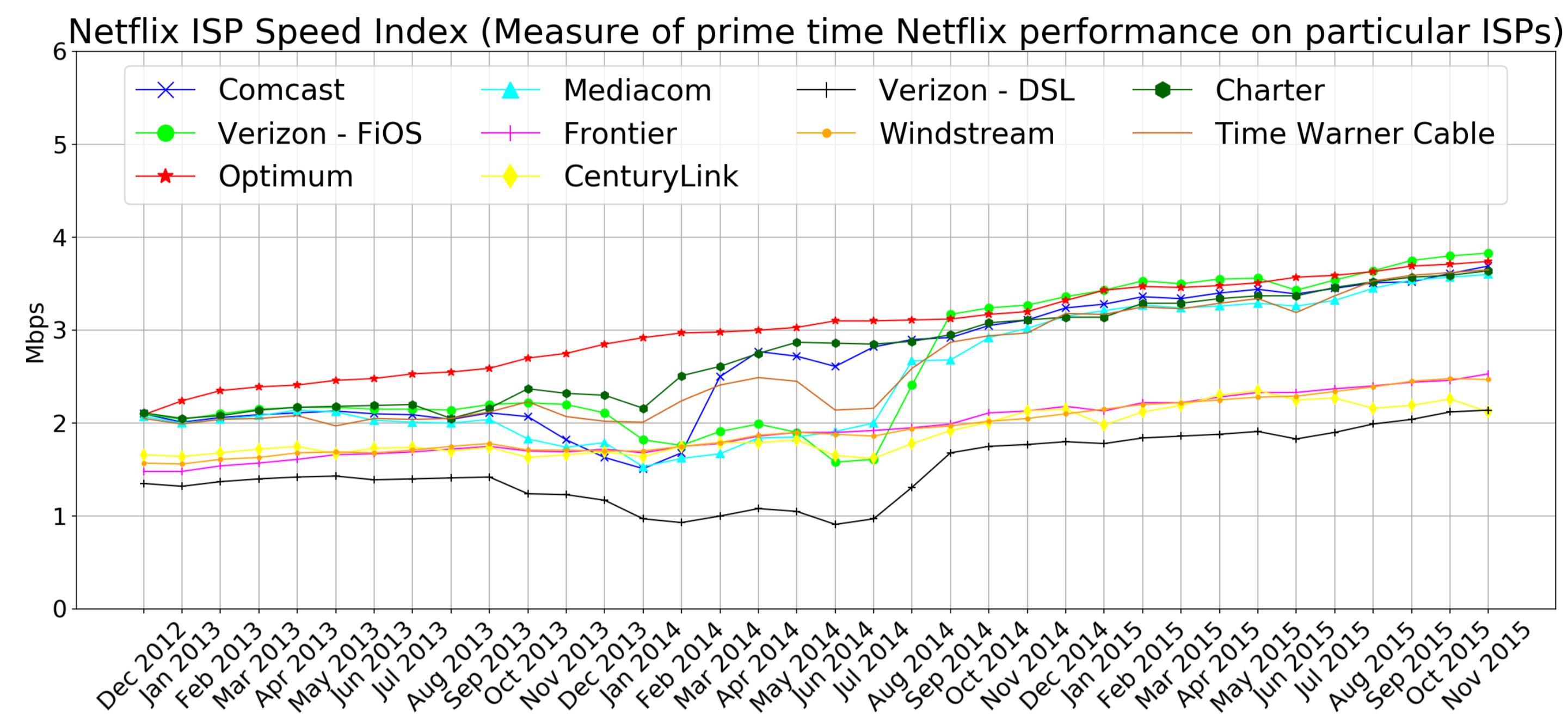


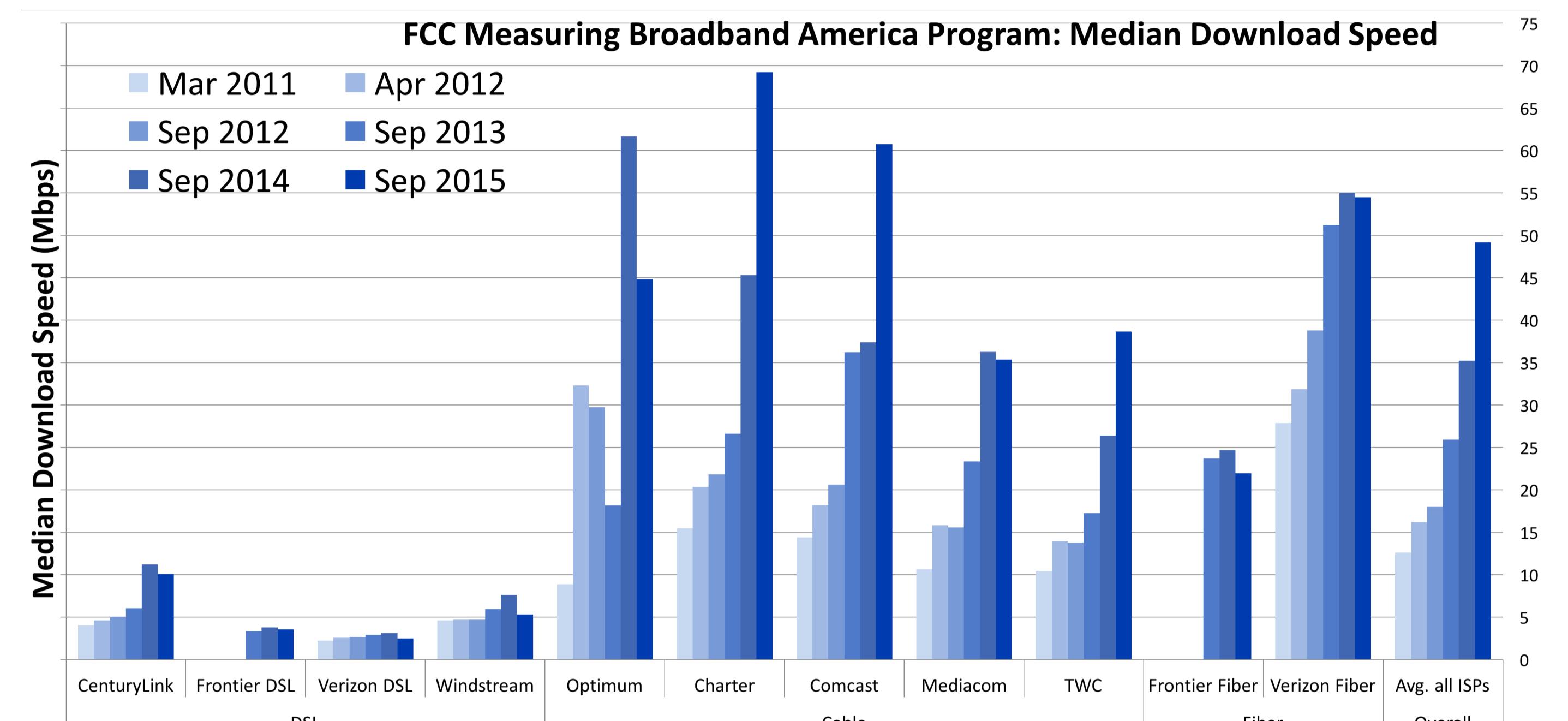
Srikanth Sundaresan, Paul Schmitt, Guilherme Martins and
Nick Feamster -- Princeton University

Francesco Bronzino, Sarah Wassermann and
Renata Teixeira -- Inria, Paris

How is Video QoE impacted by the last mile?

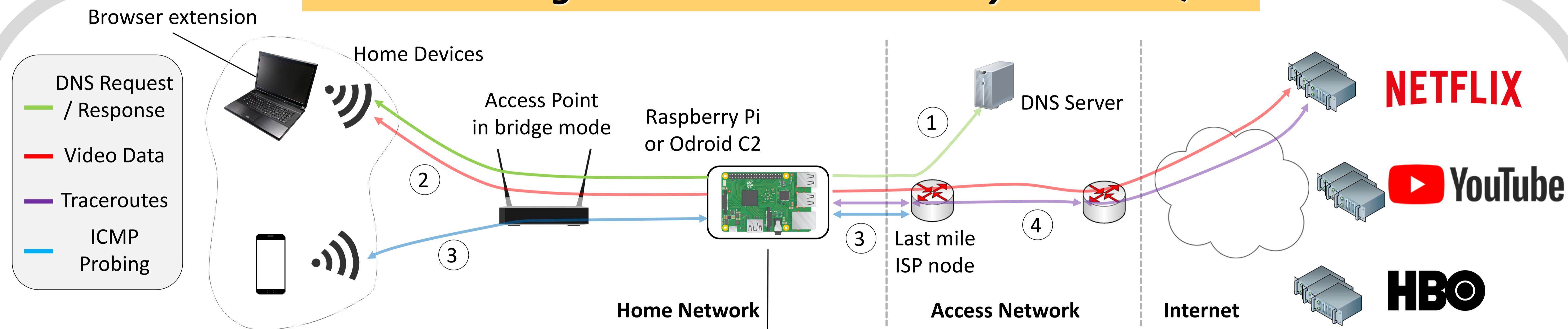


The Problem: How is video QoE affected by different network conditions? (e.g. access link throughput)

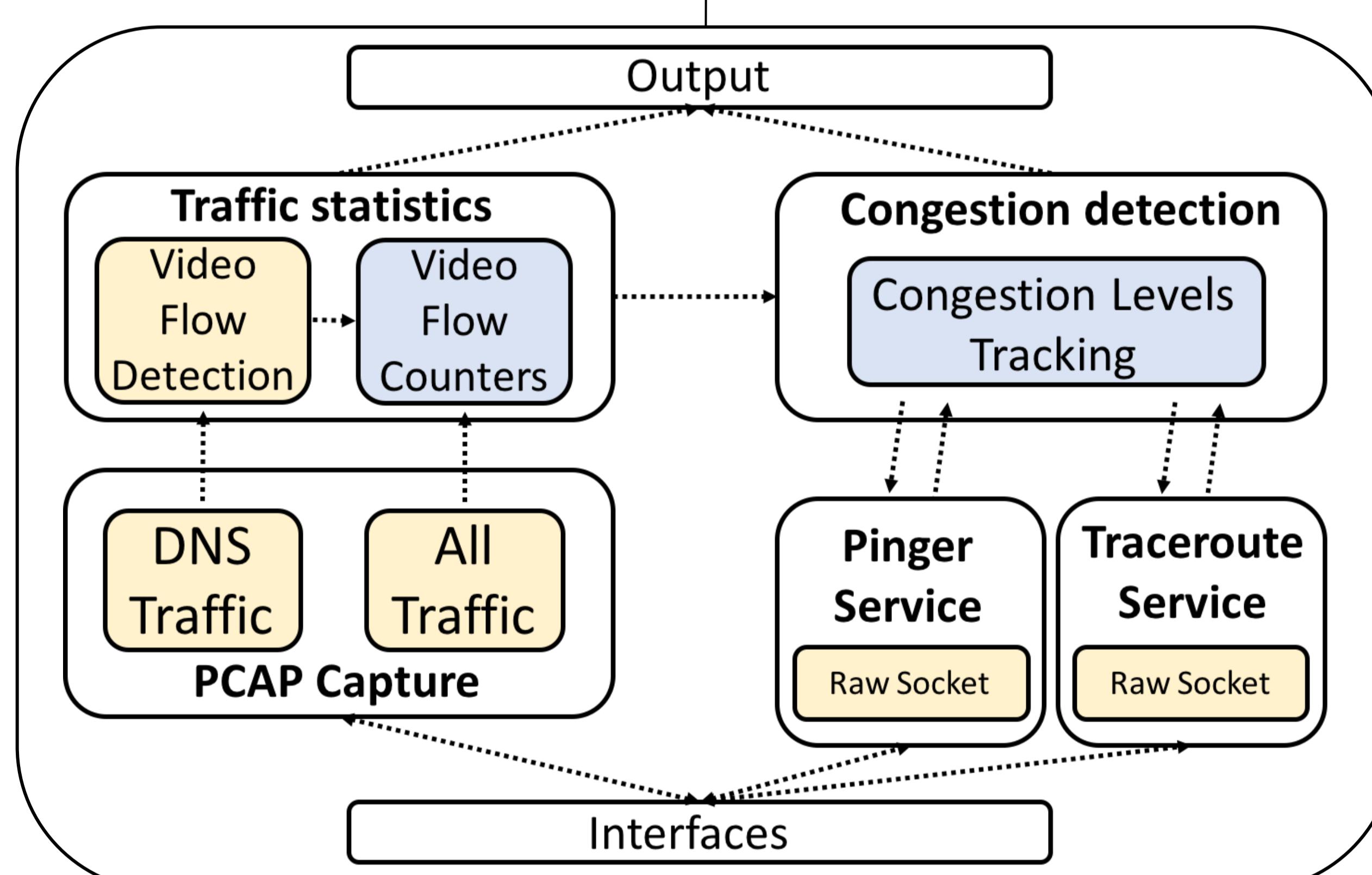


The challenge: How do we measure video QoE with only network-level access?

Instrumenting Home Networks to Analyze Video QoE



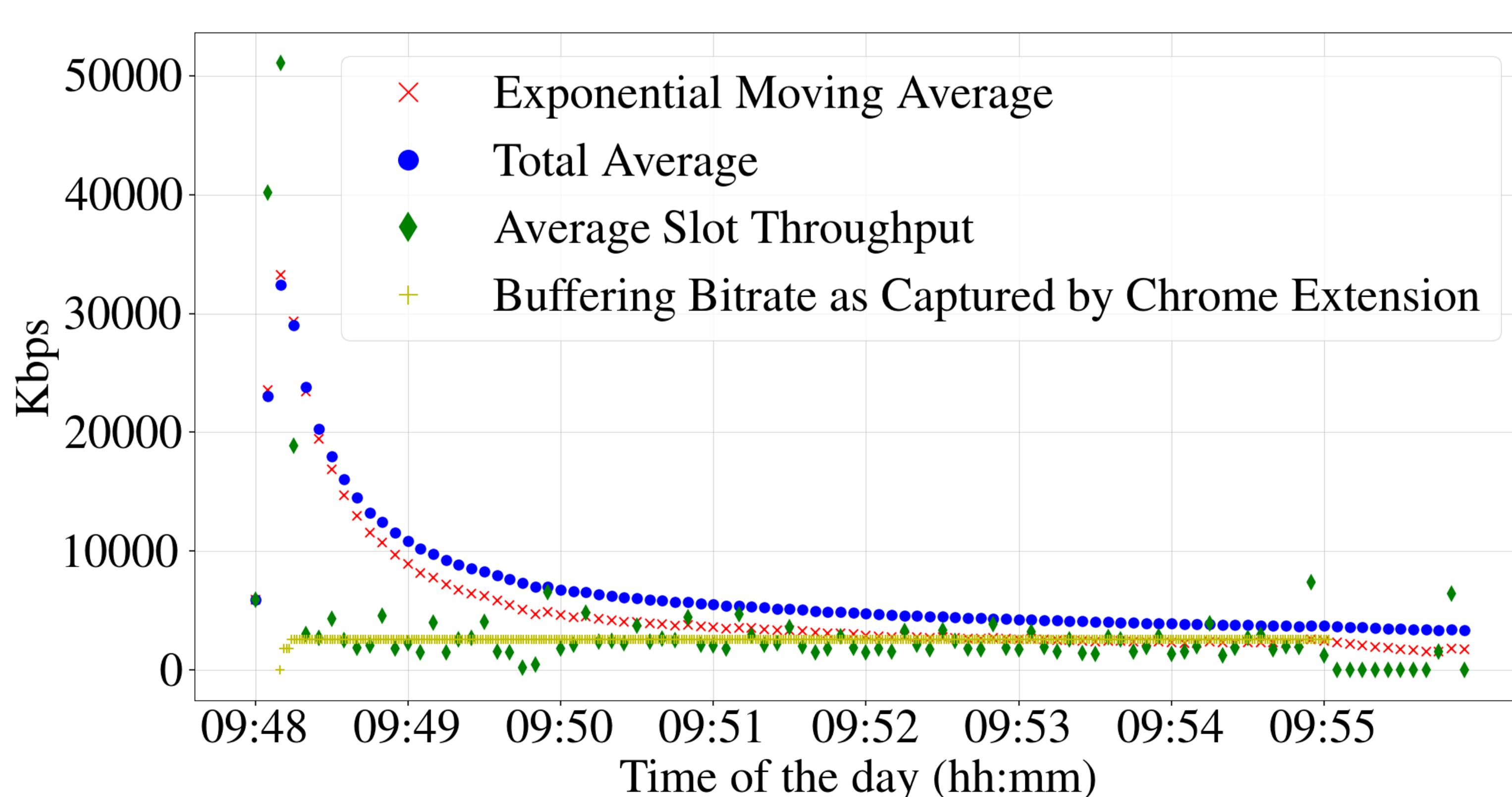
- Online monitoring of traffic generated from video services
- Developed in Go language
- Good performance on cheap multipurpose hardware
- Support for >50kpps with 128B per packet size on Raspberry Pi



- Core system techniques:
 - 1 Use DNS data to track video flows
 - 2 Track flow size
 - 3 Active probing (ICMP Pings)
 - 4 Traceroute to active services

Inferring Video QoE

- Exponential weighted moving average of monitored throughput captures the video bitrate streamed by the DASH client



Detecting External Bottlenecks

- Take advantage of the home network vantage point to pinpoint bottlenecks.
- Active probing to devices in the home network and last mile nodes to identify bottleneck location.

Future Work

- Deploy the system into a diverse set of homes.
- Further develop system mechanisms based on analysis of collected data.
- Analysis of potential network optimizations to improve video QoE.

Support

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