

Update on NADA: Implementation Status and Performance Evaluation Results

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July 2013

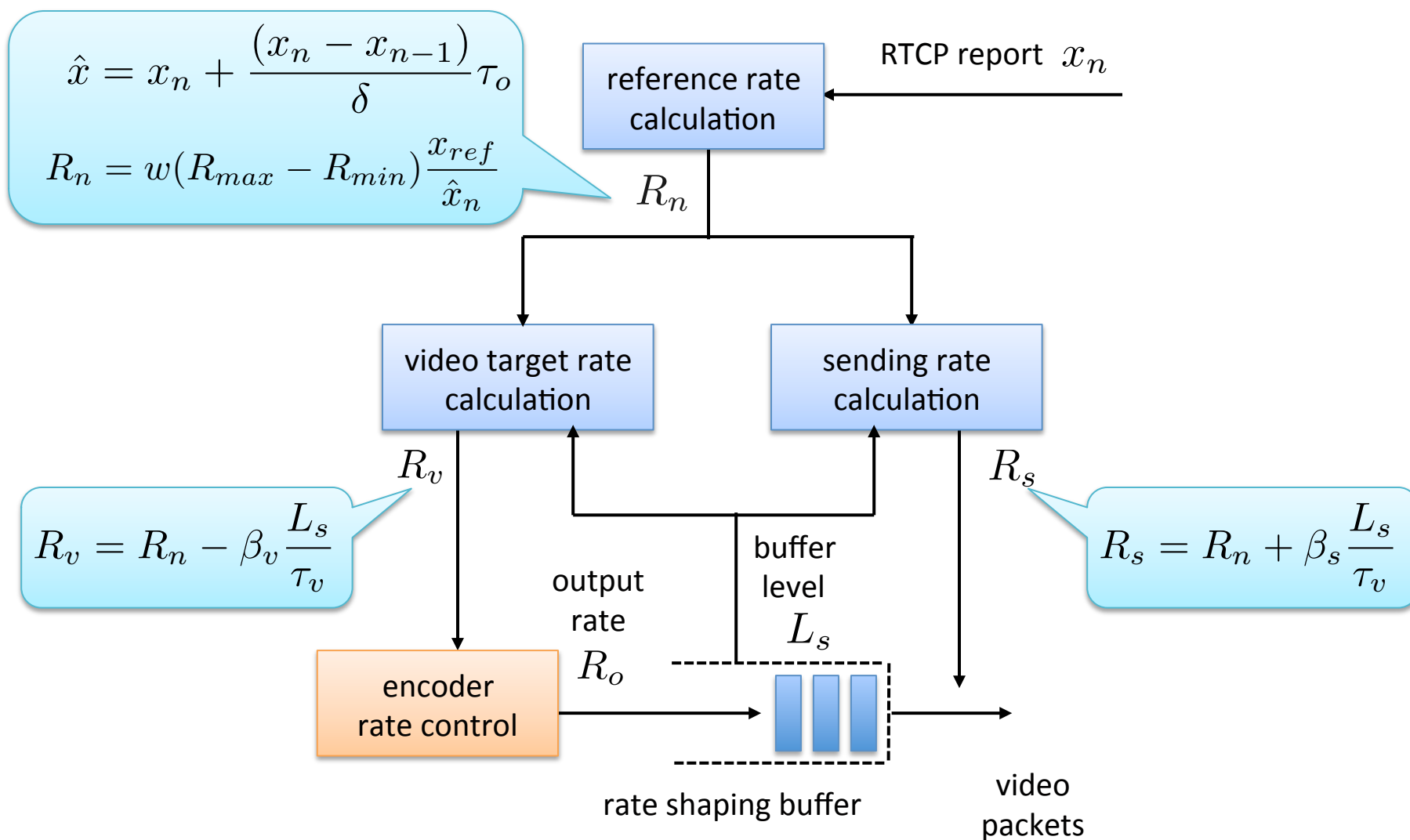
Agenda

- Recap: design of NADA
- Implementation status
- Performance evaluation results

Recap: Design Goals of NADA

- Limit self-inflicted delay
- Incorporate all forms of congestions signals:
 - Delay
 - Loss
 - ECN markings
 - ...
- Achieve weighted bandwidth sharing

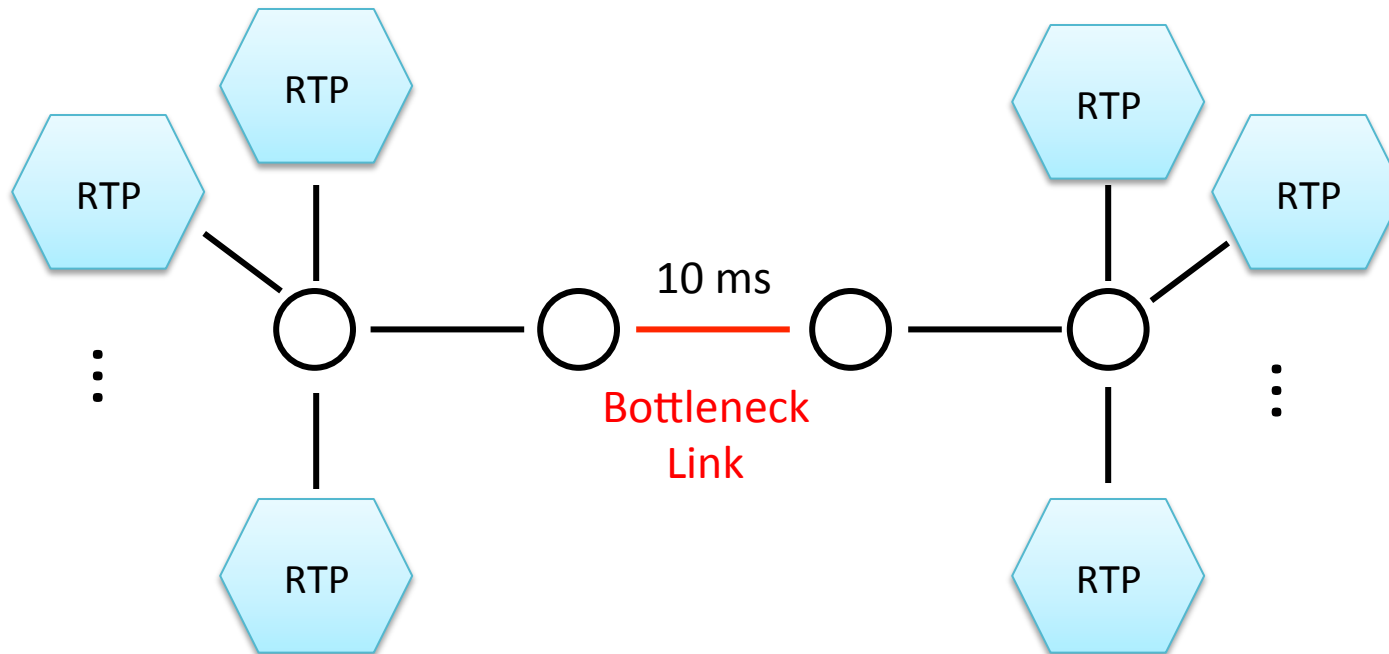
Recap: NADA Sender Behavior



Implementation Status

- Complete test suite in ns-2:
 - NADA Sender
 - NADA Receiver
 - Live video encoder with tunable reaction time and output rate variations
- Ongoing: linux-based test bed

Simulation Scenarios

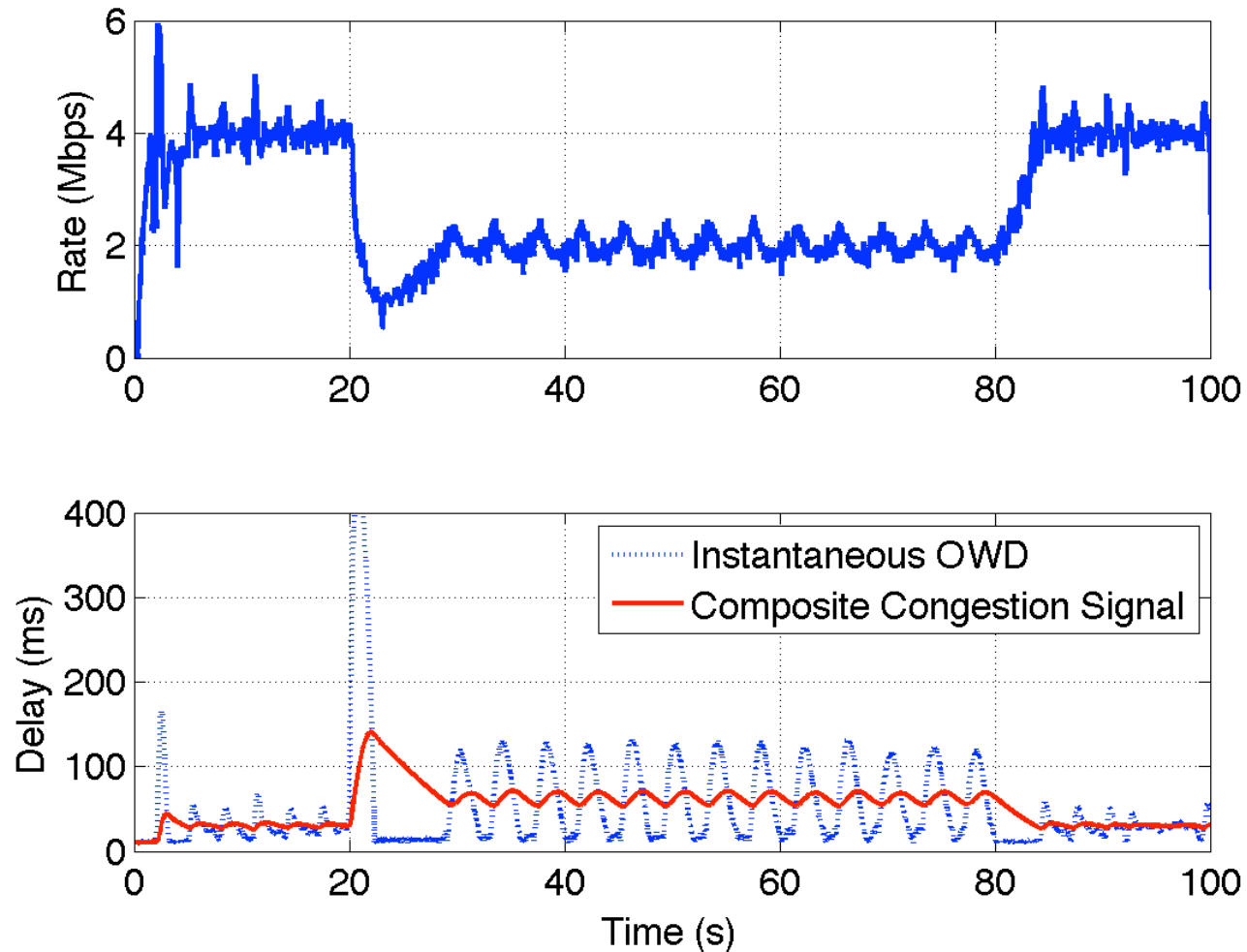


- Single NADA stream with time-varying link capacity
- Multiple competing NADA streams with different weights of priority
- Multiple NADA streams competing against TCP

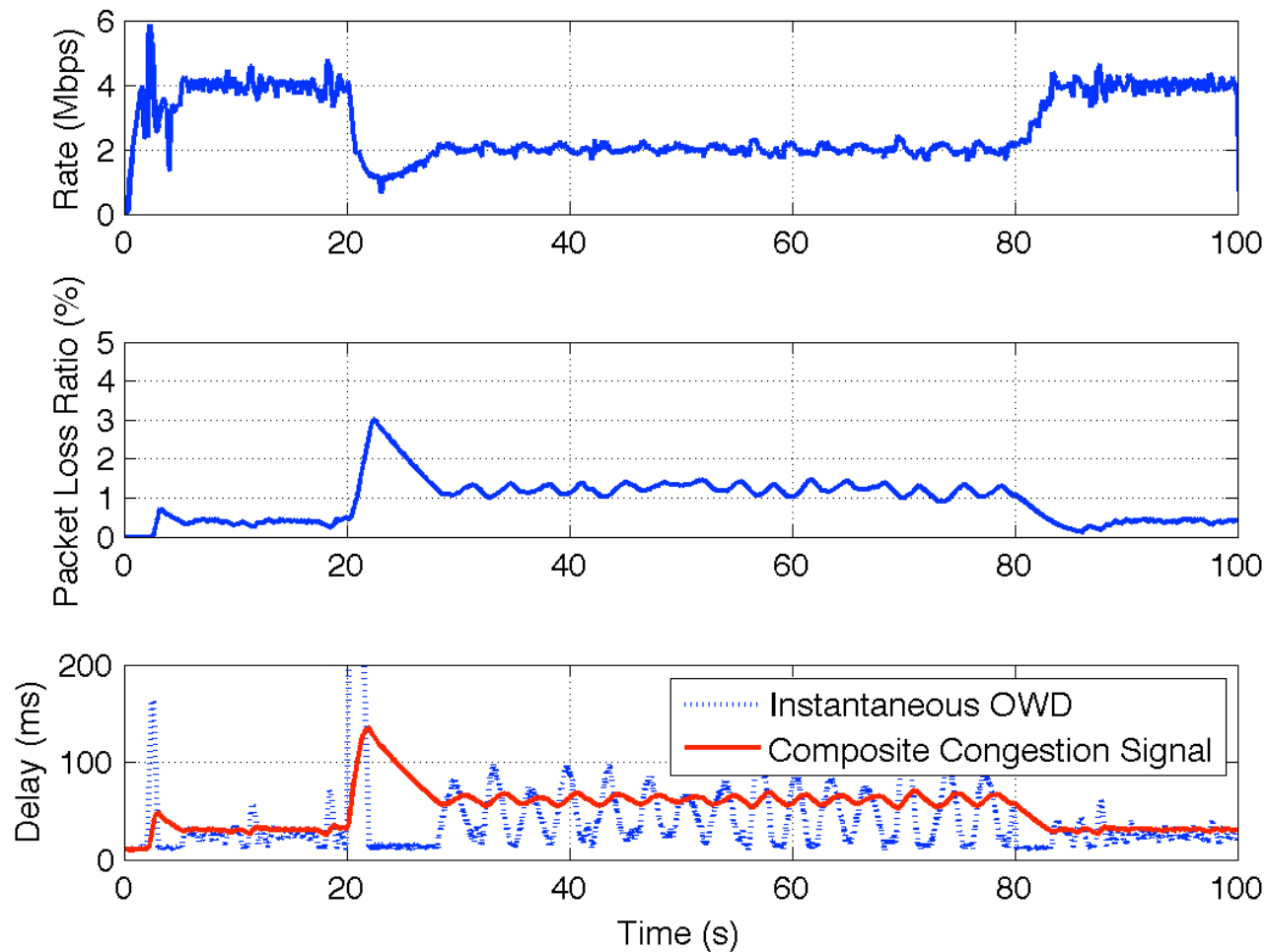
A Suite of Queue Management Schemes

- DropTail: Queue-based dropping
- RED: Queue-based random dropping
- CoDel: Delay-based deterministic dropping
- PIE: Delay-based random dropping
- PCN: Virtual-queue-based random marking

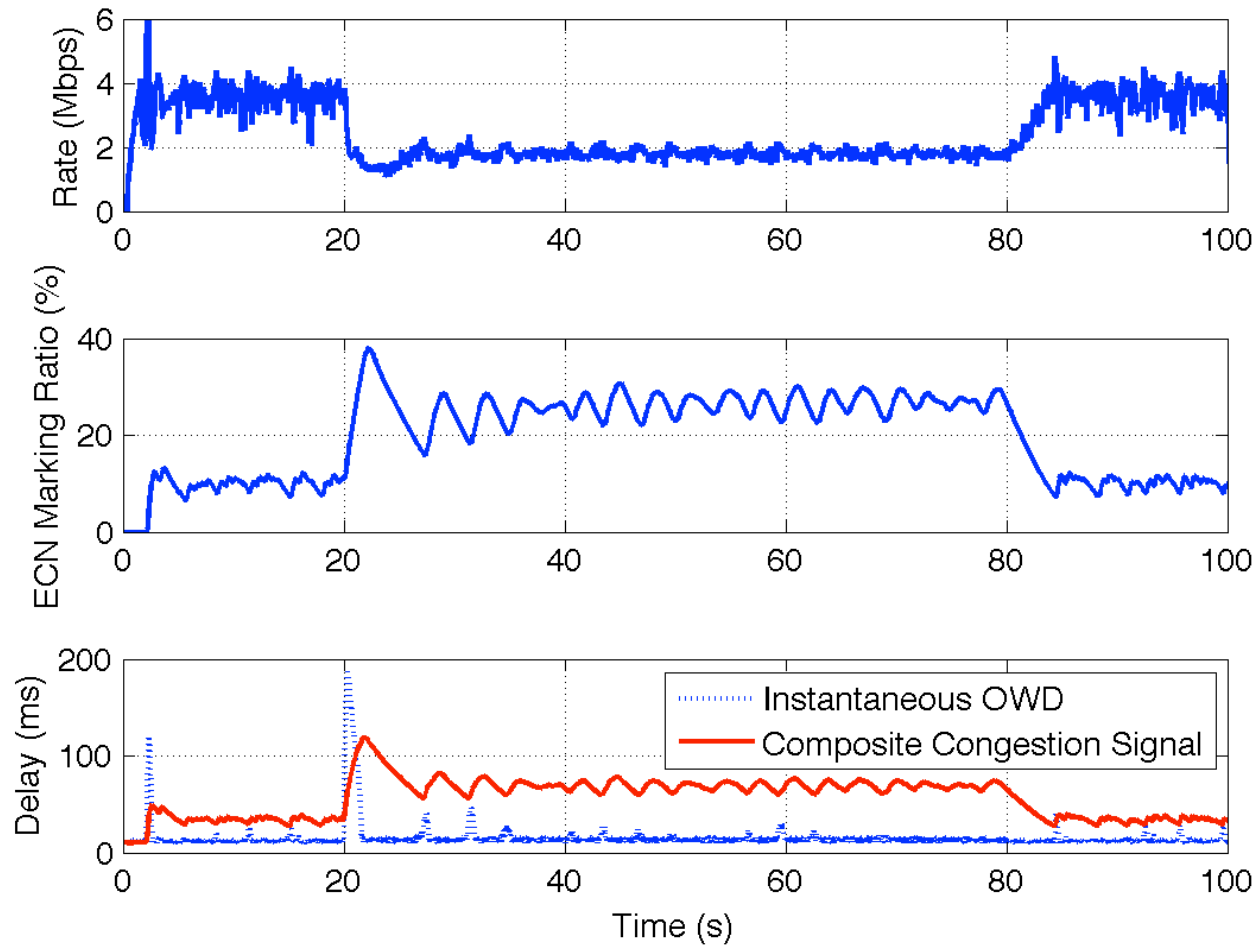
Time-Varying Link: NADA+DropTail



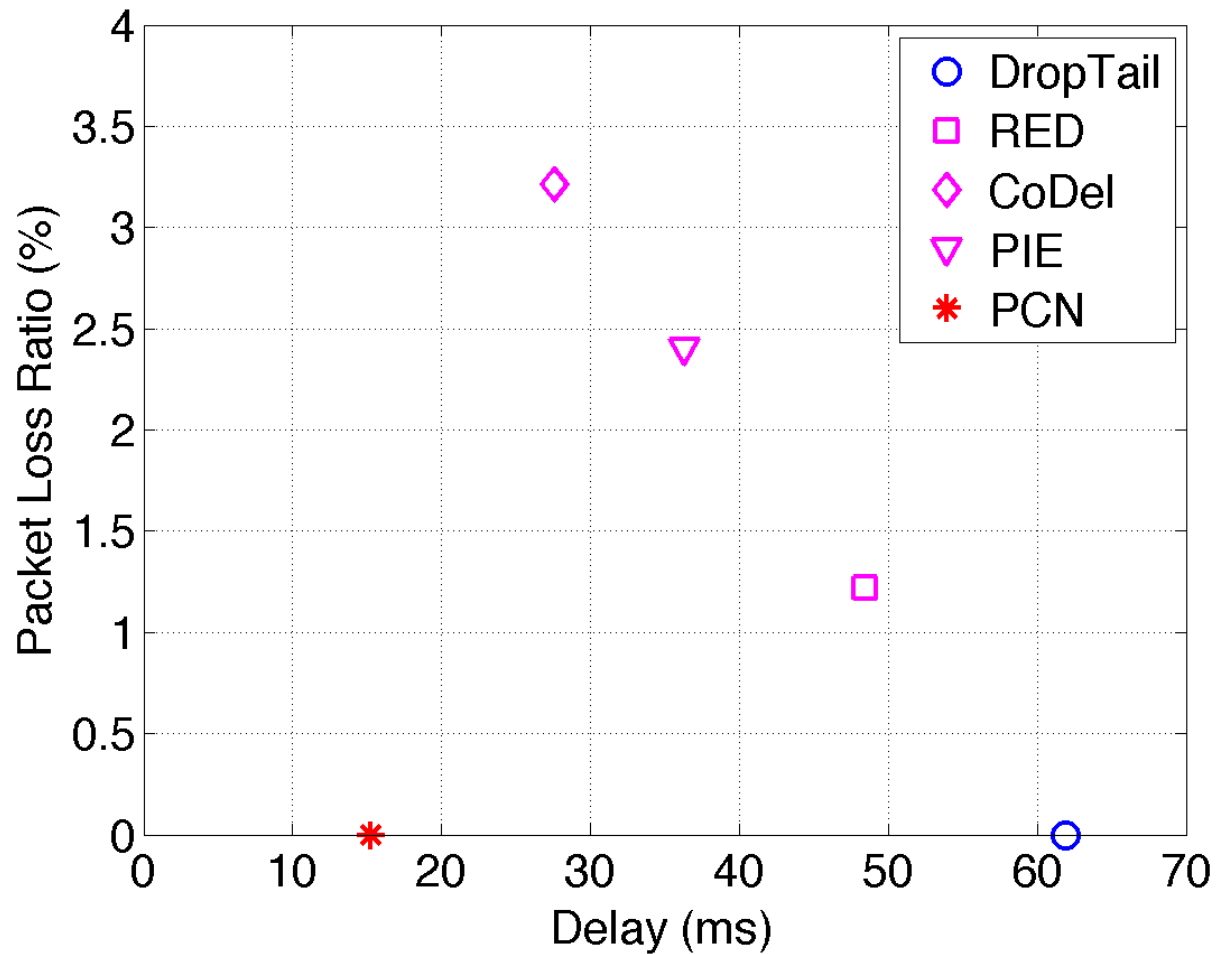
Time-Varying Link: NADA+RED



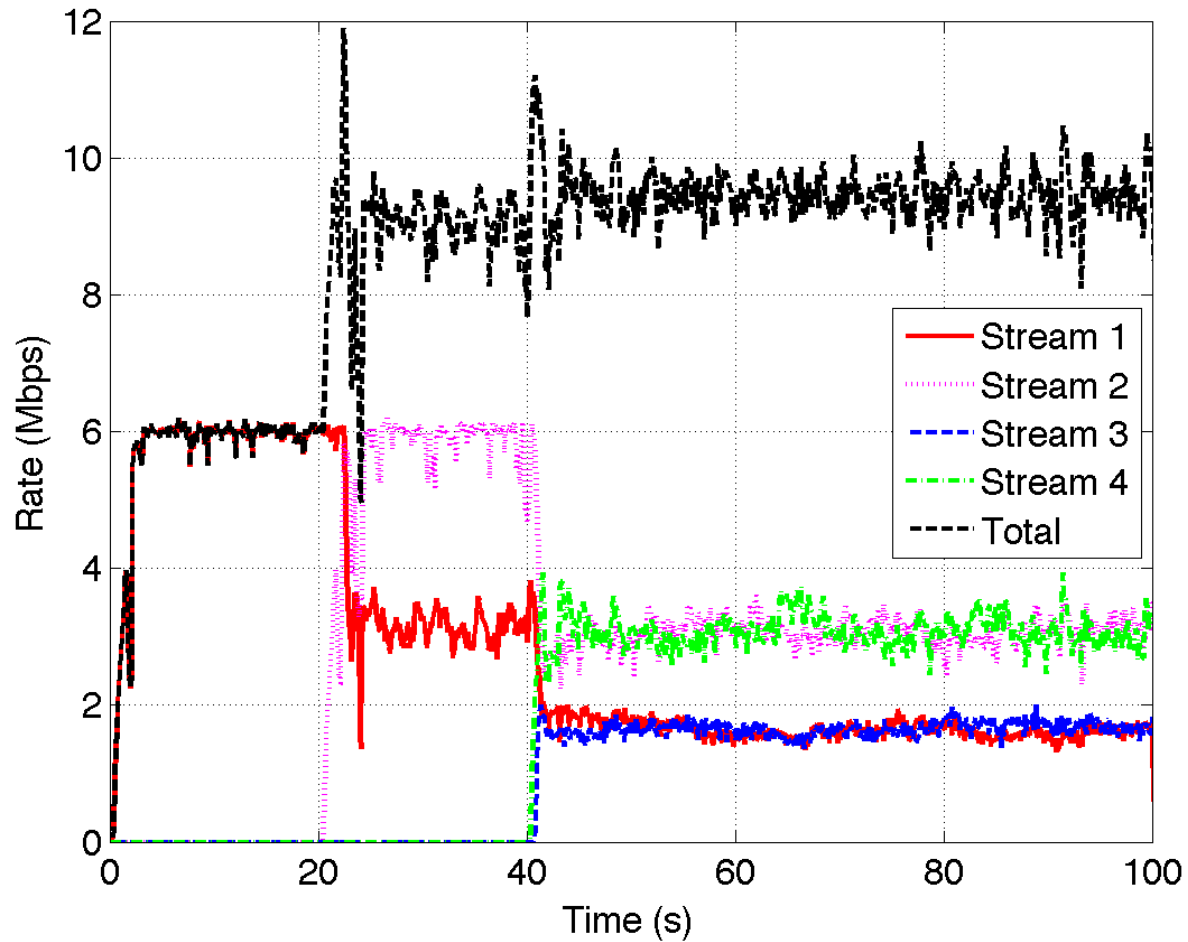
Time-Varying Link: NADA+PCN



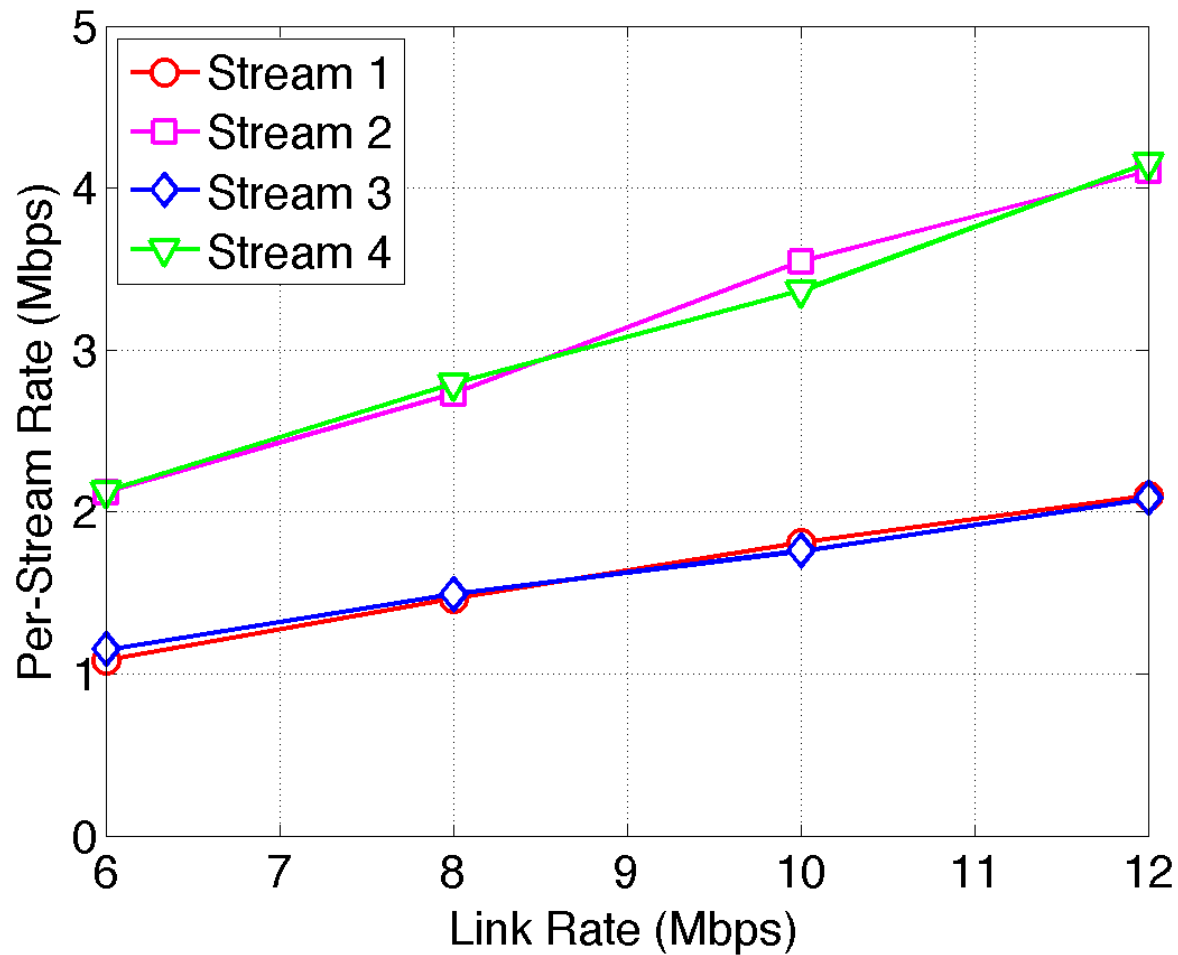
Interaction with Various Queuing Schemes



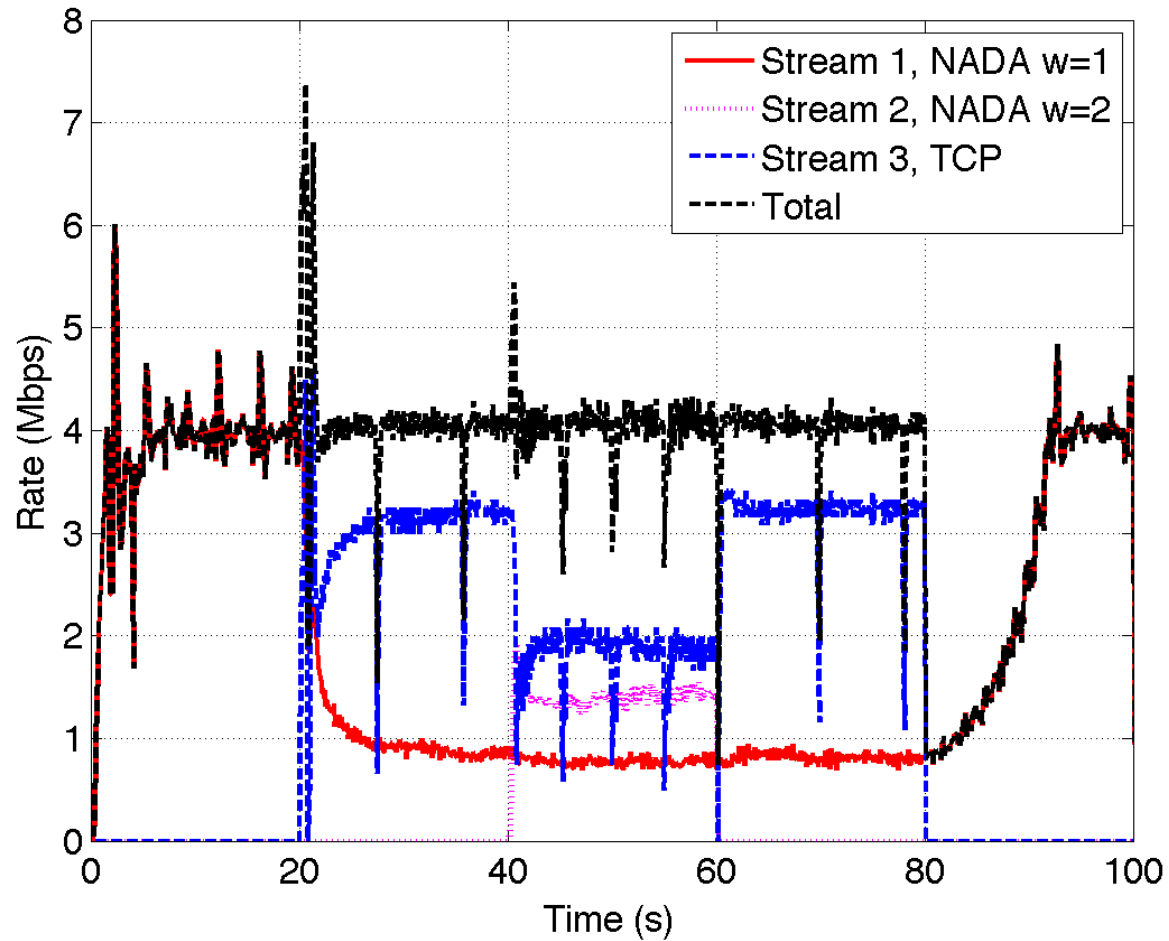
Multiple Competing NADA Streams



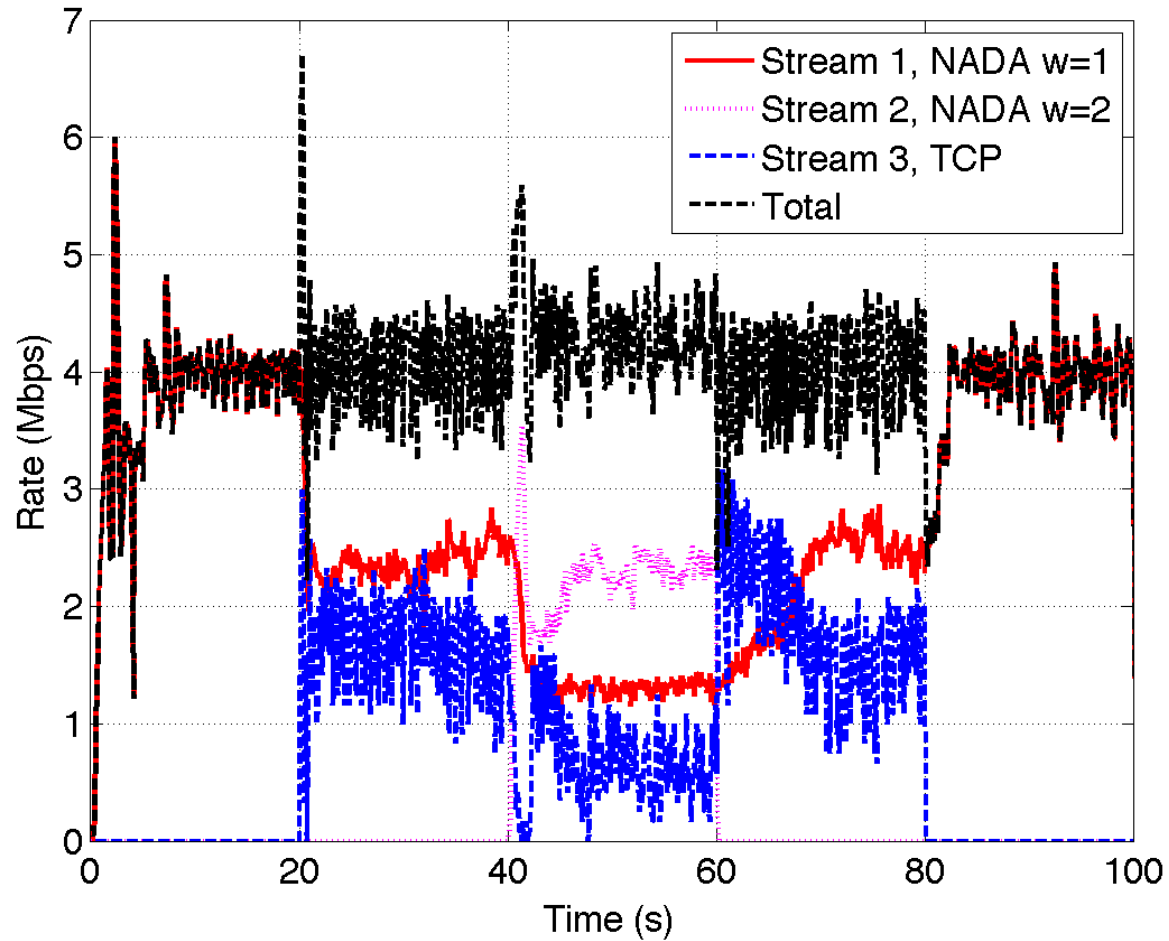
Multiple Competing NADA Streams: Varying Link Rate



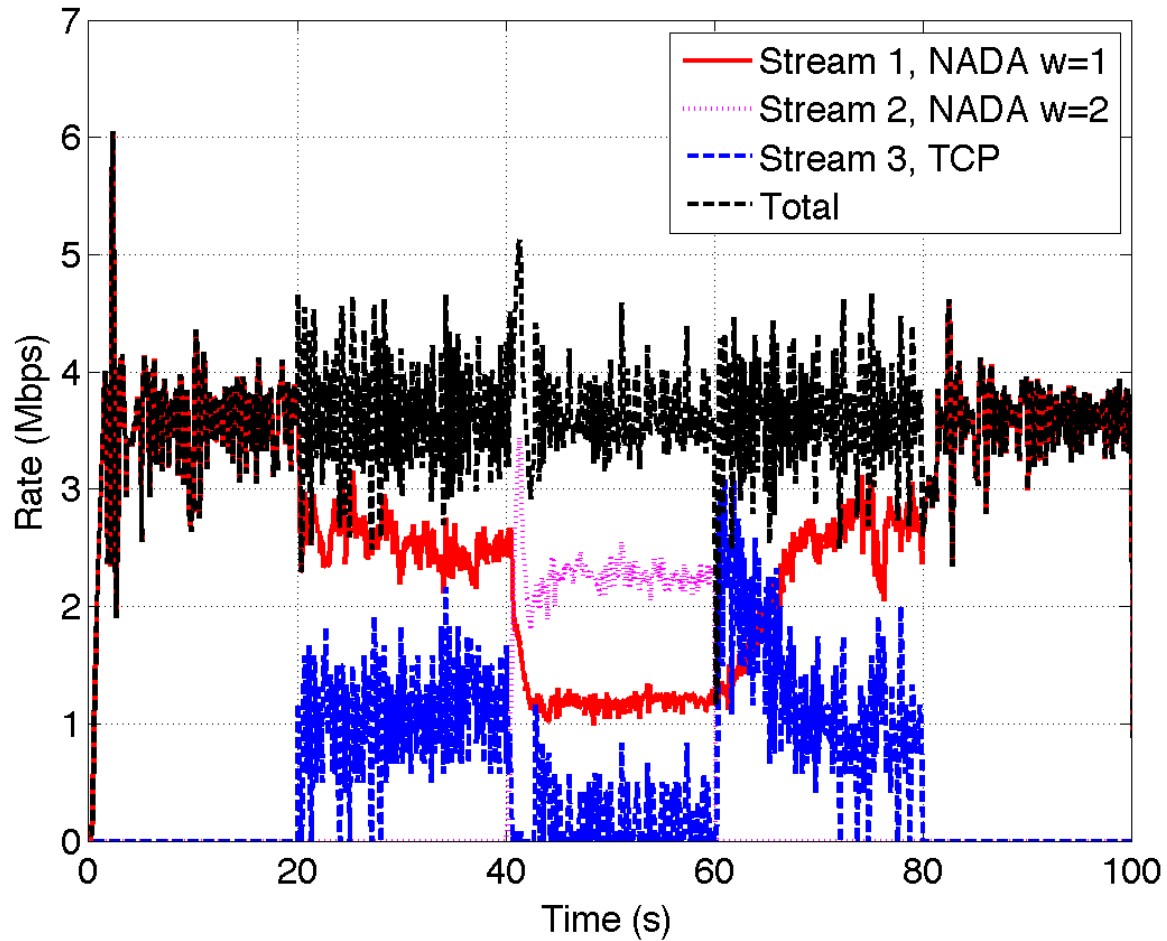
NADA Competing with TCP: w/ DropTail



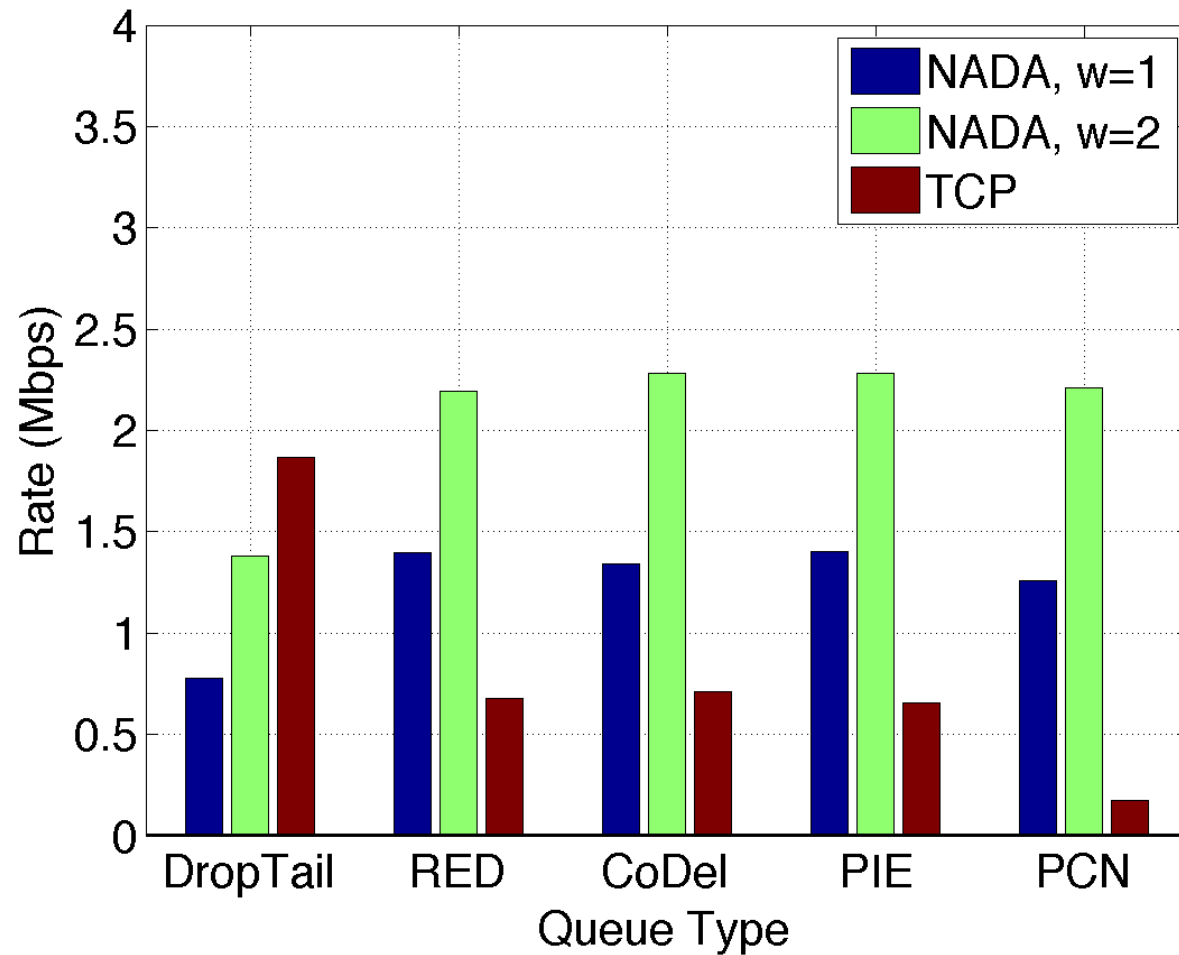
NADA Competing against TCP: w/ RED



NADA Competing against TCP: w/ PCN



NADA Competing against TCP: Throughput Comparisons



Summary

- Performance highlights of NADA:
 - Reacts fast to abrupt changes in link rate
 - Works well with a wide variety of queuing mechanisms
 - Achieves weighted bandwidth sharing
 - Remains robust against loss-based TCP
- Ongoing work:
 - Studying the impact of loss-delay tradeoff for video
 - Building a linux-based test bed
 - Open to suggestions for new evaluation scenarios