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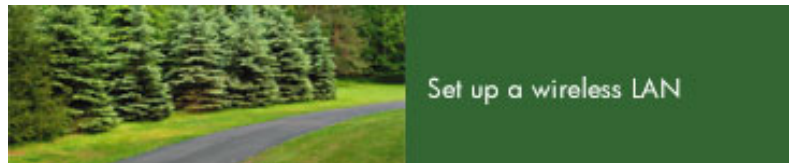
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Overview

This How-To Guide walks you through the steps you need to take to evaluate the role wireless networking technologies might play in your organization's overall networking solution, and helps you understand what it will take to implement a wireless networking solution. The different sections of the guide include:

- » **Understand it:** learn more about the benefits of wireless networking and how it can help you save money and be more productive.
 - » **Plan it:** evaluate your current business activities and network usage to identify areas that might benefit from wireless connectivity. Then, create a plan for integrating wireless connectivity into your wired infrastructure.
 - » **Do it:** walk through the different steps in setting up a wireless networking solution. This section shows you exactly what it takes to get your solution up and running.
 - » **Use it:** use your new wireless connectivity to be more productive and efficient. Learn what security measures you should take to protect your wireless communications as effectively as you protect your wired communications.
 - » **Buy it:** shop for the products that can help you implement your wireless LAN solution.
- » Understand it

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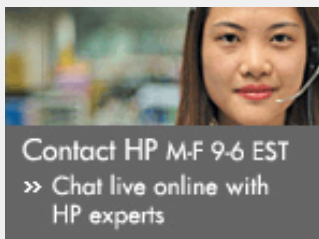
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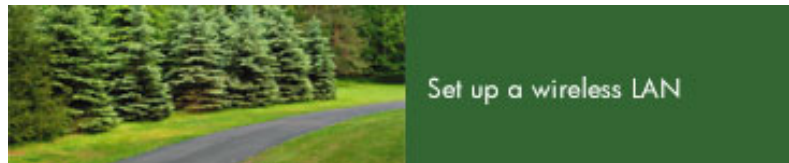
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Understand it

Wires may connote a busy office full of the latest equipment, but wires can be an inefficient networking medium. They can only carry a signal so far, and you have to physically move and rearrange them if you want to reorganize your network configuration. Wires do not add to the aesthetic appearance of your computing setup, either. While wires are the traditional medium for creating networks, they aren't always the best. Wireless networking is a viable and affordable alternative to traditional wired networks that gives you the same benefits without cumbersome and limiting wires.

In a wireless network, all of the computers broadcast their information to one another using radio signals. This can make networking extremely easy, especially when you have computers throughout your office. When you don't have to work with wires you can more easily reconfigure your office space as your company grows and changes, and you can also extend connectivity to new or visiting staff quickly and easily. A wireless network gives employees increased mobility and allows them to share files, printers, other computing devices, and Internet access without wires.

For example, your staff can use laptops with a wireless network card at a conference room table and still be connected to your network -- without worrying about whether the conference room is actually wired for access. From their networked computer they can share files, printers, and Internet access just as they would if there were connected to the LAN with wires. Meetings can be more productive as participants have access to the information they need when they need it and can begin work on, if not complete, action items right in the meeting.

Wireless LANs can be part of a completely wireless network, or an extension of your wired LAN. In the real world, you probably won't switch from a wired LAN to a wireless LAN overnight, but will instead integrate wireless into your network as it makes sense and meets your needs. Once you have a thorough understanding of what wireless can do for you, and what it takes to integrate it into your current systems, you can better proceed down the path to a wireless networking solution.

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Plan it

No technology solution, regardless of its application or potential, is a good solution for your organization if it doesn't meet a need, improve productivity and efficiency, or otherwise contribute to your ROI. As you consider wireless networking as a LAN solution you should first assess its fit for your organization and then investigate what it will take to integrate wireless technologies with your existing infrastructure. Once you've determined that wireless is a viable solution, you can begin to formulate your customized wireless plan.

Assess the fit

A wireless network has several major advantages over a wired network. As you review them, consider how they might benefit your organization.

- **Reduced cost of installation:** It can be expensive to wire your building with Category 5 cabling to enable Ethernet capability or extend your existing capabilities. It may be significantly less expensive to install wireless access points and enable wireless support for notebooks, desktops, and printers (discussed in the do it section).
- **Flexibility:** If you regularly expand or reorganize your office, or need to accommodate a variety of network configurations, the rapid transition time from one configuration to other that wireless provides can help reduce your network down time. In addition, you won't have to incur the costs associated with physically rewiring office space.
- **Convenient information access:** The most exciting advantage of wireless networking is the ability to extend access to key information to anyone on your staff, from anywhere in the office, even when they aren't physically connected to your wired LAN connection. Do members of your staff regularly work away from their desks or stations, but could benefit from anytime, anywhere access to important data? Could you improve productivity by increasing access to important company systems? Do you have business processes you could streamline by reducing the number of times employees have to go back to their wired connections?

As you begin to visualize how wireless networking might play a role in your larger networking solution, you should next consider what integration points you'll need to address for the solution to work. Your wireless networking solution doesn't exist in a vacuum (unless of course you are building a complete wireless networking infrastructure from scratch that is).

Assess the integration points

To evaluate your current general networking capabilities and your future networking needs with wireless integration in mind, ask yourself the following:

- How is your current networking infrastructure configured? How many workstations, offices, and conference rooms are connected to the network? How many are not connected that you would like to connect?
- How many people use the computers and communications systems in your company now?
- Does your staff conduct business at locations away from their primary work area?

What kind of equipment does your staff use? Are they mobile with notebook computers and PDAs or do the majority of your workers use desktop systems? Do those who would benefit most from wireless, mobile access already use notebooks?

Formulate a plan

After you have a good idea of how wireless can improve your business processes and some

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insight into the integration points a wireless solution would have with your existing wired environment, you can begin to formulate a business plan for your wireless solution. The equipment you buy and the way you configure your wireless network will be driven by your business needs and plan, so it's important you have a clear plan before you spend any money on equipment or other resources.

Carefully define all of the ways you would like to use wireless networking and related technologies in your organization. If you have several ideas for ways wireless can improve your business write them all down and rank them in order of importance. Identify a potential pilot program you can use a to test a wireless integration. If you start small and plan to grow your wireless network (an easy thing to do), you have the opportunity to see if your wireless solution has the effect you thought it would and to learn more about wireless capabilities.

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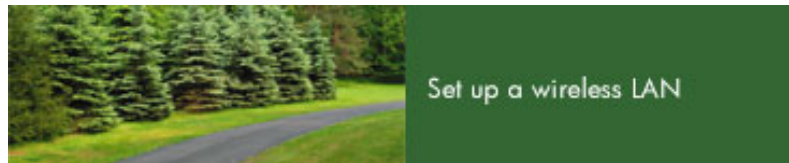
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Do it

Once you have a business plan in place that defines how you want to add wireless networking capabilities to your office you can get down to the business of actually setting up your wireless network. It's easier than you might think. The first step is understanding the equipment involved in a wireless network.

Wireless LAN equipment

A wireless LAN consists of two main components:

- A wireless LAN-enabled client
- An access point

A wireless LAN-enabled client is a notebook computer, printer, handheld, or any other device capable of communicating over a wireless LAN. Wireless-enabled devices come in two flavors: those that are built with wireless networking functionality embedded in them and those that have it added to them later. A variety of notebook PCs, PDAs, printers and other devices from HP come with wireless functionality built right in.

Devices that aren't already wireless-enabled can quickly be made so with the simple addition of a wireless LAN card. A wireless LAN card is a PC card for a notebook computer, or PC card and a PCI adapter, or a Universal Serial Bus (USB) device for your desktop computer. Printers and PDAs use similar cards for their wireless communications.

The center of the wireless to wired LAN connectivity is the wireless access point. These points aggregate wireless radio signals and then connect the two LANs. The access point is generally book-sized. It contains a radio transceiver, communications and encryption software, and an Ethernet port for a cable connection to a hub or switch on the wired LAN.

The radio transceiver built into the access point negotiates a connection between the end user and the wired LAN, hooking the user up to the LAN in the same way a cable would. The greater the distance is from the computer to the access point, the poorer the signal and the slower the connection. Because of this limitation, large offices often deploy several access points with overlapping ranges. In an open-space environment free of obstruction, access points can be as much as 300 feet apart. Where walls and ceilings jut out, 50 feet is a useful maximum range.

Building a wireless LAN

There is no single way to build a wireless LAN. Your particular needs and budget will drive how and when you integrate wireless networking technologies into your network infrastructure. Even so, building your own wireless LAN is very much a step-by-step process that includes:

- Identifying the equipment you want to buy.
- Determining the number of users who need to have access to the network.
- Planning for the connection to your wired LAN.
- Configuring your wireless devices to work with your network.
- Testing the installation before it goes live.
- Establishing a procedure to manage your wireless LAN.

Your shopping list should include wireless-enabled devices such as wireless notebooks, access points, wireless LAN adapters, and wireless cards. The quantity of equipment you buy will depend on the number of users that you will have.

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Next, you will need to determine where to install the access point. Ideally, you would want a professional to do this, since they could design a network that would give you maximum range within your building. However, it is very easy to do it yourself as well.

You probably want to install your access point in a central location because there is a limited wireless sphere around it in which wireless devices can access the LAN. You also want to make sure that the access point is installed in as open an environment as possible, so that there are not many obstacles between the access point and usage points. This maximizes the access point's wireless range. To install the access point simply plug in an Ethernet cable that is connected to the wired LAN and use the software that ships with the access point to assign a network name and an encryption key.

Once you buy and configure all of your equipment, you should test your new wireless setup. A good test would not be unlike a rehearsal for a play. With several users and devices, work up a realistic scenario for an exchange of data on the wireless LAN. Using link test software provided by such vendors as Agilent Technologies, you should test for the percent of data sent correctly, the time it takes to receive a response from the destination device, and the strength of the transmitted signal.

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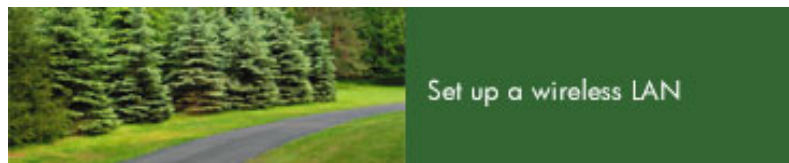
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Use it

Data exchange on a wireless network functions just like data exchange on a wired network. However, because wireless communications are transmitted through the air rather than over a closed cable, you will need to implement some wireless-specific security measures to ensure that your wireless communications are as secure as your wired communications. Wireless solutions use three primary tactics to maintain network integrity:

- MAC addressing
- WEP encryption
- Traditional VPN security

MAC addressing

MAC (media access control) addressing restricts network access to authorized devices by assigning each network card a unique hardware identification number. The network access point can be programmed to communicate only with approved MAC addresses, and it maintains these approved addresses in a password-protected table. Any attempts to access the wireless network by devices with unauthorized MAC addresses are denied.

You shouldn't purchase a network access point that doesn't have support for MAC addressing, and of course be sure you enable MAC addressing once you have the access point up and running. Quality access points like those available from HP will always have support for MAC addressing.

Encryption

Once they access the network, wireless products use the WEP (wired equivalent privacy or wireless encryption protocol) protocol to keep your data transmission safe from prying eyes. The WEP standard delivers the same security associated with traditional wired networks. It is essentially a complicated software algorithm that scrambles data as it is sent and unscrambles it as soon as it is received, keeping it safe in transit.

The down side to WEP encryption is that hackers are already beginning to learn how to hack through it and access networks. However, future wireless protocols will eventually replace WEP. When you evaluate access points and wireless network cards, be sure that you can upgrade them easily as new wireless access standards emerge.

For example, you will be able to upgrade HP's wireless software and hardware as new security methods are tested and become standard. You won't have to invest in new hardware or software, just a bit of your time to run the installation utilities that will bring the hardware and software in your wireless network up to the newest security level.

VPN

The best practice in wireless network security is to begin your security efforts at the front door to the network. You can use Virtual Private Network (VPN) technology to control which users outside of your system have access to it. A VPN is nothing more than a gateway to your network that authorized users who are on the outside (because they are not in the building or working from home for example) have to pass through before they can access any part of your network, wired or otherwise. Before anyone gets to your wireless network, they should have to log onto your VPN and pass its authentication requirements.

Organizations that allow remote access to networks almost always use VPN to control that remote access, so VPN isn't a new technology and there are many resources and tools available to help you get one set up. Don't see a VPN as a barrier to a wireless network, but rather as a common component any network that allows outside access should include. Combined with MAC addresses and either WEP or new wireless LAN protocols, VPN can make your wireless network extremely secure.

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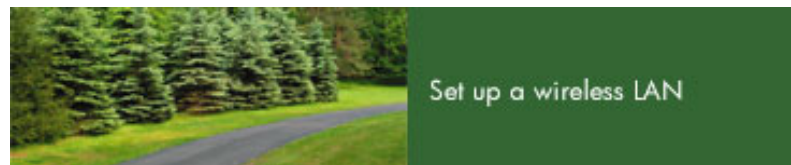
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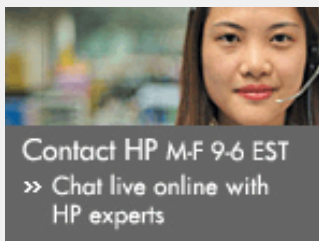
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