

802.11g is a Wi-Fi standard ratified by the IEEE in 2003, designed to provide higher data rates compared to the preceding 802.11b standard while maintaining compatibility with it. It operates in the 2.4 GHz frequency band, just like 802.11b, and offers a maximum theoretical data rate of up to 54 Mbps.

Here are some key features of 802.11g:

- **Backward Compatibility:** One of the significant advantages of 802.11g is its backward compatibility with 802.11b. This means that devices supporting 802.11g can communicate with devices using the older 802.11b standard, albeit at the slower 802.11b data rates when doing so.
- **Increased Data Rate:** 802.11g offers a maximum theoretical data rate of up to 54 Mbps, which is significantly higher than the 11 Mbps offered by 802.11b. This higher data rate was achieved through the use of Orthogonal Frequency Division Multiplexing (OFDM), a more efficient modulation technique compared to the Direct Sequence Spread Spectrum (DSSS) used in 802.11b.
- **Interference Mitigation:** 802.11g improved upon 802.11b in terms of interference mitigation, although it still operates in the crowded 2.4 GHz frequency band, which is shared with other wireless technologies such as Bluetooth and cordless phones. This band is susceptible to interference, which can degrade performance.
- **Range and Coverage:** Like 802.11b, the range of 802.11g networks can vary depending on factors such as environmental conditions and interference. In general, it offers similar coverage to 802.11b due to operating in the same frequency band.
- **Widespread Adoption:** 802.11g quickly gained popularity due to its backward compatibility with 802.11b, higher data rates, and relatively low cost. It became the dominant Wi-Fi standard for several years until newer standards like 802.11n and beyond were introduced, offering even higher speeds and improved performance.

Overall, 802.11g played a crucial role in the proliferation of Wi-Fi technology, providing a significant improvement in data rates and paving the way for the development of subsequent Wi-Fi standards.