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Where is the energy spent inside my app?: fine grained energy accounting on smartphones with Eprof Paper critique

Summary

The authors of this paper introduces a framework for fine-grained energy accounting on smartphones called Eprof, then implements it and use it to evaluate power consumption in two mobile OSes Android and Windows Mobile. Eprof energy profiler is the first of its kind being able to analyze closely energy dissipated by applications, which leads to interesting discoveries about smartphones apps energy usage characteristics. Motivated by those findings, bundles, a new applications I/O energy accounting presentation is proposed and achieved considerable cut in energy consumption in tested apps.

Strengths

The authors successfully identifies problems of energy profiling in smartphones apps. Then, they proposes a design of an energy profiler that captures complex energy behavior of smartphones apps accurately. Many characteristics of power usage of smartphone applications were discovered using this profiler.

This paper encourages applications developers to make more power-efficient apps by providing a fine-grained energy profiler for mobile OSes. Such tool can greatly improves battery life of smart devices as mobile applications developed so far were oblivious to the energy consumption aspect.

The paper also proposes a strategy for optimizing I/O energy, bundles, base on findings about applications power usage.

Weaknesses

Eprof uses the system-call based power model and disregard utilization-based models which could be useful in estimating multi-core CPU and GPU power consumption.

Improvement suggestions

Support for real-time power profiling and more visualization tools could be made to further the understanding of power usage.