Careful resumption of congestion control from retained state with QUIC

draft-kuhn-quic-careful-resume-02

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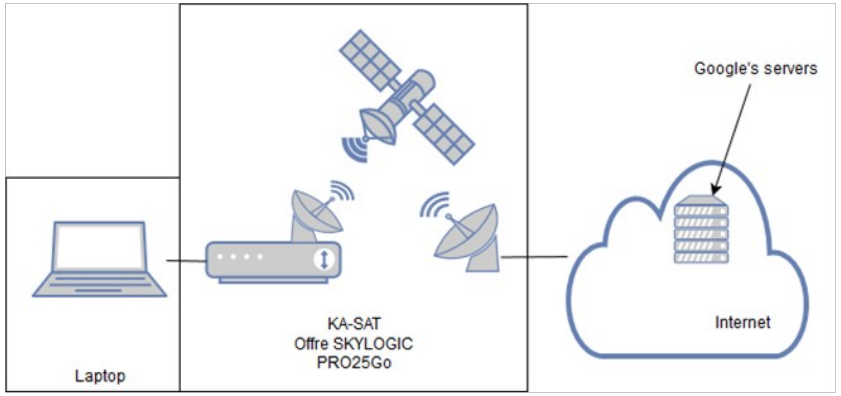
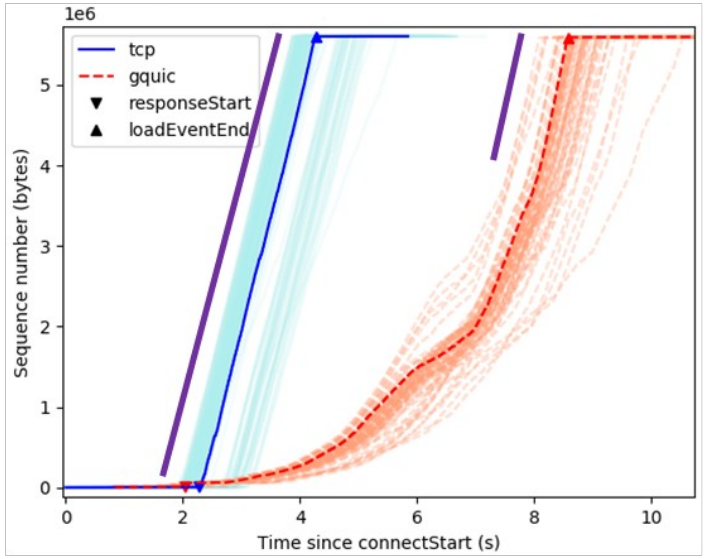
Catching-up with the activity

- Need for quick ramp-up for high BDP paths



Target (1 object, 5.3MB)

Storing previous path characteristics (rate, rtt, etc).
Deciding to use information to initialise a new connection
Being careful to « undo » if there any problem is found



Google QUIC performance over a public SATCOM access
International Journal of Satellite Communications and Networking
THOMAS, L. ; DUBOIS, E. ; KUHN, N. ; LOCHIN, E. 2019

Catching up with the activity

- QUIC WG adoption call of
  - draft-kuhn-quic-careful-resume-02
    - Store computed congestion control parameters of a give connection
    - Modify the congestion control behavior of a subsequent connection
  - draft-kuhn-quic-bdpframe-extension-00
    - BDP Frame extension for QUIC
    - How to store and exchange computed congestion control parameters
- Current design uses QUIC (see draft-kuhn-quic-bdpframe-extension)
  - “Problem space […] more broadly to do with congestion control and not entirely QUIC specific”
  - The final CC solution ***must*** effectively share capacity with all transports
  - It ***could*** be possible to find a way to do this with other transports?

CC Discussion items – relevant for TSVWG

- Assume previous connection finished and stored information.
- What relevant information can be got to ***check*** the path ?
  - packet loss after sending the IW
  - minRTT
  - inter-packet time
- How does a server ***"carefully" jump*** to utilise previously estimated capacity?
- How does it detect any congestion and ***react*** after the jump?
- What aspects are ***congestion-control specific*** ?
  - Eg. CUBIC vs Reno
  - E.g. impact of HYSTART / HYSTART ++

NB : Currently discussed in draft-kuhn-quic-careful-resume-02

Other topics
– related to specific transports

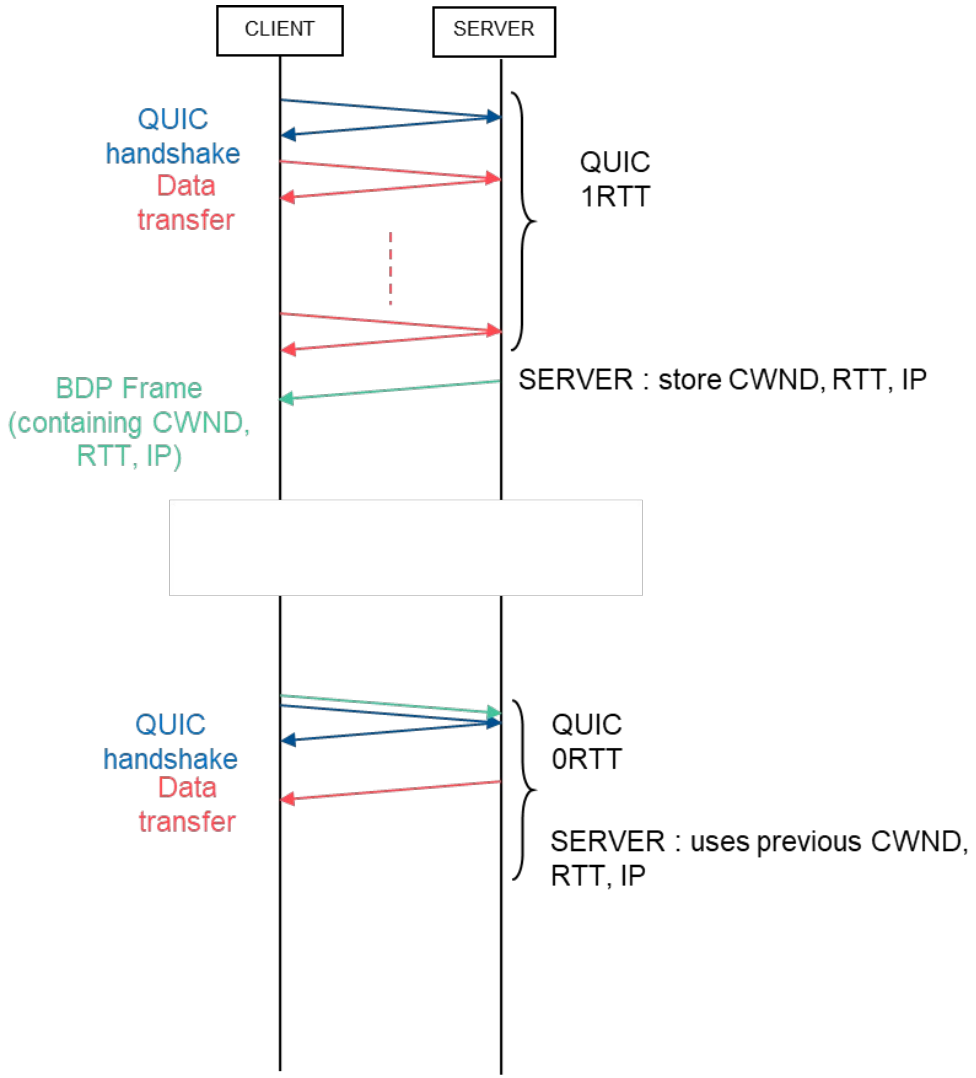
- ***How does client ask*** for this jump?
  - QUIC 0-RTT and TLS certificate signaling
  - Congestion control and TLS dependent
  - For QUIC,
    - draft-kuhn-quic-careful-resume-02 compares three approaches
    - draft-kuhn-quic-bdpframe-extension-00 details design of one approach
  - What do I send and when do I send it ?
- Real system performance

Summary

- Is there appetite for the CC part of this work in TSVWG?
- Who would join us as we seek to define appropriate details?

Catching-up with the activity (QUIC)

- BDP FRAME extension for QUIC



1. During a previous session, current RTT (current_rtt), CWND (current_cwnd) and client's current IP (current_client_ip) are stored as saved_rtt, saved_cwnd and saved_client_ip;

2. When resuming a session, the server might set the current_rtt and the current_cwnd to the saved_rtt and saved_cwnd of a previous connection.

https://datatracker.ietf.org/doc/html/draft-kuhn-quic-0rtt-bdp

VIVERIS
Innover. Simplifier. Partager.

Implemented in PICOQUIC by F. Simo, D. Pradas
https://github.com/private-octopus/picoquic/pull/1209