

Enhancing the Efficiency of Classic Flows with ABE and L4S

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HotRFC Lightning Talks

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Credits:

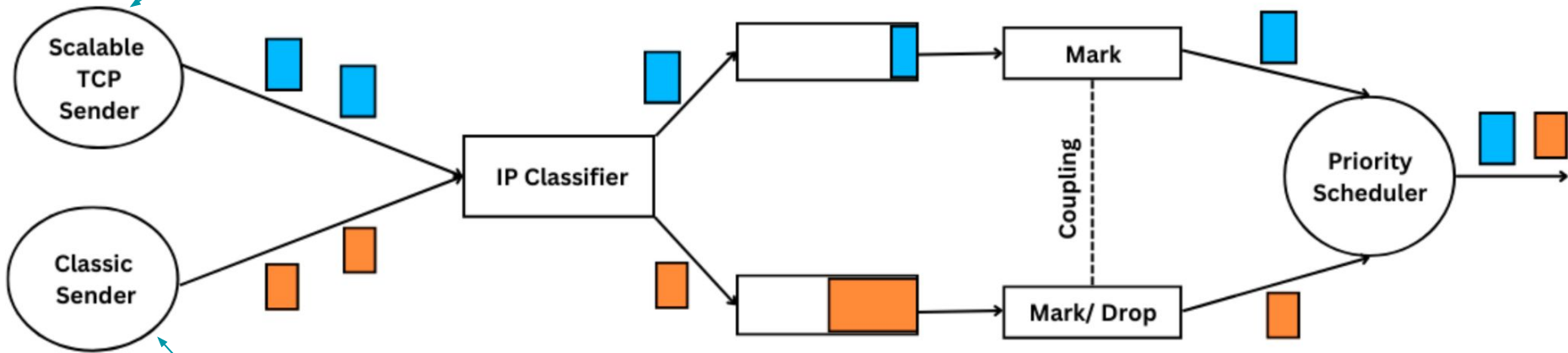
Anjali Vishwakarma

Alternative Backoff with ECN (RFC 8511 - Exp)

- ECN signals are treated same as 'packet drop' signals by the TCP senders
 - As recommended in RFC 3168 (the original ECN mechanism)
- ABE is a sender-side technique; provides an alternative for ECN marked packets
 - because 'ECN marked' packets are not 'actually' dropped.
 - Hence, the congestion window (*cwnd*) reduction can be less aggressive
 - Note: a concept similar to ABE was proposed in DECBT paper
- For congestion response from a TCP Sender with ABE, RFC 8511 recommends:
 - For CUBIC (once per *cwnd*):
 - reduce *cwnd* by 0.15 if packet is ECN marked, 0.3 if it is dropped
 - For Reno (once per *cwnd*):
 - reduce *cwnd* by [0.15, 0.3] if packet is ECN marked, 0.5 if it is dropped

L4S (RFC 9330, 9331, 9332, I4sops-ID)

Adaptive *cwnd* reduction based on the information received from ECN marks

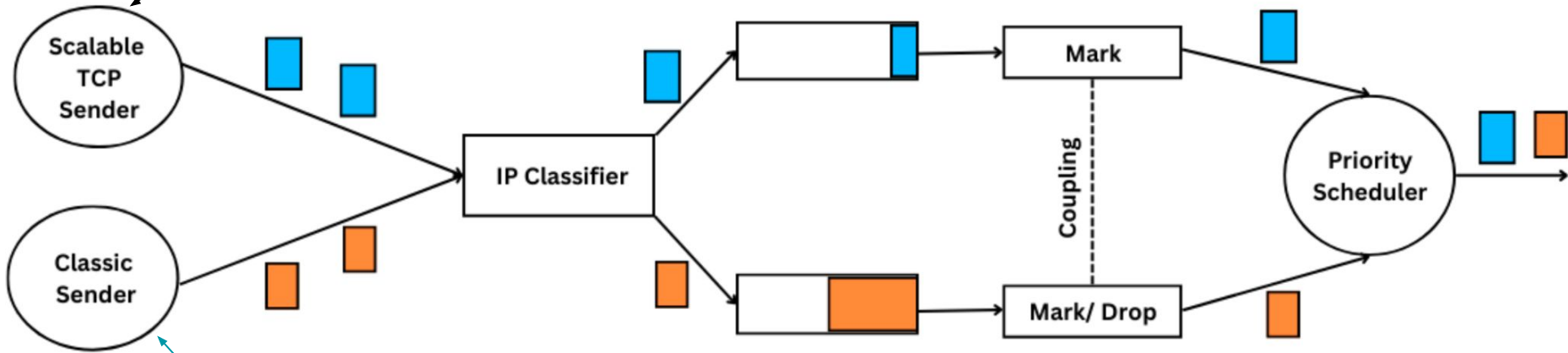


Fixed *cwnd* reduction, irrespective of ECN mark or a packet drop

No incentive to enable ECN

Proposal: Use ABE for Classic flows

Adaptive *cwnd* reduction based on the information received from ECN marks

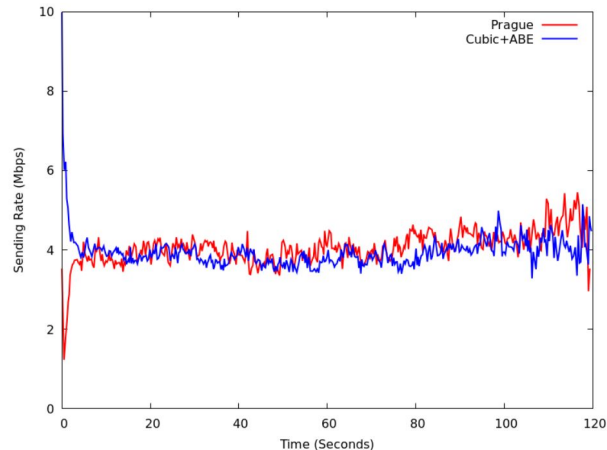
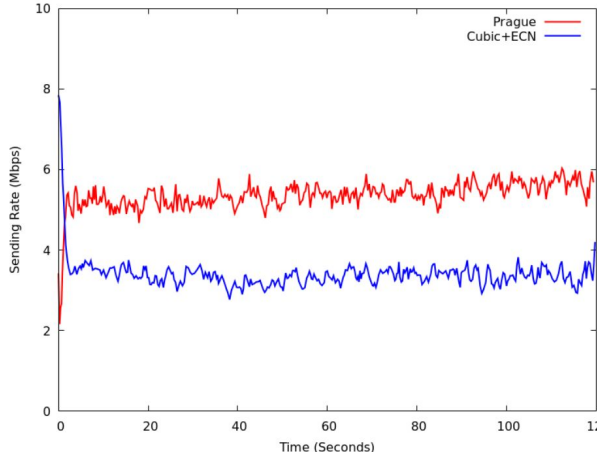
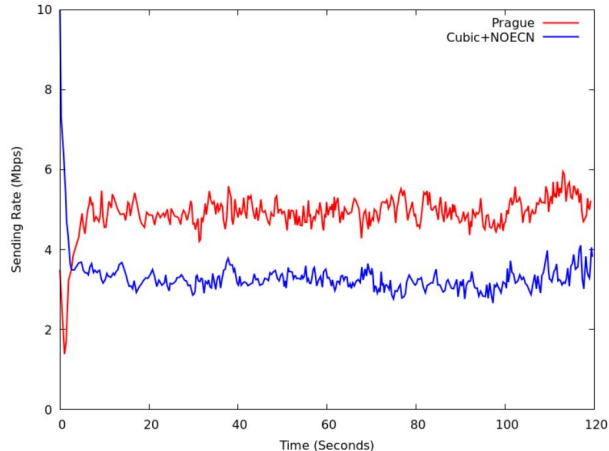
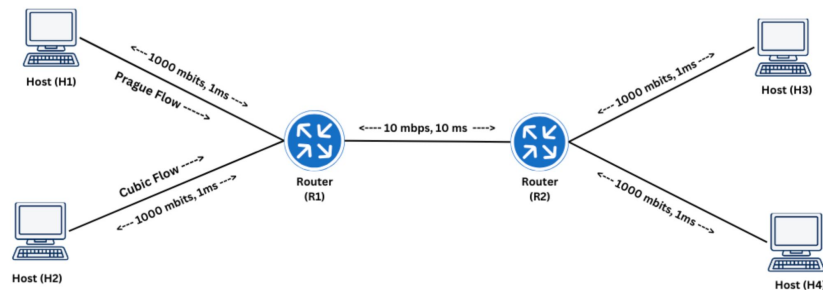


Fixed *cwnd* reduction, but with lesser reduction for ECN marks

ABE gives multiple options for *cwnd* reduction

Preliminary results

- One Prague flow
- One CUBIC flow (No ECN, ECN, ABE)
- Linux and ns-3 implementations of ABE are available for testing!
- Looking for collaborators to test in real deployments: fairness, queue delay, others



Thank you!

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