SELECTING BASIC WIRELESS NETWORKING HARDWARE

For the most part, all you really need to add to your existing wired network to extend it with a wireless local area network (WLAN) is that piece of hardware we've been talking about - the wireless access point. For less than the cost of an additional public access computer, you can extend your wired network with a WLAN by installing a wireless access point in your building. Because this is the most important piece of hardware you'll need, most of this article will focus on what to look for in your access point(s). You may also want to look into a wireless "gateway," which will separate your public access computers and your staff computers into two separate networks that share one internet connection. (For more information about a wireless hotspot gateway in action, read our "Wireless Security for a Small Library".)

Wireless Access Point

- **Choosing a wireless standard**

  As soon as you start investigating wireless hardware, you will be confronted with the magic numbers - 802.11. The IEEE 802.11 standard specifies the wireless transmission of data on a certain frequency band at a specific speed between a wireless client and an access point. The standard comes in several flavors and determining which one to use can get confusing. We'll make it simple. Look for a wireless access point that supports the 802.11g standard. IEEE 802.11g is the latest member of the wireless standard family. It specifies speeds of 54 Mbps over the 2.4 GHz radio frequency band and is designed to be backward-compatible with 802.11b networks. It's pretty much the best of all worlds in terms of which wireless standard you want.

- **Wi-Fi Alliance certification**

  Make sure the wireless access point you buy is Wi-Fi certified. The Wi-Fi certification seal certifies that your equipment will interoperate with any other Wi-Fi certified equipment. (For more information on the Wi-Fi Alliance and its "seal of approval", visit the website at http://www.wi-fi.org.)

- **Networking functionality**

  What functions does the access point perform? Aside from acting as a relay between the wireless devices and the wired network, many access points today are able to perform many of the functions that traditional routers serve - DHCP (doling out IP

addresses to both wired and wireless clients on your network), switching and bridging are a few. What you actually use depends heavily on what your existing network already has. If you already have a DHCP server on your network, you might not use the DHCP functionality of your access point. However, the more functionality the access point offers, the more flexible it allows you to be with your entire network configuration.

- **Security functionality**
  What wireless security functionality does the access point support? The 802.11 standard attempts to address who is allowed to send traffic on the WLAN (authentication) and how traffic sent on the WLAN remains private and maintains integrity (encryption). Wireless Equivalent Privacy (WEP) is the security technology that is standard with all Wi-Fi equipment and was the first 802.11 attempt at security. There are some drawbacks to relying on WEP to secure your wireless LAN - it has proven vulnerable to attacks. The next generation 802.11 security is Wi-Fi Protected Access (WPA) and it's more secure than WEP. Most access points on the market today support WEP and WPA. You might choose to use either one of these or none of them. How much security you need or want on the WLAN depends on what kind of data you are protecting. Many libraries who use WLAN segments for public internet access use neither WEP or WPA and let their patrons know that they use the WLAN at their own risk. Regardless of what type of security you use (or don't use) on the wireless access point, you will still want to have some sort of hardware firewall to protect your private network from the public access computer network.
- **Initial setup and management**
  What method(s) can you use to manage the access point and, more importantly, access to the WLAN? Most wireless access points on the market today offer an easy-to-access web-based management program. For the most part, all you have to do to get started is connect a computer to the access point via its one of its Ethernet ports, open your web browser and go to the default (out-of-the-box) IP address of the access point. Browser-based software will walk you through the steps of the initial setup. Another important thing to consider is how you will be able to upgrade your device's firmware. As wireless functionality and standards evolve, you may need to upgrade the firmware that makes the access point compatible with other wireless devices and able to operate with newer technologies you might install in your building.

Here are some other hardware features you might like to have, but may pay more for!

- **Power over Ethernet (PoE)** - This feature allows power for the access point to be delivered via one of its Ethernet ports instead of requiring an electrical outlet. PoE requires an additional piece of hardware, which can be expensive. If you have an available electrical outlet for your access point, you probably don't need this feature.
- **Automatic channel selection**
  This feature becomes important if you are going to try to install more than one access point. When a second access point is added to an existing wireless network, the automatic channel selection feature does exactly what it says - it automatically finds a channel to operate on that does not conflict with the operating channel of the original access point.
- **Removable/upgradeable antennas**
  The range of your access point can sometimes be improved by upgrading the access point's antennae. If your access point comes with detachable antennae, you'll be able to do this down the road.

Cost

This one goes without saying. Don't pay for features and functionality you don't need.

Wireless Network Adapters

If you will be going that extra mile and providing wireless network adapters (sometimes called wireless NICs) for your patrons to borrow, you will want to make sure that the adapters you purchase work with your wireless access point. Again, make sure that the adapters you purchase are Wi-Fi certified. One way to ensure that the adapters you loan out will work with your access point is to purchase adapters that are the same brand as the access point or actually say in the product documentation that they work with your specific access point model. (Seems like a no brainer, but we thought we'd say it anyway.) You will want to purchase adapters that operate using the same standard as your access point (802.11b or 802.11g) and support WEP or WPA security, if you choose to use those.

The two most common form of wireless adapter are the PC Card (also called PCMCIA cards) and the USB adapter. Almost all wireless-capable devices today come with at least one USB port. In order to use the PC Card, a device needs to have a PCMCIA slot - still fairly common in notebook computers today.

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