



Network & Internet Communications Guide

Business PCs

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This guide provides definitions and instructions for using network interface controller (NIC) features that are preinstalled on some models. It also provides information about Internet Service Providers and solving Internet access problems.

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Network Communications

The following items are covered in this section:

- Ethernet Network Structure
- Network Interface Controller (NIC)-Based Alerts
- Wake-On-Lan (WOL) Support
- Interpreting the Network Status Lights
- Disabling the Autosensing Capabilities
- Installing Network Drivers
- Wireless Networks

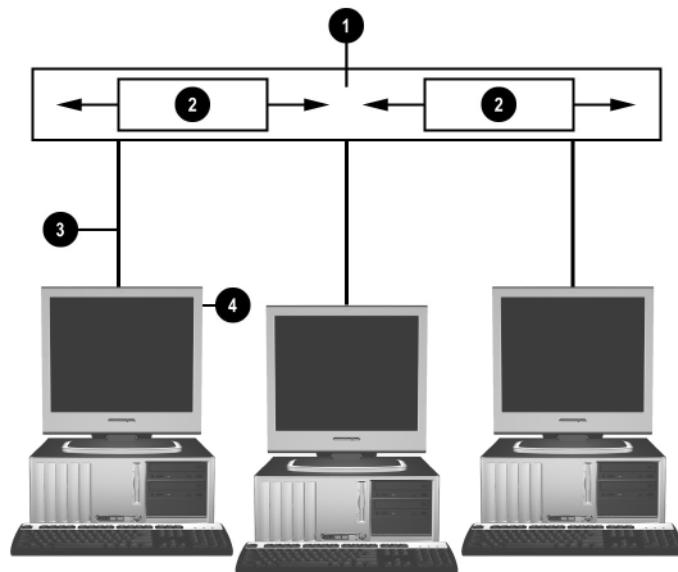
This section provides information about Ethernet networks and the hardware connectors and software device drivers that allow you to access an Ethernet network. Access to a computer network immediately increases your productivity potential. Once the network connection is active, you can share resources, such as a printer, exchange information from computer to computer, and run common software programs.

The computer comes network-ready, which means that it has an integrated network controller and network device drivers already loaded onto the computer hard drive. The computer is ready to make the network connection.

Ethernet Network Structure

All Ethernet networks include some combination of the following elements:

- ❶ Ethernet cable
- ❷ Information packets
- ❸ Drop cables
- ❹ Workstations



Ethernet Network Structure

Refer to the *Hardware Reference Guide* on the *Documentation and Diagnostics* CD for network connector identification.

NIC-Based Alerts

Some NICs feature Alerting Capabilities, which allow a system administrator to monitor the computer over the network remotely. The computer can send hardware and operating system alerts over the network before the operating system is loaded, while the operating system is loaded, while the computer is in low power states, and when the computer is powered off. Depending on the NIC model, these alerts can be monitored in the following states:

- System BIOS hang—On action
- Operating system hang—On action
- Processor missing—On power up
- Operating temperature exceeded—On action
- Chassis intrusion—On power up or on action if system is running
- Watchdog—On action (same as Operating system hang)
- Heartbeat monitoring—Always



NICs featuring Alerting Capabilities comply with Alert Standard Format (ASF) specification 2.0 and support Remote Management and Control Protocol (RMCP) based alerts. ASF 1.0 implementations will not support RMCP due to lack of security in the ASF 1.0 specification.

NIC-Based Alerts are enabled and configured by installing the ASF 2.0 agents for the NIC you are using. These are available at www.hp.com. ASF alerts can also be enabled and configured using the Common Information Model (CIM).

Wake-On-LAN Support (WOL)

Wake-On-Lan (WOL) can be enabled and disabled in Windows XP and Windows 2000.

To enable or disable Wake-On-Lan:

Windows XP

1. Select **Start > Control Panel**.
2. Double-click **Network Connections**.
3. Double-click **Local Area Connection**.
4. Click **Properties**.
5. Click **Configure**.
6. Click the **Power Management** tab, then select or clear the check box to **Allow this device to bring the computer out of standby**.

Windows 2000

1. Select **Start > Settings > Control Panel**.
2. Double-click **Network and Dial-up Connections**.
3. Right-click **Local Area Connection**.
4. Click **Properties**.
5. Click **Configure**.
6. Click the **Power Management** tab, then select or clear the check box to **Allow this device to bring the computer out of standby**.



For more information on Wake-On-LAN, refer to the *Remote Management Administrators Guide*. The *Remote Management Administrators Guide* is included with the Remote Management Setup Utilities and is available on the *Support Software CD* or at www.hp.com.

Interpreting the Network Status Lights

Some Ethernet network interface controllers include network status lights:

- **Link light**—illuminates when the system is physically connected to an active network.
- **Activity light**—illuminates when the computer detects network activity. When the system is connected to a highly used network, the activity light will remain on almost constantly.
- **Operating Speed light**—illuminates during 1000 Mbps or 100 Mbps operation. The color of the light identifies the operating speed.

Some NICs include only two network status lights where link (light on) and activity (light blinking) are indicated by one light and 1000-Mbps or 100-Mbps operation is indicated by the second light. The integrated NIC has two network status lights on the NIC connector:

- **Link/Activity light**—Illuminates green when physically linked to the network and blinks on and off to indicate network activity.
- **Operating Speed light**—Illuminates green when operating at 1000 Mbps, yellow when operating at 100 Mbps, and is not illuminated when operating at 10 Mbps.

Disabling 802.3u Auto-Negotiation Capabilities

Auto-Negotiation NICs automatically determine the maximum network operating speed and duplex capabilities of the attached network and configure themselves on the highest common combination. The computer begins Auto-Negotiation whenever it obtains a valid network link, or when the NIC driver is loaded.

In addition to determining the network operating speed, the computer determines if full-duplex is supported. Full-duplex systems can transmit and receive information on the network simultaneously. Half-duplex systems cannot transmit and receive simultaneously.

If necessary, you can disable the Auto-Negotiation capabilities and force the system to operate in one mode only.

Windows XP

1. Select **Start > Control Panel**.
2. Double-click **Network Connections**.
3. Double-click **Local Area Connection**.
4. Click **Properties**.
5. Click **Configure**.
6. Click the **Advanced** tab.
7. Select **Link Speed & Duplex** in the Property list box.
8. Change the speed and duplex values to the appropriate values, depending on the capabilities of the network.
9. Click **OK**. You may be prompted to restart the computer for the changes to take effect.

Windows 2000

1. Select **Start > Settings > Control Panel**.
2. Double-click **Network and Dial-up Connections**.
3. Right-click **Local Area Connection**.
4. Click **Properties**.
5. Click **Configure**.

6. Click the **Advanced** tab.
7. Select **Link Speed/Duplex Mode** in the Property list box.
8. Change the speed and duplex values to the appropriate values, depending on the capabilities of the network.
9. Click **OK**. You may be prompted to restart the computer for the changes to take effect.

Refer to the documentation provided with the network controller for additional information.



100BaseTX and 1000BaseT operation requires the use of CAT5 UTP cabling or better (CAT5, CAT5a, CAT6).

Installing Network Drivers

The device drivers for the network controller enable the drivers to load correctly in the operating system used, allowing communication with the network.



Device drivers are supplied for the Windows XP. If you are using another operating system, device drivers may be installed from media included with the network operating system or are available from HP. If it ever becomes necessary to reinstall the operating system, use the *Restore Plus!* CD.

Install the correct device drivers according to the operating system you are using, as listed below.

Windows XP

1. Select **Start > Control Panel**.
2. Double-click **Network Connections**.
3. Double-click the **New Connection Wizard** icon and follow the instructions on the screen.

Windows 2000

Device drivers are not pre-loaded for Windows 2000. Go to www.hp.com to download the drivers and installation instructions.

Wireless Networks

A wireless LAN provides the same functionality of a wired network, but it eliminates the need to install networking cables and other networking equipment, making it easier to deploy.

A wireless LAN can be configured for two different modes of operation. While each method has its advantages, one may be better suited for your needs. Review the following configuration information to determine which mode is best for you.

- Ad-hoc Network
- Access Point (Infrastructure) Network

Ad-hoc Network

An Ad-hoc network is the simplest to deploy and is ideal for small offices. Ad-hoc wireless networks can be comprised of two or more wireless clients configured to communicate with one another. All Ad-hoc clients communicate directly with each other without using an Access Point (AP). As a user on this type of network, you are able to quickly build up a wireless network in order to share files with other employees, print to a shared office printer, and access the Internet through a single shared connection.

Ad-hoc networking is cost effective because no other devices' components are needed (access points, hubs, or routers) in order to set up a network. However, with Ad-hoc networking, your computer is only able to communicate with other nearby wireless clients.

Access Point (Infrastructure) Network

An Access Point network is also referred to as an “Infrastructure” network. The key difference between a wireless Access Point network and an Ad-hoc network is the addition of one extra element—the Access Point. The Access Point serves as the focal point for all data traffic on your wireless network, optimally managing all wireless data transactions.

The Access Point extends the range of the wireless LAN. Each wireless client computer can communicate with other computers equipped with wireless devices that are within the range of the Access Point.

Additionally, the wireless Infrastructure can provide access to an existing wired LAN. This link allows computers on the Infrastructure wireless LAN to access the other wired LAN's resources and tools, including Internet access, email delivery, file transfer, and printer sharing. HP can provide all of the installation services you need to extend your wired LAN with a wireless LAN.

In addition to the computers that will connect to a wireless network, you only need two other kinds of equipment to get your Access Point wireless network up and running:

- **Access Points:** wireless transmitters that connect every user within range to the wireless LAN. You can install as many access points on your network as you need, and add new ones easily as your network grows, so you can cover an entire suite of offices with a single wireless LAN. Each access point requires two connections:
 - ❑ A standard outlet for power
 - ❑ An Ethernet connection to your existing wired LAN or incoming Internet connection
- **Wireless LAN cards:** the wireless equivalent of a network interface card (NIC) that allow a PC to communicate with the wireless network. Many HP computers come with built-in wireless LAN cards so they are ready out of the box to connect to a wireless network. If your PC doesn't have a wireless card, you can easily add one. Refer to the *Hardware Reference Guide* on the *Documentation and Diagnostics* CD for installation instructions.

Advantages of Wireless Networking

Wireless local area networking (WLAN) brings new levels of flexibility and accessibility to your business. The many advantages of wireless networking include:

- There is no need to install labor-intensive and expensive wiring in a workplace.
- Entire workplaces can be added or moved with minimal downtime.
- Workers can rearrange their workplaces without being tied to a wall jack for network access.

- A WLAN can often be installed faster and more cost-effectively than a wired network.
- Additional computers can be added to a WLAN quickly and with minimal cost.
- WLANs are potentially easier to maintain and manage than wired networks.
- Wireless local area networks give workers the freedom to access real-time business information anytime and anywhere within your office or campus environment.

For more information on wireless networks, go to www.hp.com or contact your HP representative.

Internet Communications

The following items are covered in this section:

- Choosing an Internet Service Provider
- Content Advisor
- Solving Internet Access Problems

Choosing an Internet Service Provider

An Internet service provider (ISP) provides you with access (dial-up, cable, DSL, or wireless) and software you need to connect to the Internet. Most ISPs also offer e-mail, access to newsgroups, space to create Web pages, and technical support. Some ISPs offer commercial services, such as domain hosting, to companies and individuals wanting to do business on the Internet. You can choose from local and national ISPs.

An online service provider, such as MSN or America Online (AOL), offers special features, content, and technical support in addition to providing access to the Internet. An online service provider may provide a categorized or customizable home page that makes it easy for you to find some of the most popular and useful sites on the Internet.

To find the provider that is right for you:

- Look in the Yellow Pages
- Ask a friend or colleague for recommendations
- If you have access to the Internet already, you can use a search engine, such as Google, to help you locate an ISP or online service provider.

- ISPs typically offer a variety of service plans for different customers' needs. Be sure to review and compare plans, services offered, and price to find the provider that is right for you and your needs.

Content Advisor

The Internet provides you with access to a wide variety of information, but some information may not be suitable for every viewer.

With Content Advisor, you can:

- Control Internet access
- Set up a password
- Set up a list of Web sites that people who use the computer cannot view
- Adjust the types of content people who use the computer can view with or without your permission

Restricting Internet Content

Windows XP

If you have not previously enabled Content Advisor:

1. Select **Start > Control Panel**.
2. Double-click **Internet Options**.
3. Click the **Content** tab.
4. In the Content Advisor area, click the **Enable** button. If you have previously created a password for Internet settings, you will be prompted for your password now.
5. Click a category in the list, then drag the slider to set the limits you want to use. Repeat this process for each category you want to limit.
6. Click **OK**, then type your password in the Password box. A dialog box will inform you that Content Advisor has been turned on. Click **OK**.

If you have previously enabled Content Advisor:

1. Select **Start > Control Panel**.
2. Double-click **Internet Options**.
3. Click the **Content** tab.
4. To change the settings:
 - a. Click the **Settings** button. Type your password and click **OK**.
 - b. Click a category in the list, then drag the slider to set the limits you want to use. Repeat this process for each category you want to limit.
5. To disable Content Advisor:
 - a. Click the **Disable** button. Type your password and click **OK**.
 - b. A dialog box will inform you that Content Advisor has been turned off. Click **OK**.

Windows 2000

If you have not previously enabled Content Advisor:

1. On the Windows desktop, select **Start > Settings > Control Panel**.
2. Double-click **Internet Options**.
3. Click the **Content** tab.
4. In the Content Advisor area, click the **Enable** button.
5. Click a category in the list, then drag the slider to set the limits you want to use. Repeat this process for each category you want to limit.
6. Click **OK**, then type your password in the Password box. A dialog box will inform you that Content Advisor has been turned on. Click **OK**.

If you have previously enabled Content Advisor:

1. Select **Start > Settings > Control Panel**.
2. Double-click **Internet Options**.
3. Click the **Content** tab.

4. To change the settings:
 - a. Click the **Settings** button. Type your password and click **OK**.
 - b. Click a category in the list, then drag the slider to set the limits you want to use. Repeat this process for each category you want to limit.
5. To disable Content Advisor:
 - a. Click the **Disable** button. Type your password and click **OK**.
 - b. A dialog box will inform you that Content Advisor has been turned off. Click **OK**.

Solving Internet Access Problems

If you encounter Internet access problems, consult the ISP or refer to the common causes and solutions listed in the following table.

Solving Internet Access Problems

Problem	Cause	Solution
Unable to connect to the Internet.	Internet Service Provider (ISP) account is not set up properly.	Verify Internet settings or contact the ISP for assistance.
	Modem is not set up properly.	Reconnect the modem. Verify the connections are correct using the quick setup documentation.
	Web browser is not set up properly.	Verify that the Web browser is installed and set up to work with the ISP.
	Cable/DSL modem is not plugged in.	Plug in cable/DSL modem. You should see a "power" LED light on the front of the cable/DSL modem.
	Cable/DSL service is not available or has been interrupted due to bad weather.	Try connecting to the Internet at a later time or contact your ISP. (If the cable/DSL service is connected, the "cable" LED light on the front of the cable/DSL modem will be on.)

Solving Internet Access Problems *(Continued)*

Problem	Cause	Solution
Unable to connect to the Internet. <i>(continued)</i>	The CAT5 UTP cable is disconnected.	Connect the CAT5 UTP cable between the cable modem and the computer's RJ-45 connector. (If the connection is good, the "PC" LED light on the front of the cable/DSL modem will be on.)
	IP address is not configured properly.	Contact your ISP for the correct IP address.
	Cookies are corrupted. (A "cookie" is a small piece of information that a Web server can store temporarily with the Web browser. This is useful for having the browser remember some specific information that the Web server can later retrieve.)	<p><i>Windows XP</i></p> <ol style="list-style-type: none"> 1. Select Start > Control Panel. 2. Double-click Internet Options. 3. On the General tab, click the Delete Cookies button. <p><i>Windows 2000</i></p> <ol style="list-style-type: none"> 1. Select Start > Settings > Control Panel. 2. Double-click Internet Options. 3. On the General tab, click the Delete Cookies button.
Cannot automatically launch Internet programs.	You must log on to your ISP before some programs will start.	Log on to the ISP and launch the desired program.

Solving Internet Access Problems (Continued)

Problem	Cause	Solution
Internet takes too long to download Web sites.	Modem is not set up properly.	Verify that the correct modem speed and COM port are selected. <i>Windows XP</i> <ol style="list-style-type: none">1. Select Start > Control Panel.2. Double-click System.3. Click the Hardware tab.4. In the Device Manager area, click the Device Manager button.5. Double-click Ports (COM & LPT).6. Right-click the COM port the modem uses, then click Properties.7. Under Device status, verify that the modem is working properly.8. Under Device usage, verify the modem is enabled.9. If there are further problems, click the Troubleshoot button and follow the on-screen instructions.

Solving Internet Access Problems *(Continued)*

Problem	Cause	Solution
Internet takes too long to download Web sites. <i>(continued)</i>	Modem is not set up properly. <i>(continued)</i>	Verify that the correct modem speed and COM port are selected. <i>(continued)</i> Windows 2000 <ol style="list-style-type: none">1. Select Start > Settings > Control Panel.2. Double-click System.3. Click the Hardware tab.4. In the Device Manager area, click the Device Manager button.5. Double-click Ports (COM & LPT).6. Right-click the COM port the modem uses, then click Properties.7. Under Device status, verify that the modem is working properly.8. Under Device usage, verify the modem is enabled.9. If there are further problems, click the Troubleshoot button and follow the on-screen instructions.
