



# WI-FI AND BROADBAND TIP SHEET

## WI-FI NOTES

- In the Wi-Fi sheet it mentions frequency of the router/gateway, 2.4 GHz or 5 GHz. It is recommended that an apartment or condominium type of housing the setting should be 5 GHz to avoid any possible interference with other devices that commonly operate in the 2.4 GHz frequency range. Even though you may not use devices in that range, your neighbors may and their devices could interfere with Wi-Fi performance.
- It is recommended to use the router that is built into the residential gateway, which is at a minimal \$5.00 per month fee. This gateway/router is managed by Lumos Networks and is kept up to date on firmware updates and security protocols. Utilizing the Lumos Networks Wi-Fi router also gives us visibility on connected devices and assists us in troubleshooting issues should the need arise.
- As technology has evolved wireless routers have also evolved to match the customer's needs. If you decide to use your own router some of the important items to look for are:
  - **Router type:**
    - Early routers listed a 'G' series are very limiting on bandwidth and not recommended in today's environments. (most 'G' series routers cannot achieve more than 55Mbps of pass through)
    - The next series routers, 'N' series, are much better and the top end of this group can achieve up to 600Mbps of bandwidth pass through or more in some cases.
    - 802.11ac routers are recommended in the applications requiring more bandwidth and are typically 'Gigabit' approved.
  - **Is 5 GHz better than 2.4 GHz?**
    - 5GHz can typically pass more data and more intense data needs like video streaming and gaming. (Advantage 5Ghz)
    - The higher the frequency the shorter the range, in particular, 5Ghz frequencies do not penetrate solid objects as well as 2.4Ghz limiting their reach inside homes. Many older Wi-Fi devices do not contain 5 GHz radios and so they must be connected to 2.4 GHz. (Advantage 2.4Ghz) NOTE: The Lumos WiFi router allows you to select the frequency by device so some devices can be set at 2.4Ghz while other are set at 5Ghz.
    - Network interference usually resides in the 2.4 GHz space and by using the 5 GHz frequency interference is negated. (Advantage 5Ghz)
    - Recommendation: Flexibility to be able to switch frequencies is nice if there are older devices being deployed but in most apartment or side-by-side family dwellings the 5 GHz setting is generally preferable. The new technologies like AC routing and MESH routing can make the environment more seamless but generally at a higher price.
  - **Recommended routers:**
    - Any consumer grade router can be utilized with Lumos fiber optic broadband service however to achieve the best performance it is important to look at products that can support and deliver the bandwidth being subscribed to and do so reliably.
    - Some recommended CE routers:
      - ASUS RT-AC88U (retail \$270)
      - Netgear Nighthawk x6 (retail \$230)
      - Linksys AC1900 WRT1900ACS (retail \$160)
      - D-Link AC3200 (retail \$180)
      - Netgear Orbi Mesh (retail \$349)
      - NOTE: These units were recommended based on trade magazines and independent rating groups (reference Lifewire.com)
- The key in these recommendations is that these have been highly rated and perform well in most environments similar to our Residential Gateway / Router. The difference is that we manage the updates and security protocols for you and at \$5.00 per month it would take 32 months of use before you would break even on the lesser expensive model recommended. The Lumos Wi-Fi is the best value for the consumer and soon the Premium Wi-Fi service will be available for better performance at a slightly higher price (release date TBD).

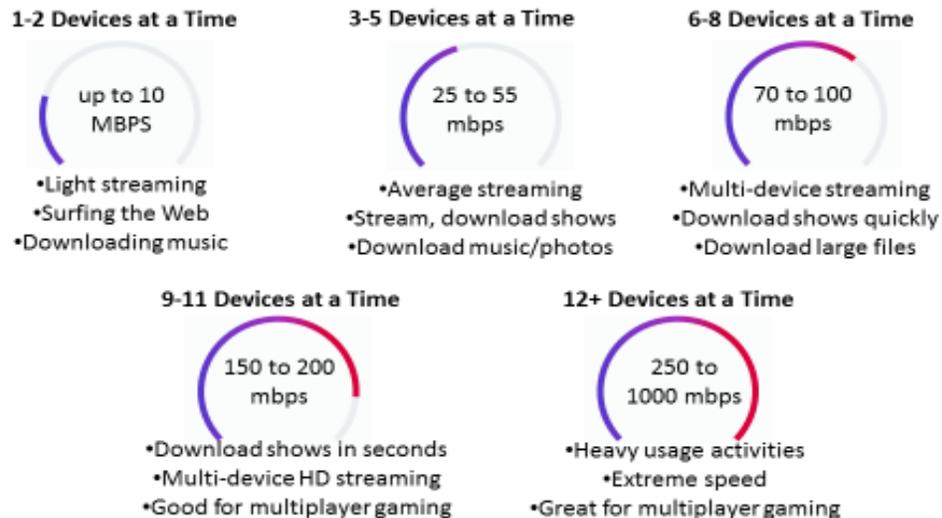
## HARDWARE VERSUS WI-FI

- Included in the Broadband set up is the ability to hardwire a device directly to the gateway. This will insure proper delivery of all bandwidth being delivered to the connected device and is preferable for a stand-alone PC.

- In this day and age on connected devices, the Achilles heel is Wi-Fi as there is no guarantee on the speeds and bandwidth being delivered due to atmospheric and ecosystem. Hardware of a device is preferable to guarantee speed delivery but newer devices may not even have a hardline connection. So think wireless and think Wi-Fi but performance is dependent on many factors so product choice is important.

## CONTENDING DEVICES

- Wi-Fi bandwidth is being shared by all of the devices being used in the home that are in contention with each other. Choosing the speed profiles is important for performance based on the house hold needs , here are some simple tips:



- Contending devices do not all share the same characteristics and the need should be taken into consideration. For example simple surfing on an IPAD or tablet may not consume much of the subscribed bandwidth however navigating Facebook may. Here are some simple metrics to determine contending utilizations:

- Netflix recommends a minimum of 5Mbps
  - 1.5Mbps SD content
  - 3Mbps DVD quality
  - 5Mbps HD quality
  - 8Mbps or more for playback from Sony PlayStation
  - 25Mbps for 4K content
- Smart TV applications: 3Mbps
- Internet TV services: minimum 3 Mbps
- TV Everywhere content: minimum 3Mbps
- Basic Internet Usage: 2 Mbps
- Streaming Video: 10Mbps
- Streaming Music: 2Mbps
- Large file downloads: up to 15Mbps
- Online gaming: 15Mbps

**NOTE:** these are general guidelines but you can see from the examples that consumption can easily be limited by the bandwidth being subscribed to. For example: Wife watching Netflix on IPAD in HD quality, Daughter streaming music while browsing Facebook, Son playing games on PlayStation and Father downloading 'how to' videos from the internet.

This example shows up to 50Mbps or more of bandwidth needed to perform all of these tasks smoothly without interruption or possible buffering.

## THE LUMOS NETWORKS ADVANTAGE

Setting up a router and managing your own Wi-Fi experience can be frustrating and most times does not optimize performance which leaves subscribed bandwidth under-utilized. If there is a problem with customer owned routers or equipment that require a service visit the average cost associated would start at \$75 and go up from there.

Lumos Networks managed Wi-Fi service takes the hassle out of set up and also troubleshooting problems as they arise. If you would like to take advantage of our managed Wi-Fi services give us a call at – 1-800-262-2200