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Practical and Context-Aware Resource Adaptation in Mobile Networks

Abstract:
With the proliferation of various portable devices such as smart phones, netbooks and tablets, it becomes more important to design and implement effective resource management schemes with (i) the increasing number of users in the network and (ii) the expectation of frequent and fast mobility of network users. In this dissertation, we conclude that the key to solve the problem in mobile networks is adaptive resource allocation, which requires the system to behave in an adaptive manner considering the dynamic network conditions and various context of mobile users. Specifically, we study the following critical resource allocation issues in this dissertation: (i) rate adaptation; (ii) station handoff; (iii) load balancing; and (iv) power saving, for each we have proposed an adaptive scheme, implemented it in the MadWifi device driver, and demonstrated its effectiveness via experiments.