HighSpeed TCP for Large Congestion Windows

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draft-floyd-tcp-highspeed-03.txt

http://www.icir.org/floyd/talks/hstcp-Jul03.pdf

http://www.icir.org/floyd/talks/hstcp-Mar03.pdf

http://www.icir.org/floyd/talks/floyd-tsvwg-Jul02.pdf

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TSVWG, IETF

Is the HighSpeed TCP draft ready for Experimental?

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- HighSpeed TCP has been discussed in this group several times, so I won't go over it all again today.

- HighSpeed TCP is designed to be a minimal change to TCP sufficient to allow TCP to use high-bandwidth paths.

- A companion draft:

Limited Slow-Start for TCP with Large Congestion Windows
draft-floyd-tcp-slowstart-02.txt

The report last time, at the March IETF:

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- Simulation and experimental results with HighSpeed TCP and with Limited Slow-Start.

- HighSpeed TCP in a Drop-Tail Environment.

- Relative Fairness with Standard TCP.

Changes since draft-floyd-tcp-highspeed-01.txt:

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- New section:
"Limiting burstiness on short time scales".

- New section:
"Tradeoffs for Choosing Congestion Control Parameters".

- Added: discussion of Scalable TCP from Tom Kelly.

- New section:
"Deployment issues."

Limiting burstiness on short time scales

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- Some method for limiting bursts is recommended.
  - E.g., rate-based pacing, or maxburst.

Tradeoffs for Choosing Congestion Control Parameters

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- The Number of Round-Trip Times between Loss Events
  - For Standard TCP: 0.66 W
  - For HighSpeed TCP: 12.7 W**0.2
  - For Scalable TCP: 26

for W the average cwnd.

- The Number of Packet Drops per Loss Event, with Drop-Tail
  - For Standard TCP: 1
  - For HighSpeed TCP: 1-70, depending on w
  - For Scalable TCP: 0.005 w

for a single flow in congestion avoidance.

Discussion of Scalable TCP:

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- Uses the linear response function.
- Issues: burstiness in a Drop Tail environment?
- Issues: convergence to fairness in a Drop Tail environment?
- Non-issues: relative fairness with HighSpeed TCP.

Deployment issues

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Bandwidth	Avg Cwnd w (pkts)	Increase a(w)	Decrease b(w)
1.5 Mbps	12.5	1	0.50
10 Mbps	83	1	0.50
100 Mbps	833	6	0.35
1 Gbps	8333	26	0.22
10 Gbps	83333	70	0.10

Performance of a HighSpeed TCP connection.

Recommendation:

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- HighSpeed TCP is ready to become an Experimental RFC.
- HighSpeed TCP is ready for further deployment and experimentation.