Wireless LAN Networks : Selecting Channels

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The IEEE 802.11b/g/n all operate in the microwaves frequencies of the radio spectrum. The IEEE 802.11b/g/n standards operate in the 2.4 GHz to 2.5 GHz Spectrum, while 802.11a/n/ac standards operate in the more heavily regulated 5 GHz band.

The figure that you can see there highlights which 802.11 standard operates in the 2.4 GHz, 5 GHz, and 60 GHz bands. Each spectrum is subdivided into channels with a center frequency and bandwidth, analogous to the way radio bands are subdivided.

The 2.4 GHz band is subdivided into multiple channels. The overall, combined channel bandwidth is 22 MHz with each channel separated by 5 MHz. The 802.11b standard identifies eleven channels for North America. The 22 MHz bandwidth, combined with the 5 MHz separation between frequencies, results in an overlap between successive channels.

In Europe, there are thirteen 802.11b channels.

Interference occurs when an undesired signal overlaps a channel reserved for a desired signal, causing possible distortion. The solution to interference is to use non-overlapping channels. Specifically, channels 1, 6, and 11 are non-overlapping 802.11b channels.

A best practice for WLANs requiring multiple APs is to use non-overlapping channels. If there are three adjacent APs, use channels 1, 6, and 11. If there are just only two, select any two that are five channels apart, such as channels 5 and 10.