The evolution of computer science and engineering is always motivated by the requirements for better performance, power efficiency, security, user interface (UI), etc. The first two factors are potential tradeoffs: better performance usually requires better hardware, e.g., the CPUs with larger number of transistors, the disks with higher rotation speed; however, the increasing number of transistors on the single die or chip reveals super-linear growth in CPU power consumption, and the change in disk rotation speed has a quadratic effect on disk power consumption. We propose three new systematic approaches, Transactional RAID, dataaffinity-aware data placement DAFA and Modeless power management, to tackle the performance problem in Database systems, large scale clusters/cloud platforms, and the power management problem in Chip Multi Processors, respectively.

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The public is welcome to attend.