Characterization of Power Efficiency of Mobile Video Streaming Services over 4G/3G/Wi-Fi

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Abstract—Smartphones and tablets have become the devices of choice for connecting to the internet and watching videos. Video data contributes to the bulk of internet traffic and, the number, length and variety of videos have increased significantly. Mobile devices live on limited battery energy which is still a major bottleneck and a source of user dissatisfaction while watching videos. For this project, we characterize the power efficiency of mobile video streaming services over 4G/3G/Wi-Fi. We evaluate the energy efficieny of various streaming applications like YouTube, Netflix and aim to identify power wastage in the existing approach.

I. RELATED WORK

A lot of research has been done in improving the power efficiency of mobile and hand-held devices. Different schemes target different features of the device for power reduction. These include network, architecture level, circuit, and software level optimizations. [3] explores a combination of these optimizations for achieving power efficiency. Some recent literature like [4], [5] also confirm the theory that transmitting video frames in bursts actually save significant amount of energy. A very recent work [2] uses battery aware rate adaptation and base station reconfiguration to achieve power savings. An interesting work which effectively schedules data transfers in return for energy savings is [1]. However the problem still persists.

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