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**JOINT OPTIMAL PRICING AND TASK SCHEDULING IN MOBILE CLOUD COMPUTING SYSTEMS**

**Abstract:**

The evolving mobile cloud computing (MCC) paradigm enables mobile users to offload their computing tasks to cloud servers. In this paper, we study the following problems in MCC systems: 1) which tasks should be offloaded to cloud servers? 2) and what is the optimal price of cloud services? We jointly address these issues by formulating two levels of optimization problems. On the mobile users side, we formulate a utility maximization problem that takes the energy consumption, delay, and price of cloud services into account and obtain the optimal scheduling for both delay-sensitive and delay-tolerant applications. On the cloud service provider (CSP) side, we determine the optimal pricing strategy by formulating a profit maximization problem, which is non-convex in general. We further propose an algorithm using convexification and primal-dual methods to mitigate the non-convexity. Through numerical studies, we investigate the mobile users' behavior and the CSP's pricing strategy. Our results reveal that the proposed scheduler effectively balances the tradeoff between the energy consumption and delay in comparison with different schedulers proposed in the literature. Furthermore, we show that with the proposed pricing algorithm, the CSP can improve its profit by up to 25% compared with static and dynamic pricing strategies.