TFRC for Voice: the VoIP Variant

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draft-ietf-dccp-tfrc-voip-02.txt

Slides: http://www.icir.org/floyd/talks.html

Graphics:

http://www.icir.org/floyd/papers/voipimages.pdf

VoIP: fairness in Bps.

- In the TCP throughput equation, use the measured loss event rate and a packet size of 1460 bytes.
- Reduce the allowed transmit rate to account for the fraction of the VoIP bandwidth that would be used by 40-byte headers:
- Enforce a Min Interval between packets of 10 ms.
- For short loss intervals (at most two RTTs), count the actual packet loss rate (but don't increase the number of loss intervals).

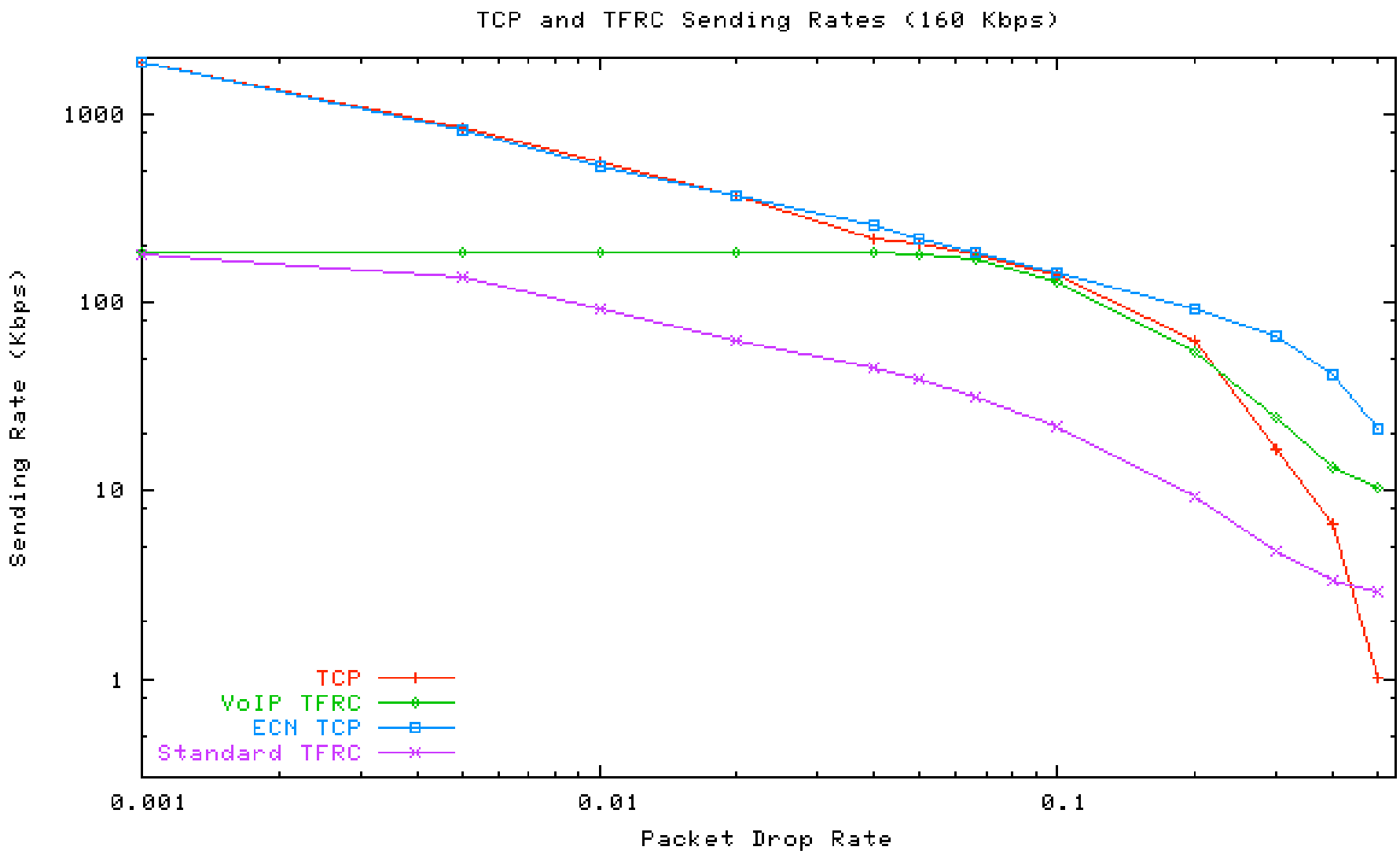
Report from the last IETF: Issues remaining

- The problem:
  - VoIP TFRC, with small packets, can see different packet drops that it would have with larger packets. When is this a problem?
- For simulations with configured byte drop rates (where small packets are less likely to be dropped than large packets):
  - When compared with 1460-byte TCP, even standard TFRC with small packets can get much more than its share of the bandwidth in times of high congestion.

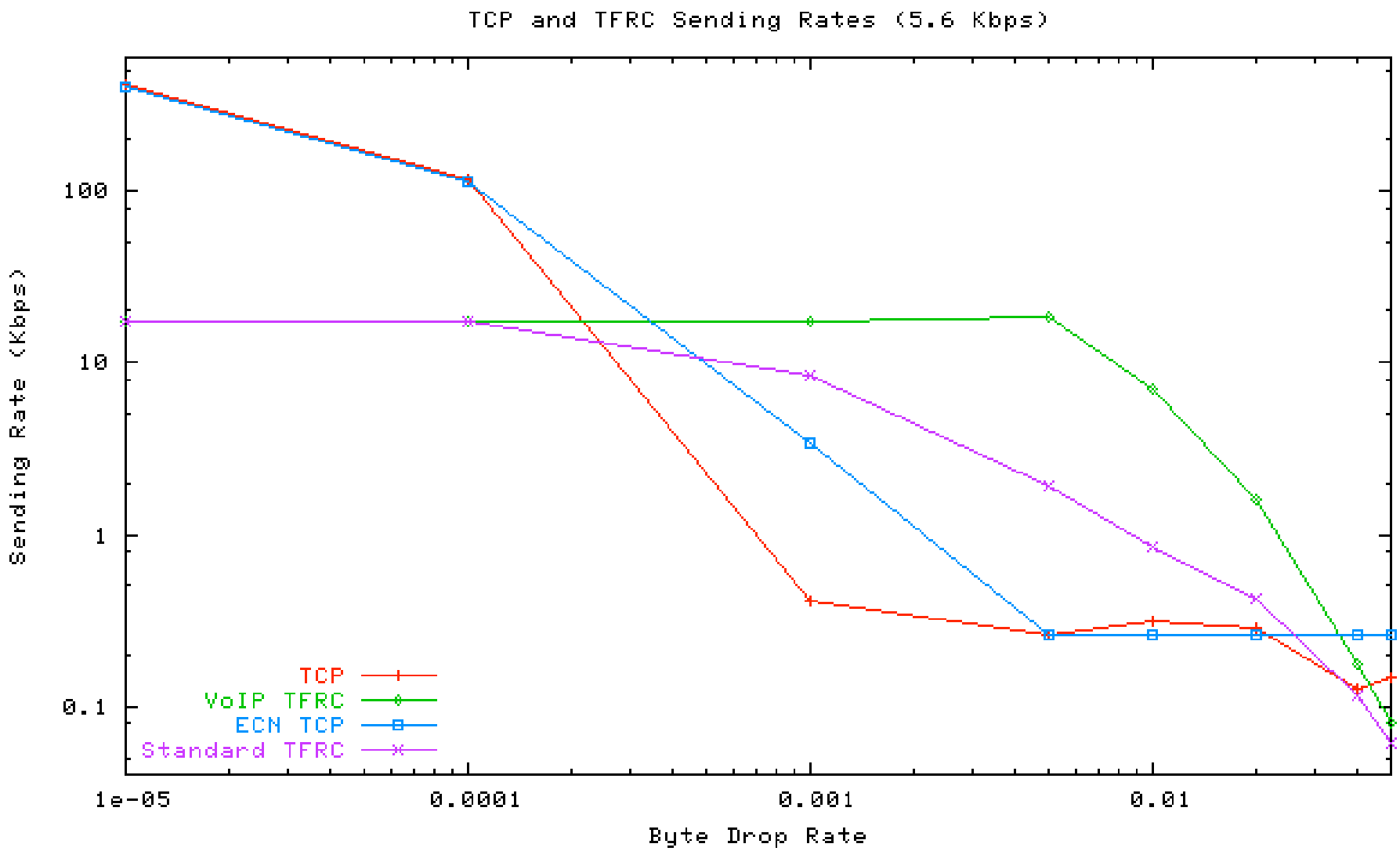
The status for TFRC using small packets:

- Configured *packet* drop rates:
  - Standard TFRC with small packets doesn't do well;
  - VoIP TFRC with small packets achieves reasonable fairness with large-packet TCP.
- Configured *byte* drop rates:
  - With byte drop rates, TCP sometimes does better with smaller packets.
  - Standard TFRC with small packets achieves reasonable fairness with TCP using the optimal packet size for that level of congestion.
  - VoIP TFRC with small packets achieves more bandwidth than TCP using optimal packet sizes.

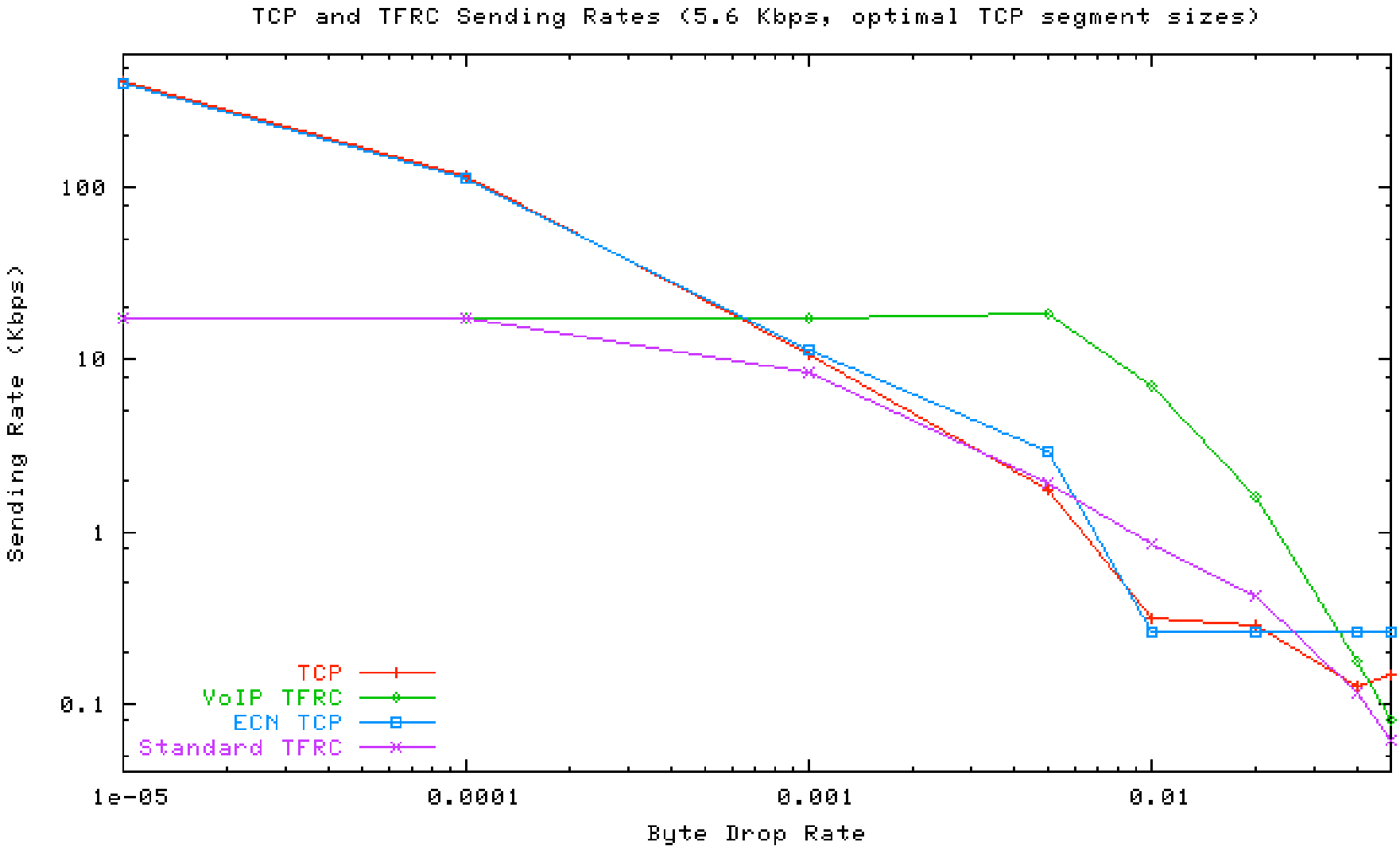
Configured *packet* drop rates, with 200-byte TFRC segments, 1460-byte TCP segments:



Configured *byte* drop rates, with 14-byte TFRC segments, 1460-byte TCP segments:



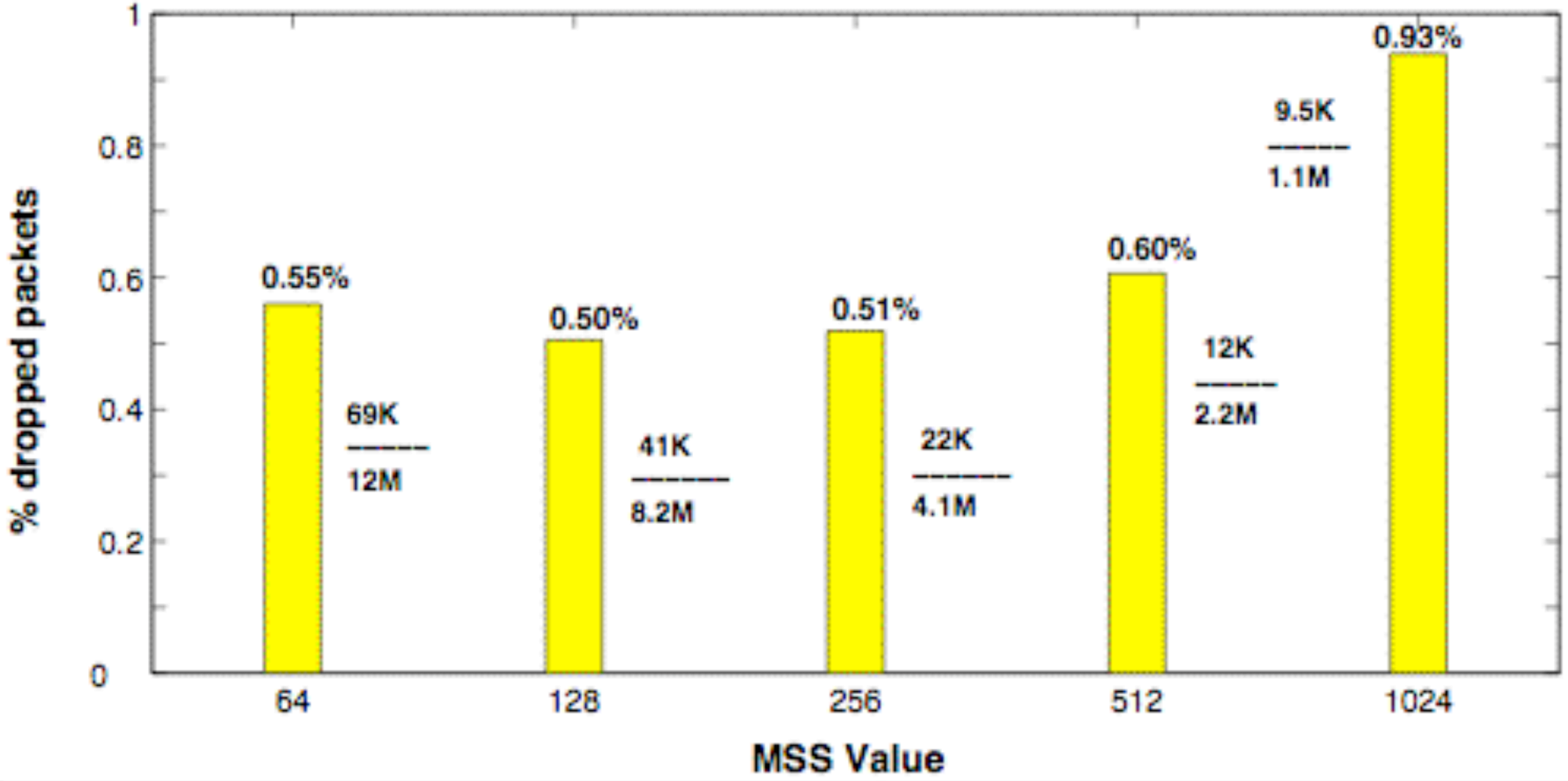
Configured *byte* drop rates, with 14-byte TFRC segments, “optimal” TCP segment sizes:



Question from last time, and an answer:

- Is it ok to have congestion control for small-packet flows that lets small-packet flows receive more bandwidth than large-packet TCP flows in environments where small packets are less likely to be dropped than large ones?
- Answer: I think so, as an Experimental CCID. It seems that for many paths in the Internet, small packets don't receive favorable treatment.

Drop rates with different packet sizes:



Downloads from web servers, from Alberto Medina.

Annotation: total # of drops / total # of packets