

Effect of Finite State AMC on the practicality of dual feedback bandwidth request control

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Abstract: Dual feedback control algorithm has proved to allow the base station to respond quickly and efficiently to the uplink bandwidth request in broadband wireless access (BWA) networks [2][3]. In this algorithm the bandwidth request is calculated based on both the length of the backlogged queue and the mismatch between packet arrival and service rates. However, the physical channel quality, SNR, does not play any role in the algorithm; therefore the algorithm is suboptimal with respect to bandwidth utilization. Under fading conditions modern BWA networks employ adaptive modulation and coding (AMC) which has only a finite number of discrete service rates to grant to subscribers. In this paper, we examine the effect of AMC in WiMAX using the Finite State Markov Channel model on the practicality and efficiency of the dual feedback bandwidth request control algorithm. © 2010 IEEE.

Index Keywords: Adaptive modulation and coding; Band-width utilization; Bandwidth request; Broadband wireless access; Control algorithms; Dual feedback; Dual feedback control; Fading conditions; Finite number; Finite state; Finite state Markov channels; Packet arrivals; Physical channels; Service rates; Uplink bandwidth; Bandwidth; Communication channels (information theory); Feedback; State feedback; Wimax; Algorithms

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