Quick-Start for TCP and IP

draft-ietf-tsvwg-quickstart-00.txt

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This and earlier presentations::

www.icir.org/floyd/talks

QuickStart with TCP, for setting the initial window:

- In an IP option in the SYN packet,
  the sender's desired sending rate:
  - Routers on the path decrement a TTL counter,
  - and decrease the allowed sending rate, if necessary.
- The receiver sends feedback to the sender in the SYN/ACK packet:
  - The sender knows if all routers on the path participated.
  - The sender has an RTT measurement.
  - The sender can set the initial congestion window.
  - The TCP sender continues using normal congestion control..
- From an initial proposal by Amit Jain

Last IETF:

- We reported on new material about possible attacks on Quick-Start.
- We were going to do a final revision, and then were to be ready for Working Group Last Call, to go as Experimental.
- Since then, we have made a (hopefully final) round of revisions.

Changes from draft-amit-quick-start-04.txt:

- If the Quick-Start Response is lost in the network, it is not retransmitted.
- Added a suggestion to send one large packet in the initial window for PMTUD, and to send the other packets at 576 bytes.
- Added sections on "Misbehaving Middleboxes", and on "Attacks on Quick-Start" (material reported at the last IETF).
- Specified that a Quick-Start-capable router denying a request SHOULD delete the Quick-Start option, and if this is not possible, SHOULD zero the QS TTL and the Rate Request fields.

More changes:

- Specified that retransmitted SYN packets should use an RTO of three seconds, and a new Initial Sequence Number (for measuring the RTT).

Two questions sent to the mailing list:

- One technical issue:
  - About retransmitted SYN packets.
- One substantive possible change:
  - Section 3.6: A Quick-Start Nonce?

Retransmitted SYN Packets:

- Are there any TCP implementations that would react badly to a retransmitted SYN packet using a different Initial Sequence Number?

Section 3.6: A Quick-Start Nonce?

- There are four unused bits in the IP option -
  - Use them for a Quick-Start Nonce?
- Some times the receiver knows the original rate request R.
- Goal of QS Nonce: discourage receivers from lying about the value of the received rate request.
- Mechanics:
  - Sender sets QS Nonce to a random value.
  - When a router reduces the approved rate request, it sets the QS Nonce to a new random value.
  - Receiver reports back value to sender.
  - If no routers reduced the rate request, then the QS Nonce should have its original value.
- Should we add this to the spec?