

802.11 is a family of IEEE standards for wireless local area networking (WLAN). These standards define the specifications for implementing wireless communication in various frequency bands, including 2.4 GHz, 3.6 GHz, 5 GHz, and 60 GHz. Here are some common features across different iterations of the 802.11 standard:

- **Wireless Connectivity:** 802.11 standards enable devices to connect to a wireless network without the need for physical cables, providing flexibility and mobility for users.
- **Data Rates:** Each 802.11 standard specifies maximum theoretical data rates, which represent the maximum speed at which data can be transmitted over the wireless network. Newer standards typically offer higher data rates compared to older ones.
- **Frequency Bands:** 802.11 standards operate in different frequency bands, such as 2.4 GHz and 5 GHz. The choice of frequency band affects factors such as range, throughput, and susceptibility to interference.
- **Modulation Techniques:** 802.11 standards use various modulation techniques to encode data onto radio waves for transmission. Common modulation schemes include Orthogonal Frequency Division Multiplexing (OFDM), Direct Sequence Spread Spectrum (DSSS), and Quadrature Amplitude Modulation (QAM).
- **Channel Width:** 802.11 standards specify the width of radio channels used for communication. Wider channels allow for higher data rates but may be more susceptible to interference.
- **Security Mechanisms:** 802.11 standards include security mechanisms to protect wireless networks from unauthorized access and eavesdropping. Common security protocols include Wired Equivalent Privacy (WEP), Wi-Fi Protected Access (WPA), and WPA2/WPA3.
- **Quality of Service (QoS):** QoS mechanisms in 802.11 standards prioritize certain types of traffic over others to ensure that critical applications receive sufficient bandwidth and latency requirements are met.
- **Multiple Access Methods:** 802.11 standards support various multiple access methods for sharing the wireless medium among multiple devices. These methods include Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) and contention-based access.

- **Interoperability:** 802.11 standards ensure interoperability between devices from different manufacturers by specifying common protocols and communication procedures.
- **Backward Compatibility:** Newer 802.11 standards are typically backward compatible with older ones, allowing devices supporting newer standards to communicate with devices supporting older standards. However, communication may be limited to the capabilities of the older standard.

These features collectively define the capabilities and characteristics of 802.11 wireless networking standards, enabling the development of diverse wireless applications and services.