# 34.Cost Minimization Algorithms For Data Center Management

Abstract:

Due to the increasing usage of cloud computing applications, it is important to minimize energy cost consumed by a data center, and simultaneously, to improve quality of service via data center management. One promising approach is to switch some servers in a data center to the idle mode for saving energy while to keep a suitable number of servers in the active mode for providing timely service. In this paper, we design both online and offline algorithms for this problem. For the offline algorithm, we formulate data center management as a cost minimization problem by considering energy cost, delay cost (to measure service quality), and switching cost (to change servers's active/idle mode). Then, we analyze certain properties of an optimal solution which lead to a dynamic programming based algorithm. Moreover, by revising the solution procedure, we successfully eliminate the recursive procedure and achieve an optimal offline algorithm with a polynomial complexity.