***Home Networking Guide***

Home networks are usually peer-to-peer networks that offer wired and wireless access to the Internet and to shared files and peripherals.

Hardware

Most home networks include basic hardware components that include a broadband modem, a router, and perhaps a switch. In addition, all network devices must have a network adapter which is usually integrated in the device.

* Broadband modem: brings an Internet signal from the Internet service provider into the home.
* A black router with multiple antennas

  Description automatically generatedRouter: the central device of a home network. The router is the gateway between the Internet and your home network. And it is how all the devices on your home network communicate with one another. Routers generally have four ports to host up to four wired networking devices. Most routers today also have wireless capabilities, and can support up to 250 networking devices.
* Switch: used to add additional wired networking devices beyond the four supported by a traditional router.

Wireless vs. Wired

Wired and wireless connections are necessary in most home networks. The best performance will come from a wired connection, but often a wireless connection offers the most convenience, especially with portable devices such as laptops, tablets, and smartphones. In fact, many new devices do not have dedicated Ethernet ports that are used for wired connections.

***Current Wireless (Wi-Fi) Standards:***

* 802.11g: Introduced in 2003, operates on a 2.4 GHz frequency, thus subject to interference with other devices also operating at the same frequency, such as microwaves and wireless home phones.
* 801.11n or Wireless-N: Available since 2009, this wireless standard operates at 2.4 GHz and 5 GHz frequencies, thus reducing interference from other devices. Dual band routers with two access points can be used with the 802.11n standard, which also improve Wi-Fi signals.
* 8011.ac or 5G Wi-Fi: operates only on the 5GHz frequency, and is much faster than previous standards.

A close-up of a wi-fi adapter

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Powerline Adapters

Powerline adapters make use of your home’s electrical wiring to create a network. As such, they are generally not meant to completely replace the traditional Ethernet wired or wireless networks, but can be a good complement to a home network to extend the signal where wireless doesn’t reach, and wires are not practical. At a minimum, two powerline adapters are needed. One adapter is connected to the router with an Ethernet cable and plugged into a standard electrical outlet. The second adapter is plugged into another electrical outlet, and a device (such as an HD TV or gaming console) is connected to the powerline adapter with an Ethernet cable.