

## Data Rate Based Grouping Scheme for Cooperative Communications in Wireless LANs

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**Abstract :** IEEE 802.11a/b/g standards provide multiple transmission rates, which can be changed dynamically according to the channel condition. Cooperative communications we reintroduced to improve the overall performance of wireless LANs with the help of relay nodes with higher transmission rates. The cooperative communications are based on the fact that the transmission is much faster when sending data packets to a destination node through a relay node with higher transmission rate, rather than sending data directly to the destination node at low transmission rate. To apply the cooperative communications in wireless LAN, several MAC protocols have been proposed. Some of them can result in collisions among relay nodes in a dense network. In order to solve this problem, we propose a new protocol. Relay nodes are grouped based on their transmission rates. And then, relay nodes only in the highest group try to get channel access. Performance evaluation is conducted using simulation, and shows that the proposed protocol significantly outperforms the previous protocol in terms of throughput and collision probability.

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

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