TECHNISCHE UNIVERSITÄT BERLIN

Evaluation of HTTP/3 for Media Streaming

Philip Nys | Open Distributed Systems | Workshop 2 | June 20th 2023

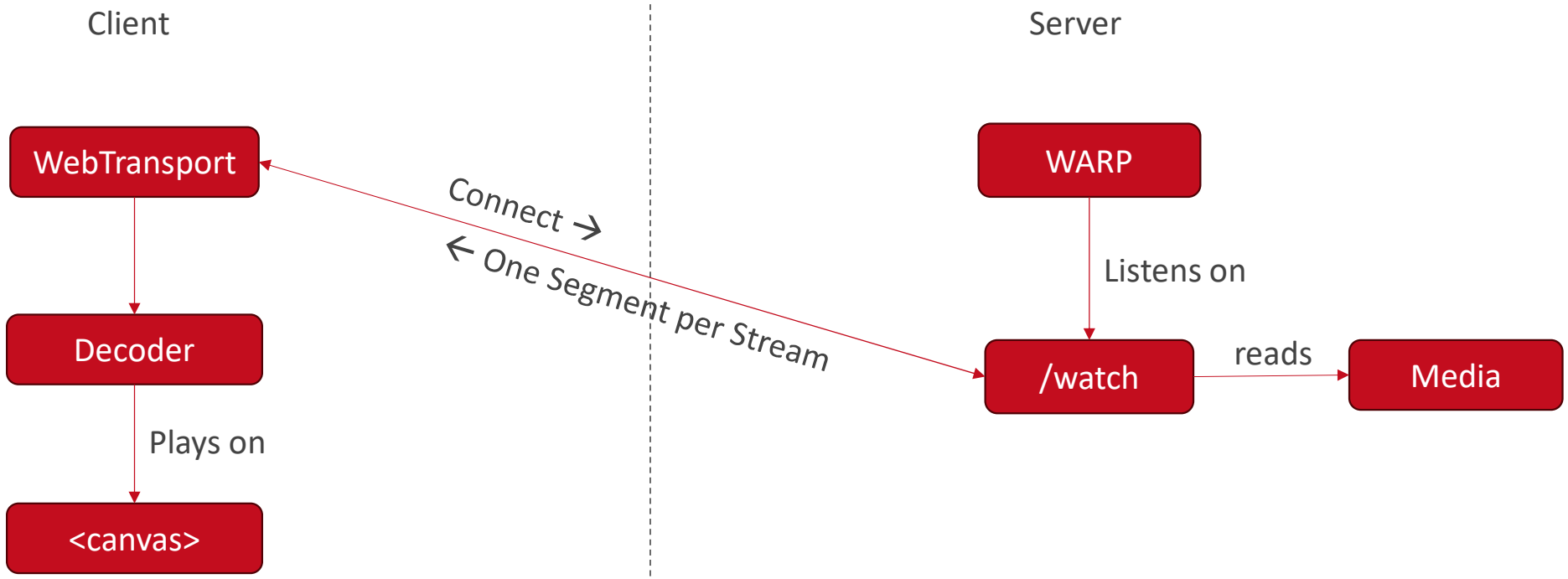
Overview

- Recap Problem Statement
- Proposed Solutions and Progress
    - WARP
    - RUSH
    - QUICR
- Challenges/Blockers
- Demo Recording
    - WARP
    - RUSH
- Next Steps
- References

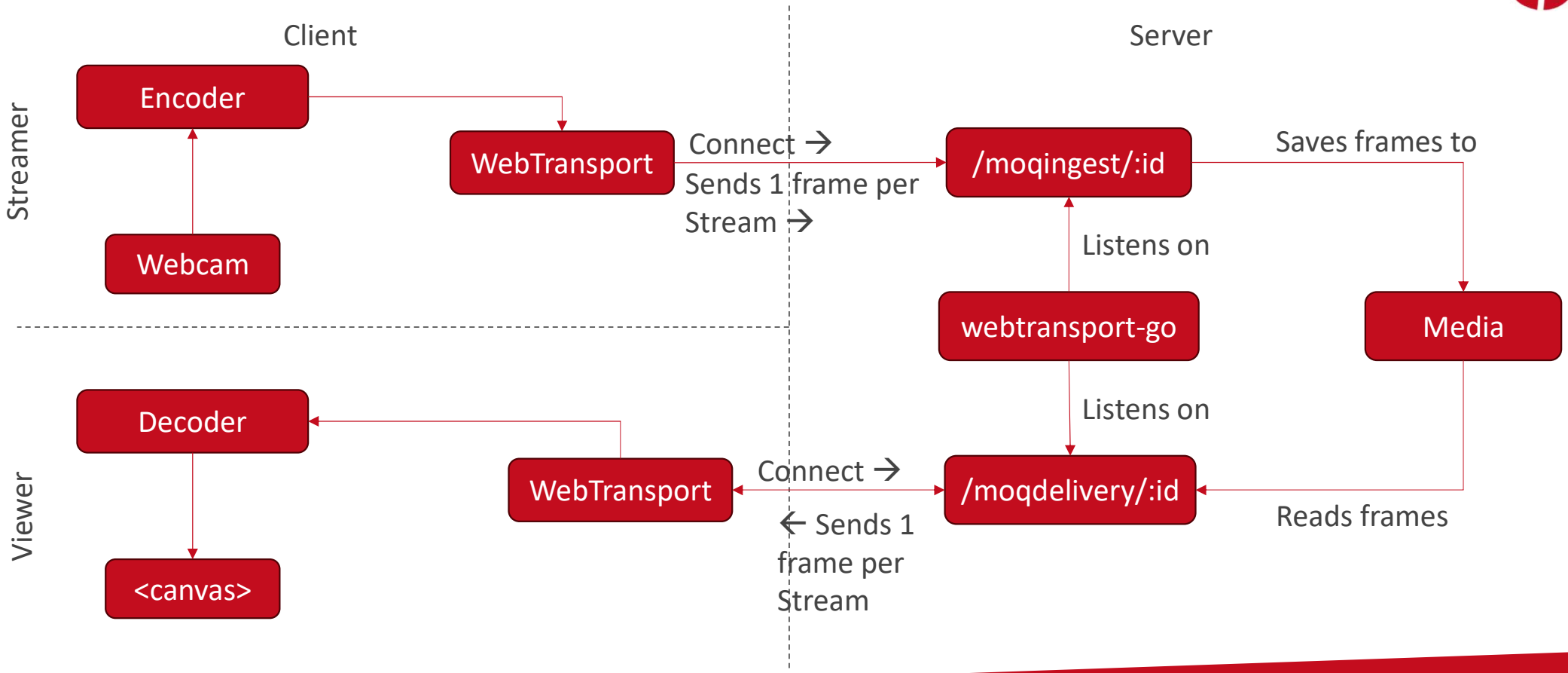
Recap Problem Statement

- Media Streaming makes up the majority of all Internet traffic
    - In 2017: **72%** [1]
- HTTP/3 aims to reduce latency, head of line (HOL) blocking and improve the user experience
    - Better stream multiplexing
    - Faster verification handshake [2]

Proposed Solution
WARP – Streaming media (vod / live stream)



Proposed Solution
RUSH – 1 Streamer / N Viewer



Proposed Solution
QUICR – 2-way Video Call or 1 Streamer / N Viewer

- Demo runs a dedicated macOS client
- Server uses libquicr [7] a API implementation of quicrq [8] library

- Demo 1:
  - 2-way call: https://user-images.githubusercontent.com/947528/201170693-629525d4-211e-4849-98c5-57b883bccba7.mp4
  - Server: Akamai's Atlanta Network, USA
  - Client: London, UK

- Demo 2:
  - 1 streamer / 3 viewers: https://user-images.githubusercontent.com/947528/181114950-400c22da-f623-4bc5-a8d6-7f4e3188a9c5.mp4
  - Server: AWS Ohio, USA
  - Client: San Jose California, USA

Challenges and Blockers

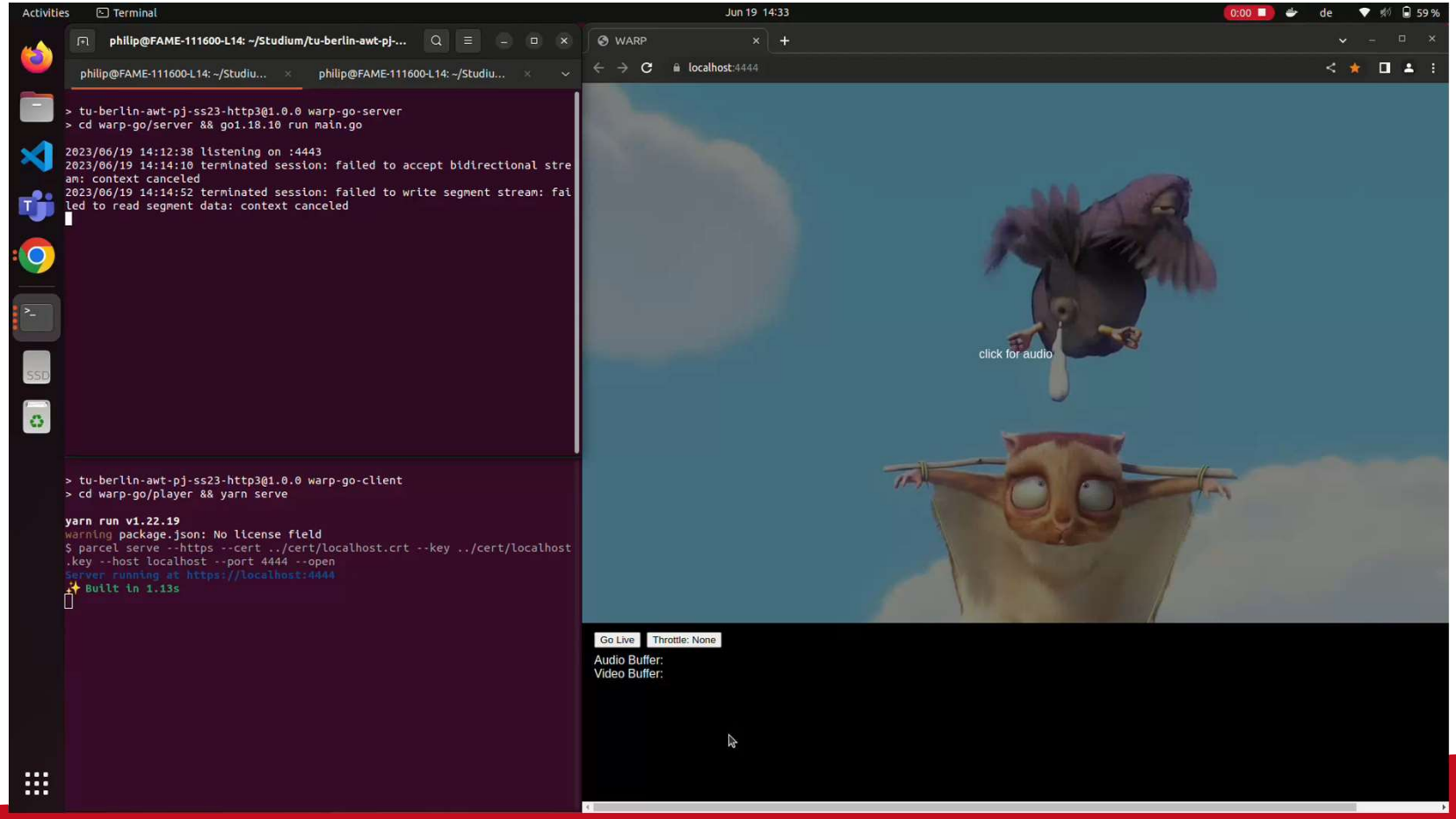
RUSH:

- Viewer doesn‘t show any video output from the server

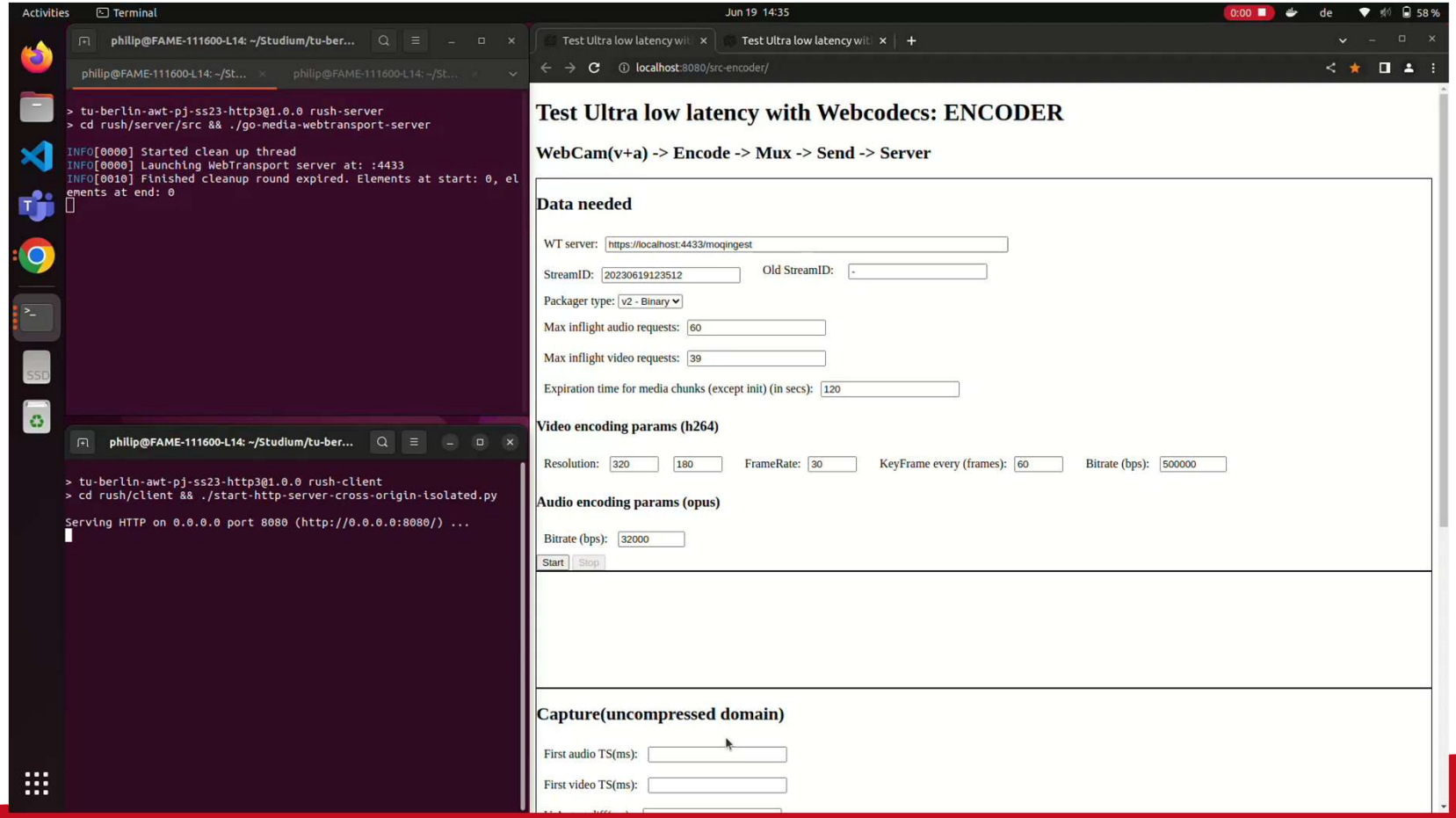
QUCIR:

- Building the code fails

Demo Recording - WARP



Demo Recording - RUSH



Next Steps

- Dockerize WARP (go) and WARP (rust)
- Integrate Bandwidth Limiter
- Run Benchmarks to compare both implementations

- Try to get RUSH and QUICR to work

References

[1] M. Nguyen, D. Lorenzi, F. Tashtarian, H. Hellwagner and C. Timmerer, "DoFP+: An HTTP/3-Based Adaptive Bitrate Approach Using Retransmission Techniques," in *IEEE Access*, vol. 10, pp. 109565-109579, 2022, doi: 10.1109/ACCESS.2022.3214827.
[2] Divyashri Bhat, Rajvardhan Deshmukh, and Michael Zink. 2018. Improving QoE of ABR Streaming Sessions through QUIC Retransmissions. In Proceedings of the 26th ACM international conference on Multimedia (MM '18). Association for Computing Machinery, New York, NY, USA, 1616–1624. DOI:https://doi.org/10.1145/3240508.3240664
[3] https://github.com/facebookexperimental/webcodecs-capture-play
[4] https://github.com/kixelated/warp
[5] https://github.com/Quicr/qmedia
[6] https://w3techs.com/technologies/details/ce-httpsdefault
[7] https://github.com/Quicr/libquicr
[8] https://github.com/Quicr/quicrq

Thank you for listening! Any questions?