Adaptive Management of Network Resources

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This paper describes a new adaptive algorithm that smoothly and dynamically adjusts the system resources of link rates and transmitter powers to maximize the performance of the system. Performance is explicitly measured from the point of view of traffic carried by the network. Transmitter powers are subsumed in the feasible rate region for the wireless network, and are not directly involved in evaluating the network. A new adaptive algorithm, DSM, is presented. DSM seeks optimal system performance by greedily searching the rate region surface seeking link rates that best meet QoS and user demand needs and then calculates transmitter powers to support these rates. If system requirements such as the number of users or their QoS change, the DSM adapts by again exploring the now changed rate region. Changes in the wireless environment are addressed by the algorithm in a similar fashion.

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