Plans for NewReno Standardization

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Sally Floyd, Tom Henderson

March, 2003

TSVWG, IETF

Moving NewReno from Experimental to Proposed Standard?

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- The NewReno Modification to TCP's Fast Recovery Algorithm.

RFC 2582, Floyd, S., and Henderson, T., Experimental, April 1999.

- This is widely implemented.

(E.g., The TBIT web page, ”http://www.icir.org/tbit/”.)

Reno vs. NewReno:

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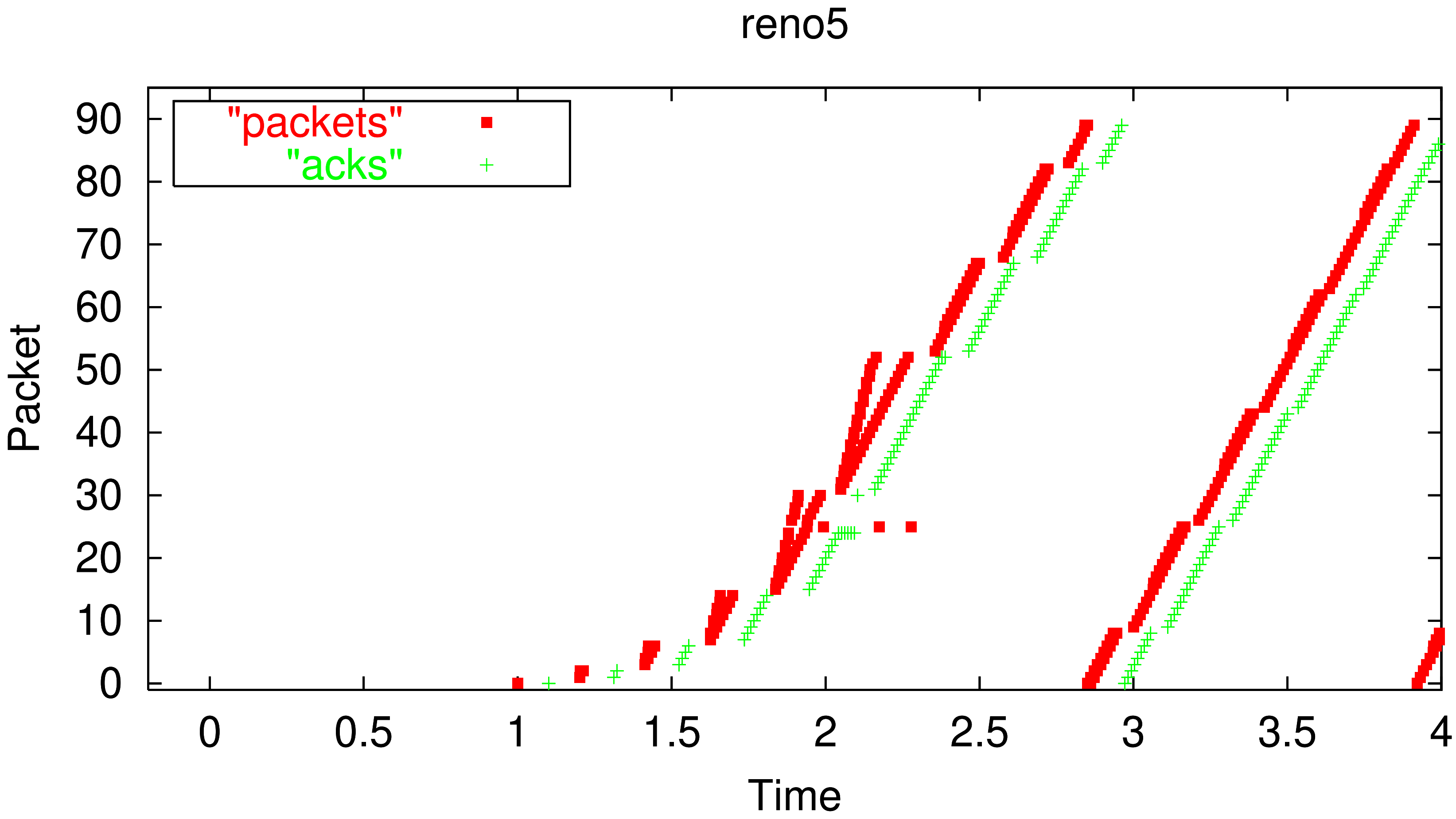
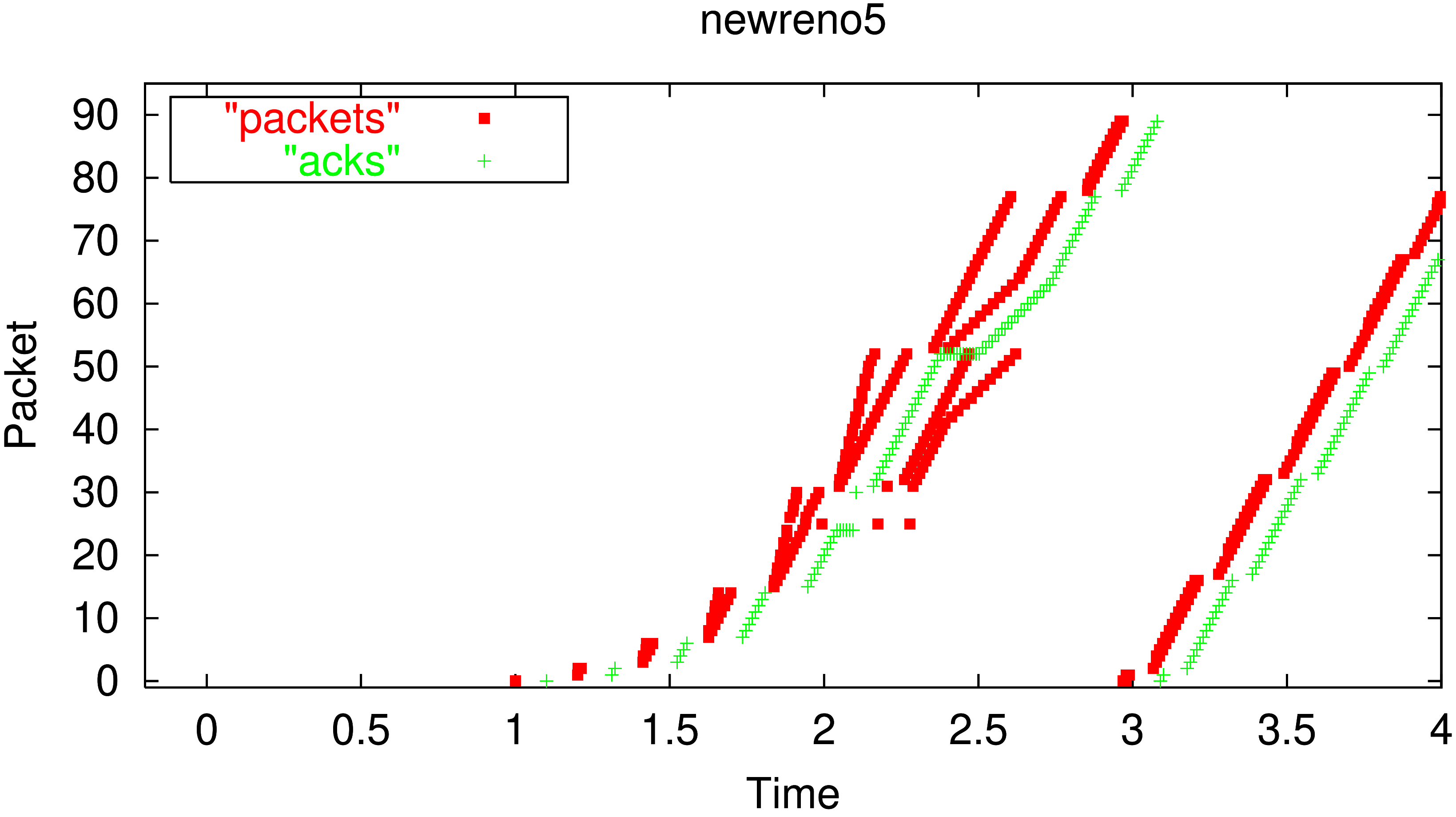
- NewReno performs *dramatically* better than Reno when multiple packets are dropped from a window of data.
  – Simulation-based Comparisons of Tahoe, Reno, and SACK TCP, K. Fall and S. Floyd, CCR, 1996.
- We would recommend NewReno over Reno, for TCP connections when the other end does not use SACK.
- We know of one scenario where Reno performs better than NewReno: with no loss but reordered packets.

Reno and Reordered Packets:



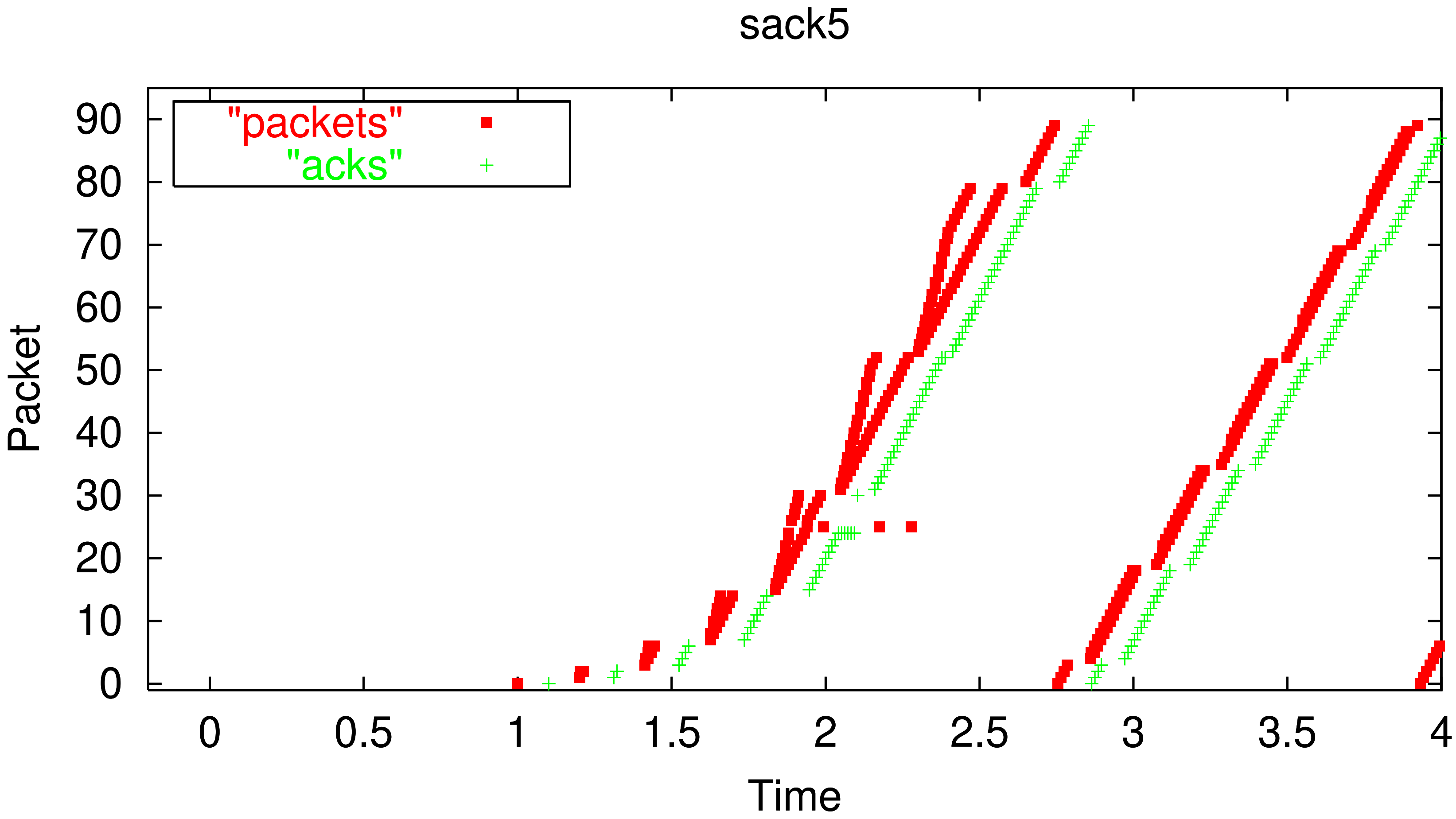
./test-all-newreno reno5

NewReno and Reordered Packets:



./test-all-newreno newreno5

SACK and Reordered Packets:



./test-all-newreno sack5

One change to RFC 2582:

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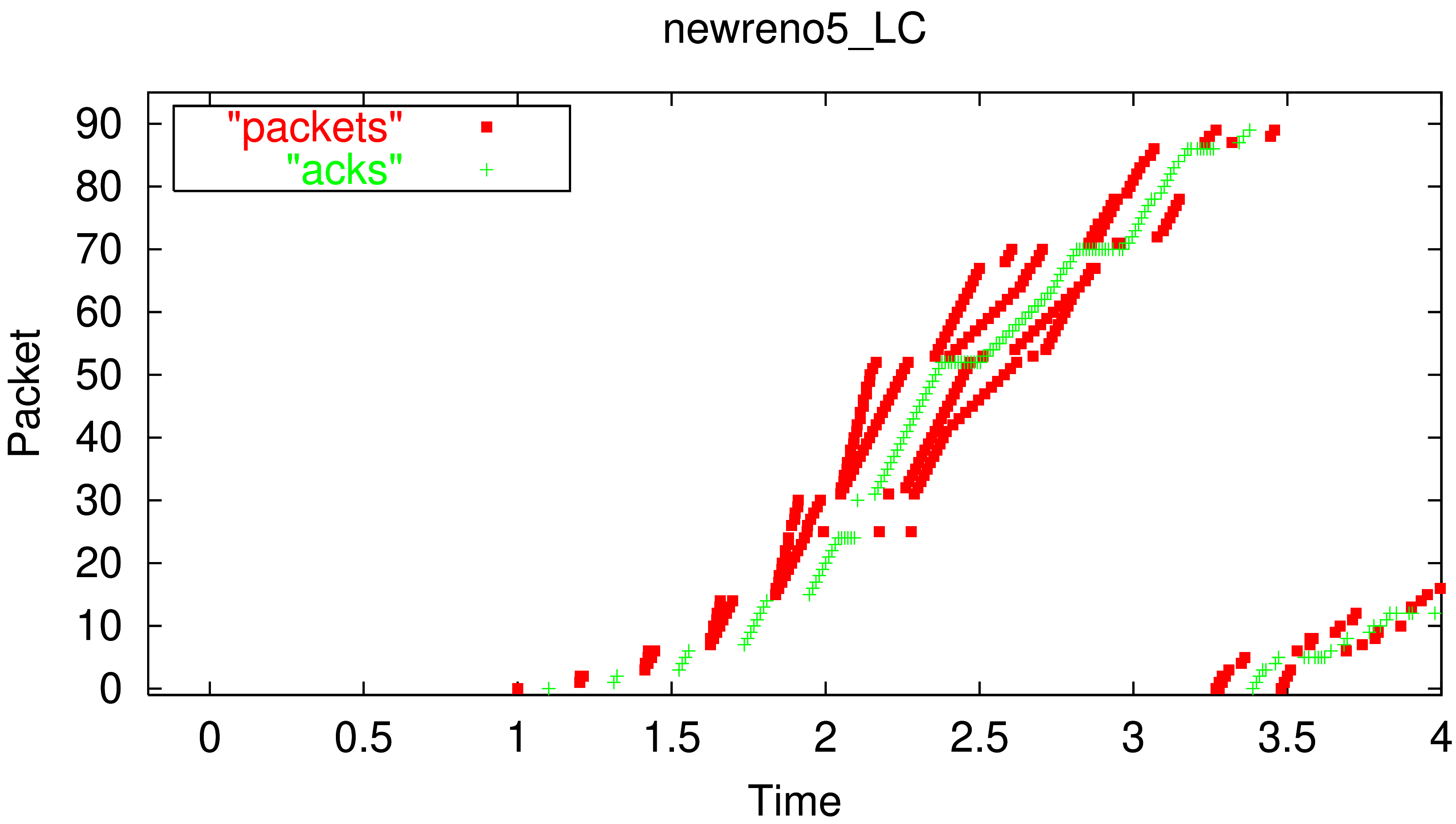
- RFC 2582 describes a Careful and a Less Careful variant for avoiding multiple Fast Retransmits caused by the retransmission of packets already received by the receiver (bugfix), and recommends the Careful variant.
- A revision would *require* instead of *recommend* the Careful variant.

The Less Careful NewReno and Reordered Packets:



./test-all-newreno newreno5_LC

Questions:

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- Is this a good idea to advance RFC 2582 to Proposed Standard?
- Any other changes to RFC 2582 that should be made at this time?

The Careful Variant:

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1A. When the third duplicate ACK is received and the sender is not already in the Fast Recovery procedure, check to see if those duplicate ACKs cover more than ”send_high”. If they do, then set ssthresh to no more than the value given in equation 1, record the the highest sequence number transmitted in the variable ”recover”, and go to Step 2. If the duplicate ACKs don't cover ”send_high”, then do nothing. That is, do not enter the Fast Retransmit and Fast Recovery procedure, do not change ssthresh, do not go to Step 2 to retransmit the ”lost” segment, and do not execute Step 3 upon subsequent duplicate ACKs.

6. After a retransmit timeout, record the highest sequence number transmitted in the variable ”send_high” and exit the Fast Recovery procedure if applicable.