

A combined approach for detecting hidden nodes in 802.11 wireless LANs

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Abstract

Hidden node is a fundamental problem that severely degrades the performance of wireless networks. The problem occurs when nodes that do not hear each other transmit at the same time, which leads to data packet collision. IEEE 802.11 Wireless Local Area Networks (WLANs) tries to solve this problem through the Request to Send/Clear to Send (RTS/CTS) mechanism. However, the mechanism is not wholly successful. The RTS/CTS idea is based on the assumption that all nodes in the vicinity of Access Points will hear CTS packets and consequently defer their transmissions. The shortcoming of RTS/CTS stems from the fact that such packets introduce high overhead if extensively used. In this article, we propose a hybrid approach for detecting hidden nodes in 802.11 WLANs. The approach is mainly based on adaptive learning about collisions in the network. We think that the approach will be useful for controlling the tuning of RTS/CTS threshold and therefore reduce the overhead those packets introduce. Detailed simulation experiments have shown the strength of the proposed approach compared with other approaches.