Quality of Outcome

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Agenda

● Quality of Outcome for different apps
  ○ Live streaming
  ○ Gaming
  ○ Video conferencing

● Answer this question:

“What are the latency thresholds for perfection and uselessness?”
Refresh on QoO

- BBF Quality Attenuation (TR-452.1)
  - Latency distribution
  - Loss as infinite latency
- Two quality thresholds per application
  - Perfection
  - Uselessness

QoO = 80.84
Testbed setup
Live Streaming - Twitch
Gaming - Call of Duty on Playstation 4

Call Of Duty: Latency vs the frequency of delay (every x packet)

- Red dots: app degrades from perfect to not-perfect
- Blue dots: app stops working

Latency (ms)

Frequency of latency

- (5, 28)
- (10, 50)
- (20, 55)
- (30, 68)
- (40, 73)
- (50, 83)
- (60, 92)
- (70, 102)
- (80, 134)
- (90, 115)
- (100, 128)

- (10, 130)
- (20, 195)
- (30, 310)
- (40, 360)
- (50, 400)
- (60, 410)
- (70, 420)
- (80, 425)
- (90, 448)
- (100, 505)
Video Conferencing - Google Meet

![Graph showing latency vs frequency of delay for Google Meet video calls. The graph includes data points indicating app degradation at different latency thresholds.](image)
Preliminary conclusions

- The data supports
  - Interactive applications are impacted by relatively rare latency events (1/100 packets), even when the added latency is relatively small (~100-200 ms)

- There may be some neat scaling laws for specific applications, which may simplify the specification of QoO thresholds