

Reflections on Congestion Control

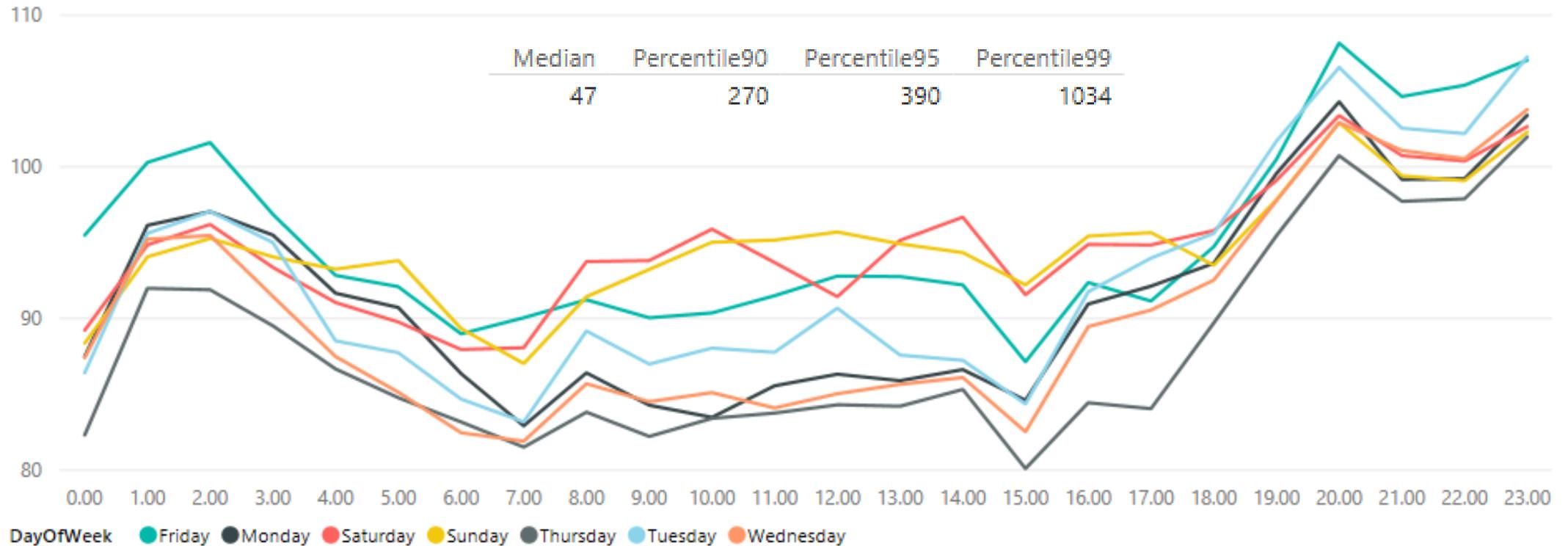
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State of the Union

- 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?