

一种MIMO-WLAN的跨层速率控制方案

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A Cross-layer Rate Control Method for MIMO-WLAN

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摘要

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摘要 针对下一代无线局域网高速率演进的要求, 该文提出一种跨层的多输入多输出(MIMO)系统速率控制算法。首先分析了保证业务误码率的物理层吞吐率最大的速率控制算法存在的不足; 然后结合自适应调制编码技术, 实现了基于预测的MAC(Media Access Control)层吞吐率最大的跨层速率控制算法。仿真和分析表明算法可以取得近似优化的速率选择结果, 能够保证业务的误码率性能, 提高业务的吞吐率。该文的算法计算简单、预测准确、运行高效, 不仅可以实现闭环速率控制, 还可用于帧重传和多业务调度等应用的速率控制。

关键词: 无线局域网 多输入多输出系统 速率控制 自适应调制编码 跨层设计

Abstract: Based on the high data rate evolution of next generation Wireless Local Area Network (WLAN), a cross-layer rate control algorithm of MIMO system is proposed. Firstly, the limit of physical layer rate control algorithm which maximizes the throughput of physical layer and guarantees the Bit Error Rate (BER) of traffic is analyzed. Secondly, integrated with the Adaptive Modulation and Coding (AMC) technique, a cross-layer rate control algorithm based on prediction with the purpose of maximizing the throughput of Media Access Control (MAC) layer is presented. The simulation and analysis show that sub-optimal result can be obtained with the guaranteed BER, and thereby enhances the throughput of traffic. Simplicity of calculation, accuracy of prediction and efficiency of run-time are the benefits of this algorithm. The algorithm can be used in close-loop rate control, and the scene of traffic scheduling or frame retransmission.

Keywords: Wireless Local Area Network (WLAN) MIMO System Rate control Adaptive Modulation and Coding (AMC) Cross-layer design

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