

# Reflections on Congestion Control

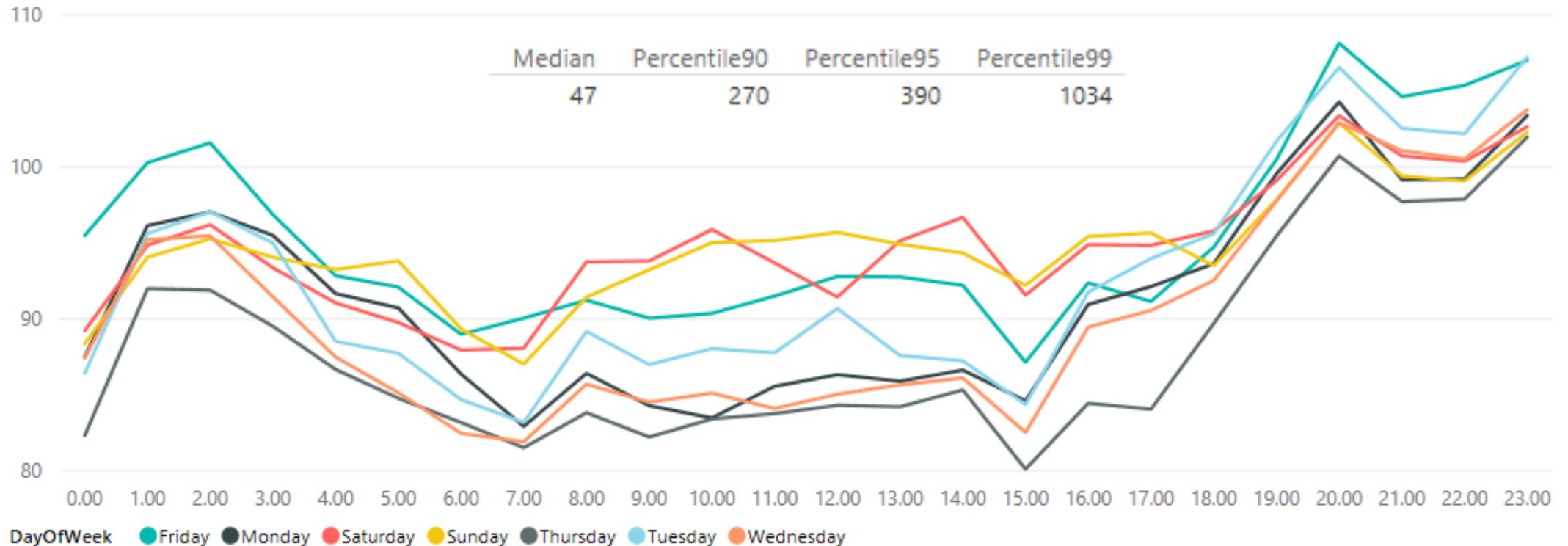
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# State of the Union

- Congestion control defaults in major device platforms
  - Android, ChromeOS: CUBIC
  - iOS, macOS: CUBIC
  - Windows: CTCP
- Datacenter congestion control
  - DCTCP, DCQCN and variants
  - BBR, Timely
- Academia proposals
  - PCC (performance oriented congestion control)
  - Sprout, Remy
- Trends
  - AQM
  - QUIC, User mode transports
  - IaaS

# Bufferbloat - RTT inflation during peak load times

Average RTT Over Time of Day Adjusted For Time Zone



Average SRTT information from sampled TCP connections for Windows Desktop and Xbox consoles

# Food for thought

- With a multitude of congestion control algorithms sharing bottleneck links, how do we ensure fairness and good performance?
  - How do we deal with user mode transports which may accelerate the variety of congestion control algorithms?
  - Is the onus on each individual developer to test all the various permutations? Will this scale?
- How can we prevent congestion control from becoming an arms race?
  - Can we define a minimum spec for all congestion control to adhere to in the presence and absence of explicit congestion signaling?
  - What does “TCP friendly” mean now?
- What is the role of the IETF here?
  - Is standardization or establishing best practices possible?
  - Is publishing informational RFCs for individual algorithms sufficient?