Paper Critique – Week 5

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Power provisioning for a warehouse-sized computer

This paper is the first studying about power usage of very large scale systems running real live workloads, and the first reported use of power modeling for power provisioning. The authors presented the aggregate power usage characteristics of large collections of servers (up to 15 thousand) for different classes of applications over a period of approximately six months. They constructed a power estimation methodology that is based on real-time activity information and the baseline server hardware configuration. This model facilitate estimate the potential power and energy savings of power management techniques.

The strength of this paper is that experiments were conducted in real-world and big-scale datacenter which are machines that are deployed in Google's Web search services. Also, the paper's explanation about advantages can be obtained (leveraging the power cost headroom, maximizing deploying computers to upgrade infrastructure…) when we apply this solution with detail numbers and concrete context, are persuasive and successfully convinced audience.

However, the workload of datacenter in this study is specific to Google search operation only, it didn't reflect or can be representative for another application or business software operations. Finally, this study didn't account and consider the cost and power usage for cooling system which also are important factor in power consuming.

Where is the energy spent inside my app? Fine Grained Energy Accounting on Smartphones with Eprof

The challenge of profiling energy consumption for individual application on smartphones are asynchronous power behavior in which the previous program entity affect the current program entity's power state. The authors of this paper overcome this challenge by proposing their Eprof, and profiler to account and present energy for apps on smartphone operating system (Android and Windows Mobile) with the last-trigger policy which intuitively reflect asynchronous power behaviors. Base on evaluations by Eprof, authors constructed and proposed bundle which is a new accounting presentation of app I/O energy. Bundle help programmer comprehensive understand app's energy routine, consumption and by that optimizing their source code in order to make the app's algorithm energy-aware.

The strength of this paper are authors drew some interest characteristics about energy drawing of smartphone's app (such as over 60% energy on free app spent on 3rd party advertisement module or the most energy drawing part is I/O routine). Moreover, by proposing the "bundle", this paper (authors) argued the point that it's not only the duty of operating system to save energy but also the responsible of programmer to program their code with saving energy duty in mind.

The paper could be better with some example, references about how to program energy-saving code or some energy-aware algorithms.