DCCP:
Issues From the Mailing List

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DCCP WG
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Quotes from the Mailing List:

• "Real Time apps have no interest in being 'fair'."
• "Don't expect people like XXX to be happy with the 'you must fit in to TCPs view of the world' when most of their real-time applications are already being good citizens (by not sending 'all they can' when they don't have to).”
  — [Referring to a silence-suppressed, CBR, 4 Mbps video stream!]
• "Maybe some codecs of today, which were designed assuming a QoS enabled network, cannot make use of TRFC or DCCP."
• "TCP is broken. Nowhere is it written that TCP=best effort."
Background assumptions (ours):

- DCCP and best-effort traffic:
  - DCCP with best-effort service does not necessarily meet the needs of all apps.
  - In fact, best-effort service does not necessarily meet the needs of all apps.
  - DCCP is intended to solve the best-effort problem, not the QoS problem.
  - We believe that in the long run DCCP offers better performance than UDP to applications (e.g., ECN, NAT traversal, etc.)
Issue:
Steady-state fairness with TCP?

• RFC 2914, Congestion Control Principles, September 2000, BCP.
  – Preventing congestion collapse.
  – Sharing bandwidth reasonably fairly with TCP.

• The IETF doesn't control what is deployed in the Internet.
  – The IETF controls what is standardized in the IETF.
  – The current IETF will not standardize transport protocols for best-effort service that do not have adequate end-to-end congestion control.
Issue: Slow-Start

• CBR app writers don't want to slow start
  – ...after idle periods
  – ...ever

• CBR app writer perceptions [NB not direct quotes]
  – "We're sending at a low rate so why bother?"
  – Idle periods: "We're benefitting the network by going idle, why penalize us by forcing slow start after a quiet period?"
  – "Our traffic is more financially valuable to ISPs so congestion rules don't apply”
  – "TCP must be fixed [to be friendlier to CBR apps]"
Issue: Slow-Start

• CCID3 specifies initial rates of 4 pkts/RTT.
  – Recommends investigating initial rates of 8 pkts/RTT for small packets.

• For CBR apps with higher rates, this means that some initial packets could be ‘dropped’ by DCCP.

• Best-effort traffic with higher initial rates?
  – My own view:
    Explicit feedback from routers is needed.
  – E.g., Quick-Start, expired draft
draft-amit-quick-start-02.txt.
  – You could help make this happen!
Issue: Limitation of at most doubling the sending rate

• Thread triggered by earlier user guide suggestion:
  – Send 2x your nominal rate to avoid:
    • getting penalized by "greedy" TCPs
    • slow start after idle periods

• But TFRC isn’t penalized by TCP flows:
  – Transmit rate limited by *loss rate* not current rate.

• The limitation of at most doubling the sending rate remains (above a minimum rate):
  – A problem for bursty apps, instant-on apps, silence suppression.
  – When can this limitation be safely relaxed?
Issue: Slow-Start after Idle

• Proposal: Faster Start
  – Initial rate 8 pkts/RTT (instead of 4).
  – Quadruple rate each RTT up to previous rate (instead of doubling).
  – Until a drop or mark.
  – This needs further investigation.

• Implementation experience about slow-start problems will help.
Issues: apps with fixed rates, or a small number of possible rates, or limited to downshifting.

• Email: For some apps, users prefer fixed rates.
• **DCCP can be used by fixed-rate apps.**
  – Modulo slow-start, restart-after-idle issues.
  – DCCP will send at a sending rate allowed by the overall packet drop rate.
  – As always, implementation experience is needed.
• **Proposal:** for the apps above, **DCCP could sometimes send as much as twice the “allowed” sending rate?**
  – This requires a new CCID, and some further work.
New viewgraphs:
Issues: CBR flows

• Advice for CBR flows:
  – Monitor the steady-state packet drop rate, stop sending when the drop rate is too high.
  – "IAB Concerns Regarding Congestion Control for Voice Traffic in the Internet”, approved as an RFC.
Issues: Special Consideration for CBR Traffic?

• What if all of the traffic is CBR?
  – What about the two hours after an earthquake?
  – What about a chronically-congested link?

• What about the congested link where the TCP traffic is backing off, and the CBR traffic is causing the high drop rate?

• The TCP traffic is not all bulk-data transfers:
  – E.g., my web traffic making plane reservations.