

## Performance versus power consumption in large-scale distributed systems over the Internet

**Summary:** An important problem in the management of IT enterprises is power consumption. This has triggered substantial research aimed at finding energy-aware designs at all levels from microchips to data-centers or wireless networks. The goal of this project is to investigate an analytical model in order to understand the trade-off between performance and power consumption of a class of distributed systems over the Internet. Since these systems are composed of several millions of nodes, we will use mean-field theory to obtain insights and approximate the behavior of the system in terms of a set of ordinary differential equations (ODEs). The equilibria of such ODEs are finally used to perform some dimensioning or capacity planning to find a good compromise between power consumption and performance.

**Keywords:** Power consumption, Performance, Mean field theory, Capacity planning

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