

# ***P-DCF*: Enhanced Backoff Scheme for the IEEE 802.11 DCF**

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## **Abstract**

The IEEE 802.11 standard is the most dominant MAC protocol in wireless LANs. This paper introduces a novel backoff scheme to improve the performance of the IEEE 802.11 DCF. The original IEEE 802.11 DCF with the binary exponential backoff mechanism suffers from frequent packet collisions under high traffic load. Our proposed backoff scheme termed *P-DCF* enables mobile nodes to choose their next backoff times in the collision-free backoff range by continuously listening to the medium. *P-DCF* ensures high throughput and low packet latency by reducing the packet collision probability. We show through simulation that the *P-DCF* greatly outperforms the original IEEE 802.11 DCF in the saturated network condition.

## **Index Terms**

IEEE 802.11 MAC; Distributed Coordination Function; Random Binary Exponential Backoff; Packet Collision;