

On the Cost of Using Happy Eyeballs for Transport Protocol Selection

Giorgos Papastergiou[†], Karl-Johan Grinnemo^{*},
Anna Brunstrom^{*}, David Rost[†], Michael Tüxen^{*},
Naeem Khademi[†], Per Hurtig^{*}

[†]Simula Research Laboratory, ^{*}Karlstad University,

^{*}Fachhochschule Münster, [†]University of Oslo

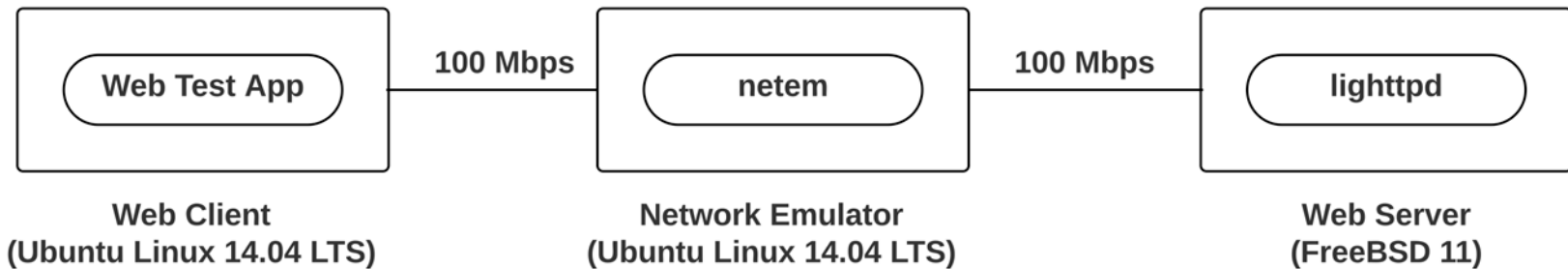


Introduction

- TAPS work item 3
 - “... explain how to select and engage an appropriate protocol and how to discover which protocols are available for the selected service between a given pair of end points”
- Calls for happy eyeballs mechanism for transport protocol selection
 - Try multiple protocols in parallel

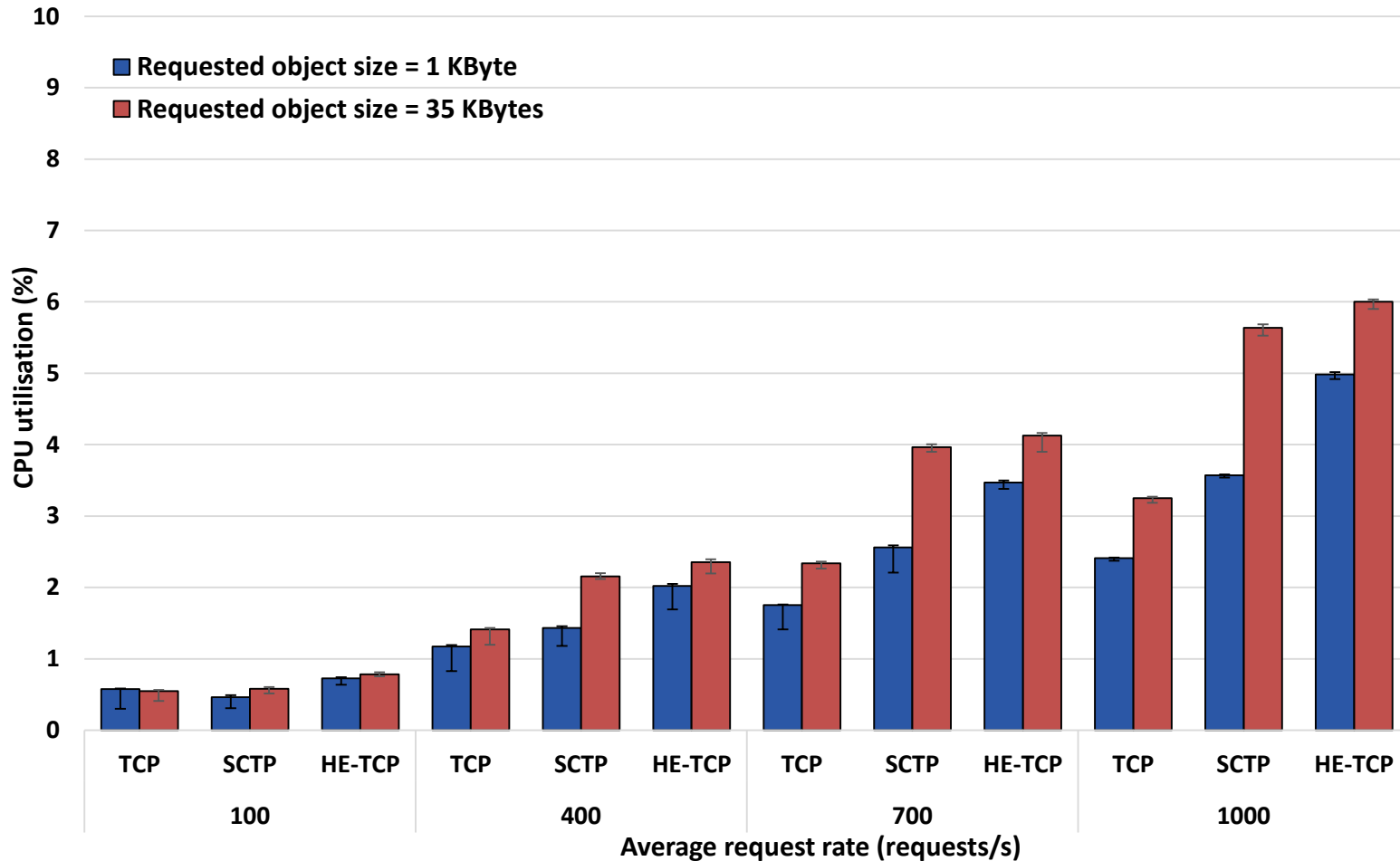


Cost of Happy Eyeballs?

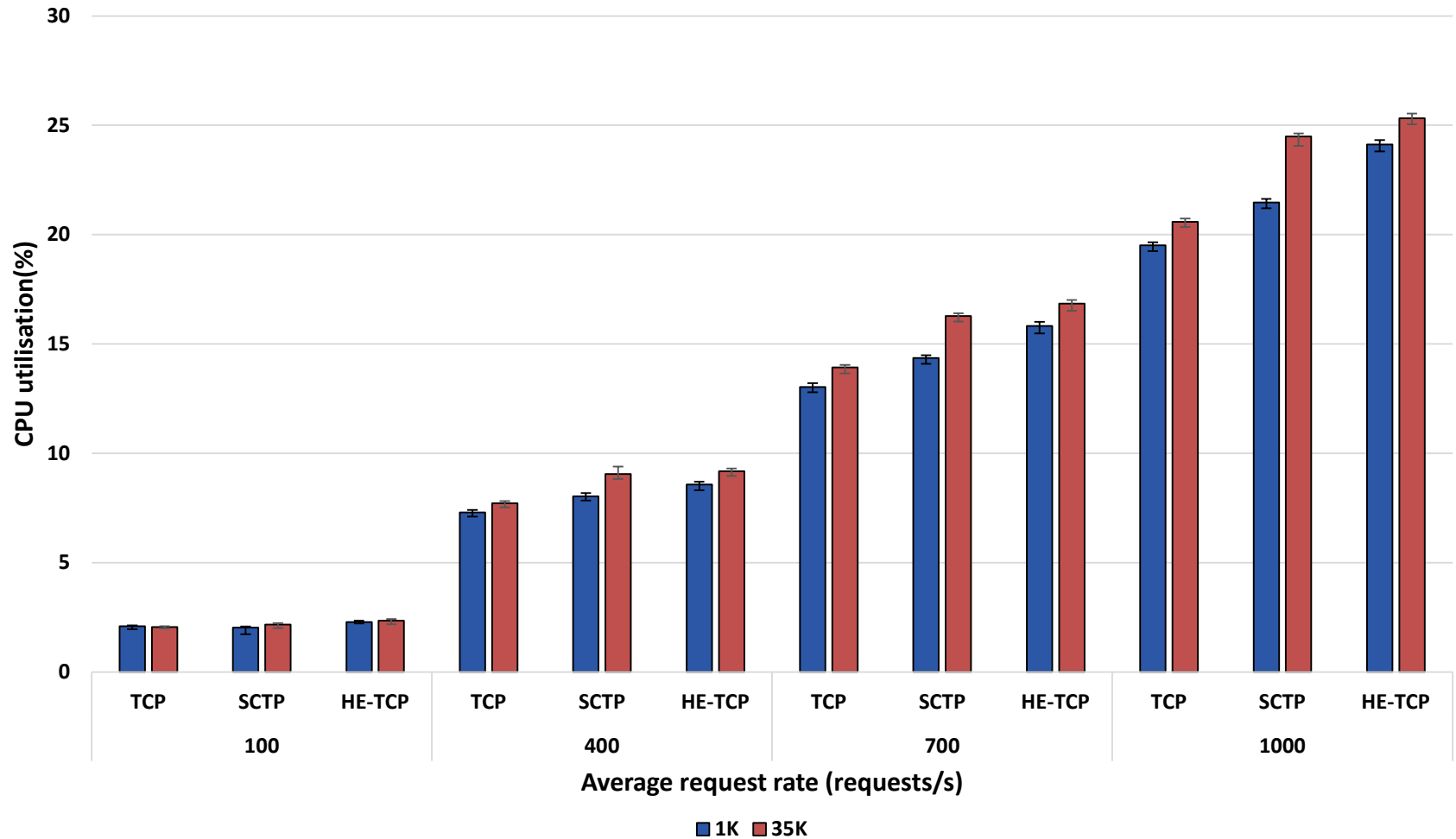


- Three test cases
 - Basic: unencrypted connections, no caching
 - TLS: TLS-encrypted connections, no caching
 - Cache: Caching of previous connection attempts
- Metrics
 - CPU utilization
 - Kernel memory usage

CPU Utilization in Basic Test Case



CPU Utilization in TLS Test Case

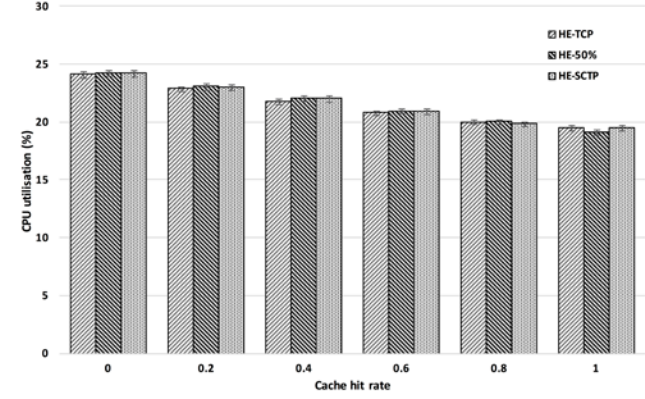
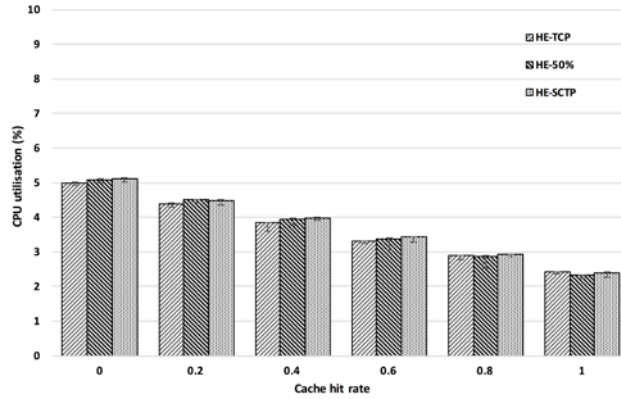


Cache Hit Ratio vs. CPU Utilization

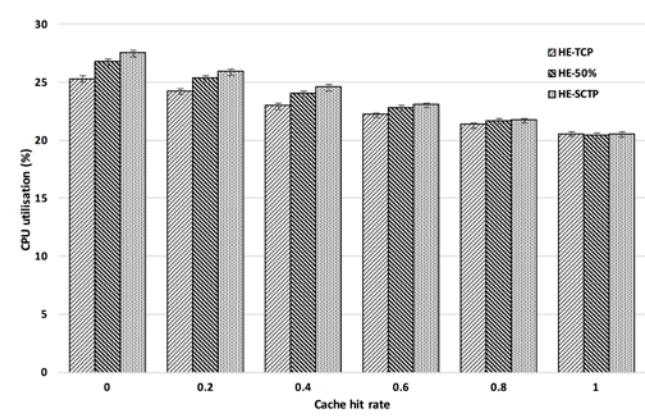
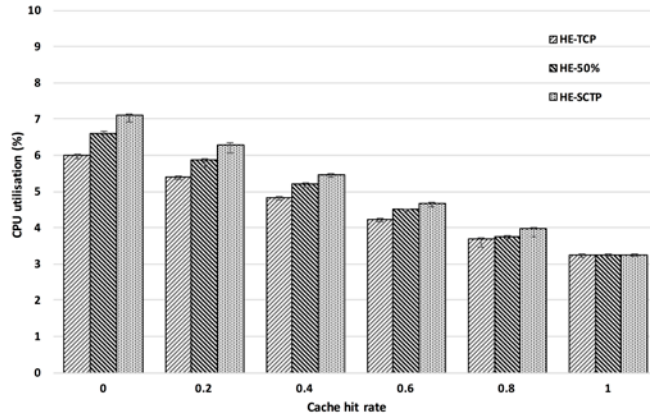
Unencrypted

TLS-encrypted

1 KiB



35 KiB



Conclusion and next steps

- Happy Eyeballs is a feasible transport selection mechanism
- Transport service library with Happy Eyeballs support
 - <https://github.com/NEAT-project/neat>
- More extensive evaluations
- draft-grinnemo-taps-he



References

- For details on the evaluation of happy eyeballs see:

G. Papastergiou, K.-J. Grinnemo, A. Brunstrom, D. Ros, M. Tüxen, N. Khademi and P. Hurtig, “On the Cost of Using Happy Eyeballs for Transport Protocol Selection”, Applied Networking Research Workshop, July 2016.

<https://irtf.org/anrw/2016/anrw16-final27.pdf>

