QUIC measurements spindump IETF Hackathon

IETF 108
July 20-24, 2020
Online

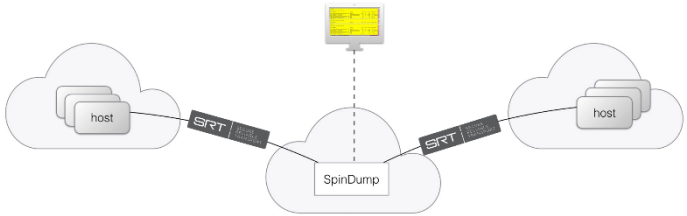
QUIC Measurements: Goals

- Provide tools and ideas for traffic measurement in the era of encrypted transports
  - Debugging
  - Research
  - Network health monitoring
  - Optimization and network management adjustment

- Updates to the spindump tool github.com/EricssonResearch/spindump

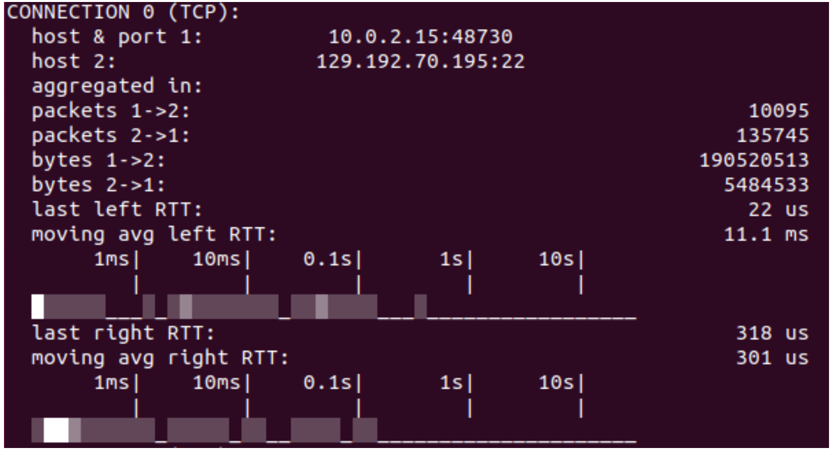
What got done

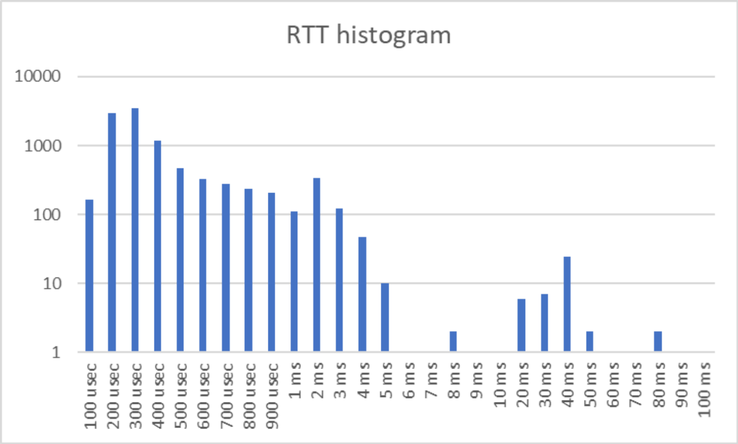
- Traffic classification
  - What % of my traffic goes to FB etc?
- Model generation for simulation
- Giving the power for observations to clients
  - Per-UE measurement agents (HotRFC-Presentation)
- Measuring SRT (draft-sharabayko-mops-srt)
- Qlog (draft-marx-qlog-main-schema)
  - Write a converter for netlog->qlog
- Explicit packet loss measurement (draft-cfb-ippm-spinbit-measurements)
  - Using sQuare bit (Q-bit) and Reflection square bit (R-bit)
- Maintenance, new versions
  - Fixes for OSs (Ubuntu 20.04, MacOS, Fedora)
  - Use ideas from QUIC, add support in tools



Model generation

- Connection statistics – RTT histogram (logarithmic histogram)


```
CONNECTION 0 (TCP):
  host & port 1:          10.0.2.15:48730
  host 2:                 129.192.70.195:22
  aggregated in:
  packets 1->2:                                   10095
  packets 2->1:                                  135745
  bytes 1->2:                                 190520513
  bytes 2->1:                                   5484533
  last left RTT:                                  22 us
  moving avg left RTT:                          11.1 ms
       1ms|     10ms|     0.1s|       1s|      10s|
  last right RTT:                                318 us
  moving avg right RTT:                          301 us
       1ms|     10ms|     0.1s|       1s|      10s|
```



Measuring SRT | Haivision

During the hackathon:

- Getting familiar with the tool
- Submitting PR 213 to address minor issues while building on MacOS
- Next step will be to learn the code and architecture better, and to estimate an effort required to add the SRT protocol support in spindump

For more info:

- SRT RFC Draft Proposal https://datatracker.ietf.org/doc/draft-sharabayko-mops-srt/
- SRT Technical Overview https://github.com/Haivision/srt/files/2489142/SRT_Protocol_TechnicalOverview_DRAFT_2018-10-17.pdf
- SRT Open-source Library https://github.com/Haivision/srt
- SRT Alliance https://www.srtalliance.org/
- SRT Slack Channel https://srtalliance.slack.com/

*Enabling **low-latency video** contribution & distribution and **fast file transfer** over unpredictable networks.*

Explicit packet loss measurement

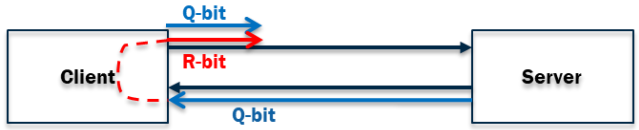
During the hackathon:

- Implementation of the observer inside Spindump
- Testing of the methodology using quic-go to generate traffic
- Next step: comparison with other explicit packet loss methodologies

For more info:

- Explicit measurements IPPM draft https://tools.ietf.org/html/draft-cfb-ippm-spinbit-measurements-02
- QR-bits quic-go implementation https://github.com/fabiobulgarella/quic-go/tree/tim-pl2-qr

The Client generates the Q-bit signal and reflects the received Q-bit signal using the R-bit signal:



The Server does the same in the opposite direction.

The sizes of the generated R-bit blocks are the **"average sizes"** of the received Q-bit blocks.

Wrap Up

Team members:
Mauro Cociglio (Telecom Italia - TIM)
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Maxim Sharabayko (Haivision)
Szilveszter Nadas (Ericsson)
Ferenc Fejes (Ericsson)
Mirja Kühlewind (Ericsson)
Jari Arkko (Ericsson, driver)

+ few other interested ones, on vacation or busy this week

github.com/EricssonResearch/spindump