**6. What are the differences between 802.11a and 802.11b?**

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| **Feature** | **802.11a** | **802.11b** |
| **Frequency Band** | |  | | --- | |  |  |  | | --- | | 5 GHz | | 2.4 GHz |
| **Maximum Data Rate** | 54 Mbps | 11 Mbps |
| **Channel Bandwidth** | 20 MHz | 22 MHz |
| **Modulation** | OFDM (Orthogonal Frequency Division Multiplexing) | DSSS (Direct Sequence Spread Spectrum) |
| **Range** | Shorter due to higher frequency (around 50m indoors) | Longer due to lower frequency (around 100m indoors) |
| **Interference** | Less interference (fewer devices use 5 GHz) | More interference (2.4 GHz is crowded with Bluetooth, microwaves, etc.) |
| **Adoption & Cost** | More expensive, used in enterprise environments | Cheaper, widely adopted in homes and businesses |
| **Speed** | 802.11a is faster but has a shorter range. | 802.11b is slower but has a longer range. |