

Increasing TCP's Initial Window

TCP Implementation Working Group,
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References:

- Allman, M., Floyd, S., and Partridge, Craig, Increasing TCP's Initial Window, Internet draft draft-floyd-incr-init-win-01.txt, March 1998.
- The web page on Increasing TCP's Initial Window:
http://www-nrg.ee.lbl.gov/floyd/tcp_init_win.html

The Current Status:

- There was rough consensus at the last Working Group meeting for allowing a TCP Initial Window (IW) of two segments.
- At this meeting, we are scheduled to revisit the question of allowing an Initial Window of three segments (for segments of less than 2190 bytes), and allowing an Initial Window of four segments (for segments at most 1095 bytes).

Changes or clarifications in the internet draft:

- The increased IW would only apply after the initial SYN/ACK handshake. If the SYN or SYN-ACK had to be retransmitted, then the host retransmitting it must start with IW=1.
- Interactions with the "Don't Fragment" (DF) bit: the IW should be re-computed if the segment size is changed during Path MTU Discovery.

Additional simulation studies:

- Studies by [HAGT98] showing that the use of larger initial windows decreases HTTP transfer time, for experiments in a satellite environment.
- Studies by [PN98] investigating the impact of larger initial windows on competing traffic in a simulation scenario with both HTTP and FTP flows. The larger initial windows decreased HTTP transfer times and at the same time slightly increased the segment drop rate.
- Studies by [Mor97] showing that in a heavily-congested network, initial windows of four segments can ****increase**** HTTP transfer times and increase the segment drop rate.

References:

- HAGT98: Hans Kruse, Mark Allman, Jim Griner, Diepchi Tran. HTTP Page Transfer Rates Over Geo-Stationary Satellite Links. March 1998. Proceedings of the Sixth International Conference on Telecommunication Systems.
- PN98: Poduri, K., and Nichols, K., Simulation Studies of Increased Initial TCP Window Size, February 1998. Internet-Draft draft-ietf-tcpimpl-poduri-00.txt (work in progress).
- Mor97: Robert Morris. Private communication.