UDP Usage Guidelines for Application Designers
draft-eggert-tsvwg-udp-guidelines-00

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Background

• some discussions recently with APP area document authors on UDP usage
• there are some caveats of using UDP that are obvious to TSV folks, but maybe not to others
• this document attempts to capture these guidelines for easy reference
• nothing in this document is new (to TSV folks)
Content

- guidelines to the designers of applications and application-layer protocols that use unicast UDP
- topics:
  1. congestion control
  2. message sizes
  3. reliability
Baseline Guideline

- apps should use TCP, SCTP or DCCP whenever they can
- congestion control, message size determination and reliability are difficult to get right
- if used correctly, more featureful transports aren’t as heavyweight as often claimed
- if you can’t use those transports, use UDP according to the rest of these guidelines
Congestion Control Guidelines

• apps doing UDP bulk transfers → should use TFRC or TCP-like windowing

• apps that send a small number of messages → should maintain an RTT estimate and limit themselves to 1 outstanding message per RTT
  • loss looks like long RTT sample
Congestion Control Guidelines (2)

• apps that can’t maintain an RTT estimate → should use a conservative fixed timer and exponentially back it off under loss
  • e.g., 500ms, such as SIP & GIST

• apps that can’t detect loss → should use a more conservative fixed timer
  • e.g., 3 seconds, such as TCP SYN retransmit
Message Size Guidelines

• apps should not send messages larger than the path MTU
• either implement pathMTU discovery
• or use IP-layer path MTU information
• or don’t send anything larger than the minimum path MTU
  • IPv6 ➞ 1280 bytes
  • IPv4 ➞ min(1st-hop-MTU, 576 bytes)
Reliability Guidelines

- apps should be aware that UDP does not provide
  - reliability
  - duplication protection
  - reordering protection
- apps should be robust in the presence of such events
Status

• -00 discussed on the list
• comments from a number of folks will be rolled into a revision
• next: cross-area review (esp. from APP area)
• adopt as WG item?