Relay Node Selection Algorithm for Cooperative Communications in Wireless Networks

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Abstract : IEEE 802.11a/b/g standards support multiple transmission rates. Even though the use of multiple transmission rates increase the WLAN capacity, this feature leads to the performance anomaly problem. Cooperative communication was introduced to relieve the performance anomaly problem. Data packets are delivered to the destination much faster through a relay node with high rate than through direct transmission to the destination at low rate. In the legacy cooperative protocols, a source node chooses a relay node only based on the transmission rate. Therefore, they are not so feasible in multi-flow environments since they do not consider the effect of other flows. To alleviate the effect, we propose a new relay node selection algorithm based on the transmission rate and channel contention level. Performance evaluation is conducted using simulation, and shows that the proposed protocol significantly outperforms the previous protocol in terms of throughput and delay.

Keywords : cooperative communications, MAC protocol, relay node, WLAN

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