

# Adaptive FEC for Congestion Control

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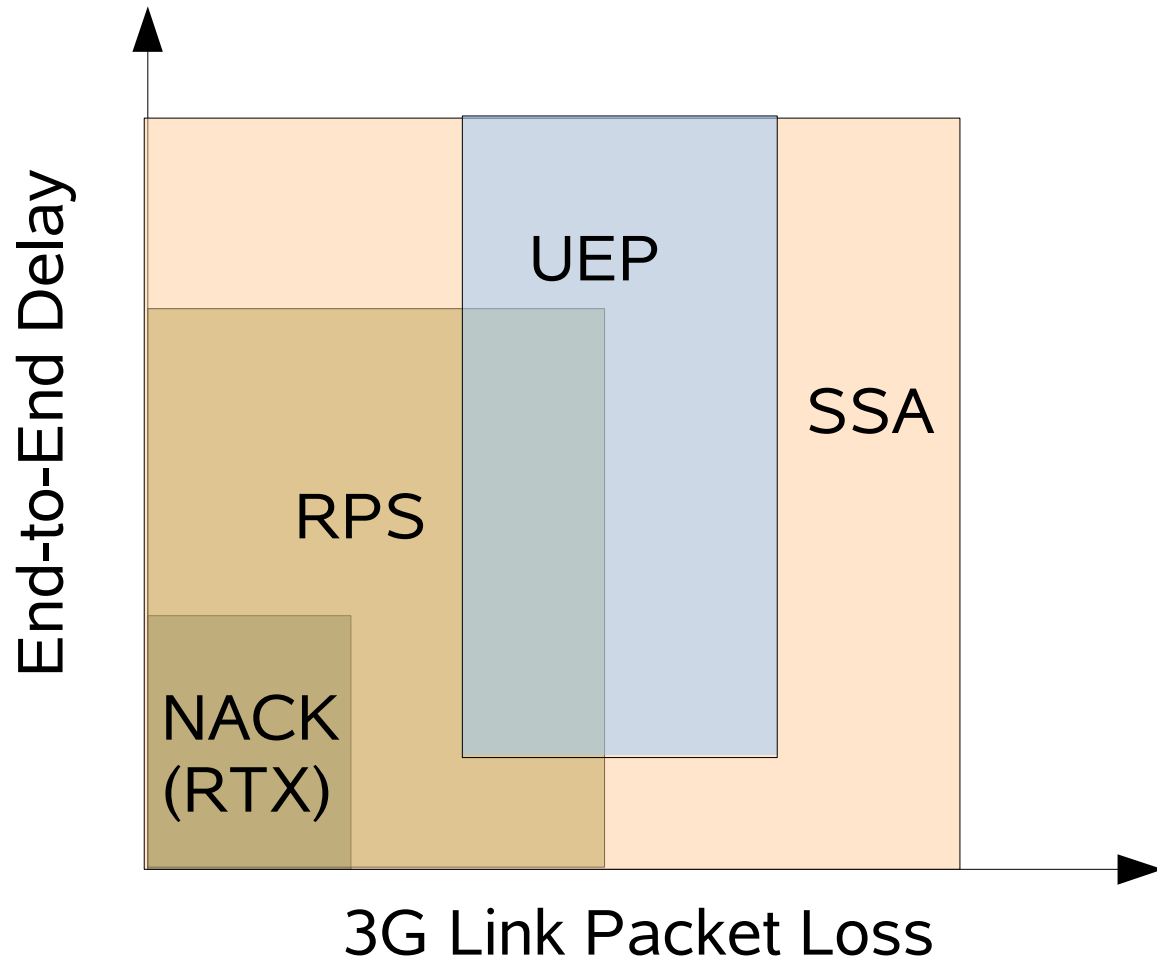
IETF 90, Toronto,  
24. July 2014

[tools.ietf.org/html/draft-singh-rmcat-adaptive-fec-00](http://tools.ietf.org/html/draft-singh-rmcat-adaptive-fec-00)

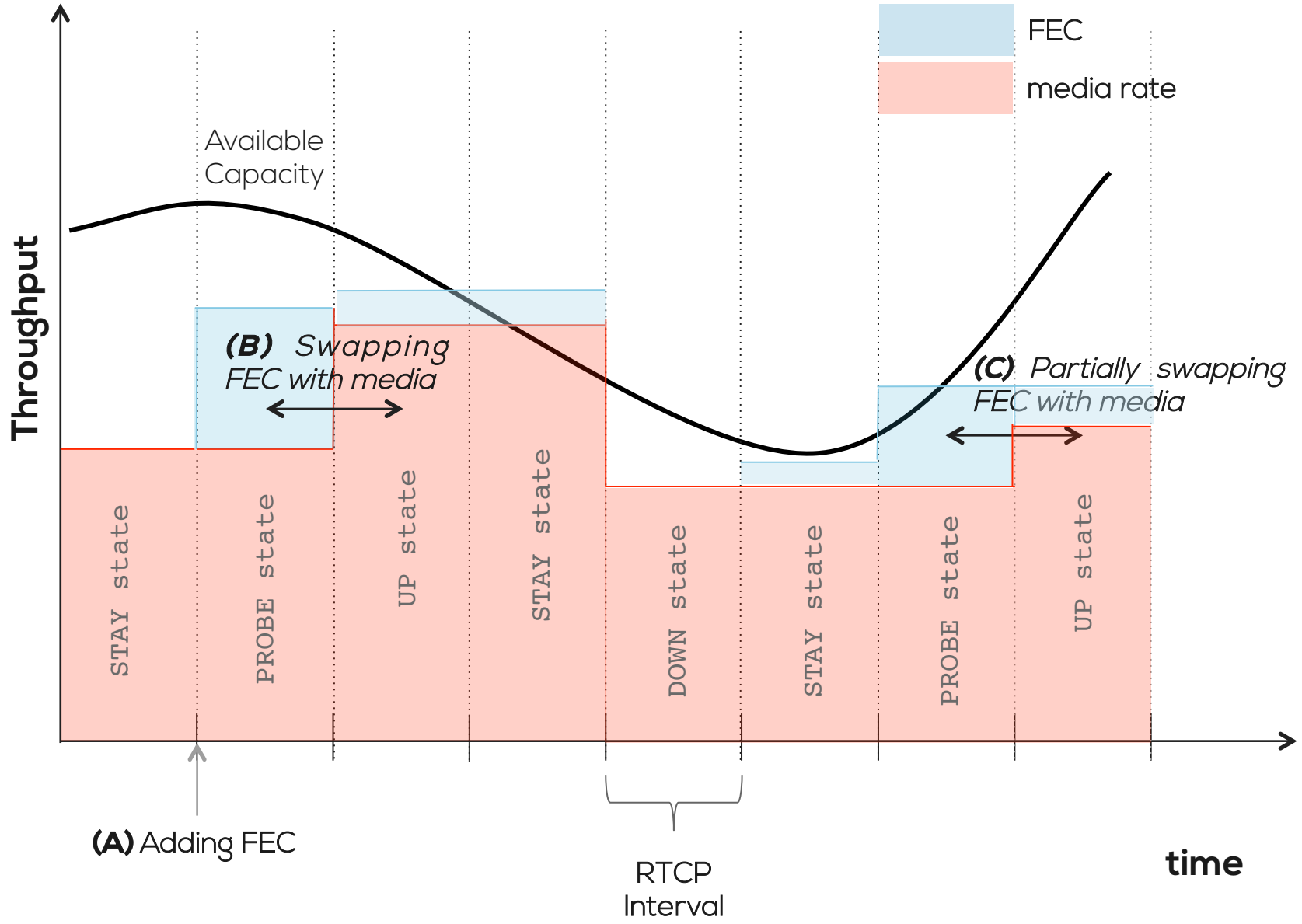
# IPR

- Lars made a 3<sup>rd</sup> party disclosure:
  - <https://datatracker.ietf.org/ipr/2394/>
  - Also sent to the mailing list

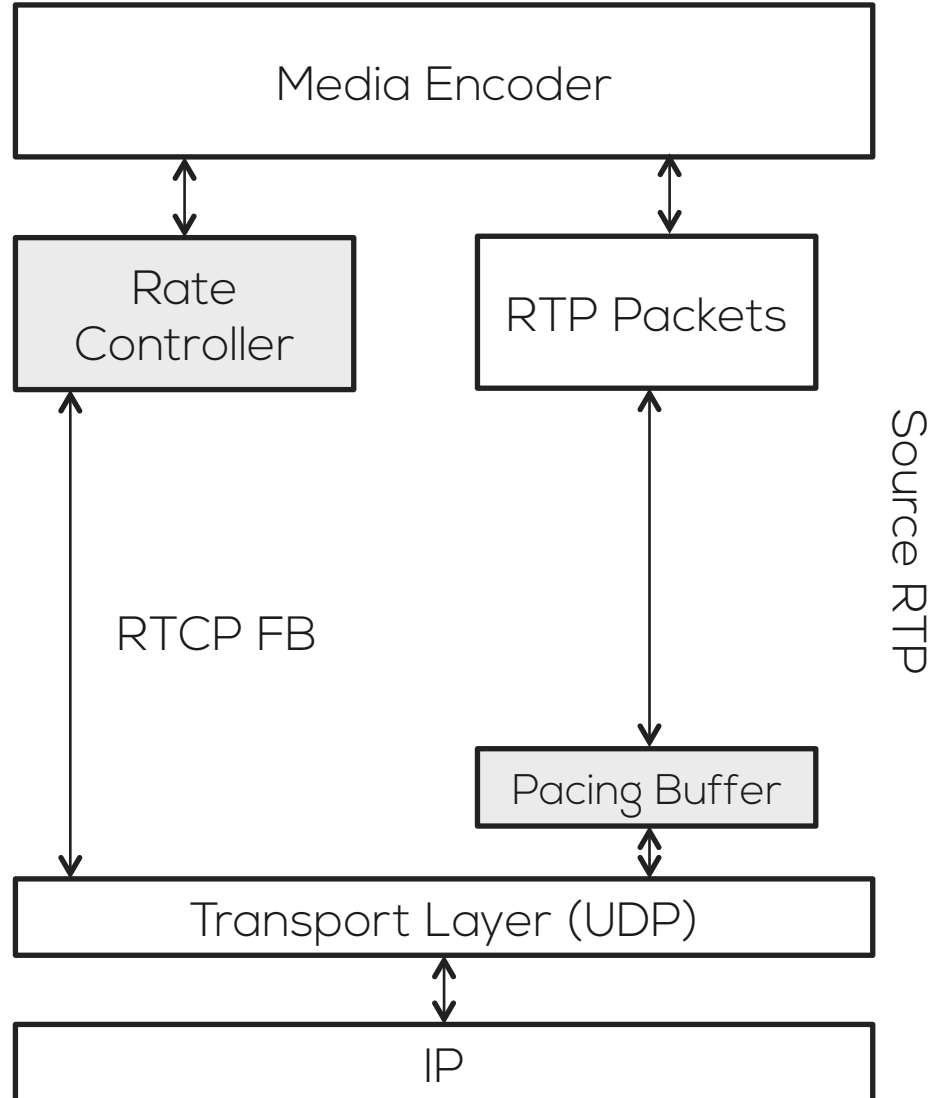
# Error Resilience



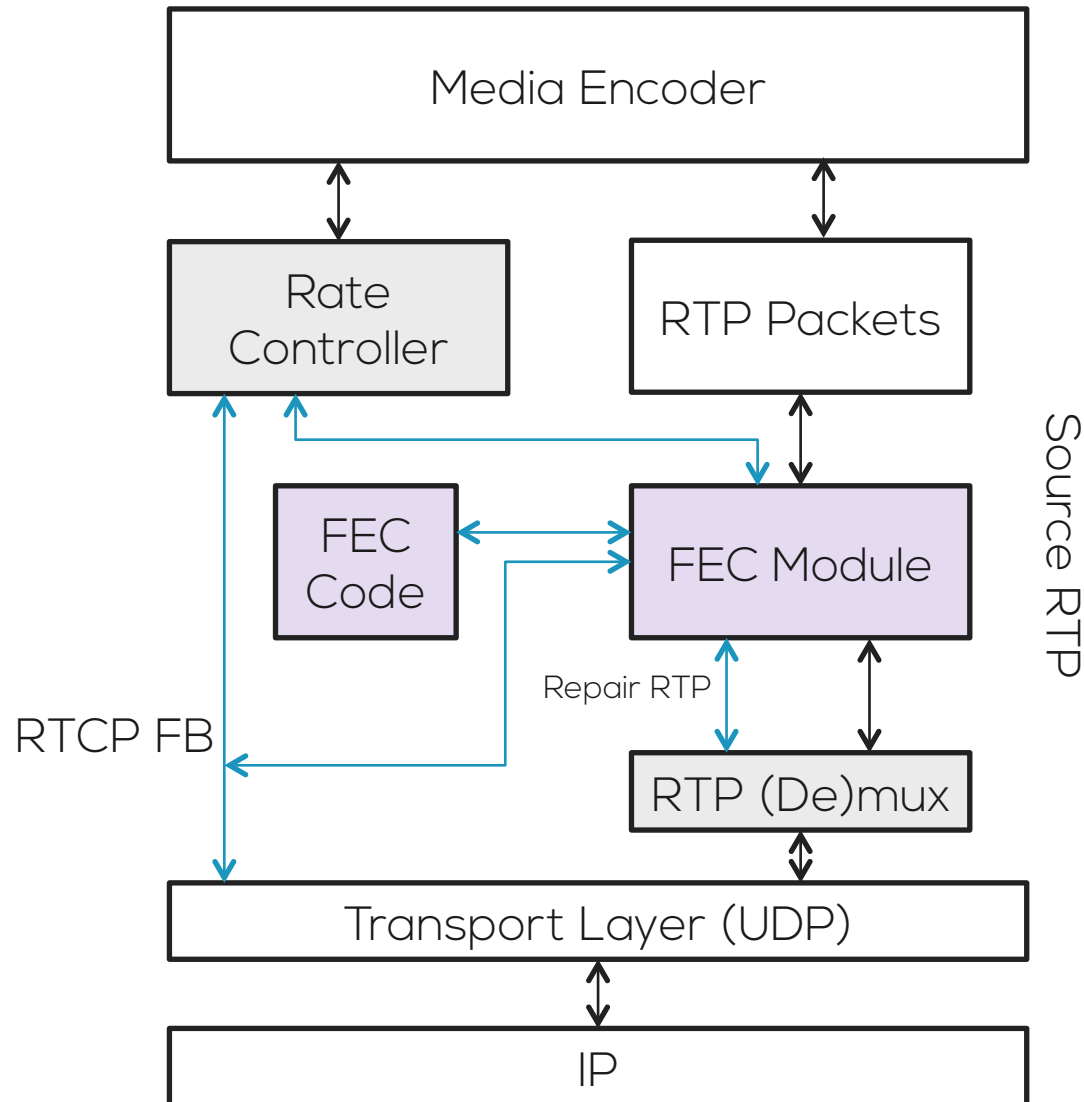
# CONCEPT



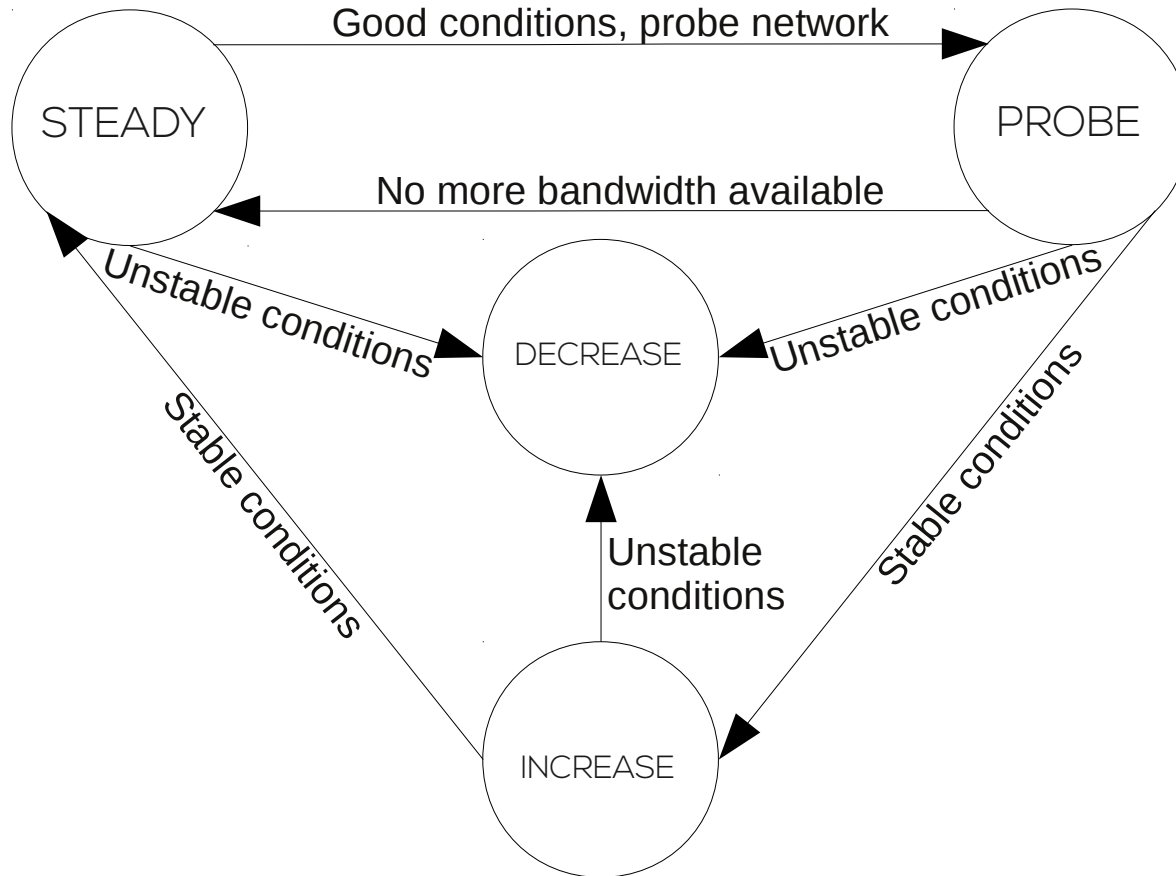
# CC Framework



# RFC 6363: FEC Framework



# State Machine



# FEC Scheme

- Open Issue
  - Leave it open i.e., generic
  - Or, RF5109 (ULP), RFC6015 (1-d interleaved), parity, 1- or 2-d interleaved XOR, Reed-Solomon, ...
  - There was discussion in RTCWEB on FEC Schemes.



# RTCP Feedback

- RLE of Post-repair (RFC5725)
- RLE of loss packets (RFC3611)
- RLE of discarded packets (RFC7097)
- Packet count of lost and repaired packets
  - (draft-ietf-xrblock-post-loss-repair)

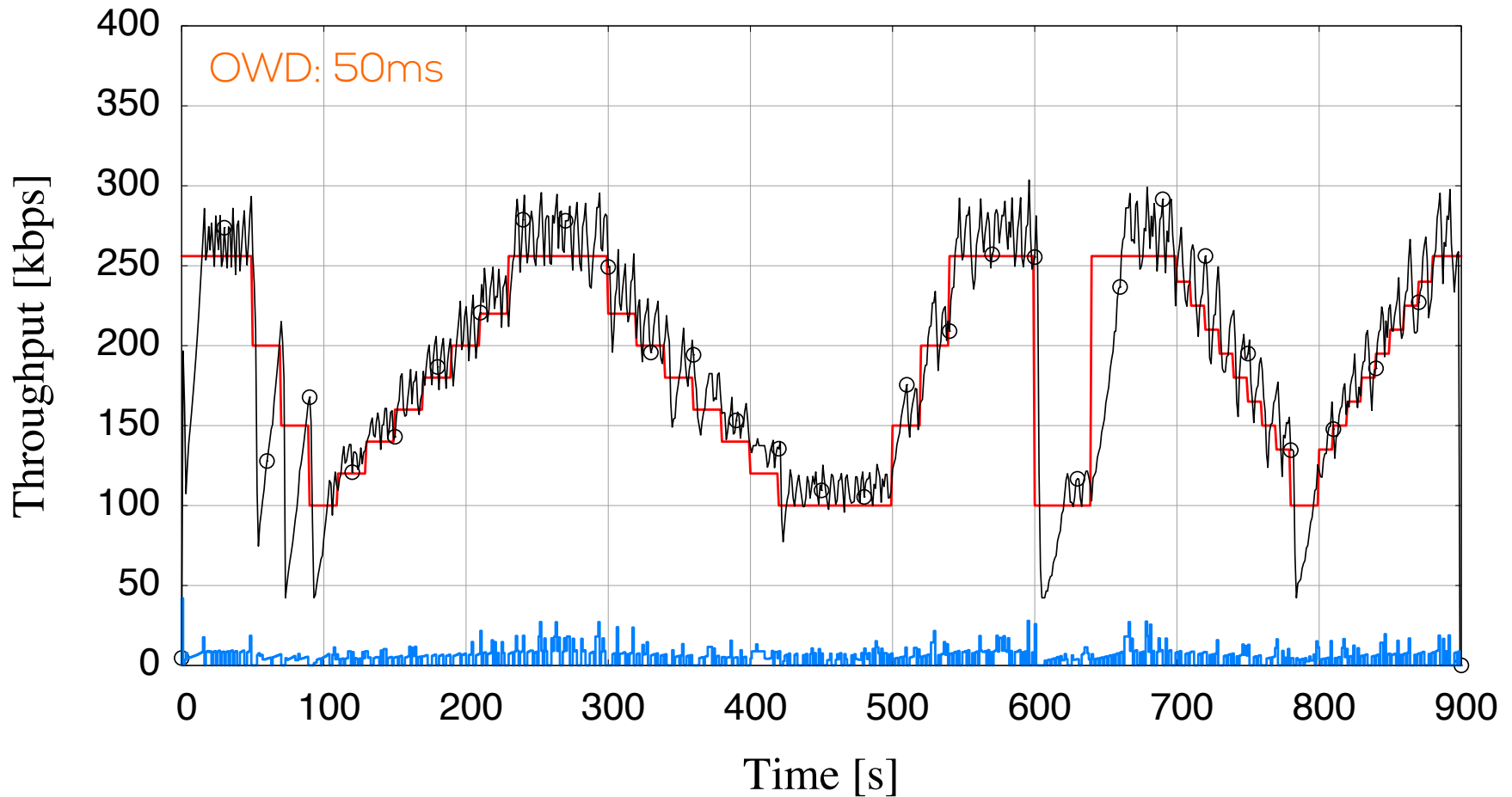
# Applicability

- Implemented over a delay-based congestion control
  - See paper for details
- However would like to generalize it.
  - Apply to SCReAM, GCC, ...

# Next steps

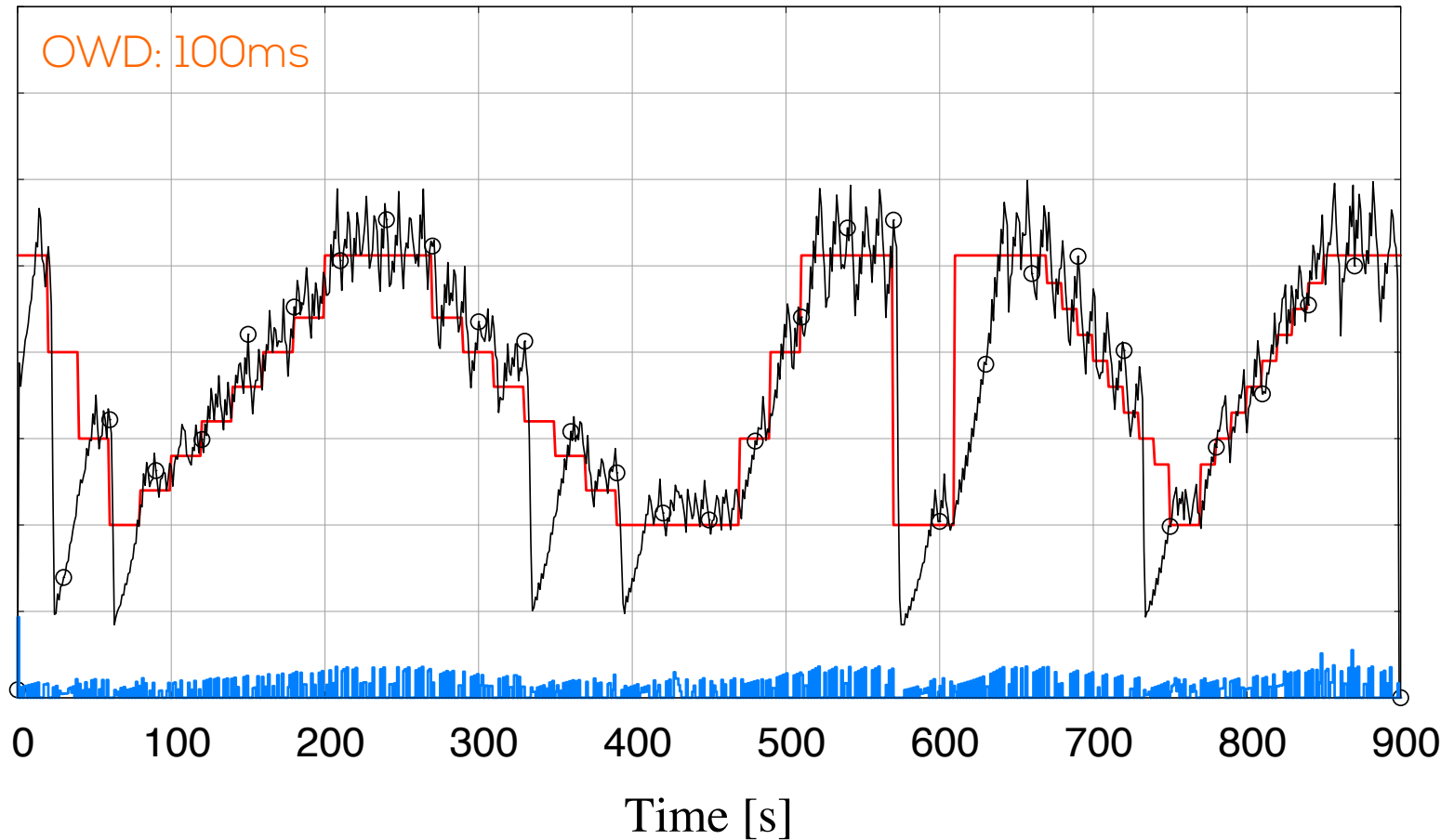
- Code: (coming soon)
  - <https://github.com/protocols-comnet/rmcat-adaptive-fec-code>
- Evaluation Paper:
  - Nagy M., Singh V., Ott J., Eggert L., Congestion Control using FEC for Conversational Multimedia Communication, Proc. of ACM Multimedia Systems, Singapore, SG, Mar, 2014,
- Initial comments received from Ingemar Johansson
  - More feedback is appreciated 😊

# Evaluation (1/3)

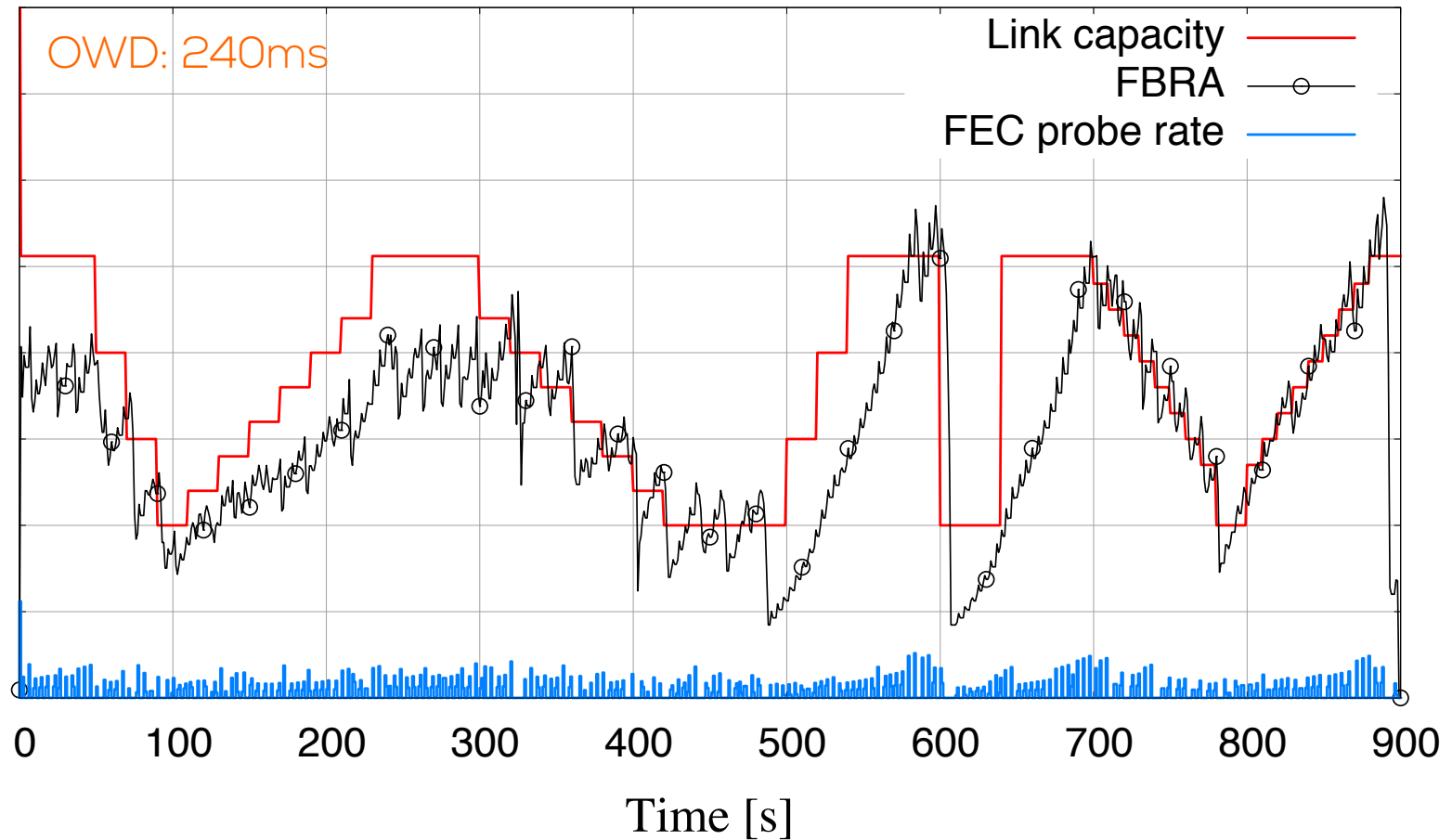


- Ns-2 simulation, Variable link capacity, Single flow on the link

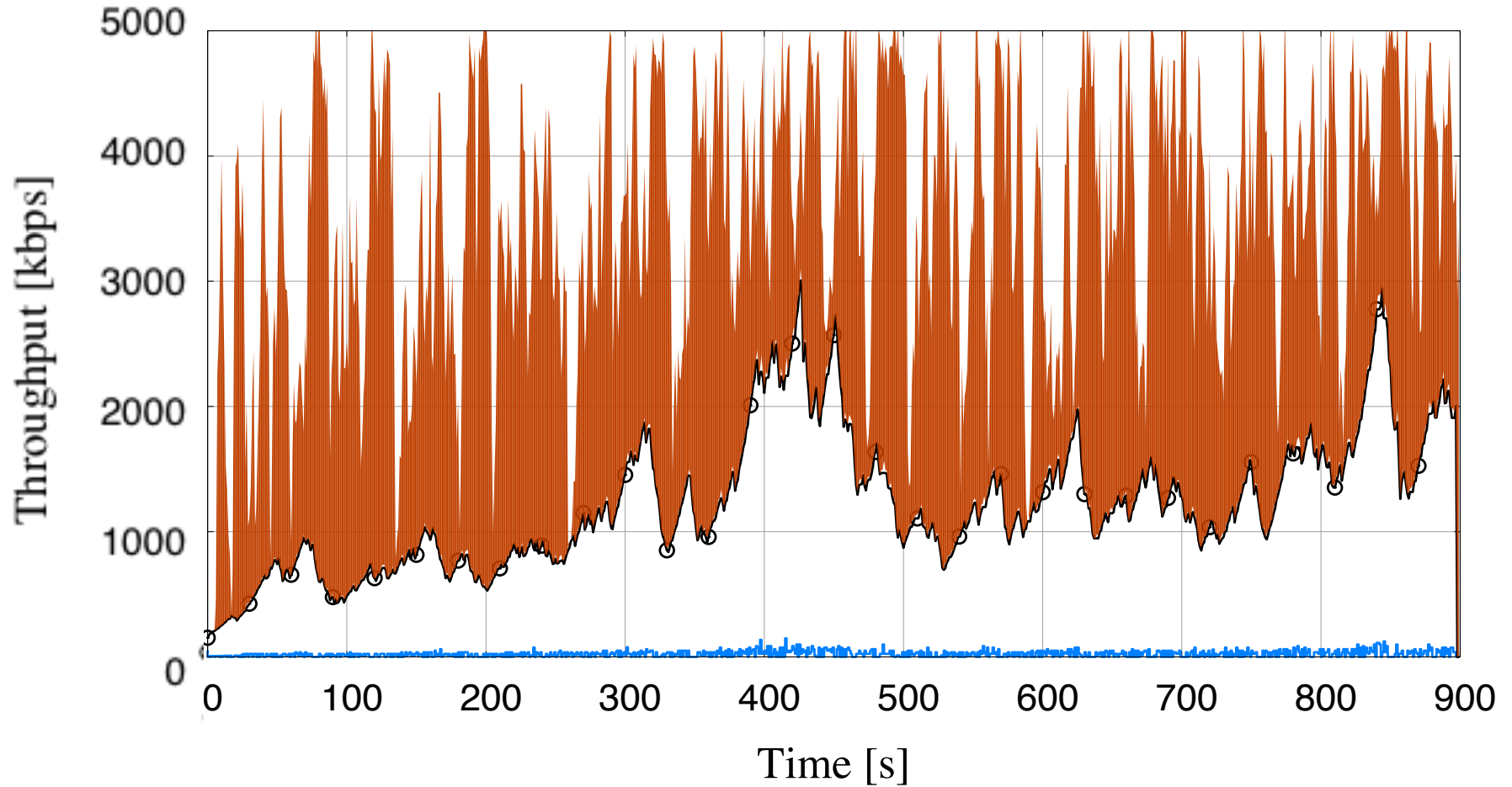
# Evaluation (2/3)



# Evaluation (3/3)

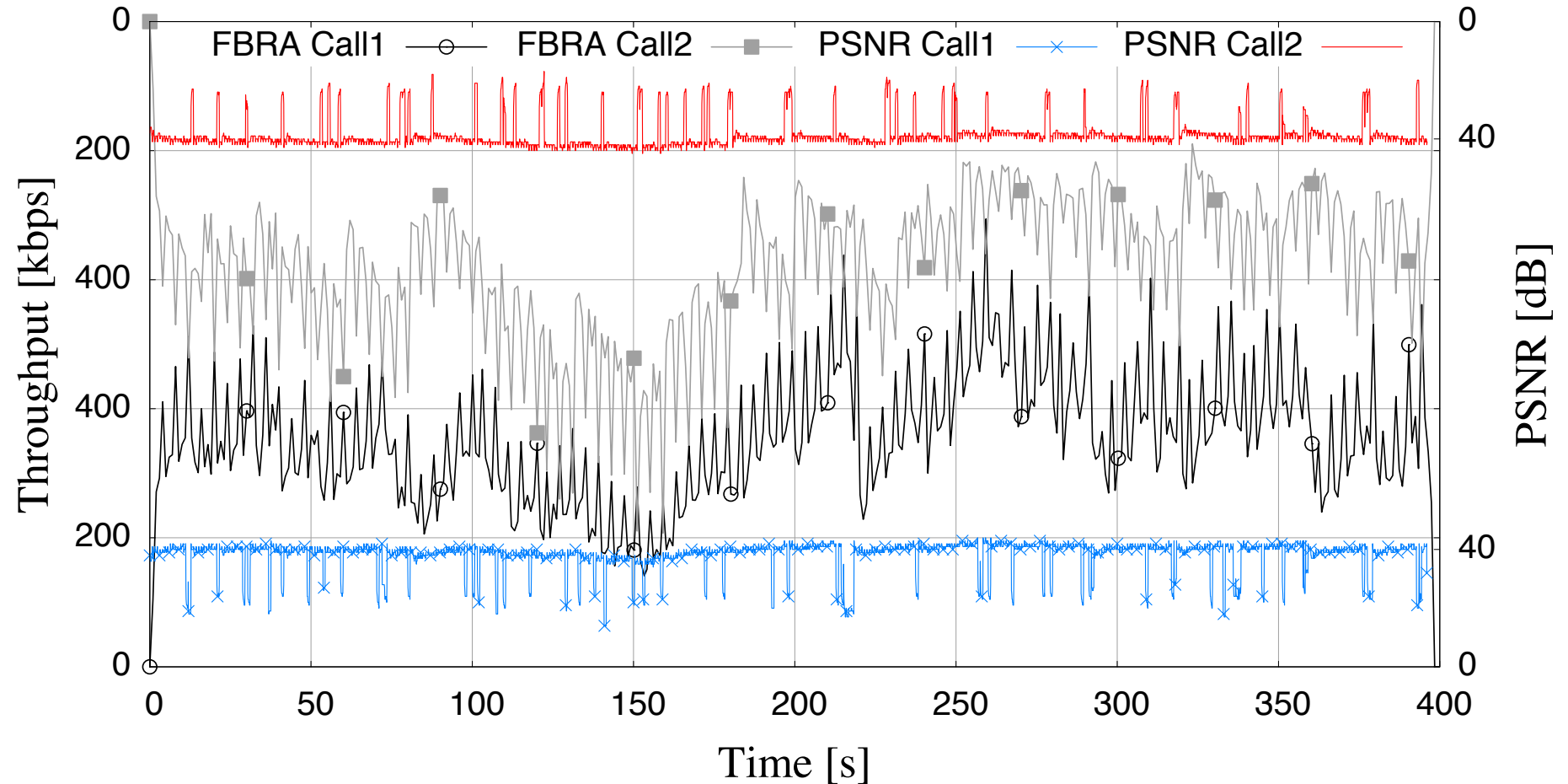


# Compete with short TCPs



# TESTBED Evaluation (1/2)

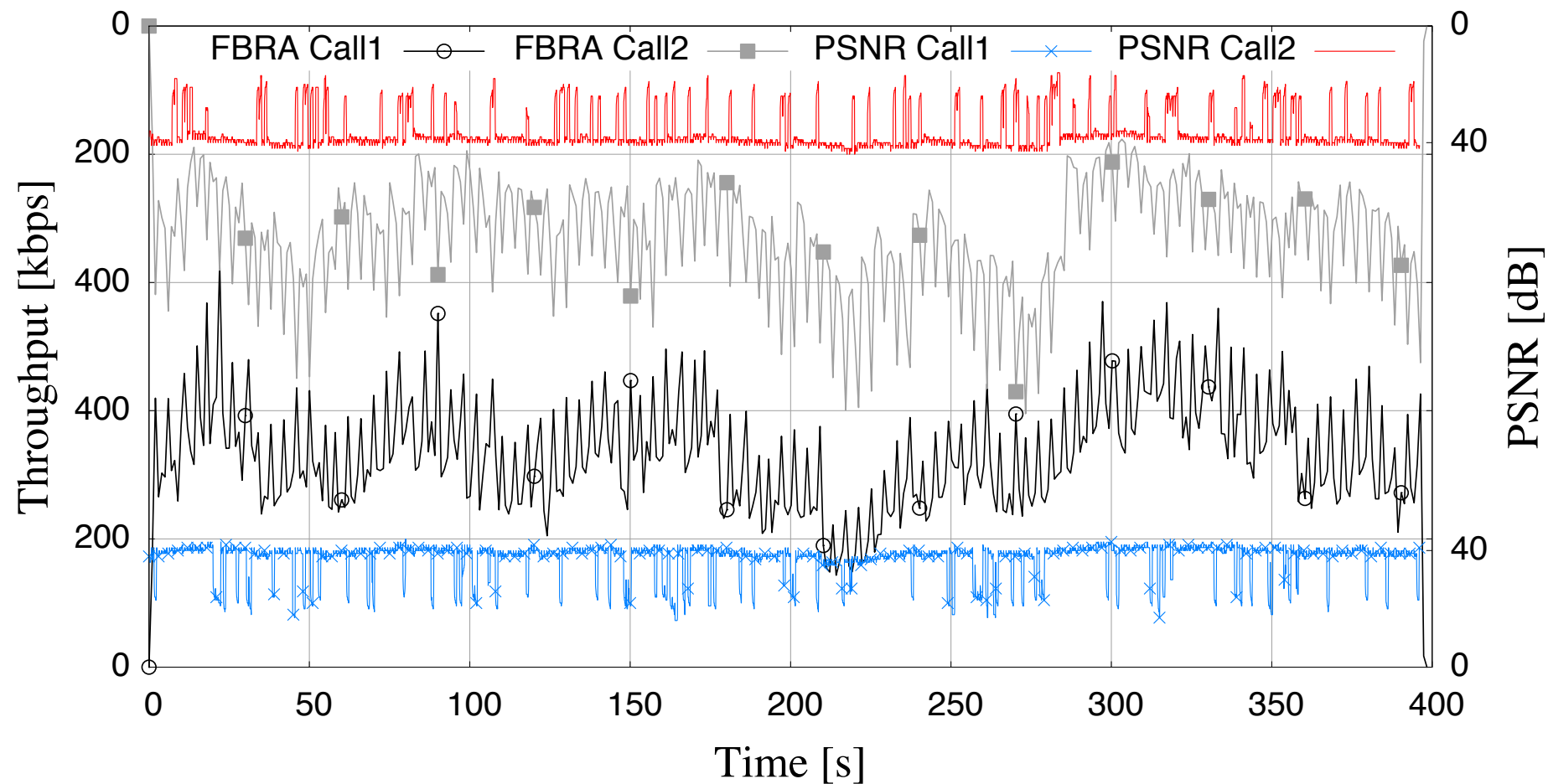
Two RTP flows on the link



- 1Mbit/s link capacity, 50ms one-way-delay,



# TESTBED Evaluation (2/2)



- 1Mbit/s link capacity, 100ms one-way-delay,