

Creating a Home Network

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What is a home network, and why should I care?

A home network is a small collection of computers and other devices able to communicate with each other. By allowing them to communicate, you can greatly increase the number of things your devices can do.

What can a home network do?

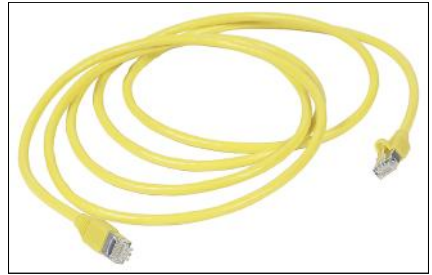
- **Internet connection sharing** among multiple devices/computers in your home.
- **File sharing** allows you to copy, move or delete files among computers on the network.
- **Network printing** allows you to make a hard copy of a document or photo from any computer in your home.
- **Backing up files** to another computer over the network can be a convenient and efficient alternative to duplicating your files on an external drive.
- **Local media streaming** refers to playing media files housed on another computer or device on the network. For example, an Apple TV (\$99) connected to your HDTV can stream digital music and movies from files stored on your office computer.



Stream movies and music from a computer on your network to a device connected to a TV. The Apple TV is one of several media streamers available.

What are my options for network connections in the home?

- **Wireless networks** have become a de facto standard; nearly all notebook computers sold today and many other electronic gadgets come equipped with wireless networking capabilities (called Wi-Fi). Browsing the Internet or streaming media using Wi-Fi is liberating compared to being tied down to your office desk and chair. The speediest current models follow the 802.11n Wi-Fi standard, though slower 802.11g and 802.11b models can still be found.
- **Wired networks** send and receive their signals over a special type of cable called Ethernet. Most desktop computers, and many notebook computers have Ethernet jacks.
- **Powerline networks** use your existing AC wiring to transmit and receive network signals. Netgear, Belkin and other companies offer products of this type.



Ethernet cables provide a speedy means of sending information from one device to another on a network.

Which type of network is best for me?

- For convenience and lack of cable clutter, you can't beat **Wi-Fi** networking. If you decide to go wireless, make sure to enable wireless security, preferably of the type Wi-Fi Protected Access (WPA) or the more recent WPA2. Wi-Fi networks – particularly those using the recent 802.11n standard – should be sufficiently speedy for most household activities, but if you're planning to stream high-definition video, either from a local source or from a remote service like Netflix, you may run into trouble. High-definition video can often be more than wireless networks can handle, causing the picture to stutter or pause.
- **Wired networks** are the best choice if data speed is your highest priority. They can be difficult to implement in an existing home, though, as you'll need to run special cable to each room with a network-connected computer or device. For the fastest and most future-proof wired network installation, look for **gigabit Ethernet** or **1000BASE-T** (two phrases referring to the same standard) rather than the older 100BASE-T standard. Gigabit

Ethernet is theoretically ten times faster than the 100BASE-T.

- The latest generation of **powerline network adapters** are capable of exceeding the speed of wireless networks, so they are worth a look if you're trying to stream high-definition video but cannot install Ethernet cable.

What do I need to get started?

1. You'll need **networkable computers or devices**. The most recent versions of major operating systems (Windows, Macintosh and Linux) have excellent support for home networks. For other devices, such as printers, game consoles and media streamers, check product literature to determine whether they are networkable.
2. You'll also need a **router** (\$50–\$150). This device acts as control and distribution center for network addresses and enables Internet connection sharing. Most routers on the market support both wireless and wired networks.
3. For wired networks, you'll need several **Ethernet cables** – sometimes called network patch cables. It's best to use a type of cable called Category 6 (Cat 6 for short) in order to future-proof your network. Cat 5E cables will also work, though their maximum speed is somewhat lower.
4. If you opt for power line networking, you'll need at least two **power network adapters** (\$100–\$150 per pair). Due to variability in results, it's probably wise to purchase them from a store with a good return policy. Don't attempt to mix and match power network adapters from different manufacturers on a network.
5. For large wired networks, you may need one or more **network switches** (\$20–\$50 per five-port switch). These devices are analogous to power strips which expand a single electrical outlet into several outlets. In the case of a network switch, you can connect multiple devices like printers, computers or game consoles to one Ethernet connection. If your computer supports gigabit Ethernet, make sure any switches you purchase are gigabit Ethernet capable.



A network switch, such as this model from Netgear, lets you attach additional devices to your network.

I've heard that some routers can be hacked to run other software. Should I try to get one of them?

It's true that some routers can be modified to run other firmware (software loaded into the router's computer chips). Running 3rd-party firmware often gives you additional functionality and control over the operation of the router than factory firmware. However, unless you're an advanced computer hobbyist, you're likely to find that factory firmware will suffice.

Perhaps the best-known 3rd party firmware for routers is known as DD-WRT (*dd-wrt.com*). Other popular firmware options include Tomato (*polarcloud.com/tomato*) and OpenWRT (*openwrt.org*). Not all routers support 3rd party firmware, so make sure to check the firmware site to make sure your model is compatible. Modifying an incompatible router can render it inoperable.

Home Networking Resources on the Internet

- **ConsumerSearch.com's** guide to wireless routers (*consumersearch.com/wireless-routers*) summarizes reviews from online and print sources and provides recommendations of specific models.
- **The Ultimate Guide to Home Networking** by *PCWorld* (*pcworld.com/article/196049/the_ultimate_guide_to_home_networking.html*) is an excellent primer on creating a home network.
- **SmallNetBuilder** (*smallnetbuilder.com*) provides in-depth reviews on networking products like routers and switches. The information provided is geared to intermediate and advanced users, but even novices can benefit from the many performance test results.

If you have questions, comments or suggestions, you can visit me at the Reference Desk, contact me via email (moetting@hinsdalelibrary.info), or call me at 630.986.1976 ext. 225.

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