

Update on Wireless Test Cases

draft-ietf-rmcat-wireless-tests-01

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Outline

- Updated Wi-Fi network setting from 802.11g to 802.11n
- Updated ns3 simulation results on previous test cases
- New test case: varying number of bidirectional streams
- New test case: bidirectional streams w/ dynamic UDP background traffic
- Summary

Wi-Fi Network Configurations in NS3

- Wi-Fi network MAC Protocol: IEEE 802.11n
- Frequency Band: 5GHz
- Channel Bandwidth: 20MHz
- Number of Antennas: 2 for transmitters; 2 for receivers
- Guard Interval: 800ns
- Aggregated MAC Protocol Data Unit (AMPDU): Disabled *
- MCS Index at 11: 16-QAM 1/2, Raw Data Rate@52Mbps

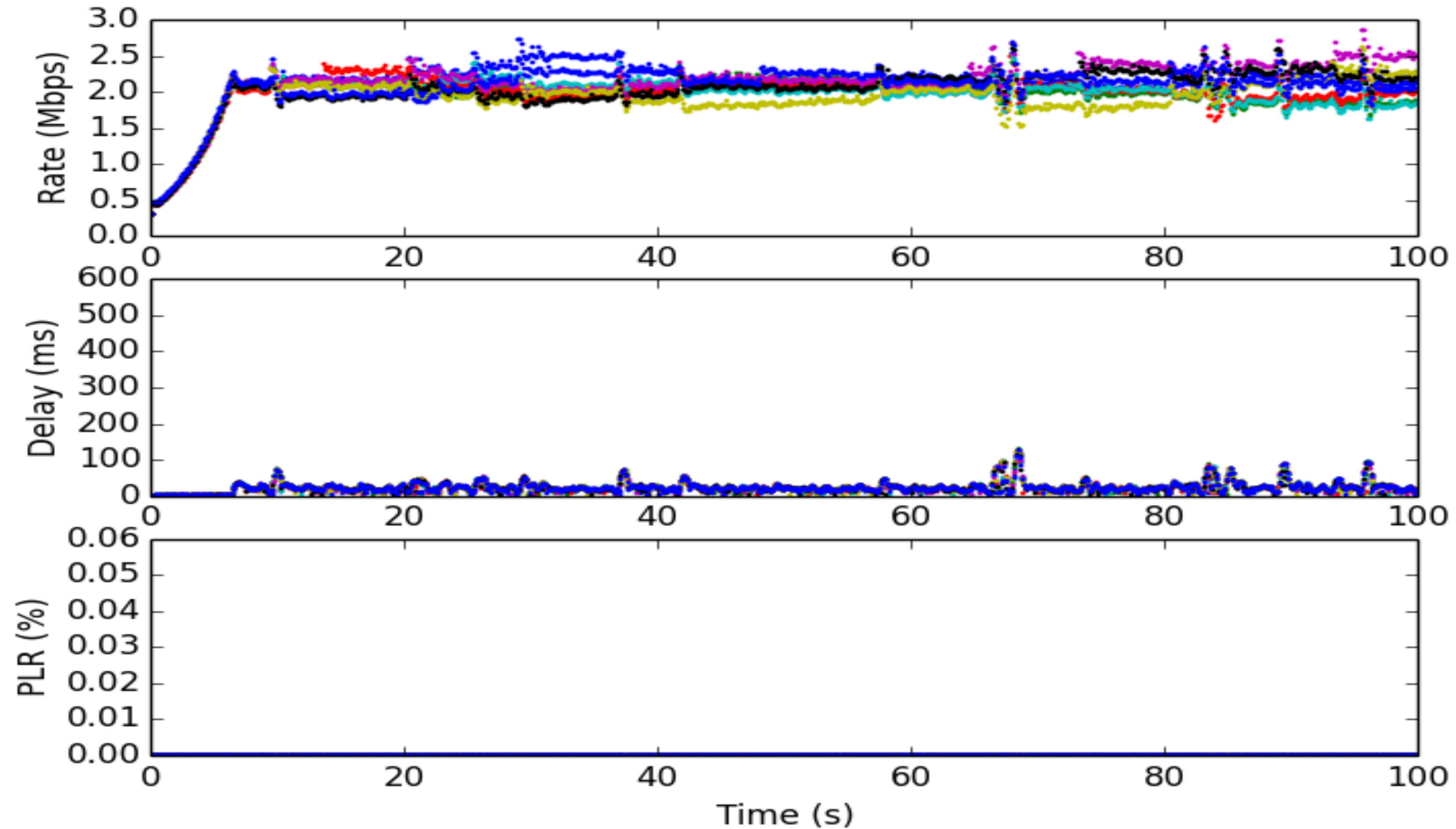
** to bypass crashing issue in NS3 implementation*

Key Algorithm Parameters in NADA

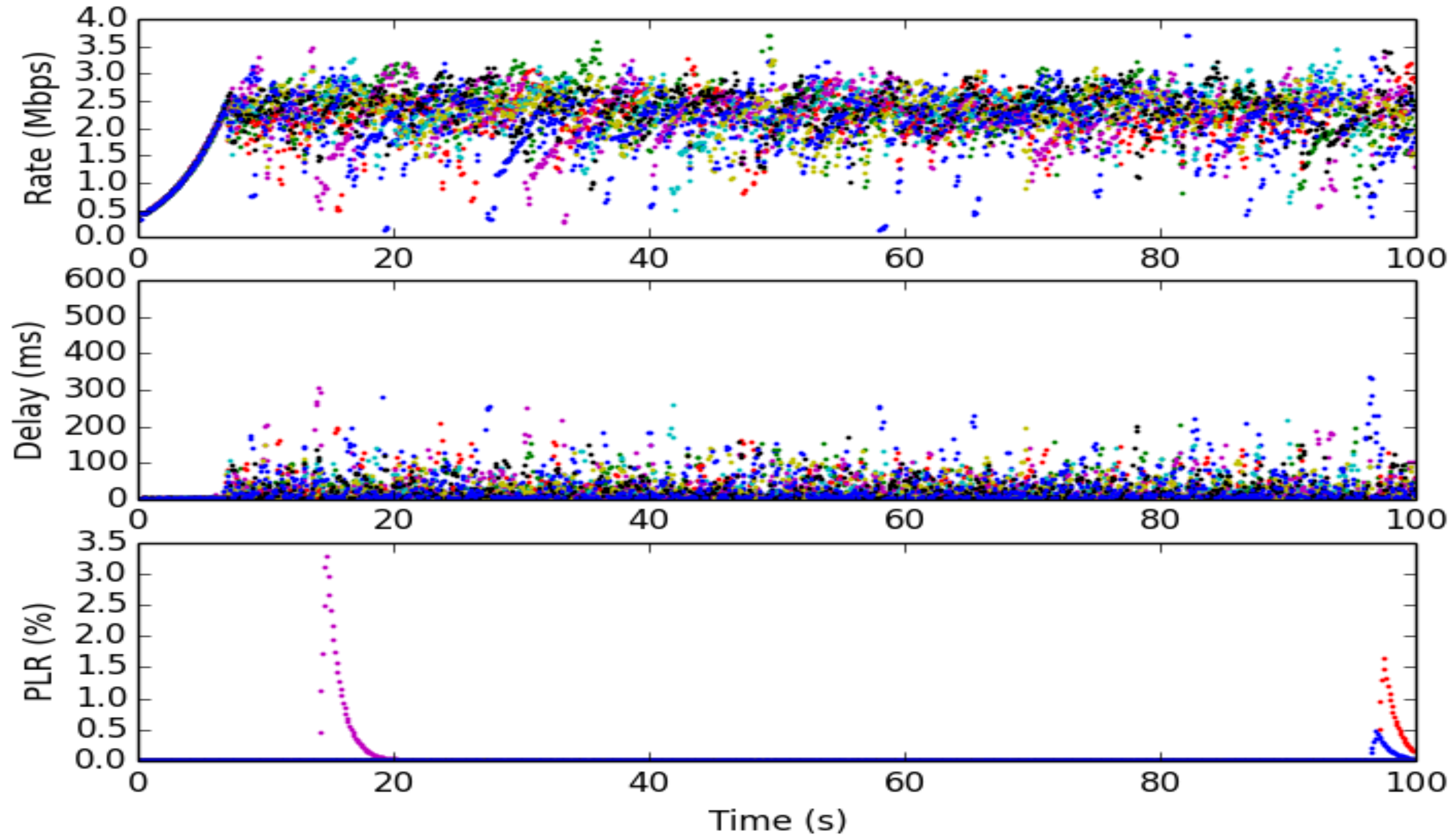
- Rate range: 120Kbps ~ 3.6Mbps *
- Reference congestion level: XREF = 10ms
- Scaling parameters: KAPPA = 0.5, ETA = 2.0
- Upper bound on RTT: TAU = 500ms
- Target feedback interval: DELTA = 100ms
- Accelerated ramp up mode: GAMMA_MAX = 0.5; QBOUND = 50ms
- Non-linear delay warping: QTH = 50ms; QMAX = 400ms
- Delay penalty for marking and loss: DMARK = 200ms; DLOSS = 1s

** different from default value in draft*

Multiple Downstream Flows: 8 Clients

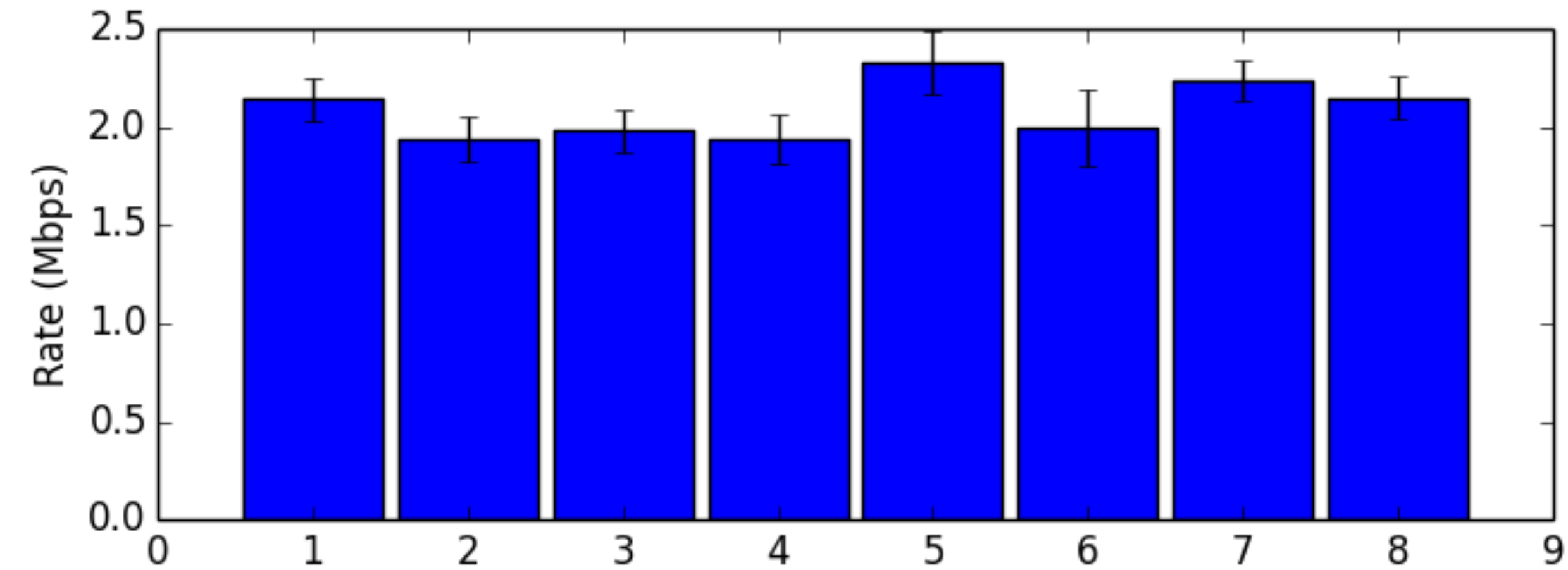


Multiple Upstream Flows: 8 Clients

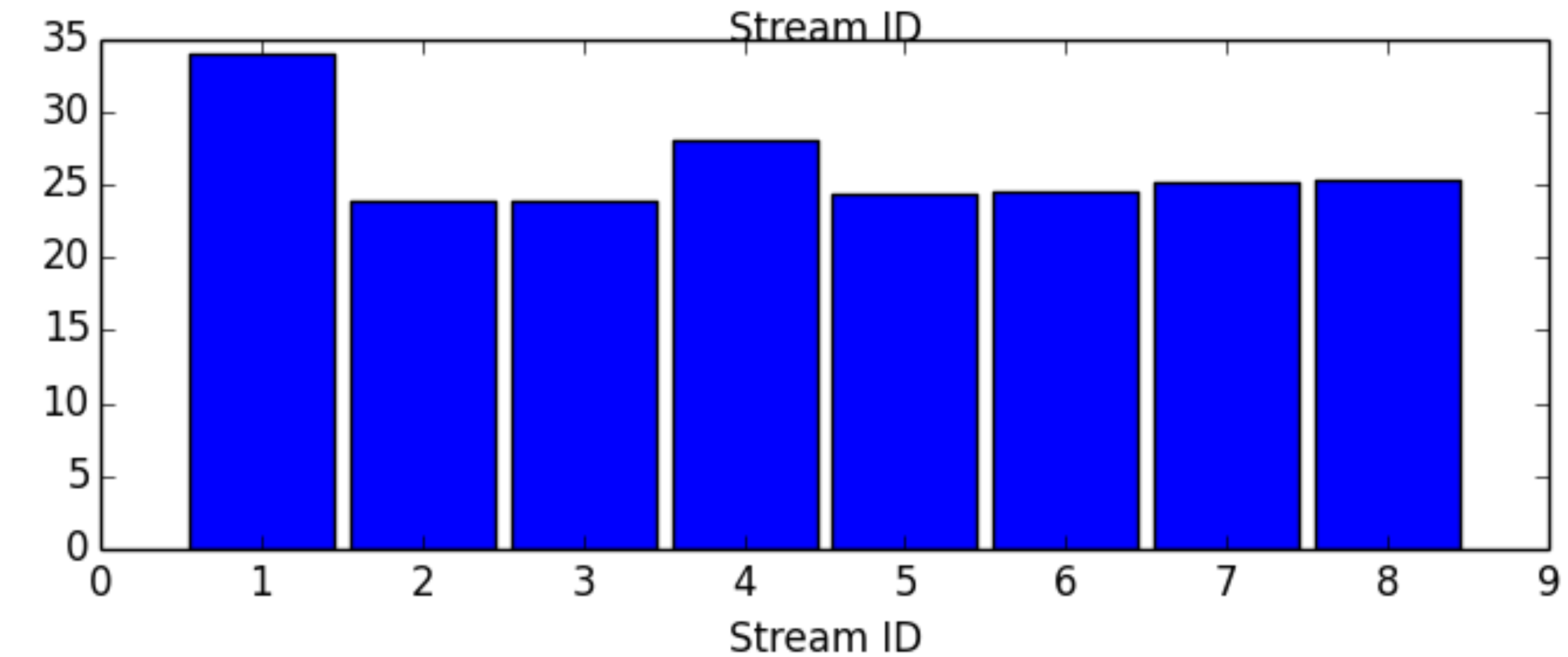
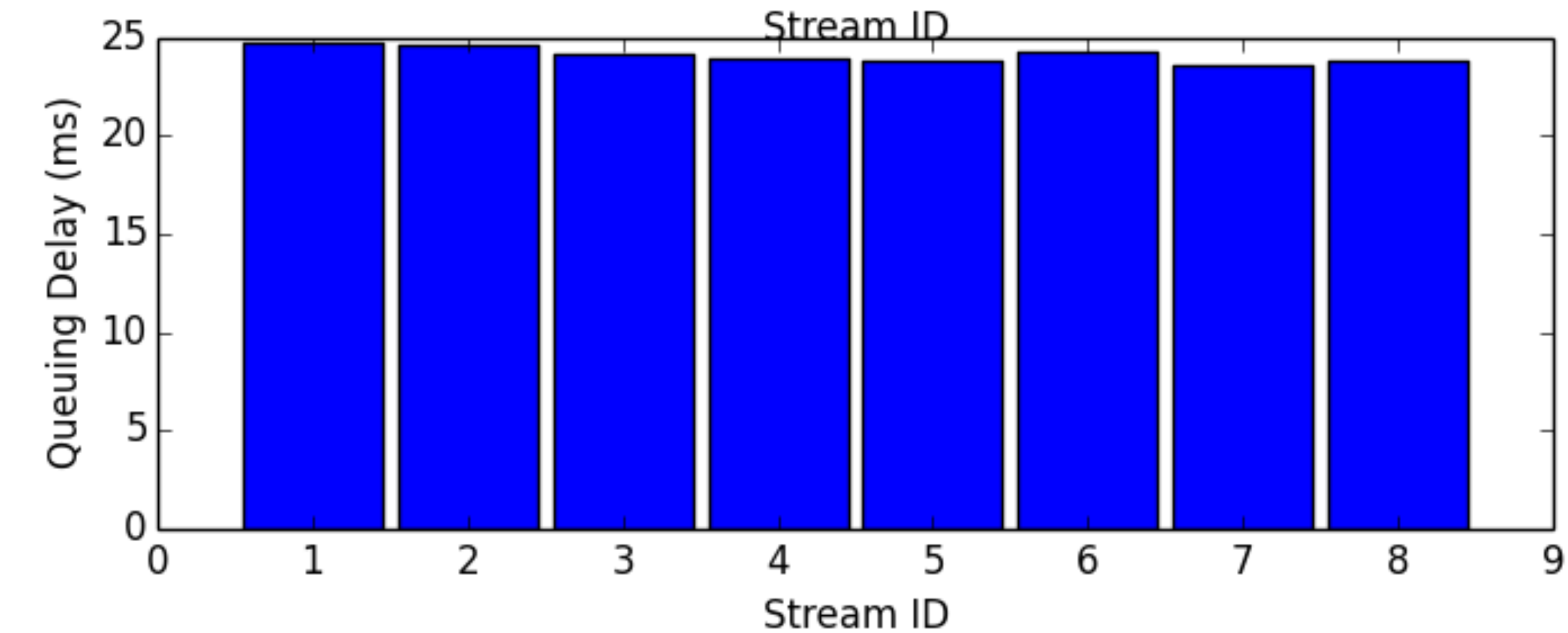
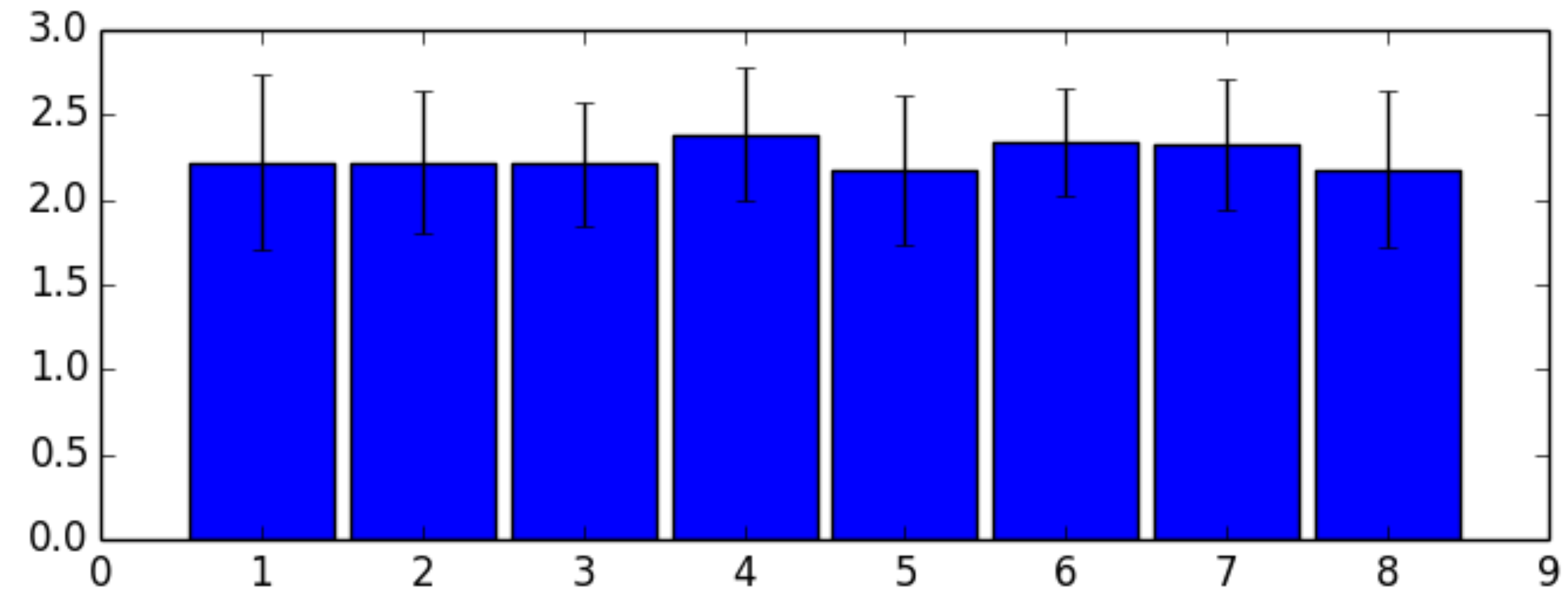


Per-Stream Rate and Queuing Delay

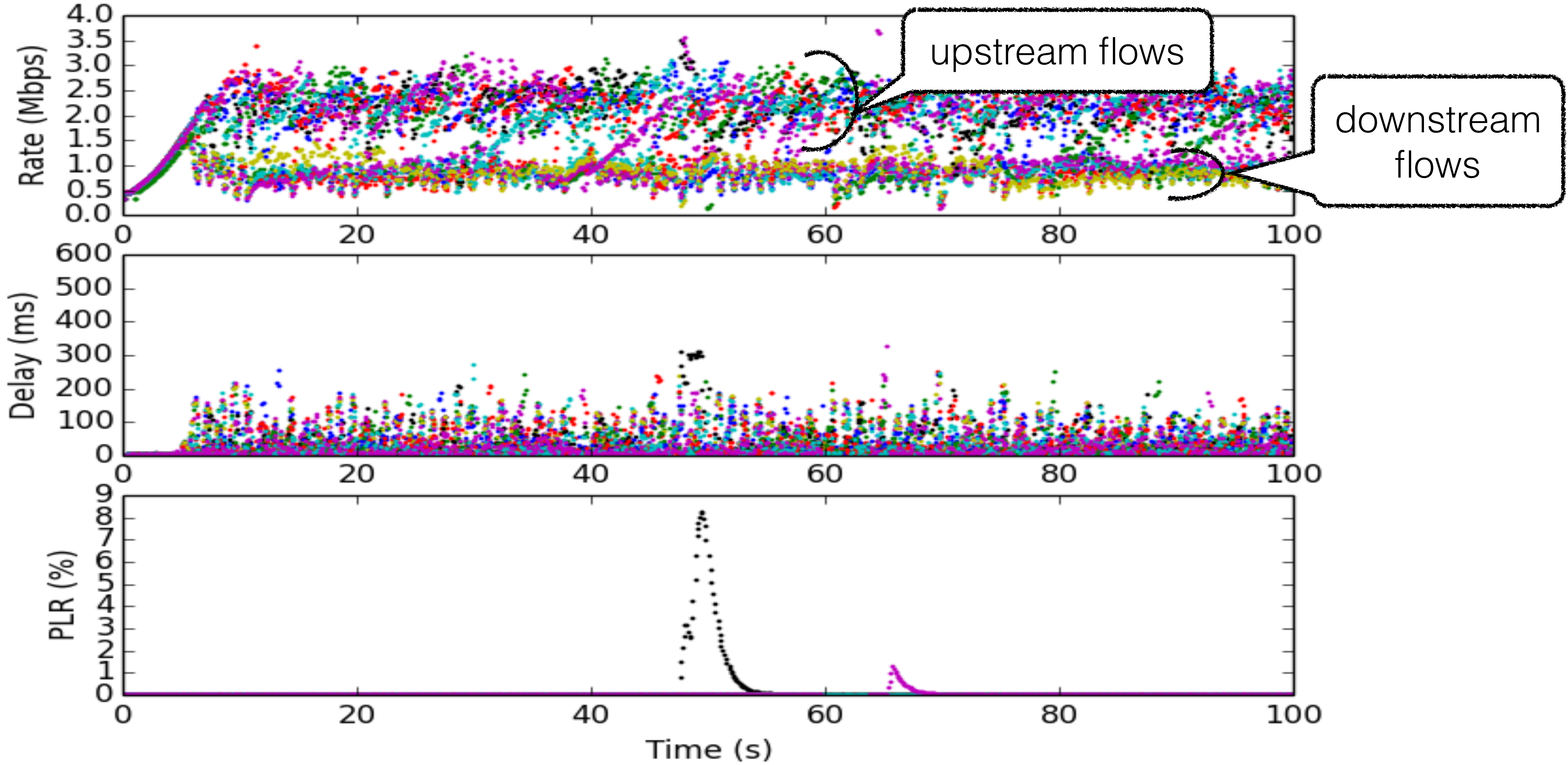
Eight (8) downstream clients



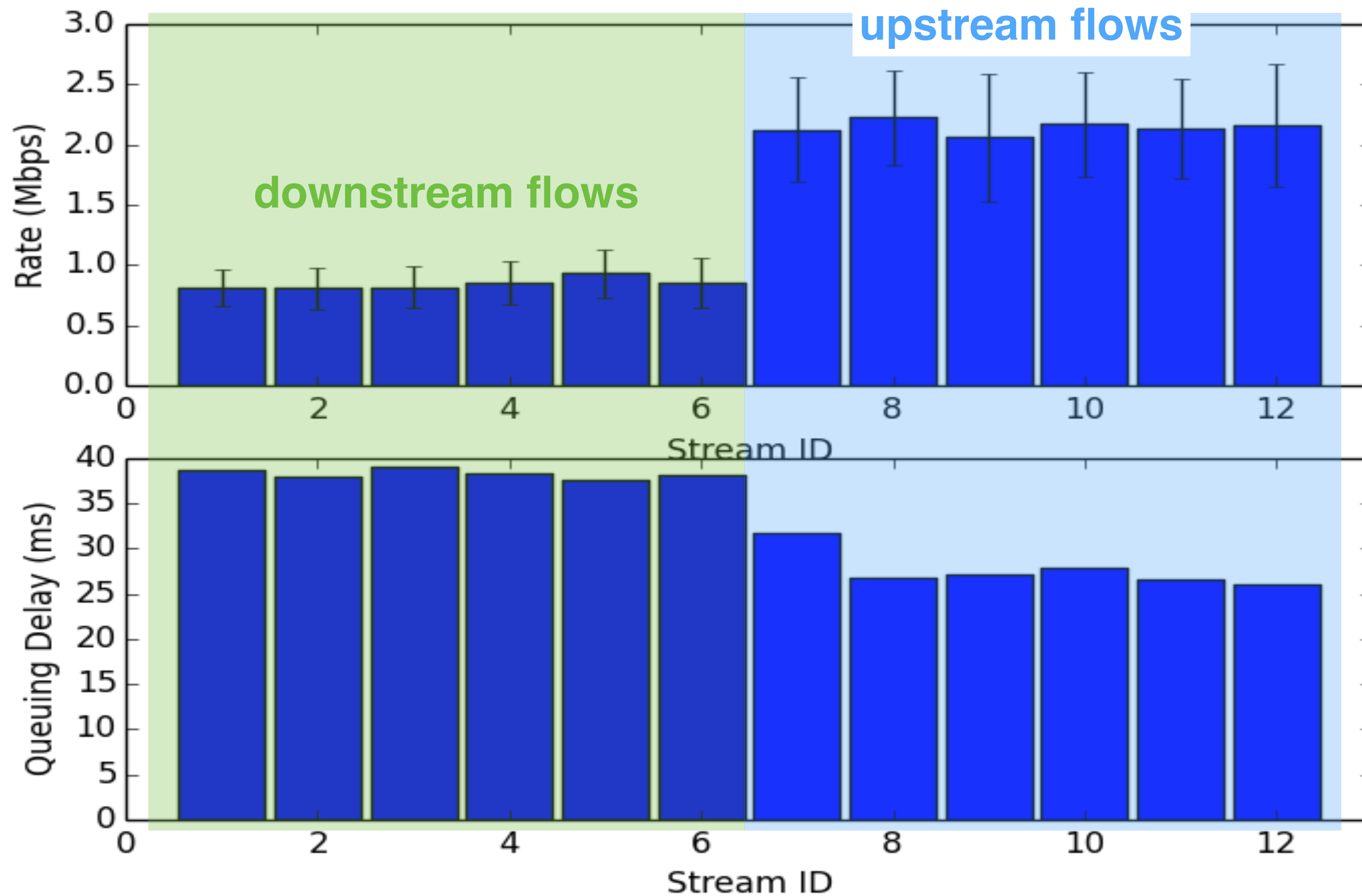
Eight (8) upstream clients



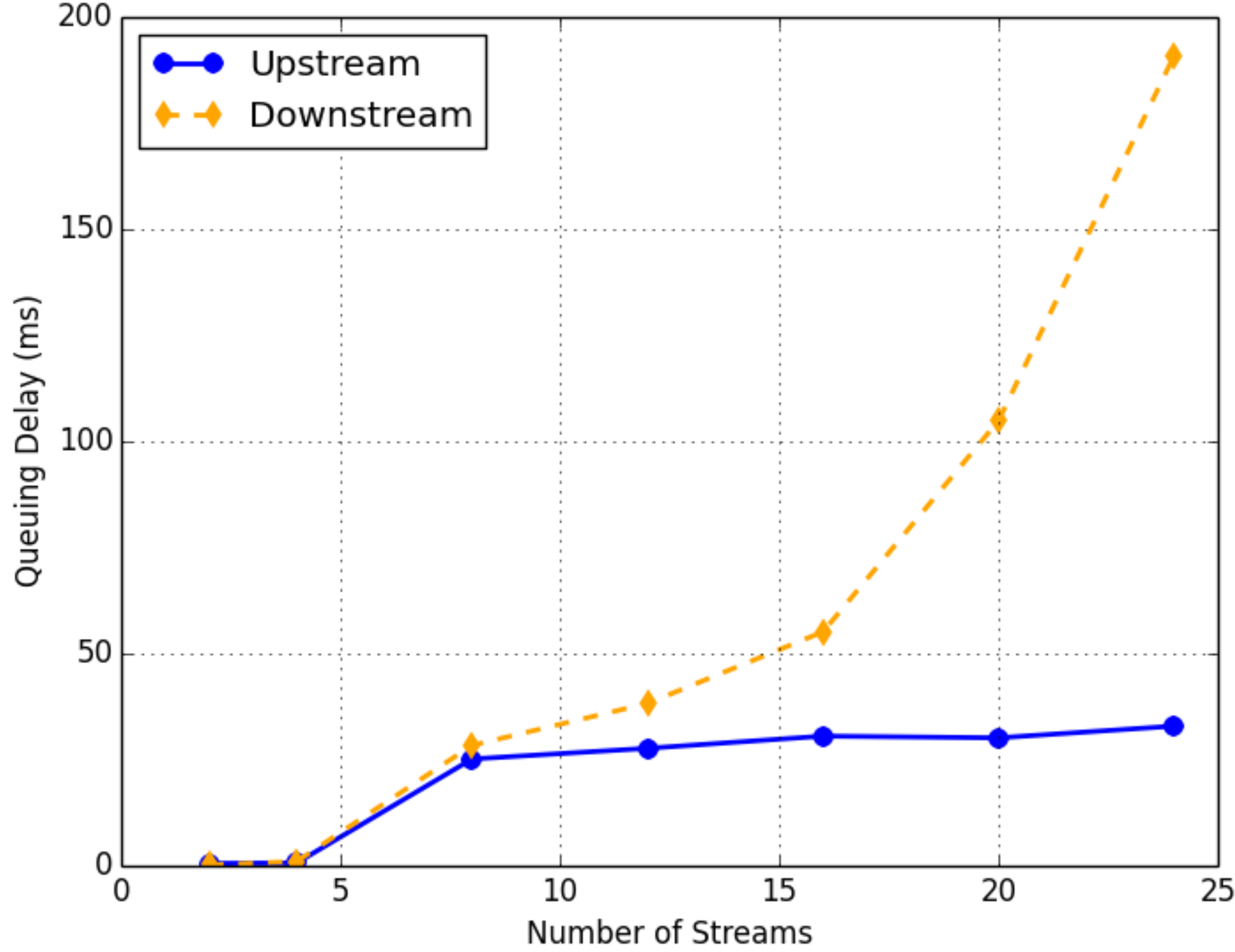
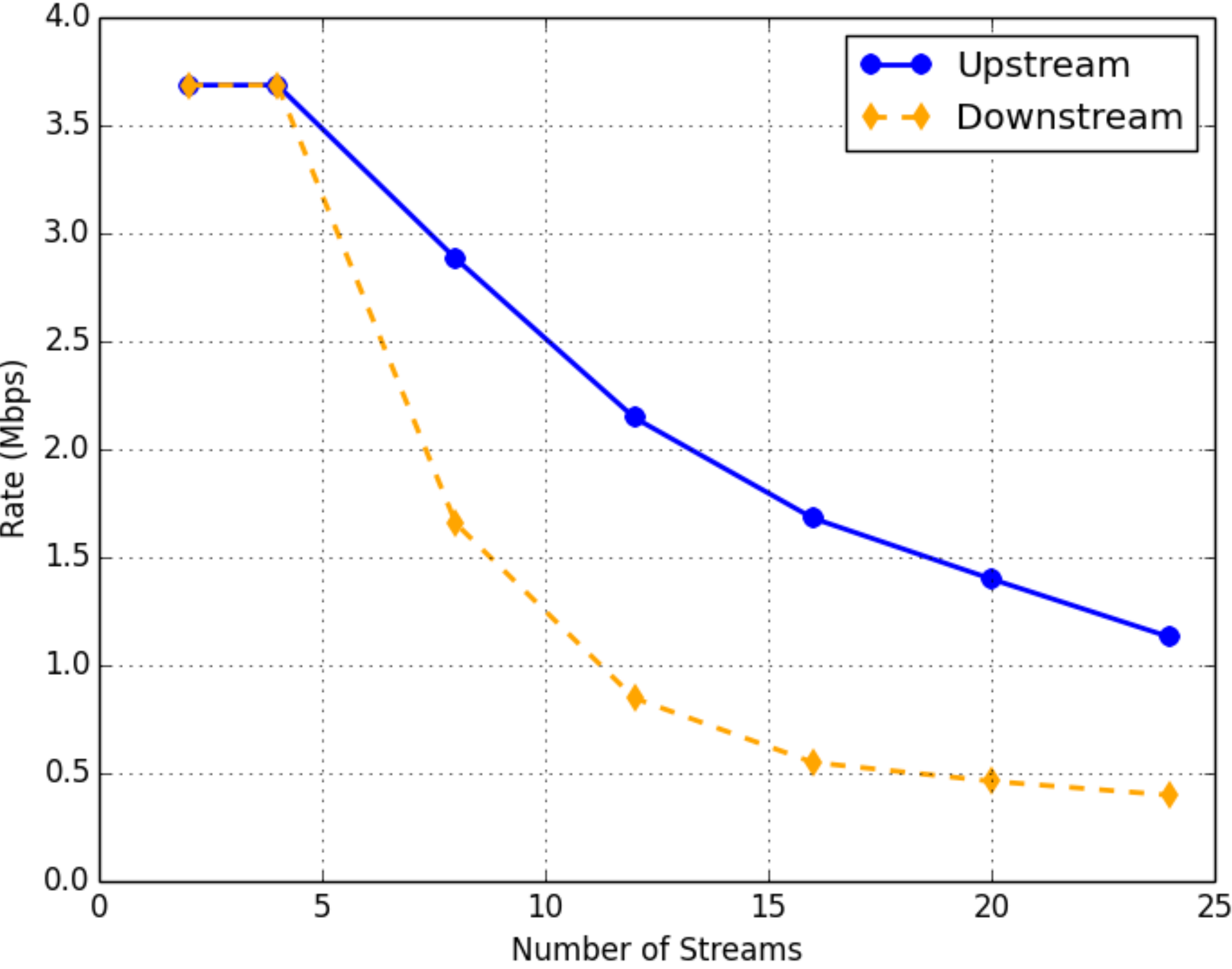
Bidirectional Flows: 6 Downstream/Upstream Clients



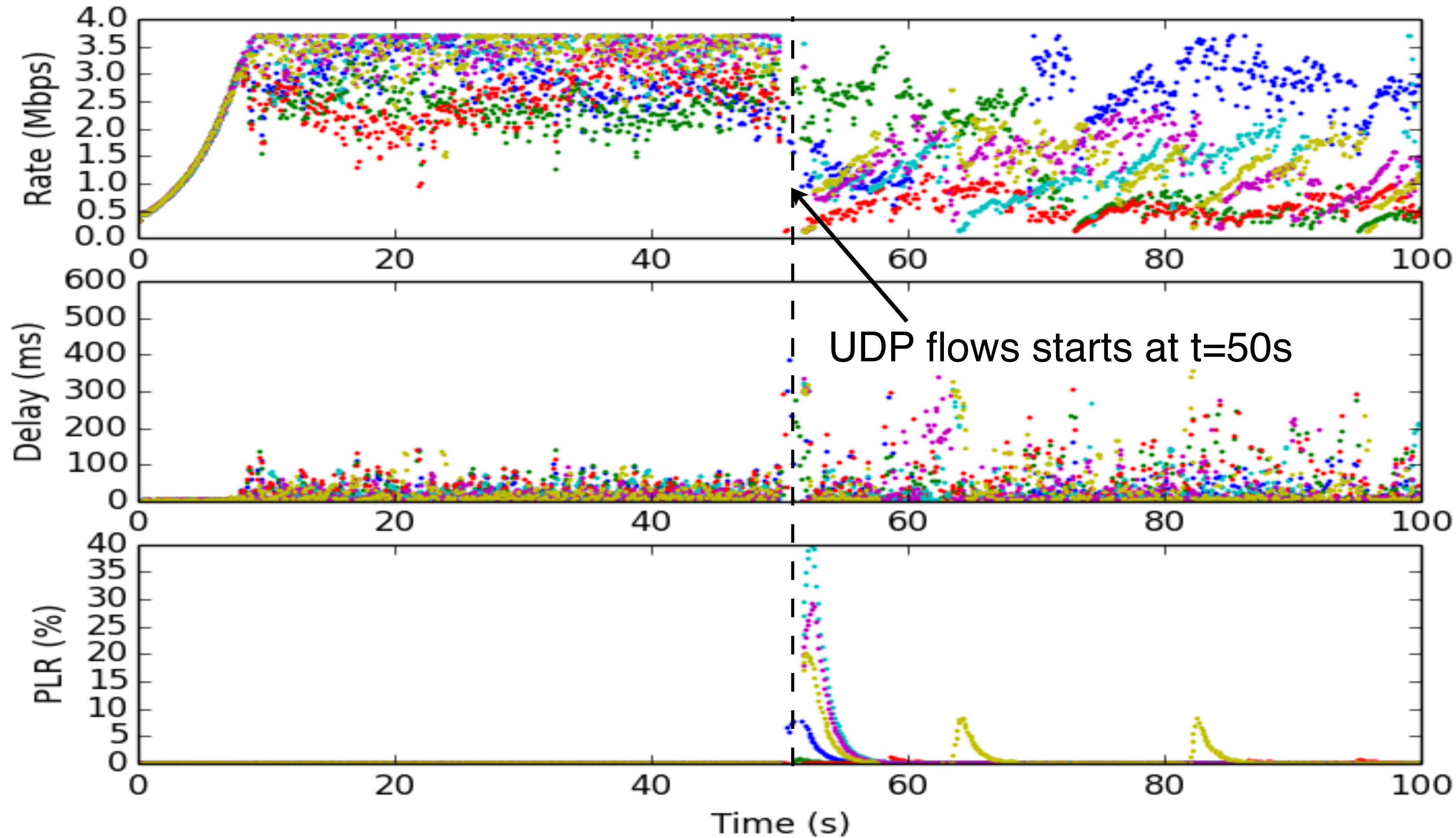
Bidirectional Flows: Per-Stream Rate and Delay



Varying Number of Streams: Average Rate and Queuing Delay

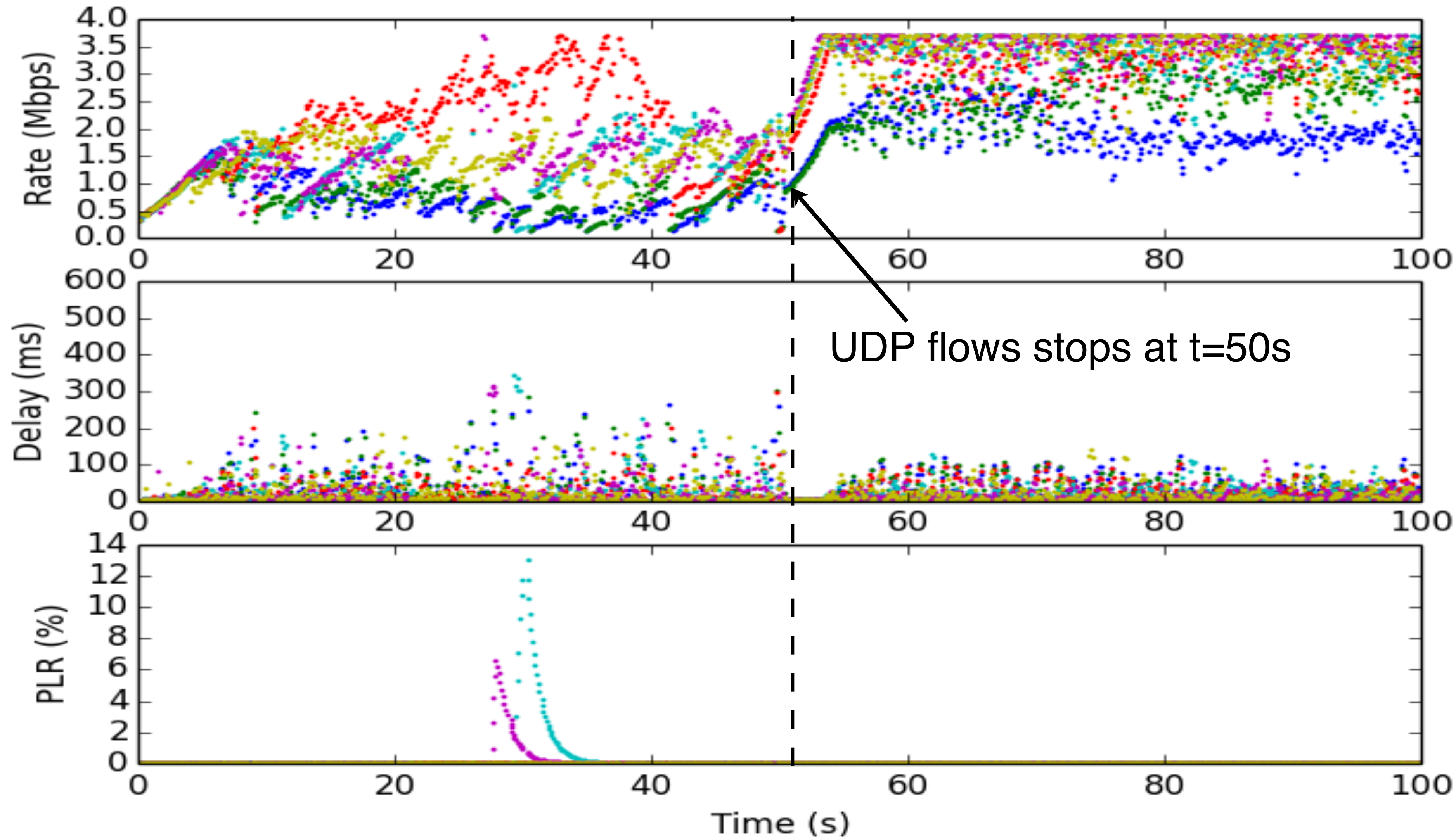


Dynamic UDP Background Traffic



- Test Setup**
- Six (6) NADA flows;
 - Five (5) UDP flows
 - UDP flows@3Mbps

Dynamic UDP Background Traffic



Test Setup

- Six (6) NADA flows;
- Five (5) UDP flows
- UDP flows@3Mbps

Summary

- Qualitatively consistent results in 802.11n as before in 802.11g:
 - All downstream flows: stable and fair bandwidth sharing
 - All upstream flows: more over-the-air content, higher queuing delay and short-term rate fluctuations; long-term fairness across clients with similar wireless link quality
 - Bidirectional flows: higher rate and lower delay for the group of upstream flows
- New test case on varying clients examine how per-stream rate degrades fast with increasing number of clients; demonstrates consistently higher rates of upstream flows over downstream flows;
- New test case with dynamic UDP background shows how flows react to change of load in Wi-Fi network