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Energy Measurement of SPDY Protocol on Mobile Platform

Zisheng Liao, Ashiwan Sivakumar, and Sanjay Rao
Department of Electrical Engineering, Purdue University

ABSTRACT

The past few years have witnessed an explosive growth in mobile Internet data traffic with web browsing being one of the key activities on mobile devices. There is tremendous interest in optimizing mobile web. In this regard, a new protocol called SPDY was introduced by Google to augment web browsing, however it's impact on the device energy consumption is not clearly understood. In this work we evaluate the energy characteristics of SPDY-based web browsing on mobile devices. In order to measure the energy consumption of web activities, we use AT&T's ARO [1]. This tool is widely accepted and used by the industry as well as academia for radio (LTE) energy measurement. However the tool was initially designed as a GUI and hence the efficiency for handling large-scaled data was compromised. The first part of the project involves optimizing ARO so that the program runs automatically on a fairly large amount of data with minimum time. In this process we reduced the running time of ARO by a factor of 13 in average compared to the baseline GUI version. In the second part of the project, we set up a SPDY proxy to be used in our evaluations, since there are limited number of websites that support SPDY at this moment. Further we conduct an initial evaluation comparing SPDY proxy-based download to traditional HTTP-based download.

Our initial analysis shows that for 18 out of 20 page that we evaluated SPDY is doing better than the existing HTTP energy wise. E.g. for 50% of pages, SPDY reduces the LTE energy consumption by at least 3J (>20%) while for few pages the benefits are small and sometimes it is doing worse than HTTP.

As part of future work, we will extend our evaluation to get a comprehensive understanding on the energy characteristics of SPDY and compare it to other better approaches.

KEYWORDS

spdy, energy performance, LTE, ARO

REFERENCES

[1] J. Huang, F.Qian, A. Gerber, Z. M. Mao, S.sen, and O. Spatcheck. A Close Examination of Performance and Power Characteristics of 4G LTE Networks. *In Mobisys*, 2012