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**ENHANCING MOBILE NETWORKS WITH SOFTWARE DEFINED NETWORKING AND CLOUD COMPUTING**

**Abstract:**

In the past decade, mobile devices and applications have experienced an explosive growth, and users are expecting higher data rates and better quality services every year. In this paper, we propose several ideas to increase the functionality and capacity of wireless networks using software-defined networking (SDN) and cloud computing technologies. Connections between users and services in mobile networks typically have to pass through a required set of middleboxes. The complex routing is one of the major impetus for the SDN paradigm, which enables flexible policy-aware routing in the next generation mobile networks. In addition, the high costs of middleboxes and limited capabilities of mobile devices call for revolutionary virtualization technologies enabled by cloud computing. Based on these, we consider an online routing problem for mobile networks with SDN and cloud computing. In this problem, connection requests are given one at a time (as in a real mobile system), and the objective is to steer traffic flows to maximize the total amount of traffic accepted over time, subject to capacity, budget, policy, and quality of service constraints. A fast log-competitive approximation algorithm is developed based on time-dependent duals.