## HTTP/1.1 vs HTTP/2 vs HTTP/3 Performance Comparison Throughput vs Bandwidth Page Load Time vs Bandwidth Response Time vs Bandwidth → HTTP/1.1 **→** HTTP/1.1 HTTP/2 $10^1$ HTTP/1.1: N/A **HTTP/2** HTTP/2 HTTP/3 6 -HTTP/3 HTTP/3 $10^{1}$ (S) Throughput (Mbps) Page Load Time (s) Time 4 $10^{0}$ $10^{-1}$ 12.5 2.5 5.0 7.5 10.0 15.0 17.5 20.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 Bandwidth (Mbps) Bandwidth (Mbps) Bandwidth (Mbps) Jitter vs Bandwidth Retransmissions vs Bandwidth 120 -HTTP/2 HTTP/2 HTTP/1.1: N/A HTTP/1.1: N/A Performance Summary: HTTP/3 HTTP/3 HTTP/1.1: 1.2 Avg Throughput: 1.79 MbpsAvg PLT: 0.61s 100 HTTP/2: 1.0 • Avg Throughput: 5.19 Mbps • Avg PLT: 2.14s 80 • Avg Response Time: 0.60s • Avg Jitter: 0.038s Retransmissions 8.0 • Avg Retransmissions: 5.0 Jitter (s) 9.0 HTTP/3: 60 • Avg Throughput: 0.41 Mbps • Avg PLT: 13.86s • Avg Response Time: 3.32s • Avg Jitter: 0.510s • Avg Retransmissions: 69.8 40 Key Differences: HTTP/3 shows improved throughput HTTP/2 multiplexing reduces HoL blocking QPACK (HTTP/3) vs HPACK (HTTP/2) compression UDP-based QUIC (HTTP/3) vs TCP (HTTP/1.1,2) 0.2 20 0.0 7.5 10.0 12.5 17.5 20.0 2.5 7.5 10.0 12.5 15.0 17.5 20.0 2.5 5.0 15.0 5.0

Bandwidth (Mbps)

Bandwidth (Mbps)