ECE5658: Operating Systems Design

Paper Reading Assignment

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Power Provisioning for a Warehouse-sized Computer

Summary:

The objective of this paper is to present a novel power management model in multi-server environment. The paper introduces the characteristics of power use by multiple mainframe computers and evaluates them to maximize power efficiency while preventing over-subscription. It mentions the gap between ideal power usage and achieved power usage, and it addresses such issue with their model that increases efficiency in energy. It is shown that their model is effective especially in cluster-level (i.e. with thousands of server computers) setting.

Strengths:

As stated by the paper, this is the first paper on a concrete power management model for massive multi-server environment ever to be proposed in the history of computer-related fields. The paper is able to discretely analyze the power usage statistics of multi-server environment in detail. It then diagnoses the main problems and reasons in terms of power consumption. Using multiple workloads, it quantifies how the workload affects patterns in power usage. The paper is able to efficiently address the problem with their own power management model suitable for datacenter workloads.