

## Internet Connection Method

Wireless (Home Wi-Fi) is usually the most common means of connecting to the internet for residential customers. Unfortunately, there is a downside to this form of connection and can add more points of interference. For the fastest and most stable connection we recommend using an Ethernet cable that's plugged directly into your router.

### Signs of Wi-Fi Interference

- Slower speeds
- High latency
- Frequent disconnects
- Inability to connect

### *Variables That Can Affect Wi-Fi Networks*

#### *Other Wi-Fi Networks*

- When multiple networks are located close together, for example in apartment buildings, this will affect the wireless capacity. This usually causes issues with the 2.4 GHz band since this frequency has a larger range and less channel options. Neighboring networks are the single largest source of interference on our wireless network.

#### *Bluetooth*

- Wireless devices such as headsets, keyboards, and mice can interfere with the Wi-Fi signals. Bluetooth uses frequency hopping to connect devices, which means it skips around on the 2.4 GHz band, this can happen up to 1600 times per second.

- When equipment that uses Bluetooth jumps into the frequency range of equipment that uses Wi-Fi, it can therefore ruin some of the Wi-Fi traffic and create delays. As it jumps so often, actual impact on Wi-Fi will be highly variable, making such scenarios rather hard to troubleshoot.

- Most newer routers will have the channel mode set to auto by default. This means that the router will scan all channels every so often and switch over to whichever channel has the least amount of use. If you're having an issue that relates to Bluetooth this setting may cause you to lose more Wi-Fi traffic.

#### *Other Devices That Use Radio Waves*

- Baby monitors, walkie talkies, and/or radio locator to keep track of your pets or keys. Such equipment tends to use the same frequency as the older Wi-Fi standards 802.11 b/g/n and will therefore interfere with the 2.4 GHz band.

- Traditionally, this type of equipment does not use Wi-Fi and uses the entire frequency band without any regard to other communication on the same frequency.

### *Microwave Ovens*

- Microwave ovens use electromagnetic waves of 2.4 GHz to heat food. Unfortunately, the older Wi-Fi standards, 802.11 b/g/n also use electromagnetic waves at 2.4 GHz, but with far weaker transmit power.

- Although all microwave ovens are well covered, there will always be some degree of "leakage" of waves. A slight leak is not dangerous to humans but most microwave ovens are about 1000 W and most Wi-Fi access points transmit a maximum of 0.1 W. Therefore, it does not take much of a leak for the 2.4 GHz band to become unusable in the area

### *Physical Obstacles*

- Some obstacles are simple to remove, and in other cases you may be able to move the access point (router and/or mesh unit) away from the obstacles. Building materials in the home are harder to address; thick walls, old wiring, bookshelves, ect.. Equipment that uses the 5GHz band is more dependent on having a clear line of sight. This also affects the 2.4GHz band but to a lesser degree. So if your Wi-Fi needs to reach multiple floors or out to a detached garage/building you'll notice reduced speeds. This is especially true if the floors are heated or if the detached building has metal siding.

- The solution we recommend to ensure coverage in such cases is adding one or more mesh network extender units. This adds additional wireless access points that can work their way around the obstacles.