**WLAN Operation Comparision**

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| **Feature** | **CSMA/CA** | **RTS/CTS** |
| **Primary goal** | Collision avoidance in shared wireless medium. | Further collision reduction, especially in hidden node scenarios. |
| **Mechanism** | "Listen before talk" (carrier sense) with random backoff. | Explicit "request" and "clear" messages before data transmission. |
| **Operation** | Device listens, waits if busy, transmits after IFS and backoff. | Device sends RTS, waits for CTS, then transmits data. |
| **Overhead** | Relatively low overhead. | Increased overhead due to RTS/CTS exchange. |
| **Effectiveness** | Effective in most standard WLAN environments. | Highly effective in dense or hidden node environments, but less efficient in sparse ones. |
| **Usage** | Used in all 802.11 WLANs. | Optional, used when collision avoidance is critical. |
| **Purpose of IFS** | To provide a time delay between wireless transmissions, and to prioritize certain types of wireless traffic. | Not directly relevant. IFS is used in both CSMA/CA and RTS/CTS. |
| **Purpose of backoff** | To provide a random time delay, to help avoid collisions when multiple stations try to transmit at the same time. | Not directly relevant. Backoff is used in both CSMA/CA and RTS/CTS. |
| **Hidden Node Problem** | Less effective against hidden node problems. | More effective against hidden node problems. |