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Abstract
A wireless mesh network（WMN）consists of mesh routers and mesh clients, where mesh routers have minimal mobility and form the backbone of WMN. A WMN is dynamically self-organized and self-configured, which the nodes in the network automatically establish and maintain the mesh connectivity among themselves. Therefore, the service coverage of this type of network is significantly increased.
IEEE 802.11 CSMA/CA mechanism is originally designed for single-hop WLAN environment, not for wireless multi-hop networks. The throughput drops significantly as the number of hops in a WMN increases. Therefore, the existing 802.11 MAC protocol should be modified to meet the requirement of WMNs. That is, the modified MAC protocol should have the capability to guarantee the end-to-end delay and throughput for each connection. In this paper, we proposed a new MAC protocol called CT-APC（Concurrent Transmission with Adaptive Power Control）to improve performance. If the nodes can choose the adequate transmission power, concurrent multiple data transmissions can take place, causing the increased throughput of the network and reduced power consumption of the nodes. Besides, after the negotiation phase of control messages we add an extra control interval. The control interval is used to allow multiple sender-receiver pairs to synchronize data transfers. Therefore data collisions and exposed terminal problem can be avoided. The simulation results showed that our proposed scheme can significantly outperform IEEE 802.11 MAC protocol.
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