contents.

1 introduction.

The Microsoft Broadband Networking Wireless Base Station

Note
The Setup Wizard guides you through the process of connecting and configuring your base station. Install the software and then follow the steps in the wizard to connect your new base station.

Congratulations on the purchase of your Microsoft® Broadband Networking Wireless Base Station! The base station allows you to share an Internet connection, files, printers, and other devices among all the computers on a wireless network. Your box contains:

Setup CD-ROM
Install This First!

Wireless
Base Station

Base Station Stand
(Detachable)

Blank Floppy
Disk

Power Supply

Blue Ethernet
Cable

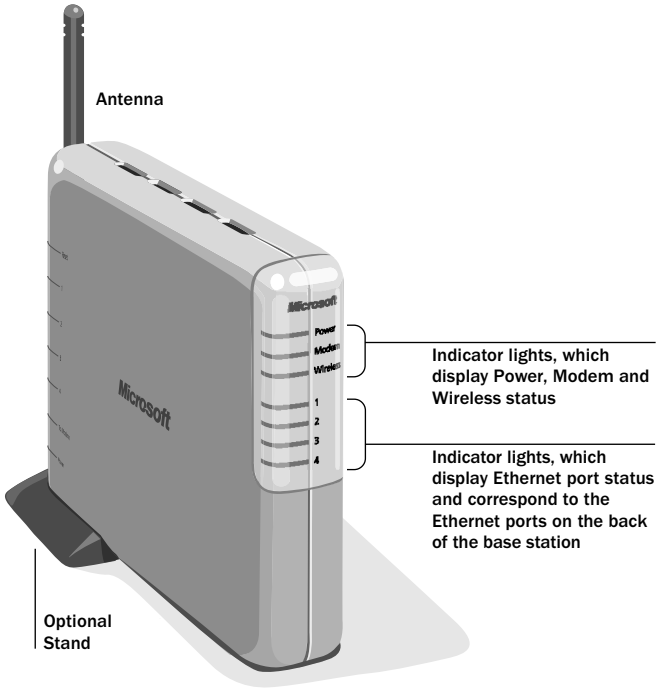
***User's Guide* and**
***Start Here* Guide**

The Microsoft Wireless Base Station can support over 200 simultaneous wired and wireless connections. You can use this flexibility to choose the best type of network connection for each of your networked devices. For a discussion of connection options, see Chapter 2.

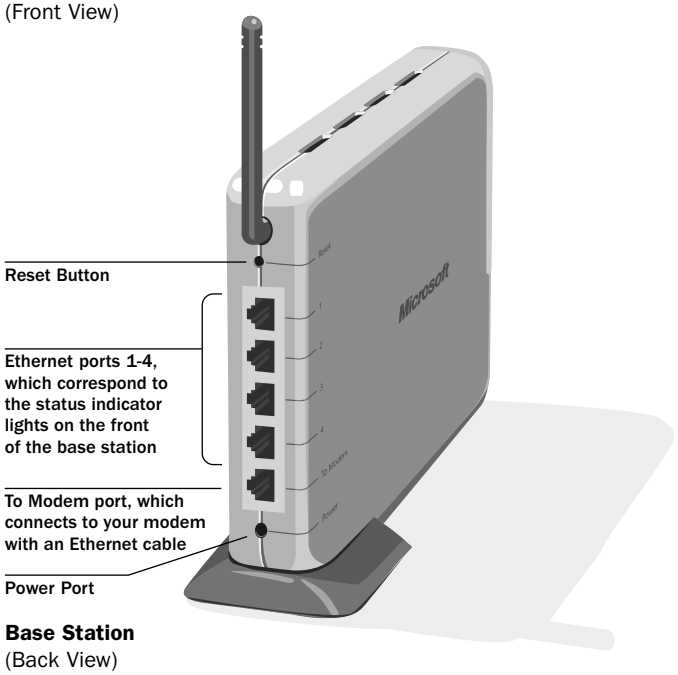
The typical network configuration is for the base station to serve as the central access point for your wireless network and share your broadband Internet connection with all the computers on the network. For setup instructions, see Chapter 3.

The base station includes a firewall and network address translation (NAT), which provide security for your broadband Internet connection. This is especially important when an "always-on" broadband Internet connection is shared among computers on a home or small office network. With the base station installed, intruders from the Internet cannot access the computers or files on your network.

Even with the base station installed, however, your wireless network is vulnerable to eavesdropping by other wireless networks, and your system can be attacked by computer viruses. To protect your network, establish a wireless security (also known as Wired Equivalent Privacy, or WEP) key during setup, use an antivirus program to protect against computer viruses, and follow basic security rules such as setting strong passwords and not opening unknown attachments.



Base Station
(Front View)



Base Station
(Back View)

Base Station Indicators and Controls

The preceding diagram shows the location of all ports, jacks, controls, and indicator lights on the base station.

The base station contains two antennas, one internal and one external. The external antenna is adjustable for best wireless reception.

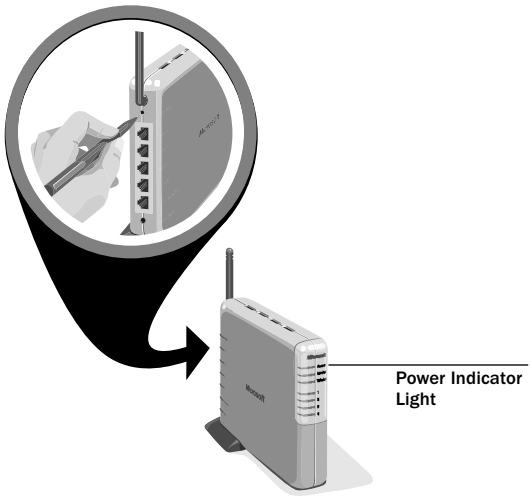
The front of the base station has seven green (and labeled) indicator lights. After the base station is connected, these lights will be on, off, or blinking, indicating the following states.

Light	On	Off	Blinking
Power	Receiving power	Not receiving power	Green or orange during reset and restore
Modem	Modem connected and on	Modem off or not connected	Data being sent or received on modem
Wireless status	Radio enabled	Radio disabled	Wireless data being sent or received
Ethernet status (4)	Ethernet device connected and on	Ethernet device off or not connected	Data being sent or received over Ethernet

Resetting the Base Station

Important
Do not hold down the reset button for more than five seconds, unless you want to erase all of your base station settings and return them to the factory defaults.

To reset the base station to correct temporary connectivity problems, use a pointed object to briefly press and release the reset button on the back of the base station, as shown in the following illustration.



Resetting or Restoring the Base Station

Observe the power indicator light, and release the button as soon as the light turns from green to orange. The light will return to green when the reset is complete. Do not unplug the base station during a reset.

Restoring Base Station Factory Settings

To return the base station to its factory default settings (for example, if you forget your base station password), you can use the reset button on the back of the base station to clear all base station settings, restore the default settings, and reset the base station.

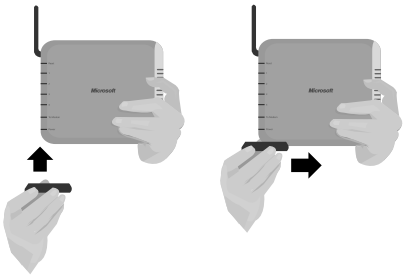
To restore the base station factory settings

1. Use a pointed object to press the reset button on the back of the base station, while observing the power indicator light. Hold the button down until the light starts to blink green and orange, about five seconds.
2. Release the button and wait for the light to turn solid orange and then green, which can take up to 60 seconds.

Do not unplug the base station during a restore.

Placing and Positioning the Base Station

You can place the base station vertically in the provided stand, as shown in the following diagram, or horizontally without the stand. You can also rotate the base station to obtain the best wireless performance.



Attaching the Base Station Stand

The Microsoft Wireless Base Station must be physically connected to a power outlet and to your broadband modem, so the base station should be placed near these.

To place the base station and adjust its antenna for the best wireless performance, see “Recommendations for Best Wireless Performance” in this chapter.

Understanding Wireless Connections

Your base station uses a wireless protocol called IEEE 802.11b, or Wi-Fi (wireless-fidelity), which works by radio transmission. Although wireless transmission speed is usually faster than broadband connection speed, it is slower than Ethernet.

Wi-Fi radio waves travel in all directions, and can transmit through walls and floors. Wireless transmission can theoretically cover up to 1,000 square feet and occur at speeds of up to 11 megabits per second (Mbps), but actual network range and data throughput rate will be less, depending on several factors.

Recommendations for Best Wireless Performance

Important
Do not rely on radio transmission limitations to secure your network. Enable wireless security (WEP) to protect your network from unwanted access. For more information, see "Understanding Wireless Security (WEP)" in this chapter.

The following information will help you achieve the best wireless range, coverage, and transmission rate from your wireless devices:

- You should place the base station near the center of your intended wireless network area. This will also minimize the possibility of eavesdropping by neighboring wireless networks.
- Radio signals can travel farther outside of buildings, and the best performance is when wireless components are in direct line of sight to one another.
- Putting wireless components in high places helps avoid obstacles and provides better coverage to upper stories of buildings.
- Building construction such as metal framing, UV window film, metallic paint, and concrete or masonry walls and floors will reduce radio signal strength. Try to avoid putting wireless components next to walls, fireplaces, or other large, solid objects; or next to large metal objects such as computer cases, monitors, and appliances.
- Wireless signal range, speed, and strength can be affected by interference from neighboring wireless networks and devices. Electro-magnetic devices such as televisions, radios, microwave ovens, and cordless phones, especially those with frequencies in the 2.4 GHz range, may also interfere with wireless transmission.
- Standing or sitting too close to wireless equipment can also affect radio signal quality.

Adjusting the Antennas

You can adjust the wireless antennas for the best radio reception. Start with the antenna pointing straight up, and adjust the antenna if wireless reception is poor. Certain areas, such as directly below the antenna, get relatively poor reception. Pointing the antenna toward another wireless component does not improve reception. The antennas should not be placed next to large pieces of metal, because this can cause interference.

Wireless Range Table

The following table shows the interaction between wireless coverage area and transmission speed for Microsoft wireless components under typical installation circumstances.

Data Rate	Open Environment	Closed Environment
11 Mbps	up to 900 feet	up to 160 feet
5.5 Mbps	up to 1300 feet	up to 200 feet
2 or 1 Mbps	up to 1500 feet	up to 300 feet

Understanding Wireless Security (WEP)

Anyone within wireless range who knows your wireless network name will be able to access the network and any data that is being transmitted over it, unless you enable wireless security. Microsoft wireless components use wireless security called Wireless Equivalent Privacy (WEP) to prevent unauthorized users from accessing your network. A network key—called a WEP key—encrypts, or codes, data so that it is readable only by other computers that have the key. The WEP key is stored on each networked computer, so that data can be encrypted and decrypted as it is transmitted over the network.

It is recommended that you enable WEP during base station setup. You can simply choose to enable WEP security and allow the Setup Wizard to assign your network a WEP key, or you can set your own WEP key and choose other advanced options. For more information about WEP and security, see “Securing Your Network” in Chapter 5 and “Security Settings” in Chapter 6.

Understanding Ethernet Connections

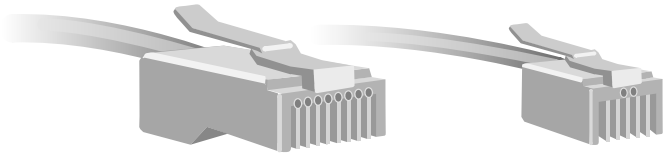
In most cases, the Microsoft Wireless Base Station uses Ethernet to connect to your broadband modem and at least one computer. You can also connect up to three additional Ethernet devices, such as the Microsoft Broadband Networking 10/100 Ethernet PCI Adapter and the Microsoft Broadband Networking 10/100 Ethernet 5-Port Switch, to the Microsoft Wireless Base Station. By using hubs or switches, you can connect many more Ethernet devices to your base station.

Ethernet is the most common and one of the fastest wired network protocols, with connection speeds of 10 Mbps, 100 Mbps, or higher. Although power outlets, fluorescent lights, power supplies, and coiled or overlong cables can interfere with Ethernet transmission, interference is seldom a problem in Ethernet networks.

To connect to your base station through Ethernet, a computer or other device must have an Ethernet network interface card, which provides an external port for an Ethernet cable.

Ethernet Cables, Phone Cables, and Connections

Ethernet ports and cables resemble telephone connections and lines, but are thicker and wider. To determine whether a cable is an Ethernet or phone cable, look at the end and count the number of wires or contacts in the connector. Ethernet (RJ-45) connectors have eight contacts, whereas standard phone line (RJ-11) connectors have four, as shown in the following diagram.



RJ-45 Ethernet (8 wires)

RJ-11 Telephone (4 or 6 wires)

Use only Ethernet cables to connect to your base station. Plugging a phone jack into the base station could damage the base station.

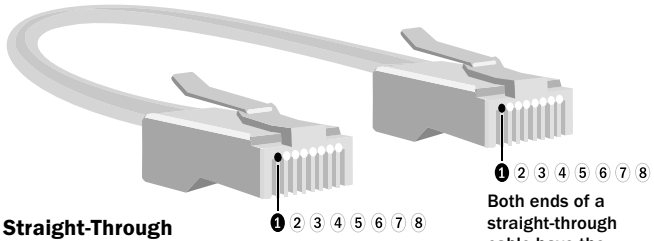
Straight-Through and Crossover Ethernet Cables

Data is sent and received through specific wires in Ethernet cables. Depending on the arrangement of the send and receive wires within the cable, Ethernet cables may be the straight-through type or the crossover type.

Most broadband modems are connected to computers through Ethernet, and they may use straight-through or crossover cables. To connect the modem to the base station, it is important to use the original cable that came with your modem, or the same type.

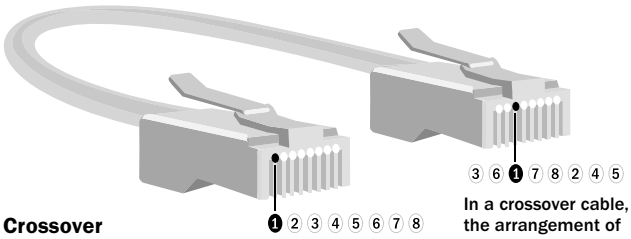
To connect computers to the base station, you should use straight-through Ethernet cables. If the blue cable provided in your kit is not long enough for your needs, you can use any straight-through cable.

To determine which type of Ethernet cable you have, inspect the cable ends. The following diagram shows the arrangement of wires in each type of cable.



Straight-Through Ethernet Cable

Both ends of a straight-through cable have the same arrangement of colored wires.



Crossover Ethernet Cable

In a crossover cable, the arrangement of the colored wires changes between the two ends.

2 planning.

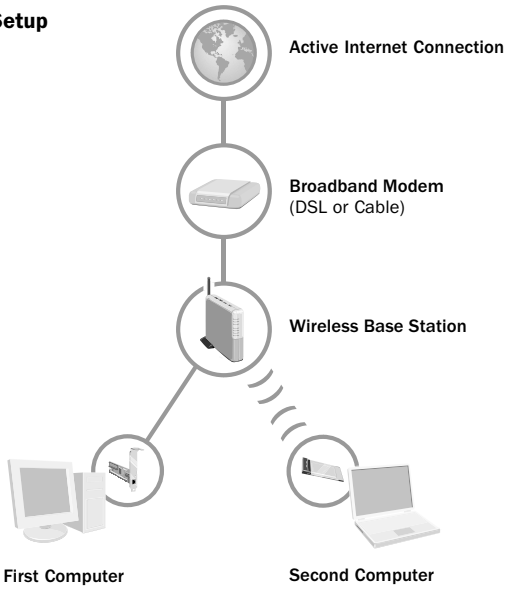
Wireless Base Station Setup Options

The easiest and fastest way to set up your Microsoft® Broadband Networking Wireless Base Station is to follow the setup instructions in the *Start Here* guide or the "Typical Setup Steps" in Chapter 3 of this manual.

Set up the base station on the computer that is now connected to your broadband modem, by running the Setup Wizard and connecting your base station when the wizard prompts you to do so. Set up the base station before you install any wireless network adapters on other computers,

Your finished network setup may resemble the following diagram.

Typical Setup



One computer, and your broadband modem, connect to the base station with Ethernet cables. Other computers can make wired or wireless connections to the base station.

Note
You cannot set up the base station on a Windows 2000 computer by using the Setup Wizard. You can use a different computer to set up the base station, you can use the Base Station Management Tool to set up the base station on the Windows 2000 computer, or you can set up a network by installing wireless adapters only.

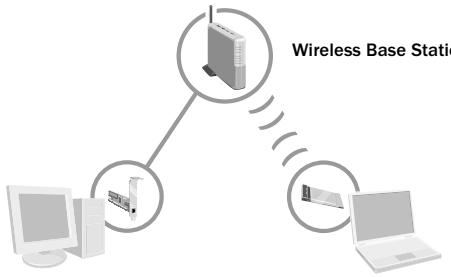
Note
If you are not sure which types of connections your computer or modem has, see Chapter 1.

You can use this setup method on a computer that is running Microsoft Windows® XP, Windows Millennium Edition, Windows 98 SE, or Windows 98, and is not currently networked. The computer must have a working broadband Internet connection and must connect directly to your broadband modem with an Ethernet cable.

If you have a different computer configuration, or want a different setup method, look through this chapter for the description that best matches your situation.

My modem doesn't connect to my computer through Ethernet.

- If your modem connects through USB but also has an Ethernet connection, you can switch to the Ethernet port. For instructions, see page 19.
- If your modem has no Ethernet connection, you have three choices:
  - You can obtain a new modem that has an Ethernet connection.
  - You can set up a network by using wireless adapters only and no base station. For information, see the documentation that came with your adapter.
  - You may be able to set up the base station as a wireless access point only, as shown in the following diagram. For more information, see page 19.



*To connect the base station, the first computer requires an installed Ethernet adapter (shown), or wireless adapter.

I don't have a working Internet connection, or I don't want to share my Internet connection through my base station.

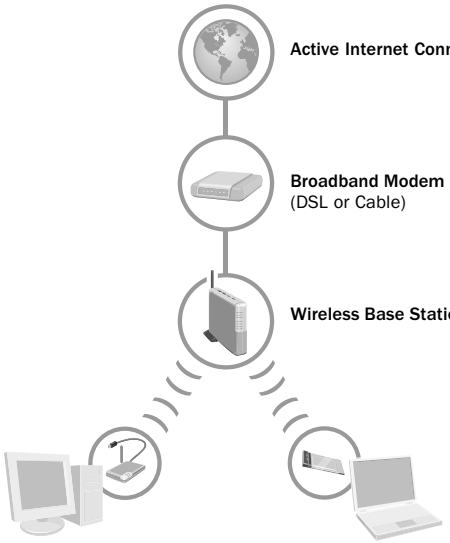
The Setup Wizard cannot configure the base station automatically if your computer does not have an active Internet connection. It is highly recommended that you establish a working broadband Internet connection before you set up the base station.

If you have a broadband Internet connection, but it is not working during setup or the Setup Wizard cannot access your Internet settings, you can enter the settings manually. For instructions, see Chapter 6, or specific procedures in Chapter 3 that require this.

The base station was designed to share a broadband Internet connection over a wireless network. If you want to set up a wireless network without sharing an Internet connection through the base station, it is recommended that you set up a network by using wireless adapters only and no base station. For instructions, see your adapter documentation.

None of my computers have Ethernet connections.

By using wireless adapters, you can connect all your computers to the base station wirelessly, as shown in the following diagram. For instructions, see page 20.



I want all my computers to connect to the base station wirelessly.

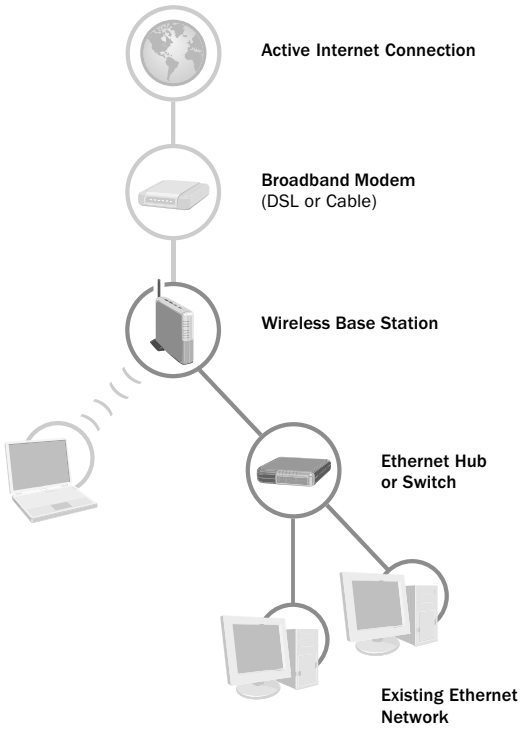
You can switch a computer to a wireless connection to the base station after first using it to set up the base station with a wired connection. For instructions, see page 21.

I want to replace my existing base station, router, or gateway with the Microsoft Wireless Base Station.

For instructions, see page 22. Do not disconnect your existing base station until you are instructed to do so during setup.

I want to add my existing network to the base station.

- The following diagram shows how you can add an Ethernet hub or switch to the base station. For instructions, see page 23.



- To connect HomePNA or HomeRF networks, see page 23.
- To connect existing wireless networks, see page 23.

One or more of my computers is on a domain.

To set up computers that are already on a domain, see page 24.

I want to install the base station on a computer that is running Microsoft WIndows 2000.

You cannot set up the base station on a Windows 2000 computer by using the Setup Wizard. For setup options, see page 24.

I want to install the base station on Macintosh or other computers that are not running Windows.

For base station setup instructions, see page 24 and Chapter 6.

I want to add more computers or other devices to my base station.

- To add computers that have wireless adapters, see page 25.
- To add computers that have Ethernet adapters, see page 25.
- To add non-computer devices, see page 25.

I am not sure whether to use wired or wireless connections to add devices to my base station.

Consider the following factors:

- **Speed**. If connection speed between your network components is very important, you may want to use Ethernet connections.
- **Convenience**. Wireless connections don't require cabling or opening your computer cases, but connecting existing networks to the base station through Ethernet may be more convenient.
- **Range and coverage**. An environment that contains many physical barriers or interference factors may not be ideal for wireless networking.
- **Mobility**. Mobility may be relatively unimportant for a desktop computer, but is much more useful for a laptop, notebook, or other portable computer.
- **Security**. Because of the unrestricted nature of their transmission, wireless networks have inherent security issues. However, the base station's built-in firewall and NAT provide security, and you can also use WEP encryption.

I don't want to use the Setup Wizard.

To set up the base station by using the Base Station Management Tool, see Chapter 6.

I connected the base station before running the Setup Wizard.

For setup options, see page 26.

Determining Your Network Settings

If your system matches the configuration described on page 10 and you are using the typical setup method, the Setup Wizard can detect your settings automatically and use them to set up your network. However, if your system configuration or chosen setup option requires you to enter your settings manually, the following instructions will help you locate them. You can record this information on the inside back cover of this *User's Guide* for future reference.

To determine your workgroup name in Windows XP or Windows 2000

1. Click **Start**, then click **Control Panel**, and then double-click **System**.
2. For Windows XP, click the **Computer Name** tab.
   For Windows 2000, click the **Network Identification** tab.

To determine your workgroup name in Windows 98

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click **Network**, and then double-click **Locating your network workgroup**.

To determine your Internet settings

Your Internet settings may include such information as dynamic or static IP address, username, password, primary and secondary DNS, and default gateway. To determine these:

- Use your modem's utility program if you have one.
- Call your Internet service provider or locate the documentation they sent you when you signed up for DSL or cable service.
- Before starting setup or disconnecting your modem, you can use the Windows Network or Network Connections control panel to determine the settings. For more information, see Windows Help.

To determine your wireless network settings

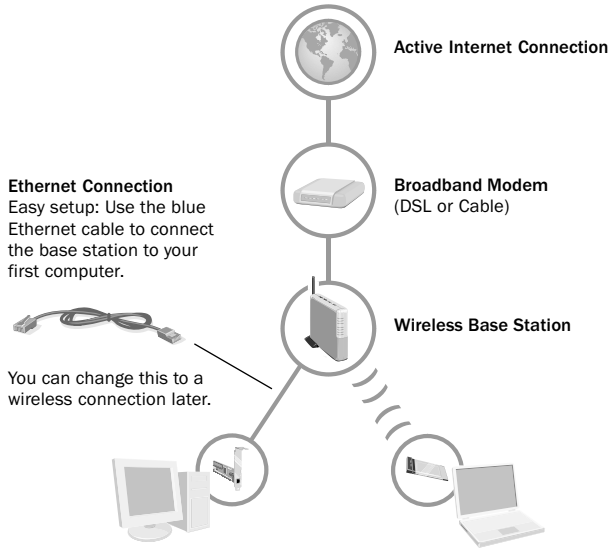
- If you are adding to a Microsoft wireless network, use the Broadband Network Utility to determine your wireless network name, channel, and WEP security key (if set).
- If you have a non-Microsoft wireless network, use your network utility program to determine the settings.

3 setup.

Installing, Connecting, and Configuring Your Wireless Base Station

Important
Run the Setup Wizard before connecting your base station. If you connected your base station before installing the software, or if you do not want to use the Setup Wizard, see "If You Connected the Hardware First" and "If You Do Not Want to Use the Setup Wizard" in this chapter.

The typical connection method for the base station resembles the following diagram.



*In this setup method, the first computer requires an installed Ethernet adapter to connect the base station, as shown here.

Note
You cannot set up the base station on a Microsoft Windows 2000 computer by using the Setup Wizard. You can use a different computer to set up the base station, you can use the Base Station Management Tool to set up the base station on the Windows 2000 computer, or you can set up a network by installing wireless adapters only.

One computer, and your broadband modem, connect to the base station with Ethernet cables. Other computers can make a wireless or wired connections to the base station.

You can use this setup method for a Microsoft® Windows® XP, Windows Me, Windows 2000, Windows 98 SE, or Windows 98 based computer that is connected directly to a DSL or cable modem with an Ethernet cable. The computer must have a working Internet connection and must not be connected to any other computers or networks.

Important
If you have an existing network, do not use the typical setup steps. See Chapter 2 to locate the correct setup method. Do not disconnect your existing network until you are instructed to do so.

Do not use this setup method if your computers do not match the above configuration, or if they are already connected to a network. See Chapter 2 to choose an alternate setup method.

It is important to follow the setup steps in the exact order given. Install the software first, and then connect the base station. This takes advantage of the software's ability to detect your current Internet and system settings and use them to configure your wireless network.

Set up the Microsoft Wireless Base Station before you set up other devices on your wireless network.

Typical Setup Steps

Step 1: Install the software

1. Take the following items to the computer that is now directly connected by an Ethernet cable to your cable or DSL modem:

- The Microsoft Broadband Networking Setup CD-ROM
- The Microsoft Wireless Base Station
- The blue Ethernet cable that came with your base station
- The AC power supply
- The blank floppy disk from your kit
- These installation instructions

Note
During setup, you may be prompted to restart your computer or insert your Windows Setup CD-ROM. You may also need to specify the location of the needed setup files on the Windows Setup CD-ROM by typing **D:\win98**. Substitute the drive letter of your CD-ROM drive.

2. Before you proceed with setup, check the following:

- Are you a member of the Administrator group?

  On computers running Windows 2000 or Windows XP, you must be a member of the Administrator group to set up a network. If you cannot run setup, click **Log Off** from the **Start** menu, press CTRL+ALT+DELETE, and then log on with an administrator's name and password.

- Are you running any firewall or Internet connection sharing software?

  Disable any firewall or Internet connection sharing software on your computers. Your base station will replace these functions, and the Setup Wizard cannot proceed if they are enabled.

- Do you have a Point-to-Point Protocol over Ethernet (PPPoE) Internet connection or a static Internet Protocol (IP) address?

Note
If you have questions or problems during setup, click the **Help** button on each setup page for more information. If you need to start setup over, choose the **Repair** option.

With these types of Internet connections, the Setup Wizard will prompt you to enter information—for a PPPoE connection, your user name, password, and service name; for a static IP address, the IP, subnet, and ISP gateway addresses. If you know you have one of these types of connections, gather this information beforehand. For information about how to determine your Internet settings, see "Determining Your Network Settings" in Chapter 2.

3. To install the software, insert the setup CD-ROM into the CD-ROM drive. If the Setup Wizard does not start automatically after a few seconds, open **My Computer**, double-click the CD-ROM icon, and then double-click **Setup** or **Setup.exe**. The **Welcome** screen should appear.
4. In the Setup Wizard, choose to set up the **base station**, and then proceed through the Setup Wizard.

Note
Leave your computer and modem on while you connect your base station.

Step 2: Connect the base station to the computer

1. When the Setup Wizard instructs you to connect your base station, position the base station close to your modem and computer, and near the center of your intended network area. If you want to position the base station vertically, attach the included stand. For more information about placing and positioning your base station, see Chapter 1.

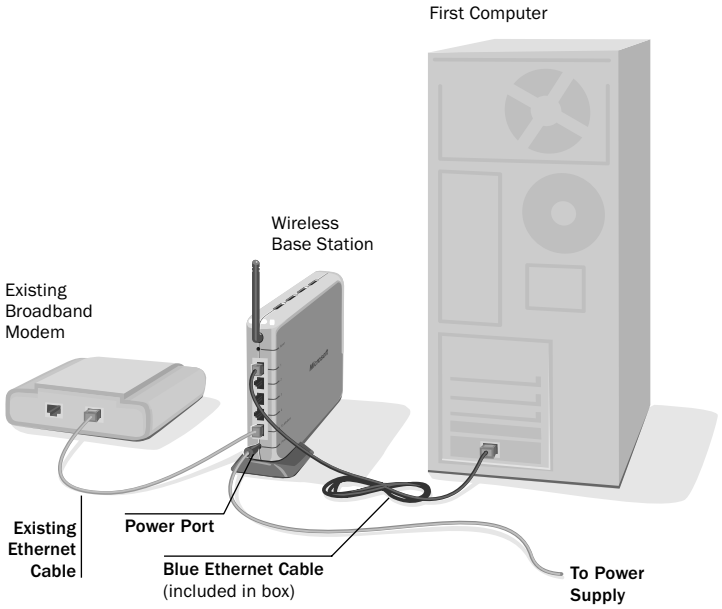
Important
The modem must use its original Ethernet cable or one of the same type to connect to the base station. For more information, see "Straight-Through and Crossover Ethernet Cables" in Chapter 1.

2. Unplug your modem cable from the Ethernet port on the back of your computer. Leave the other end of the cable plugged in to the modem. Plug the cable into the port labeled **To Modem** on the back of the base station. The base station is now connected to your modem.
3. Plug one end of the blue Ethernet cable that came with your base station into the Ethernet port labeled **1** on the back of the base station and plug the other end into the Ethernet port on the back of your computer.

Note
If the blue Ethernet cable is too short for your needs, you can use any straight-through Ethernet cable to connect your computer to the base station. For more information about Ethernet cables, see "Understanding Ethernet Connections" in Chapter 1.

4. Plug one end of the power supply that came with your base station into the **Power** port on the back of the base station, and plug the other end into an electrical outlet. The power indicator light on the front of the base station should illuminate.
5. Return to the Setup Wizard and click **Next**.

Your base station setup should now resemble the following diagram.



Step 3: Configure the base station and network

1. Continue to follow the Setup instructions to establish your wireless network settings:
   - You will be given an opportunity to enable wireless security (WEP). It is recommended that you choose to enable WEP. For more information, click **Help** on the WEP security page, or see Chapter 1 and Chapter 6 of this manual.
   - When you are asked, you can save your network settings to a floppy disk for use in subsequent setups. A blank floppy disk is provided for this. If you don't choose to save to a disk, you will be given a list of network settings to print or write down.
2. Click **Finish** to exit Setup.
3. Remove the Setup CD-ROM from the CD-ROM drive and the floppy disk (if used) from the floppy disk drive. You can use the same CD-ROM and floppy disk to set up additional computers.

Step 4: Test your network

1. View the status of your network in the Broadband Network Utility. Ensure that you can see your base station and the computer that is connected to it in the utility's status screen.

2. If your broadband Internet connection is being shared through your wireless network, open your Web browser and try accessing a Web site such as www.microsoft.com. If your network is working properly, you will be able to access the Internet from the computer you just set up.

Other Setup Methods

In addition to the typical method, there are other ways to set up your base station, depending on your computer and network characteristics and the results you want. See Chapter 2 for help in choosing your base station setup method and finding the appropriate setup instructions.

If You Have a Non-Ethernet Modem

The Microsoft Wireless Base Station is designed specifically for use with an external, broadband Ethernet modem. If you have a modem with both USB and Ethernet connections, you must use the Ethernet connection to connect to the base station.

To change your USB modem to an Ethernet connection

1. Before running setup, replace the USB cable between your modem and computer with the Ethernet cable that came with your modem. If you do not have this cable, see your modem documentation or contact your Internet service provider to determine whether you need to obtain a straight-through or crossover Ethernet cable for the modem. Ensure that your Internet connection is working through the Ethernet cable before you start setup.
2. If your system matches the requirements for the typical setup method, you can now follow the “Typical Setup Steps” in this chapter.

If your modem does not have an Ethernet connection, you have three choices:

- You can obtain a new modem that has an Ethernet connection.
- You can set up a network with wireless adapters only and no base station. For information, see your adapter documentation.
- You may be able to set up the base station as a wireless access point only. See the following section.

Using the Base Station as a Wireless Access Point Only

The base station is designed to work with an external Ethernet modem. If you do not have one, you will not be able to run the Setup Wizard or share your Internet connection through the base station. If you do not want to share your Internet connection through the base station, and you are comfortable with configuring your base station through the Base Station Management Tool, you can use the base station as an access point for your wireless network only.

To set up the base station as a wireless access point only

1. Plug one end of the blue Ethernet cable that came with your base station into the Ethernet port labeled **1** on the back of the base station and plug the other end into the Ethernet port on the back of your computer.
2. Plug one end of the power supply that came with your base station into the **Power** port on the back of the base station, and plug the other end into an electrical outlet.
3. Use a pointed object to press the reset button on the back of the base station, while observing the power indicator light. Hold the button down until the light starts to blink green and orange, about five seconds.
4. Release the button and wait for the light to turn solid orange and then green, which can take up to 60 seconds.
5. Configure the base station through the Base Station Management Tool. See Chapter 6 for instructions.

To set up the base station as a wireless access point if none of your computers have Ethernet ports

1. Attach a wireless adapter to your computer by following the instructions in your adapter documentation.
2. Follow steps 2 through 5 in the preceding procedure to connect and configure the base station.

You should then be able to connect to your base station through the wireless adapter. Although you may be able to share your Internet connection through the networked computer, this is not supported through Microsoft Wireless Setup. If you use a computer that is running Windows XP to share your Internet connection, be sure to enable Windows Internet Connection Sharing and Internet Connection Firewall on that computer.

If You Have No Ethernet Computers

If none of your computers have available Ethernet ports, but they do have available USB or PC Card connections, you can connect all of your computers to the base station wirelessly, as described in the following section. You will need to purchase wireless adapters to configure your base station this way.

Connecting the Base Station Wirelessly

You can connect all of your computers to the base station wirelessly if none of the computers have Ethernet connections, if they cannot be located near the modem and base station, or if you want all of them to be mobile.

You will need to purchase a wireless adapter for each computer that you want to connect to the base station.

If you have a computer with an Ethernet connection, the recommended method for connecting to the base station wirelessly is to first set up and configure the base station through a wired connection, and then change the computer to a wireless connection. That way, you can set up the base station automatically through the Setup Wizard and use these settings to set up the wireless connection. The wired setup method is also more secure.

To connect a computer to the base station wirelessly if it was originally set up with a wired connection

1. Complete the "Typical Setup Steps." Ensure that your Internet connection and network are operating correctly through the wired connections.
2. Remove the blue Ethernet cable between the base station and the computer that you want to set up wirelessly. Leave the modem connected to the base station.
3. Install a wireless adapter on the computer according to the instructions in your adapter documentation. If it is a MIcrosoft adapter, run the Setup Wizard first.

Important
Setting up the base station through a wireless adapter is not recommended, because your wireless and Internet settings are vulnerable to wireless eavesdropper during setup. If possible, set up the base station through a wired connection and then switch to a wireless connection.

If none of your computers have Ethernet connections, you can set up the base station wirelessly from the beginning. You will install a wireless adapter on the computer that was originally connected to the modem, and configure the base station through this adapter.

The modem must still connect to the base station through Ethernet, so if you had a USB modem connection, you must switch to the Ethernet connection for connecting to the base station.

To configure the base station wirelessly from the beginning

Important
Get your Internet connection settings before you disconnect your computer from your modem.

1. Before you start setup or disconnect your modem, get your Internet settings. For instructions, see "Determining Your Network Settings" in Chapter 2. For most Internet connections, you will need your Internet host name. For static IP connections, you will need your MAC address and IP addresses; and for PPPoE connections, your user name, password, and service name. You must enter these settings during setup.
2. After recording your Internet settings, disconnect your modem from your computer. If your modem previously used a USB cable, replace the USB cable with an Ethernet cable by following the instructions under "If You Have a Non-Ethernet Modem" in this chapter.
3. On the computer that was connected to your broadband modem, follow the "Typical Setup Steps" in this chapter. Choose to set up the base station.

   Because your modem has now been disconnected from your computer, the Setup Wizard will alert you that it cannot detect your Internet connection. Choose to proceed with setup. Later in setup, you will be able to enter the Internet settings you saved in step 1 of this procedure.

4. In Step 2.1 of the "Typical Setup Steps," when the Setup Wizard directs you to connect your base station, connect the Ethernet cable from your modem to the **To Modem** port of the base station, and connect AC power to the base station as instructed. Your modem is now connected to the base station. Do not connect your computer to the base station.
5. Continue to follow the Setup Wizard. During the wizard, choose the type of wireless adapter you are going to install.

Important
You cannot configure the base station through a non-Microsoft wireless adapter.

6. When the Setup Wizard directs you to connect your adapter, connect a Microsoft Wireless USB Adapter or Microsoft Wireless Notebook Adapter to your computer as instructed in the adapter documentation.
7. When you are prompted, enter the Internet settings you recorded in step 1 of this procedure.

Important
If you are replacing an existing network, do not disconnect any devices on your existing network until the Setup Wizard directs you to connect your base station.

Note
You can leave your computers, modem, and base station on while you replace or add existing networks.

Replacing Existing Networks

If any of your computers are currently connected to a network, you can remove the computers from the network and connect each of them to your Microsoft Wireless Base Station by following the "Typical Setup Steps" in this chapter.

If your computers were disconnected from a base station, router, or gateway, the Setup Wizard will not be able to access your Internet or network settings after the existing base station is removed. Therefore, you should obtain your Internet settings before disconnecting the existing base station. For instructions, see "Determining Your Network Settings" in Chapter 2.

For most Internet connections, you will need your Internet host name. For static IP connections, you will need your MAC address and IP addresses; and for PPPoE connections, your user name, password, and service name. You must enter these during setup to reestablish your Internet connection.

Connecting Existing Networks

You can connect several types of existing networks to the base station, as explained in the sections that follow. If you are connecting an existing network to the Microsoft Wireless Base Station, disable any Internet connection sharing or firewall software on the network before you start setting up the base station. The base station replaces this software.

If your existing network contains a router, gateway, or base station, the existing router may conflict with the Microsoft Wireless Base Station. If you experience problems with your Internet connection or with certain programs after adding the Microsoft base station to an existing wired or wireless router, you may need to disable network address translation (NAT) on one of the routers. For more information, see "Network Address Translation" in Chapter 6.

Note
You can leave your computers, modem, and base station on while you replace or add existing networks.

Connecting Ethernet Networks to the Base Station

If your computers are networked directly together through crossover Ethernet cables or through direct parallel, serial, or USB connections, disconnect them and use non-crossover Ethernet cables (including the provided blue cable) or wireless adapters to connect each computer to the base station.

To connect your existing Ethernet hub or switch to the base station

1. Choose one of the computers on the network to set up first, and follow the "Typical Setup Steps" in this chapter.
2. In Step 2.1 of the "Typical Setup Steps," when the Setup Wizard prompts you to connect your base station, unplug your modem cable from the Ethernet hub or switch. Leave the cable plugged in to the modem.
3. Plug the modem cable into the **To Modem** port on the back of the base station.
4. Plug one end of the blue Ethernet cable into the Ethernet port labeled **1** on the back of the base station.
5. Plug the other end of the cable into the Uplink port on your hub.

Note
Some Uplink ports on hubs have directional switches. If your base station is not detected after being connected to the Uplink port of your hub, move the directional switch to the opposite position and try your connection again.

An alternate connection method is to use a crossover Ethernet cable to connect the base station to an Ethernet port, rather than the Uplink port, on the hub.

Connecting HomePNA or HomeRF Networks

You can connect a HomePNA network to your Microsoft Wireless Base Station by using a HomePNA-to-Ethernet adapter. For more information, see your HomePNA network documentation or contact the manufacturer.

Microsoft wireless components are not compatible with HomeRF technology. To access computers on an existing HomeRF network, disconnect the computers from the HomeRF network and connect them to the Microsoft Wireless Base Station by using Ethernet adapters or Wi-Fi compatible wireless adapters.

Connecting Existing Wireless Networks

You can connect an existing Wi-Fi compatible wireless network to your Microsoft Wireless Base Station. Ensure that the existing base station and adapters use the same wireless network name, channel, and WEP key, if enabled, as your Microsoft Wireless Base Station. If the routing function of the existing base station, router, or gateway conflicts with the router on the Microsoft Wireless Base Station, you may need to disable network address translation (NAT) on one of the routers. For more information, see "Network Address Translation" in Chapter 6.

If Your Computers Are on a Domain

If any of the computers that you want to network are already members of a domain—for example, if you have a laptop that is on a domain at work, and you want to connect it to your home wireless network—the Setup Wizard will detect this and skip the file-sharing and printer-sharing sections of setup. You will not be able to share files and printers with other computers on the wireless network, but you will be able to access your computer's domain when you return to work.

It is possible to switch to a workgroup after setup, to access files on your wireless network. However, you will then have to switch back to the domain to access your work network. For more information, see your Broadband Network Utility Help.

Setting Up the Base Station on a Windows 2000 Computer

You cannot use the Setup Wizard to set up the base station on a computer that is running Windows 2000. Your options are to

- Use a different computer to set up the base station.
- Use the Base Station Management Tool to set up the base station. See Chapter 6 for instructions.
- Set up a network by installing wireless adapters only. See your adapter documentation for instructions.

Setting Up the Base Station on a Non-Windows Computer

You will not be able to use the Setup Wizard to set up the base station on a Macintosh or other computer that is not running Windows. You can connect the base station to your broadband modem and to an Ethernet port on the computer as shown in the "Typical Setup Steps." To configure the base station, you can use the Base Station Management Tool. See Chapter 6 for instructions.

Adding to Your Network

The base station can support over 200 simultaneous wired and wireless connections. You can add even more Ethernet devices by connecting Ethernet hubs or switches to the base station. For more information on connecting hubs or switches, see "Connecting Ethernet Networks to the Base Station" in this chapter.

The following sections discuss adding wireless computers, wired computers, and other devices to your network. If you are not sure whether to use a wired or a wireless connection for adding devices to your network, see Chapter 2.

Adding Wireless Computers to Your Network

To connect wireless computers to your network, follow the steps in your adapter documentation. The Microsoft Wireless Base Station works with Microsoft or non-Microsoft Wi-Fi compliant wireless adapters.

The base station will automatically detect a wireless computer, provided that the computer has the correct network settings. The adapter must use the same wireless network name (SSID), wireless channel, and wireless security (WEP) key (if used) as the rest of your wireless network. To share files and printers, the computer must also use the same workgroup name as the other computers on the network.

To determine your wireless network settings, refer to the Broadband Network Utility. Enter these settings into your adapter's setup program if necessary.

Adding Ethernet Computers to Your Network

A computer can be added to the base station through an Ethernet connection if it has an IEEE 802.3-compliant Ethernet adapter card such as the Microsoft Broadband Networking 10/100 Ethernet PCI Adapter, an available Ethernet port, and a straight-through Ethernet cable to connect the computer to the base station. You can connect up to four Ethernet computers to the base station, and you can add even more Ethernet devices by connecting Ethernet hubs or switches, such as a Microsoft Broadband Networking 10/100 Ethernet 5-Port Switch. To connect Ethernet hubs or switches to the base station, see "Connecting Ethernet Networks to the Base Station" in this chapter.

To connect an Ethernet computer to the base station, run the Setup Wizard, choosing to add an adapter to the network and selecting your type of Ethernet adapter. When Setup prompts you to do so, connect the Ethernet cable from your computer to one of the numbered Ethernet ports on the back of the base station.

Adding Non-Computer Devices to Your Network

You can connect non-computer devices, such as Microsoft Xbox™ video game systems or wireless network print servers, to the base station. A non-computer device can be added to the network if it has an IEEE 802.3-compliant Ethernet adapter or an IEEE 802.11b-compliant wireless network adapter.

Note
To determine whether your Ethernet device needs a straight-through or crossover Ethernet cable to connect to the base station, refer to the documentation for your device.

To connect an Ethernet device to the base station, run the Setup Wizard, choosing to add an adapter to the network and selecting your type of Ethernet adapter. When Setup prompts you to do so, connect the Ethernet cable from your device to one of the numbered Ethernet ports on the back of the base station.

To connect a wireless device to the base station, refer to the documentation for your device. You will need to configure the device to use your existing network's wireless network name, channel, and WEP security key if set.

If You Connected the Hardware First

If you connected the base station before installing the software, the Setup Wizard may not be able to access the Internet to copy configuration settings. It is recommended that you disconnect the base station, reconnect your modem and computer in their original configuration, ensure that your Internet connection is working, and then rerun the Setup Wizard.

If You Do Not Want to Use the Setup Wizard

If you do not want to use the Setup Wizard to set up your base station, you can enter your Internet settings and configure the base station in the Base Station Management Tool. For more information, see Chapter 6.

4 networking.

Using Your Network

Note
The information in this chapter provides general guidance for basic networking tasks. Microsoft Windows Help provides more specific and detailed instructions for the procedures described in this section. To open Windows Help, click **Start**, and then click **Help** (or **Help and Support** in Microsoft Windows XP).

After setting up your wireless network, you can perform common networking tasks, such as making printers and files available to other computers, and playing multiplayer games.

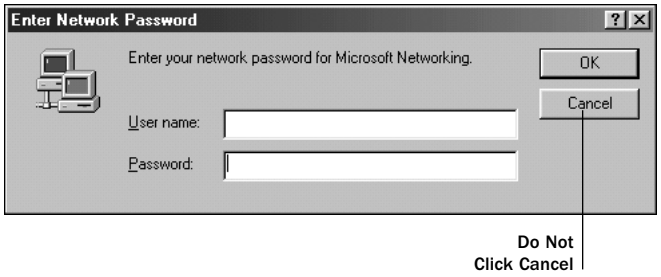
This chapter provides information about:

- Logging on to your network.
- Allowing access to an Internet connection.
- Allowing access to files and folders.
- Allowing access to printers.
- Sharing other peripheral devices.
- Reading e-mail messages on your network.
- Playing games on your network and on the Internet.
- Connecting to other wireless networks.

Logging on to Your Network

After starting your computer, you must always log on to your network to access shared files, printers, and other resources.

If you have Microsoft® Windows® 98, Microsoft Windows 98 SE, or Microsoft Windows Millennium Edition, do not click **Cancel** during the logon process, even if you decide to leave your password blank. Type your user name, type your password (or leave it blank), and then click **OK**.



If you are already in the process of using Windows, and you haven't yet logged on to your network, you can log off and then log back on.

To log off and log back on to your network

1. Click **Start**.
2. Click **Log Off**. (Or, in Microsoft Windows 2000, click **Shut Down**, make sure "Log Off" appears in the drop-down box, and then click **OK**.)
3. Log on to your network.

After you log on to your network, you can perform certain network functions, such as opening shared files from Windows Explorer.

Allowing Access to an Internet Connection

Important
Before you proceed, please check with your Internet service provider about its policy regarding Internet sharing.

Before you installed the Microsoft Broadband Networking Wireless Base Station, one of your computers was already connected to the Internet through a broadband connection. Now that you've installed the base station, the other computers on your network can share that original Internet connection. You can now use any of your networked computers to access the Internet the way you usually do.

Note that the rate that you are able to send and receive data over the Internet is highly dependent on many factors. Adding another user to your Internet connection typically reduces the speed of data transfer, but you are unlikely to notice the difference.

To access the Internet from each computer on a network

1. Make sure that you have a Web browser (such as Microsoft Internet Explorer) installed on each computer that is connected to your network.
2. On any of the networked computers, open the Web browser.
3. Search for the Web site you want, or enter the address in the **Address** bar.

Allowing Access to Files and Folders

Note
If you have Microsoft Windows 2000 or Microsoft Windows XP, you will need to have sufficient privileges (or be the network administrator) in order to share folders with others. For more information, look up "administrator" in Windows Help.

The information in this section provides general guidance for a few basic file-sharing tasks. For more detailed instructions and information about sharing files and folders, see Windows Help. To access Windows Help, click **Start**, and then click **Help** (or **Help and Support** in Windows XP).

To make it easy to share files and folders, all of your networked computers should be in the same workgroup. For more information, look up "workgroup" in Windows Help.

Sharing files and folders is a two-step process. You will need to:

1. Make the files and folders available to the network.

2. Use Windows (Network Neighborhood, My Network Places, or Windows Explorer) to access the shared files and folders.

To make your files and folders available to the network

While setting up your broadband network, you may have chosen to share all of your files and folders with the network. If you decide that you only want to share some of your files and folders with the network, you can use Microsoft Windows to specify which files and folders to share.

You can share an entire drive with the network, or you can share specific folders. Let's say that you store photographs of your children in a folder named "Kids" on your computer, and you want to make the photographs available to your network. In this case, you would share the Kids folder, and not share the other folders on your computer.

Only the computer users on your network will have access to the files you share. At times, you may want to prevent users, such as your children or your roommates, from accessing particular folders and the files they contain. If you want to increase the security of your shared files, you can assign permissions and passwords to your files and folders. For more information, look up "permission" and "access control" in Windows Help. (In Microsoft Windows Millennium Edition, look up "controlling access.")

Although you can share files, printers, and other devices on your network, you cannot share software products such as Microsoft Word or Microsoft Excel. Each computer on the network must have those programs installed, and then you can share the files that you create within those programs.

For a computer's files and folders to be available to the network, the computer must be turned on and logged into the network. Also, if the computer is turned on but in sleep mode, it will not be accessible from the network. For more information, look up "power options" in Windows XP Help, or "power management" in Windows Me, Windows 2000, and Microsoft Windows 98 Help.

To access and organize your files

Windows Explorer displays the hierarchical structure of files, folders, and drives on your computer. Using Windows Explorer, you can copy, move, rename, and search for files and folders. For example, you can open a folder that contains a file that you want to copy or move, and then drag the file to another folder or drive.

To open Windows Explorer, click **Start**, point to **All Programs** (or **Programs**, depending on your version of Windows), point to **Accessories**, and then click **Windows Explorer**. (In some versions of Windows, you can skip the **Accessories** step.)

For more information about using Windows Explorer, see Windows Help.

You can use My Network Places (or Network Neighborhood, in Windows 2000 and Windows 98) to view and access all of the shared files and folders on your network.

My Network Places presents a view of the network similar to the view of your computer presented by Windows Explorer. Use My Network Places when you:

- Want to see all the resources available on the network.
- Already know where the resource that you want is located.
- Want to copy files and folders from one network location to another.

To open My Network Places, click **Start**, and then click **My Network Places**.

To open Network Neighborhood (in Windows 2000 and Windows 98), double-click **Network Neighborhood** on your desktop.

To open a file stored on another computer on the network

In order to complete this procedure, you must have on your local computer the type of program (such as Microsoft Word or Microsoft Excel) that was used to create the type of file you're trying to open. For example, if you want to open an .xls file, you must already have Microsoft Excel installed on the computer from which you're opening the file.

1. Open My Network Places or Network Neighborhood.
2. Double-click the name of the computer that has the file that you want to open.
3. Locate the file that you want to open.
4. Double-click the file.

To copy a file from your computer to another place on the network

1. Open Windows Explorer, My Network Places, or Network Neighborhood. Your computer and the other computer to which you want to copy a file will appear in the same window.
2. On your computer (which is often represented by drive letter C:), locate the file that you want to copy to another computer on the network.
3. Click to highlight the file.
4. On the **Edit** menu, click **Copy**.

5. Click the destination folder on the other computer (which is usually represented by a drive letter other than C:). You may need to scroll through the window to find the folder you want.
6. On the **Edit** menu, click **Paste**.

Allowing Access to Printers

Using Windows, you can print documents on a printer that is attached to another computer on your network.

The following procedures provide general guidance for a few basic printer-sharing tasks. For complete instructions and information about sharing printers, see Windows Help.

Note that there is a difference between a "network printer" and a local printer that you share with your network. A network printer is connected directly to a network, rather than being attached to a particular computer. The type of printer that you are likely to use with the Broadband Network Utility is a local printer that is attached to a specific computer and can be shared with the other computers on your network.

Before you can use a printer that is attached to another computer on your network, you will need to do the following:

- Make the printer available to the network (this is also known as sharing a printer).
- Install the printer drivers on each networked computer that will use the shared printer.
- Run the Add Printer Wizard on each computer that you want to print from.

The procedures for sharing a printer, installing drivers, and running the Add Printer Wizard differ depending on your version of Windows. For more detailed instructions, look up "sharing printers" in Windows Help.

Note
Some printer drivers are not designed for sharing printers. For more information, see the documentation that came with your printer.

To print to a shared printer that is attached to another computer on the network

1. Open the document that you want to print, such as a document in Microsoft Word).
2. On the **File** menu, click **Print**.
3. In the **Print** dialog box, select the shared printer from the list of printers.
4. Click **OK**.

For more detailed instructions, look up "printers" in Windows Help.

Note
The computer that is connected to the printer must be turned on in order for the other computers on the network to use the printer.

About Sharing Other Peripheral Devices

In addition to most printers, you can share storage devices—such as hard drives, CD-ROM drives, and Zip drives—on your network.

Storage devices that are not assigned a drive letter (such as tape drives) cannot be shared. Tape backups of your computer must be done from the computer that is attached to the tape drive.

Scanners, Web cameras, and CD-ROM burners cannot be shared with other computers on your network.

About Reading E-Mail Messages on a Network

You can access your e-mail messages from each networked computer the same way that you would access your e-mail messages without a network (assuming that you have an Internet connection). Open your e-mail program, or, if you have a Web-based e-mail account, sign in to your account through your Web browser.

Keep in mind the following: If you download e-mail messages from your e-mail account to one computer, those messages will not be accessible from the other computers on your network. Likewise, if you share an account with another person, and he or she downloads mail from the shared account to one computer on the network, you will not see that mail when you access the account from another computer.

To illustrate this point, let's say you share a postal mailbox at your home with your spouse. If you come home first and take the letters out of the mailbox, they will no longer be inside the mailbox when your spouse comes home later and checks for mail.

If you want your e-mail messages to remain available to all users of your network at any time, you should not download the messages to one computer. (However, you should delete old messages from your e-mail account on a regular basis, so that you don't exceed the storage space given to you by your e-mail provider.)

Playing Games on a Network and the Internet

Many of the most popular games now have multiplayer capability, allowing two or more players to compete by using a local network. With network-enabled games, you can use your networked computers to play games with friends and family members.

Most games come with documentation that explains all you need to know to configure your network for multiplayer gaming. However, the following check list might help you prepare for playing games over the network:

- If you have purchased a multiplayer game, be sure to install it on each computer on the network that will be used for playing games.

- Make sure that the network protocols necessary to run the games that you want are installed on each computer. For more information, see the documentation that came with your games.
- If you are playing a Web-based game, you may also be required to pay user fees or download game files to your computer. Be sure to follow the directions provided on the game's Web site.
- If you experience problems connecting to a Web-based game, you may need to configure the base station to work with the ports that your game uses. For more information, see "Port Forwarding" in Chapter 6.

For information about playing games on the Web, and for other game-related information, see the following Web site:

http://www.microsoft.com/broadbandnetworking/.

Connecting to Other Wireless Networks

Many places, such as offices, hotels, and airports, provide wireless networks that you can access from a portable computer while you're away from your own home or office.

If your operating system is Windows XP and you have a Microsoft Broadband Networking Wireless USB Adapter or Microsoft Broadband Networking Wireless Notebook Adapter, you can connect to other wireless networks, assuming that you have the necessary permissions and passwords for those networks.

If you do not have Windows XP, you can use the Broadband Network Utility to connect to other wireless networks. For more information, see "View and Change Network Settings" in Chapter 5.

For example, if you are traveling and have brought your laptop computer for a flight (with the Microsoft Wireless Notebook Adapter), you can automatically switch to the airport's wireless network.

Note
While connecting to another wireless network, you may need to switch between a workgroup and a domain. For more information about this task, see "Switching Between Workgroup and Domain" in the Broadband Network Utility Help.

To connect to an available wireless network

1. In the Windows notification area (the area on the taskbar to the right of the taskbar buttons), right-click the Wireless Network Connection icon, and then click **View Available Wireless Networks**.

Wireless Network Connection Icon

2. In **Connect to Wireless Network**, under **Available Networks**, click the wireless network that you want to connect to.

3. If wireless security (also known as Wired Equivalent Privacy, or WEP) is enabled on the network you are joining, type the key in the **Network Key** field. (A network administrator, or the person who set up the local-area network, should have the key that you need for this field.)

4. Click **Connect**.

5. To configure additional wireless network connection settings, or if you are having difficulty making a connection to the wireless network that you selected, click **Advanced**, and then configure the settings on the **Wireless Networks** tab.

5 monitor.

The Broadband Network Utility

The Broadband Network Utility is automatically installed on your computer when you install the Setup software. Use it to check the status of your network or change network settings. The Broadband Network Utility also shows the devices currently connected on your network.

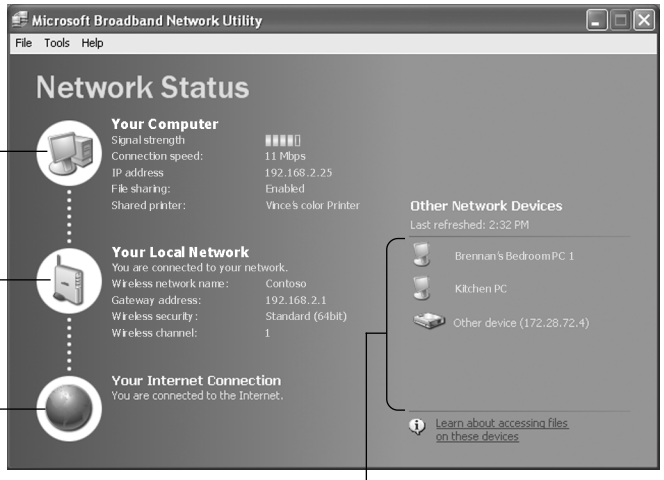
This chapter describes how to:

- View computer, network connection, and Internet connection status.
- View and change network settings.
- Update network software, drivers, and firmware.
- Secure your network.

Note
The information displayed in the main window of the Broadband Network Utility may vary depending on your network configuration.

To open the Broadband Network Utility

- Click **Start**, point to **Programs**, and then click **Broadband Network Utility**.
  -or-
- Double-click the Broadband Network Utility icon in the notification area of your desktop.



Your Computer Status

Your Network Status

Your Internet Connection Status

Status of all computers and devices in your workgroup

The following sections describe how to interpret status information about your network and perform common tasks by using the Broadband Network Utility.

If you requre more information on the status settings provided in the Broadband Network Utility, see Broadband Network Utility Help.

To open Broadband Network Utility Help

1. Open the Broadband Network Utility.
2. On the **Help** menu, click **Microsoft Broadband Network Utility Help**.

View the Status of Your Computer

This area of the Broadband Network Utility displays information about the computer that you are currently using. If there is a problem with your computer, on the **Help** menu of the Broadband Network Utility, click **Microsoft Broadband Network Utility Help.** In the left pane of the Help window, double-click **Troubleshooting**, and then click the topic that you want.

Note
If you set up an ad hoc network, **Network Connection Status** will not be displayed in the Broadband Network Utility.

View the Status of Your Network Connection

This area of the Broadband Network Utility displays information about your network, such as the workgroup name.

You can also view information about the status of your network connection by resting the pointer on the **Broadband Network Utility** icon  in the Windows notification area of your taskbar or tray.

View the Status of Your Internet Connection

This area of the Broadband Network Utility indicates whether you are currently connected to the Internet.

View the Status of Other Network Devices

This area of the Broadband Network Utility displays information about all the computers in your workgroup and other devices connected to your network.

To refresh the network device list

- Right-click the icon for the active devices in the network device list, and then click **Refresh list**.

To remove an inactive device from the network device list

- Right-click the dimmed icon for the device, and then click **Remove device**.

View and Change Network Settings

You can view network settings from the Broadband Network Utility. On computers running Windows 2000 or Windows XP, you must be logged in as an administrator to change network settings.

To view network settings

- On the **Tools** menu, click **Computer Settings**.

There are three types of settings that you can view and change from the **Computer Settings** dialog box:

- **Adapter settings**. These are the settings that you see when you first open the **Computer Settings** dialog box. On the **Adapter** tab, you can change the adapter that you are currently using. You can also view the IP address for your computer and local network and the default gateway IP address.
- **Wireless settings**. On the **Wireless** tab, you can view or change the network name (SSID), wireless channel, and data rate. You can also change these settings from the Base Station Management Tool. To learn more about these settings, see "Wireless Settings" in Chapter 6.
- **Encryption settings**. On the **Encryption** tab, you can turn wireless security (WEP) on or off, change the encryption strength, and create or change your WEP keys. You can also change these settings from the Base Station Management Tool. To learn more about these settings, see "Wireless Security (WEP)" in Chapter 6.

Update Software, Drivers, and Firmware

Occasionally, Microsoft may provide upgrades to the Broadband Network Utility software, network drivers, or firmware on the Microsoft Broadband Networking Web site. When an upgrade is available, you will automatically be notified. After you log on to a networked computer, a message will appear in the notification area of your desktop with a link to the Microsoft Broadband Networking Web site.

You can also check for upgrades on the Web site from the Broadband Network Utility.

To upgrade network software, drivers, or firmware

1. Open the Broadband Network Utility.
2. On the **Help** menu, click **Update**.
3. Follow the instructions on the Microsoft Broadband Networking Web site to download the most current software, drivers, or firmware.

Secure Your Network

This section provides some general information about how to protect your network from security threats.

The single most important step that you can take to secure your network is to install the Microsoft Broadband Networking Wireless Base Station. The base station provides an important security layer between your network computers and the Internet. However, even with the base station installed, your wireless network is still vulnerable to viruses and eavesdropping. To minimize risks to your network security, follow these suggestions:

- Enable wireless security (WEP) when you run the Setup Wizard.
- Install an antivirus software program and do not open unknown e-mail attachments.
- Create strong passwords.

Some security mechanisms, such as network address translation (NAT) and firewall settings, are activated on the Microsoft Wireless Base Station by default. You can customize these security settings from the Base Station Management Tool. For information about the Base Station Management Tool, see Chapter 6.

Protect Your Network from Hackers

The Microsoft Wireless Base Station provides a firewall and NAT to secure your system from hacker attacks.

A firewall is a barrier that helps protect your network from outside intruders. Like an actual firewall built to prevent fire from spreading between adjoining buildings, computer firewalls help prevent the spread of unauthorized communication between an individual computer or group of networked computers and the Internet.

The firewall specifies what information can be communicated from the computers on your network to the Internet, and from the Internet to the computers on your network. You may discover, however, that you may not be able to transmit data from some programs across the firewall. If this is the case, you can use the Base Station Management Tool to configure the base station to transmit the data that you require.

Network address translation hides the IP addresses of the computers on a network from the Internet so that only the base station's IP address is visible. Hiding network IP addresses provides another layer of protection against hackers trying to access the computers on your network.

For more information about NAT and firewall settings, see "Security Settings" in Chapter 6.

Protect Your Network from Computer Viruses

Setting up a network by using the Broadband Networking Wireless Base Station and adapters cannot protect against viruses.

To avoid having a problem with viruses on your network, follow these suggestions:

- Install an antivirus program on each computer on your network and use it regularly to check your computers for viruses. Remember to update the antivirus program on a regular basis.
- Learn the common signs of viruses: unusual messages that appear on your screen, decreased system performance, missing data, and inability to access your hard drive. If you notice any of these problems on your computer, run your antivirus program immediately to minimize the chances of losing data.
- Educate yourself about how viruses are commonly spread so that you do not spread one yourself:
  - Do not load a program from an untrusted source onto one of your network computers.
  - Never open attachments to e-mail messages that you are not expecting.
  - Use your antivirus software to scan all floppy disks before copying or opening files from them, or before starting your computer from them.

Protect Your Network from Unauthorized Access

Because wireless networks use radio signals, it is possible for other wireless network devices outside your immediate area to pick up the signals and either connect to your network or capture the network traffic. To help prevent unauthorized connections or the possibility of eavesdroppers listening in on your network traffic, do the following:

- Position your base station away from windows and toward the center of your home. This decreases the strength of the signal outside your home.
- Enable 128-bit wireless security (WEP) on your network when you run the Setup Wizard. Encryption scrambles the data so that it is decipherable only with the information necessary to decrypt it. If you did not enable wireless security when you ran the Setup Wizard, you can do so from the Broadband Network Utility or from the Base Station Management Tool. For more information, see “Wireless Security (WEP)” of Chapter 6.
- Use media access control (MAC) filtering. You can use MAC filtering to grant or deny users the ability to connect to your network based on the MAC addresses of the adapters they are using. For information about MAC filtering, see “MAC Filtering” in Chapter 6.

6 configure.

Customizing the Base Station

The Base Station Management Tool is a Web-based utility that you can use to manage network settings and customize security options on the Microsoft® Broadband Networking Wireless Base Station.

You can select many base station settings when you run the Setup Wizard. However, if you want to change a setting, such as your base station password, or if you have special network requirements (for example, if you want to establish a Web server on your network), you can use the Base Station Management Tool to configure the necessary settings.

If you do not run the Setup Wizard when you set up your network, you must use the Base Station Management Tool to configure your network settings.

This chapter explains how to perform the following tasks:

- Open the Base Station Management Tool and view the current configuration of your base station.
- Configure the base station with the settings provided by your Internet service provider (ISP) so that your networked computers can connect to the Internet.
- Manage network time settings, base station password, and firmware upgrades.
- Create a backup file of the base station settings.
- Change the wireless channel and wireless network name (also known as Service Set Identifier, or SSID) for your network.
- Customize security features, such as firewall settings, media access control (MAC) filtering, and wireless security (also known as Wired Equivalent Privacy, or WEP) settings.
- Change the base station configuration from routing mode to bridging mode.
- Limit access to the Internet or to particular applications on one or more of your networked computers by setting up client filtering.
- Set up the network to allow unrestricted access to the Internet from one computer by establishing a virtual demilitarized zone (DMZ).
- Configure port forwarding to run applications with special network requirements.

Opening the Base Station Management Tool

You can open the Base Station Management Tool from the Microsoft Broadband Network Utility or open it directly from a Web browser, such as Microsoft Internet Explorer 5 or later, or Netscape Navigator 4.7 or later. To use the Base Station Management Tool, you must have a Java-enabled browser installed on your computer.

To open the Base Station Management Tool

1. In the Broadband Network Utility, on the **Tools** menu, click **Base Station Management Tool**.
   -or-
   Open your Web browser, and then type the IP address of the base station in the address field. By default, this address is http://192.168.2.1. However, you can change this address in the Base Station Management Tool.
2. To log on, type the base station password that you created when you ran the Setup Wizard. The base station password is case sensitive. If you did not run the Setup Wizard, use the default base station password of **admin**.

If you do not remember the base station password that you set when you ran the Setup Wizard, you will need to restore the factory default settings on the base station and use the default base station password of **admin**. When you restore the original settings, you lose your ISP settings and must reconfigure these settings from the **Wide Area Network** page in the Base Station Management Tool.

For information about restoring factory default settings by using the Reset button on the base station, see "Resetting the Base Station" in Chapter 1.

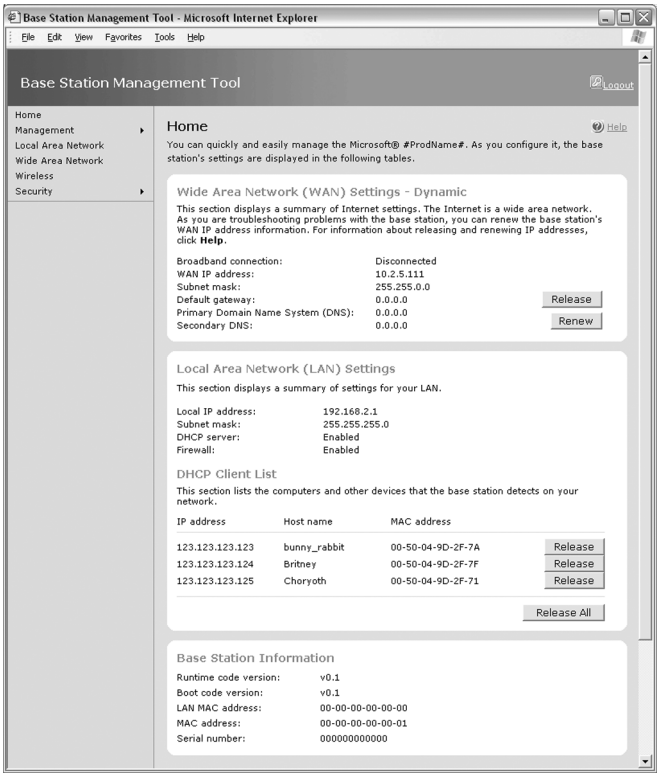
Logging Off

It is important to log off the Base Station Management Tool after you have finished using it. Logging off protects the configuration of your base station so that unauthorized users cannot access and change your settings. Logging off also ensures that you can open the Base Station Management Tool from another computer if you need to. The Base Station Management Tool cannot be opened simultaneously on two different networked computers.

To log off the Base Station Management Tool, on any page of the Base Station Management Tool, click **Log Off**.

Navigating the Base Station Management Tool

After you log on, the **Home** page of the Base Station Management Tool opens. You can use the menu in the left pane to navigate to the other pages of the Base Station Management Tool.



The following table lists the menu items in the Base Station Management Tool and the tasks that you can perform on each page.

Menu item	Tasks
Home	View current network settings and activity.
Management	Reset the base station, back up and restore base station settings, upgrade firmware, establish time settings, and change the base station password. For more information, see “Management Settings” in this chapter.
Local Area Network	Enable the Dynamic Host Configuration Protocol (DHCP) server on your base station and set the IP address range and lease time. For more information, see “Local Network Settings” in this chapter.
Wide Area Network	Specify and configure the type of Internet connection that your base station uses. For more information, see “Wide Area Network Settings” in this chapter.
Wireless	Set up or modify the connection between your base station and the wireless computers on your network. For more information, see “Wireless Settings” in this chapter.

continued

Menu item	Tasks
Security	Configure a variety of specialized security functions, including: ▪ Firewall ▪ Wireless security (WEP) ▪ Port forwarding, including virtual servers and special applications ▪ Client filtering ▪ MAC filtering

You can also view the base station log from the Security section. For more information, see "Security Settings" in this chapter.

If you need help at any time, click the **Help** button available on each page of the Base Station Management Tool.

Configuring the Base Station

Typically, when you run the Setup Wizard, you establish the settings required for your base station to connect to the Internet. If you completed the Setup Wizard, you only need to use the Base Station Management Tool when you want to modify your network settings.

You must use the Base Station Management Tool to establish the initial settings if any of the following are true:

- You did not run the Setup Wizard when you connected your network hardware and installed the network software.
- You are trying to configure the base station from a computer running Microsoft Windows® 2000 or from a computer not running Windows (for example, a Macintosh).
- You want to set the base station to bridging mode to extend the capabilities of an existing network.

If any of these situations apply to you, you must initially configure the base station from the Base Station Management Tool.

To configure the base station from the Base Station Management Tool

1. Connect the base station to a computer. For information about how to do this, see Chapter 3.
2. Configure the TCP/IP properties of each computer that you want to connect to your network. For information about how to do this, see "Configuring Network Computers" in this chapter.
3. On the computer connected to the base station, open your Web browser, and then type **192.168.2.1** in the address field.
4. In the logon box, type your password. The default password is **admin**.

5. On the **Management** menu, click **Change Password**, and then create a new base station password.
6. Click **Wide Area Network**. On the **Wide Area Network** page, select the type of Internet connection you have, and then enter the settings provided by your ISP. If you do not know the type of Internet connection you have, contact your ISP for assistance.
7. On the **Security** menu, click **Wireless Security**, and then create your wireless security settings. For information about wireless security settings, see "Wireless Security (WEP)" in this chapter.
8. Turn on your broadband modem, and then check the status of the Broadband Connection on the **Home** page of the Base Station Management Tool. If the status is **Disconnected,** click **Renew** or **Connect**. If the status is still **Disconnected**, confirm the ISP settings with your ISP, and then try to configure the base station again.

Configuring Network Computers

When you manually configure the base station, you must configure the TCP/IP properties of each computer that you connect to your network.

Before you configure the TCP/IP properties for each computer, you should establish the computer name and the workgroup name on each computer. Each computer name must be unique, while the workgroup name should be the same for all computers in the workgroup.

The procedure for establishing the computer and workgroup names on a computer varies depending on which version of Windows you are using. For information about how to establish these names, consult Windows Help or Broadband Network Utility Help.

To configure the TCP/IP properties of a computer running Windows 98, Windows 2000, or Windows Me

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network** icon.
3. In the **Configuration** dialog box, select the TCP/IP protocol line that is associated with your network adapter.
4. Click the **Properties** button, click the **IP Address** tab, and then select **Obtain an IP address automatically**.
5. Click the **Gateway** tab and make sure that all fields are empty, and then click **OK**. When the **Network Properties** dialog box appears, click **OK** again.
6. If you are prompted to supply the original Windows installation files, insert your Windows CD-ROM into the CD-ROM drive, and then browse to the location of your CD-ROM drive.
7. When you are prompted to restart your computer, click **OK**.

To configure the TCP/IP properties of a computer running Windows XP

1. Click **Start**, click **Control Panel,** and then double-click **Network Connections**.
2. Double-click the icon for the connection you want to configure, and then in the **Connection Status** dialog box, click **Properties**.
3. On the **General** tab, under **This connection uses the following items**, click **Internet Protocol (TCP/IP)**, and then click **Properties**.
4. Click **Obtain IP address automatically**, and then click **Obtain DNS server address automatically**.
5. Click **OK** to close the **TCP/IP Properties** dialog box, and then click **OK** to close the **Connection Properties** dialog box.

Caution
When you configure the base station as a bridge, the Base Station Management Tool is no longer available.

Using the Base Station As a Bridge

If you already have a functioning network in your home or office, you can use the base station to expand network connectivity, for example, by adding wireless functionality to a wired network. This is called bridging because the base station acts as a bridge between two networks or segments of a network.

Before you change the base station to bridging mode, make sure that the following conditions are true:

- A device on your network, such as your modem, is providing router capabilities, or a device on your network is providing a Network Address Translation (NAT) service.
- There is an existing DHCP server on your network.
- All devices on your network use static (fixed) IP addresses.

To configure the base station as a bridge

1. Connect the base station to a computer on your network. For information about how to do this, see Chapter 3.
2. On the computer connected to the base station, open your Web browser, and then type **192.168.2.1** in the address field.
3. At the logon prompt, type your password. The default password is **admin**.
4. On the **Management** menu, click **Change Password**, and then create a new base station password.
5. On the **Security** menu, click **Wireless Settings,** and then create your wireless security settings. For information about wireless security settings, see “Wireless Security (WEP)” in this chapter.
6. On the **Security** menu, click **Network Mode**.

7. Select the **Bridging Mode** check box, and then click **Yes** to confirm your selection. When you switch from routing mode to bridging mode, the base station resets. While the reset is in progress, the power light on the base station blinks and then turns orange. When the light is solid green, the reset is complete.
8. After the reset is complete, turn off the computer and the base station. Remove the cable from the base station **Ethernet** port and insert it into the **To Modem** port. Leave the other end of the cable connected to the **Ethernet** port of the computer.
9. Turn on the base station and restart your computer.

Home Page

You can view current base station and Internet connection settings from the **Home** page of the Base Station Management Tool. The following sections describe these settings.

Wide Area Network

The wide area network settings provide a summary of the Internet settings provided by your ISP. The settings that appear will vary depending on whether your ISP account provides a static (fixed) IP address, a dynamic Internet connection, or a Point-to-Point Protocol over Ethernet (PPPoE) connection. If your Internet connection is disabled, the WAN settings will be unavailable.

The following table describes the WAN settings and how to modify them.

Setting	Description	Notes
Broadband connection	Appears as **Connecting**, **Connected**, **Disconnecting**, or **Disconnected**.	If the Base Station Management Tool shows that your broadband connection is disconnected when you expect it to be connected, try clicking **Release** and then **Renew** to change the base station IP address. If you have a PPPoE connection, try clicking **Disconnect** and then **Connect**. You can also try resetting the base station and your broadband modem. If you complete these steps and the Broadband Connection is still disconnected, contact your ISP for assistance.
WAN IP address	Shows the IP address provided by your ISP.	This is the external (public) IP address that connects your network to the Internet. If your ISP provides you an IP address dynamically (by using a DHCP server), this address may change periodically. You can click the **Release** button and then the **Renew** button to get a new IP address.

continued

Setting	Description	Notes
		Releasing your IP address is a good idea if you are having trouble accessing the Internet and you have determined that the computer is not the source of the problem. If renewing the IP address does not resolve the problem, contact your ISP for assistance.
Subnet mask	Your ISP establishes the WAN subnet mask.	If you are using a static Internet connection, you can change the subnet mask for your wide area network, but you should use the subnet mask provided by your ISP. The subnet mask does not appear when you are using a PPPoE Internet connection.
Default gateway	The IP address that the base station uses to send data from your network to the Internet.	The gateway setting is automatically generated when you have a dynamic or PPPoE connection. If you have a static (fixed) IP address, your ISP should provide the gateway setting, and you can enter the setting on the Wide Area Network page of the Base Station Management Tool. If you have a dynamic connection and your Gateway setting is blank, you should click **Release** and then **Renew**.
Primary Domain Name System (DNS) and Secondary DNS	Your ISP provides the DNS addresses.	In some cases, these settings may be automatically filled in. Otherwise, you can enter them on the **Wide Area Network** page of the Base Station Management Tool.

Local Area Network

The Local Area Network settings relate to your local network—that is, how the base station is configured in relation to the devices on your network.

The following table describes the LAN settings and how to modify them.

Setting	Description	Notes
Local IP address	The default IP address of your base station is 192.168.2.1.	You can change the local IP address on the Local Area Network page of the Base Station Management Tool, but this is not recommended.
Subnet mask	The subnet mask for your local network is 255.255.255.0.	You cannot change the subnet mask of your LAN.

continued

Setting	Description	Notes
DHCP server	Appears as **Enabled** or **Disabled**.	You can change this setting on the Local Area Network page of the Base Station Management Tool.
Firewall	Appears as **Enabled** or **Disabled**.	You can change this setting in the Security section of the Base Station Management Tool.

DHCP Client List

When a DHCP server is enabled on a network, each device (also called a client, which can be a desktop computer, notebook computer, or another connected device) leases an IP address for a specified period of time. The DHCP client list shows all the clients that have an active lease on an IP address and the IP address and MAC address of each client. The list includes any device with an active lease, even if that device is no longer actively connected to the network. A client is removed from the DHCP client list when its lease has expired. The network can support up to 253 clients at one time.

You can specify the IP address lease time from the **Local Area Network** page of the Base Station Management Tool. For information about how to do this, see "Local Network Settings" in this chapter.

The DHCP client list is relevant to your network only if you have the DHCP server enabled on the base station. For information about how to enable or disable the DHCP server, see "DHCP Server" in this chapter.

Base Station Information

You can view current network status in the Base Station Management Tool, under **Network Information**. The following table describes this network information.

Setting	Description	Notes
Runtime code version and Boot code version	These settings show the version numbers of your firmware.	When you check for firmware upgrades at www.microsoft.com/broadbandnetworking, you should download the version on the Web only if it is later than this version.
LAN MAC address	This is the MAC address of the base station.	For information about MAC addresses, see "MAC Addresses" in this chapter.
MAC address	This is the MAC address that your ISP sees.	For information about MAC addresses, see "MAC Addresses" in this chapter.

continued

Setting	Description	Notes
Serial number	This is the serial number of your base station.	If you need to call Product Support Services for assistance, you may need to provide the serial number.

Management Settings

When you want to change the settings related to the management of your base station (for example, resetting the base station, backing up or restoring settings, establishing time settings, or changing the password), use the **Management** menu in the Base Station Management Tool. The following sections describe how to perform management-related tasks.

Reset the Base Station

Note
You can also reset the base station by using the reset button on the physical device. For information about how to perform a hardware reset, see Chapter 1.

You can reset the base station when you experience any of the following problems:

- You have DHCP enabled on the base station, but the base station is not assigning IP addresses.
- The computers on the network are no longer able to connect to the Internet.
- The base station is not performing as expected.

When you reset the base station, you are forcing it to reinitialize and restart all of its functions. The base station settings will not change when you reset the base station.

To reset the base station

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Reset**.
3. On the **Reset Base Station** page, click **Reset**. While the reset is in progress, the power light on the base station blinks and then turns orange. When the light is solid green, the reset is complete.

If you want to open the Base Station Management Tool after the reset is complete, type your base station password on the **Logon** page. Do not attempt to log on until the reset is complete and the power light on the base station is solid green.

Restore Factory Default Settings

You can restore the base station to its factory default settings if absolutely necessary. When you restore factory default settings, you clear any special base station configurations that you have established. You will need to reconfigure your base station settings or restore these settings from a backup file.

You should restore the original factory default settings only under the following circumstances:

- You are experiencing serious problems with your base station, and resetting the base station does not fix the problem.
- You cannot remember your base station password.

If you cannot remember your base station password, you will not be able to open the Base Station Management Tool. In this situation, you must restore the factory default settings from the base station, and then use the default password **admin** to log on to the Base Station Management Tool.

To restore factory default settings

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Back Up and Restore**.
3. Under **Restore Factory Default Settings**, click **Restore Factory Default Settings**. While the original factory default settings are being restored, the power light on the base station blinks and then turns orange. When the light is solid green, the settings have been restored.

If you want to open the Base Station Management Tool after the settings are restored, type **admin** as the password on the **Logon** page. Do not try to log on to the base station until the settings are restored and the base station power light is solid green.

After you restore the factory default settings, you should navigate to each page of the Base Station Management Tool and reestablish the network settings you need, or restore the base station settings by using a backup file. For information about creating a backup file of your settings, see the following section.

Be sure to establish your unique base station password as soon as possible after restoring the factory default settings to prevent unauthorized users from logging on. For information about changing the base station password, see “Change the Base Station Password” in this chapter.

Back Up Base Station Settings

You can create a backup file of all your base station settings from the Base Station Management Tool. The backup file can include settings that you established when you completed the Setup Wizard and the settings that you modified from the Base Station Management Tool.

It is a good idea to create a backup file after you have the base station set up and operating normally. If for some reason the base station malfunctions, you can restore the factory default settings to the base station, and then use the backup file to reconfigure your base station and resume normal operations.

It is recommended that you back up settings whenever you change settings, such as your base station password.

To back up base station settings

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Back Up and Restore**.
3. Click **Back Up Settings**.
4. If you receive a message asking you whether to open or save the file, click **Save**.
5. Type a name for the file that contains your base station settings (or use the default name Config.bin), browse to the folder or disk where you want to save the file, and then click **Save**.

Restore Base Station Settings from a Backup

If you have created a backup file of your base station settings, you can restore settings from the backup file at any time. This capability is particularly useful if the base station malfunctions and you must restore the factory default settings. Instead of manually reconfiguring each of your network settings from the Base Station Management Tool, you can restore all of your saved settings from the backup file.

To restore base station settings from a backup file

1. On the computer where you saved the backup file of your base station settings, open the Base Station Management Tool.
2. Type the current base station password. If you have just restored the factory default settings to the base station, the password will be **admin**.
3. On the **Management** menu, click **Back Up and Restore**.
4. Under **Restore Base Station Settings from a Backup**, type the path and name of the backup settings file, or click **Browse** to search for the file that contains your network settings.
5. Click **Restore Settings**. While the settings are being restored, the power light on the base station blinks and then turns orange. When the light is solid green, the settings have been restored.

If you want to open the Base Station Management Tool after the settings are restored, type your base station password on the **Logon** page. Do not attempt to log on until the settings are restored and the power light on the base station is solid green.

Upgrade Base Station Firmware

Firmware is the term used to describe the programs stored in the flash memory of hardware devices such as the Broadband Networking Wireless Base Station. The firmware defines the functionality of your base station. Occasionally, Microsoft may provide upgrades to the firmware to improve the performance of your base station. You can upgrade the firmware from the Base Station Management Tool.

You can perform a firmware upgrade from any of your network computers, but it is recommended that you use a computer with a wired (Ethernet) connection to the base station.

During an upgrade, all users connected to the network will lose network functionality.

To upgrade the base station firmware

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Firmware Upgrade**.
3. Follow the directions on the screen to upgrade your firmware. While the firmware is being programmed into your base station, the power light on the base station blinks and then turns orange. When the light is solid green, the update is complete. If the upgrade fails, the power light will continue to blink slowly until you successfully upgrade the firmware. In this situation, you can try to upgrade the firmware again, or you can reset the base station.

If you want to open the Base Station Management Tool after a successful firmware update, type your base station password on the **Logon** page. Do not attempt to log on until the firmware upgrade is complete and the power light on the base station is solid green.

Certain programs do not allow pop-up windows from Web browsers. If you have one of these programs installed on your computer, you may experience problems when you click the **Microsoft Broadband Networking Web site** link on the **Upgrade Firmware** page. If you do experience problems, you can open the Microsoft Broadband Networking site by typing **http://www.microsoft.com/broadbandnetworking/** in the address field of your Web browser and browsing to the update page, or by turning off the software that prevents pop-up windows.

For information about how to upgrade network software and drivers from the Broadband Network Utility, see Broadband Network Utility Help.

Establish Base Station Time Zone

The base station uses the date and time for client filtering and to time stamp entries to the base station log.

The base station system clock is set to the Pacific time zone by default. You can change the base station time zone from the Base Station Management Tool.

To change the base station time zone

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Set Time**.
3. Under **Base Station Time Zone**, in the drop-down list box, click the time zone you want.
4. Select the **Adjust automatically for daylight saving time** check box if you want the base station to adjust for daylight-saving time.
5. If you selected the **Adjust automatically for daylight saving time** check box, type the date that you want daylight-saving time to start and the date that you want daylight-saving time to end. You must update these dates each year to correspond with daylight-saving time.
6. Click **Update Time Settings** to ensure that the changes that you made are saved.

Synchronize Time to Internet Time Server

The base station automatically attempts to synchronize with one of a set of Simple Network Time Protocol (SNTP) servers when it is connected to the Internet. If you want to synchronize the base station to a specific SNTP server, you can do so from the Base Station Management Tool. Before you can set the SNTP server, you must identify the IP address for the server that you want to use.

To locate an SNTP server

1. Open your Web browser, and go to your favorite search engine (for example, http://www.msn.com).
2. Type **Time synchronization on the Internet** as a search term.
3. Review the search results, and browse to the SNTP server site that you want to use.
4. Write down the IP address for the SNTP server that you have accessed.

To synchronize the base station with an SNTP server

1. Open the Base Station Management Tool, and then click **Management**.

2. On the **Management** menu, click **Time Settings**.
3. Under **Synchronize Time to Internet Time Server**, type the IP address for the specific SNTP server that you want to use, and then click **Add**.
4. Repeat step 3 for any additional backup SNTP servers that you want to specify.

Change the Base Station Password

Access to the Base Station Management Tool is password protected so that only users who know the base station password can change your network configuration. If you ran the Setup Wizard, you were prompted to establish a password. This is your base station password. If you did not run the Setup Wizard, your default password is **admin**. You can change the base station password from the Base Station Management Tool.

It is a good idea to change your password every two to three months, or more frequently if you are concerned that an unauthorized person has administrative access to the base station.

If at any point you restore the factory default settings for the base station, the default password **admin** is also restored. You can use this password to access the base station, and then create a new password at the earliest opportunity.

When you change your base station password, be sure to update your backup file.

To change the base station password

1. Open the Base Station Management Tool, and then click **Management**.
2. On the **Management** menu, click **Change Password**.
3. In the **Current password** box, type your current password
4. In the **New password** box, type in a new password. The base station password can contain 3–16 alphanumeric characters and is case sensitive.
5. In the **Retype new password** box, retype the new password. Do not use the **Copy** and **Paste** commands to add the new password to the **Retype new password** box. If you did not type your password correctly in the **New Password** box, you will not know what your password is when you paste it into the **Retype new password** box.
6. If you want, in the **Log out inactive user in** box, type a time interval. After the specified time interval elapses without activity, you will need to log on to the Base Station Management Tool again in order to view or change settings.
7. To save the new password, click **Apply**.

Be sure to store your password in a safe place. If you forget or misplace your password and cannot log on to the Base Station Management Tool, you can restore the base station to the factory default settings from the physical device, and then use the default password **admin** to open the Base Station Management Tool. For more information about restoring factory default settings on the base station, see "Resetting the Base Station" in Chapter 1.

Note
If you set the Broadband Networking Wireless Base Station to bridging mode, the settings on the **Local Area Network** page in the Base Station Management Tool will be unavailable.

Local Area Network Settings

You can configure settings for your local network on the **Local Area Network** page of the Base Station Management Tool. This configuration includes the following:

- Changing the IP address of your base station and viewing the subnet mask assigned to your local network.
- Enabling or disabling a DHCP server on the base station.
- Setting the IP address range and lease time for the DHCP server.
- Entering the local domain name for the DHCP server if necessary.

Before you configure your local network, take some time to learn about the options available. The following sections describe each of the local area network settings.

IP Address and Subnet Mask

The default IP address of your local network is 192.168.2.1. This address is reserved for private local networks; it is not visible to the Internet.

You do not need to change the IP address unless you have a specific reason to do so—for example, if your modem IP address overlaps with the base station IP address. If you want to change the IP address of your base station, be sure to change it to another nonroutable (private) IP address.

The IP addresses assigned to the computers on your local network by the DHCP server are derived from the base station IP address. If you change the base station IP address, the DHCP IP address range will also change.

The subnet mask for your local network is 255.255.255.0. You cannot change the subnet mask assigned to your local network.

To modify the base station IP address

1. Open the Base Station Management Tool, and then click **Local Area Network**.
2. Type a new IP address for the base station.
3. To save the changes, click **Apply**.

DHCP Server

The base station DHCP server allocates IP addresses to the computers on your local network from a specific range of IP addresses. Each time a computer on your network requests an IP address, it receives one within the specified IP address range. Typically, the DHCP server will assign the same IP address to a client computer each time the client logs on to the network.

The base station provides a default IP address range for the DHCP server to use. If you want, you can select a specified IP address range when you enable the DHCP server.

To enable the DHCP server on the base station

1. Open the Base Station Management Tool, and then click **Local Area Network**.
2. If it is not already selected, select the **Enabled** check box to enable the DHCP server on the base station.
3. If you do not want to use the IP address pool specified by the DHCP server, type a starting IP address and an ending IP address for the pool. Do not include the base station IP address in the IP address pool. For example, if you are using the default base station IP address (192.168.2.1), the address range must be between 192.168.2.2 and 192.168.2.254.
4. Select a lease time for the assigned IP addresses. The default time is two hours.
5. Type a local domain name if your ISP provided one for you.
6. To save your changes, click **Apply**.

Wide Area Network Settings

The WAN settings on your network depend on your ISP account. ISPs provide broadband customers with one of three different types of Internet connections:

- Dynamic
- Static
- PPPoE

The Setup Wizard helps you configure your Internet connection. If you did not run the Setup Wizard, the Broadband Networking Wireless Base Station selects a dynamic connection by default. If you have a static Internet connection or a PPPoE connection, you can change the WAN setting from the **Wide Area Network** page of the Base Station Management Tool.

You also have the option to disable your network Internet connection, if necessary. The following sections describe each type of Internet connection and how to configure your base station for that option.

Dynamic Internet Connection

If your ISP provides a DHCP server, you should select a dynamic Internet connection for the WAN. This connection enables your ISP to assign the IP address to your base station dynamically based on the IP addresses available in the ISP's subnet.

When you select a dynamic Internet connection, you may be required to enter the host name and the DNS addresses, if your ISP provided this information.

To establish a dynamic Internet connection

1. Open the Base Station Management Tool, and then click **Wide Area Network**.
2. Under **Internet Connection Type**, click **Dynamic**.
3. Specify a host name if your ISP provided one to you.
4. Specify a MAC address, and click **Clone MAC Address**, if necessary. For information about this option, see the following section.
5. Specify the DNS primary and secondary addresses, if your ISP provided you with this information and it has not been obtained automatically.
6. To save the WAN settings, click **Connect**.

MAC Addresses

A MAC address is a unique numerical identifier for a hardware device, such as a base station or adapter. Your base station has two MAC addresses, one for the local area network and one for the wide area network. Each network adapter that you use also has a MAC address that is assigned at the time of manufacture and printed on the label.

Some ISPs record the MAC address of the adapter that you use when you first connect to the Internet. Depending on your ISP account, you may experience problems if you later use the base station's default MAC address to connect to the Internet.

One way to avoid this problem is to clone the MAC address of the adapter installed in the computer where you initially connected to the Internet. When you clone the adapter MAC address, it replaces the base station WAN MAC address, so each device on the network, including the base station, appears to have that MAC address.

To clone a MAC address

1. Open the Base Station Management Tool, and then click **Wide Area Network**.

2. In the **MAC address** box, type the MAC address of the adapter installed in the computer that is connected to your base station. The MAC address appears on the label on the underside of your adapter.
3. Click **Clone MAC address**.

It is a good idea to record the MAC address of the adapter that you clone, so that if you lose your settings or no longer have the adapter, you do not lose your ability to connect to the Internet.

Static Internet Connection

If your ISP account provides a static (fixed) IP address, you should configure the WAN settings on your base station for a static Internet connection.

To establish a static Internet connection

1. Open the Base Station Management Tool, and then click **Wide Area Network**.
2. Under **Internet Connection Type**, click **Static**.
3. Under **Static Connection**, type the information provided by your ISP, including the IP address, subnet mask, default gateway IP address, and DNS addresses (if provided).
4. To save the WAN settings, click **Apply**.

PPPoE Internet Connection

If your ISP uses a PPPoE connection, you should configure the WAN settings on your base station for a PPPoE connection.

A PPPoE Internet connection functions like a dial-up connection in that your user name and password are passed to the ISP for authentication to establish an Internet connection. This interaction happens automatically when the base station is turned on.

Unlike a dial-up connection, a PPPoE Internet connection is persistent unless any of the following occurs: you disable the connection; the base station is turned off or loses power; or you specify a maximum idle time, and this time elapses.

To establish a PPPoE Internet connection

1. Open the Base Station Management Tool, and then click **Wide Area Network**.
2. Under **Internet Connection Type**, click **PPPoE**.
3. Under **Point-to-Point Protocol over Ethernet (PPPoE)**, type your user name and password.
4. Type a service name if your ISP supplied it.

5. Type a maximum idle time, if your ISP instructs you to. You will be disconnected from the Internet if the time that you specify elapses without activity.
6. Type the DNS primary and secondary addresses, if your ISP provided you with this information.
7. To save the WAN settings, click **Apply**.

Disabled Connection

You can disable your Internet connection at any time. You may want to disable your Internet connection in the following situations:

- You suspect that an unauthorized individual is accessing your network.
- You want to limit your children's access to the Internet.
- You want to limit the exposure of your local network to the WAN.

Disabling your Internet connection does not affect your Internet connection settings in any way. When you reestablish your connection, your original settings are intact.

To disable the Internet connection

1. Open the Base Station Management Tool, and then click **Wide Area Network**.
2. Under **Internet Connection Type**, click **Disabled**.
3. To disable your Internet connection, click **Apply**.

Wireless Settings

You can enable or disable wireless access from the **Wireless** page of the Base Station Management Tool. When you enable wireless access, you must establish the following base station settings:

- Wireless network name (SSID)
- Wireless channel
- Data rate

It is likely that you already established the wireless network name (SSID) and wireless channel when you ran the Setup Wizard. If you did not run the Setup Wizard, or if for some reason you want to modify these settings, you must update the wireless network name (SSID) and wireless channel on all the devices that connect wirelessly to your network. For information about how to update the wireless network name and wireless channel on specific devices, see the Broadband Network Utility Help.

When you enable wireless access on your network, you should also enable wireless security (WEP). For more information about wireless security, see "Wireless Security (WEP)" in this chapter.

Wireless Network Name (SSID)

The wireless network name, also known as the Service Set Identifier (SSID), identifies your network. Because the network name is broadcast by the base station, any user of a wireless device that supports the Institute of Electrical and Electronics Engineers (IEEE) 802.11b standard could attempt to join your wireless network, if that device is in range.

To prevent users of unauthorized wireless clients from joining your wireless network, enable wireless security (WEP). For information about wireless security (WEP), see "Wireless Security (WEP)" in this chapter.

If you know the MAC addresses of all the wireless clients that you want to access your network, you can use MAC filtering to prevent unauthorized access. For information about MAC filtering, see "MAC Filtering" in this chapter.

Wireless Channel

The wireless channel is a path through which signals flow to and from your network. If you are having difficulty sending or receiving information on a wireless client, try changing the wireless channel. Be sure that each wireless device uses the same wireless channel as the base station.

Data Rate

The data rate indicates the speed at which wireless data can be transmitted across the network. Typically, you will want to leave the data rate at the default setting of **Automatic**, which enables the maximum data transfer speed. You may want to decrease the data rate, however, if any of the following are true:

- You are using a device that requires a slower bandwidth for data transfer.
- You want to conserve bandwidth on your network.
- You are experiencing problems maintaining a connection with a wireless device.

To enable wireless access

1. Open the Base Station Management Tool, and then click **Wireless**.
2. Select the **Enable wireless access** check box.
3. If you want to change the wireless channel, click a number in the **Wireless channel number** drop-down list box.
4. If you want to change the network name, type a new network name in the **Wireless network name (SSID)** box. The network name is case sensitive and cannot exceed 32 characters.

5. If you want to decrease the data rate from **Automatic**, click one of the other options available in the **Data rate** drop-down list box.

6. To apply these settings, click **Apply**.

Security Settings

The Broadband Networking Wireless Base Station is configured to protect your network from the most common hacker attacks and other security risks. If necessary, you can change the default base station settings or establish special services from the **Security** section of the Base Station Management Tool.

The following sections describe the security features of the base station and how to customize them.

Be aware that changing security settings may affect whether the computers on your LAN are able to connect to the LAN and Internet. You should not change the default security settings unless you are absolutely clear about your objective in doing so.

Wireless Security (WEP)

The Broadband Networking Wireless Base Station uses wireless security (WEP) to prevent unauthorized users from accessing data that is being transmitted over the network. From the Base Station Management Tool, you can:

- Enable wireless encryption.
- Change the network key or modify the encryption settings that you established in the Setup Wizard.
- Disable wireless encryption.

When data is encrypted, it is rendered unreadable by a network key—called a WEP key—before being transmitted between wireless nodes. The data is readable only by computers that have the network key to decrypt the data.

The WEP key that you establish is stored with all of your network settings on each networked computer so that data can be encrypted and decrypted as it is transmitted over the network. If you change the WEP key that the base station uses, you must ensure that each computer on your wireless network uses the same WEP key so that it can communicate with the base station. For information about how to change the WEP key on each computer, see the Broadband Network Utility Help.

When you enable wireless encryption, you can choose between 64-bit or 128-bit encryption. The number defines the strength of the data encryption. The higher the number, the more difficult the data is to decrypt.

After you select the wireless encryption strength, you can type the WEP keys. For 64-bit encryption, you can type up to four WEP keys, each of which consists of ten hexadecimal digits. For 128-bit encryption, you must type one WEP key that consists of 26 hexadecimal digits. A hexadecimal digit is a number or letter in the range 0–9 or A–F.

Although encryption may slow down the speed at which data is transmitting, you will not observe any noticeable changes to network behavior as a result of data encryption and decryption.

To enable wireless security

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Wireless Security**.
3. Click **Enable wireless security**.
4. In the **Encryption strength** drop-down list box, click **128-bit** or leave the default setting of **64-bit**.
5. If you selected 128-bit encryption, in the first **Key** box, type an encryption key. If you selected 64-bit encryption, you can type up to four WEP keys in the **Key** boxes.
6. If you selected 64-bit encryption, in the **Key index** drop-down list box, click a key index. The key index number indicates which of the four WEP keys will be enabled on the network.
7. To enable the wireless encryption, click **Apply**.
8. Update the WEP keys stored on each wireless device on your network.

You can update wireless encryption settings for each network device from the Broadband Network Utility. If you are using a non-Microsoft adapter, use the software installed with that adapter to update wireless encryption settings.

Note
If you set the Broadband Networking Wireless Base Station to bridging mode, the firewall settings in the Base Station Management Tool will be unavailable.

Firewall Settings

The Broadband Networking Wireless Base Station provides a firewall to protect your network against malicious transmissions. Just as the name implies, a firewall acts as a barrier or buffer zone between your local network and the Internet. It checks data packets being transmitted to your network and discards any suspicious data.

The firewall is enabled by default, but you can choose to disable it from the Base Station Management Tool. Do not disable the firewall unless you have a good reason to do so.

To change the firewall settings

1. Open the Base Station Management Tool, and then click **Security**.

2. On the **Security** menu, click **Firewall Settings**.
3. To enable the firewall, select the **Enable the integrated firewall** check box.
   -or-
   To disable the firewall, clear the **Enable the integrated firewall** check box.
4. To save your changes, click **Apply**.

Block Ping Commands

You can configure the firewall to discard network ping commands. A ping command is like a short conversation between a device on the WAN and your base station. When a device on the WAN sends a ping command, the base station responds.

When you block ping commands, you are telling the base station not to respond to a ping initiated from the WAN. This security mechanism hides your network from hackers who may be pinging random IP addresses to see where they get a response. A response verifies your network location, and a hacker can then use this information to send malicious communications to your network.

In general, it is a good idea to discard ping commands sent from the WAN. The only circumstances in which blocking ping commands may present a problem are:

- When your ISP needs to ping your network to ensure that the connection is still valid.
- When you or another person needs to check your Internet connection from an external network. For example, you may want to do this to make sure that you can access your Web server.
- When you are playing games on the Internet, and other players need to verify your network location and connection speed.

To block ping commands

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Firewall Settings**.
3. Select the **Discard pings** check box.
4. To save your changes, click **Apply**.

Network Mode

You have the option to use the base station for routing services or as a bridge between two networks. The Broadband Networking Wireless Base Station is set to routing mode by default.

When you change the base station to bridging mode, you disable network address translation (NAT), which is an important feature of your network. When NAT is enabled, you can use the single IP address supplied by your ISP to connect multiple computers to the Internet. Ordinarily, if you wanted to connect multiple computers, you would need to arrange additional addresses (for example, by purchasing additional accounts). NAT enables multiple clients to share a single connection to the Internet.

If you choose to use the base station as a bridge between two networks or segments of a network, make sure that another device on your network (such as a base station, gateway, or router) is providing NAT service. If you do not have a NAT service on your network, you should lease an IP address for each computer on your network. Be aware that each of these IP addresses will be exposed to the Internet.

To change the base station network mode

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Network Mode**.
3. Select the **Bridging Mode check box**.
4. To save your changes, click **Apply**.

Note
If you set the Broadband Networking Wireless Base Station to bridging mode, the port forwarding settings in the Base Station Management Tool will be unavailable.

Port Forwarding

You can configure the ports on your base station to establish virtual servers or run applications with special network requirements on your network. This is called port forwarding. To understand how port forwarding works, you must first understand ports and their role in data transmission.

About Ports

Note
Port forwarding involves the configuration of data ports. Do not confuse the data ports, which are logical programmatic elements, with physical ports, such as the Ethernet port on your base station.

Information passes from the Internet to computers on your network across ports. In any network communication, there is an outbound (destination) port and an inbound (source) port. These ports are used in conjunction with the source and destination IP addresses to establish a connection between two networked computers.

There are many different types of data transmitted across a network, and certain types of data must pass out of certain ports. The data type is recognized by the protocol, or rules, that it follows. For example, the e-mail messages that you send may follow one type of protocol, whereas the games that you play may follow another protocol. Typically, the data protocol determines the ports to which the data is passed.

The Broadband Networking Wireless Base Station opens the ports for certain applications automatically when a client on your local network transmits data to the WAN.

This enables transmission of some of the more common data sent to and from the Internet, such as e-mail messages and Web browser data.

To run applications with special network requirements or to establish a virtual server, however, you may need to change the port configuration on the base station. You can configure, or forward, ports from the Base Station Management Tool.

Application-Triggered Port Forwarding

Some applications, such as Internet games and videoconferencing, require multiple ports for data transmission. File Transfer Protocol (FTP) data, for example, is sent from your computer to one port and returns to another port. These multiple port transmissions may cause problems when the base station is set to routing mode so that NAT is enabled on your base station, because the NAT service anticipates that data sent to one port will return to the same port.

The Broadband Networking Wireless Base Station has already been configured to accommodate some common application protocols that require multiple ports, including FTP, Simple Mail Transfer Protocol (SMTP), and Post Office Protocol 3 (POP3).

To configure port forwarding for other applications that require multiple ports, you must specify the outbound (destination) port to which data following a particular protocol will be sent, and the inbound (source) port or ports to which related data will return. Essentially, you are telling the base station how to direct traffic across the networks.

The inbound ports that you specify will open only when data is sent to the corresponding outbound port. These ports will close again after a certain amount of time has elapsed with no data sent to the inbound port. You can set ranges of ports, multiple ports, and combinations of single and multiple ports for the inbound ports.

You can configure the base station to accommodate up to 20 applications. To identify the protocol that an application uses and the ports to which the data should be sent, consult the documentation for that application.

To establish application-triggered port forwarding

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Port Forwarding**, and then click **Set up application-triggered port forwarding**.
3. In the available **Description** box, type a description of the application that you want to enable.
4. In the **Outbound port** box, type the number of the outbound port. The outbound port should be one number between 0 and 65535. To determine which port the application uses, consult the documentation for the application.

5. In the **Trigger type** drop-down list box, click the trigger type. The trigger type should be specified in the documentation for the application.
6. In the **Inbound port(s)** box, type the inbound port. The inbound port can be a single port or a comma-separated list of ports or port ranges. For example, you could type **4-25**, or **243**, or **10, 24-50, 74**. You are limited to 256 characters.
7. In the **Public type** drop-down list box, click the public type. The public type should be specified in the documentation for the application.
8. Select the **Enable** check box.
9. To save the changes you have made, click **Apply**, or to delete the changes, click **Cancel**.

If an application does not function correctly after you enable multiple ports, check the documentation for the application to verify that you are enabling the correct ports to open. If you have set the correct ports to open and the application still does not function properly, you may need to establish a DMZ on one of the client computers on your network to run the application. For information about establishing a DMZ, see "Virtual Demilitarized Zone" in this chapter.

Persistent Port Forwarding

When you host a server on your network—for example, a Web or FTP server—you must configure the base station to perform persistent port forwarding.

Persistent port forwarding is similar to application-triggered port forwarding in that you are opening inbound ports to allow particular types of data or data requests to be sent from the Internet to one of the networked computers. The difference is that you are opening these inbound ports permanently, rather than configuring them to open only when there is data sent to an outbound port. In addition, you are directing the data sent to that port to a particular computer on your local network.

For example, if you set up a Web server on one of the computers on your network, you must direct unsolicited requests sent to Transmission Control Protocol (TCP) Port 80, which handles Hypertext Transfer Protocol (HTTP) or Web data, to that computer. An unsolicited request is any data communication that is not initiated by a computer on your local network.

Although not required, it is recommended that you have a static (fixed) IP address to host any type of server on your network.

To establish persistent port forwarding, you will need the following information:

- The IP address of the server computer on your local network. To determine the IP address assigned to the computer that you will use as a server, check the DHCP client list on the Home page of the Base Station Management Tool.
- The inbound and private port numbers and protocol that correspond to the type of data that your server handles.

Some of the common TCP inbound ports include:

- HTTP Port 80
- FTP Port 21
- Telnet Port 23
- POP3 Port 110

To configure persistent port forwarding

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Port Forwarding**, and then click **Set up persistent port forwarding**.
3. In the **Description** box, type a description of the server field. (This step is optional.)
4. In the **Inbound port** box, type the inbound port to which data packets sent from the Internet to the server will be passed. The inbound port can be a single port or a comma-separated list of ports or port ranges. For example, you could type **4-25**, or **243**, or **10, 24-50, 74**. You are limited to 256 characters.
5. In the **Type** box, select the protocol (UDP or TCP) for the port.
6. In the **Private IP address** box, type the private IP address of the client computer that is hosting the server.
7. In the **Private port** boxes, type the private port on the server that the data will be sent to. To identify the private port number, consult the documentation for your server software.
8. To save the changes you have made, click **Apply**, or to delete the changes, click **Cancel**.

Note
If you set the Broadband Networking Wireless Base Station to bridging mode, the virtual demilitarized zone settings in the Base Station Management Tool will be unavailable.

Virtual Demilitarized Zone

In certain situations, you may want to set up a virtual demilitarized zone (DMZ) on one of the clients on your network. When you establish a DMZ, you essentially open all inbound ports and direct the base station to forward certain inbound data packets (those that are not in response to a transmission initiated by a LAN client and not handled through application-triggered or persistent port forwarding) to a particular computer on your LAN. This computer becomes the DMZ host.

A DMZ host is useful for experimenting with new games on the Internet or for setting up a server on your network before you know which ports to open for that server. A DMZ, however, should be used only in very specific and finite situations. The computer that hosts the DMZ is fully exposed to the Internet, and is thus susceptible to malicious attacks and unauthorized access.

Because the computer is a virtual DMZ behind the base station, as opposed to a real DMZ out on the Internet, it has access to the other computers on your LAN. If a hacker were to upload a virus to the virtual DMZ, the virus could spread to all the computers on your network.

Because the virtual DMZ that you establish is behind the base station NAT, the IP address for the DMZ is not public. This means that the DMZ can resolve most, but not all, connection problems.

To establish a virtual DMZ

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Virtual DMZ (Demilitarized Zone)**.
3. Select the **Enable** check box.
4. In the text box, type the IP address assigned to the computer that will host the virtual DMZ. To determine the IP address, see the DHCP client list on the **Home** page of the Base Station Management Tool.
5. To save the changes you have made, click **Apply**, or to delete the changes, click **Cancel**.

Note
If you set the Broadband Networking Wireless Base Station to bridging mode, the MAC filtering settings in the Base Station Management tool will be unavailable.

MAC Filtering

You can increase the security on your network by using MAC filtering. MAC filtering enables you to control access to network resources, including your Internet connection and shared files and printers. You can configure the base station to permit or deny a client access to network resources based on the MAC address of the adapter that the client uses.

If you want to use MAC filtering, the first step is to enable the type or types of MAC address control that you want. The two types of MAC address control are connection control and association control.

Connection Control

You can use connection control to control which wired and wireless clients will be able to connect to the base station and have access to the Internet and all network resources.

When a wired client cannot connect to the base station, it can communicate with other clients on the wired local network, but it cannot:

- Connect to the Internet.
- Communicate with wireless clients on the network.

When a wireless client is denied association control, it cannot connect to the base station, so connection control is irrelevant. For information about using MAC filtering to control the access of wireless clients, see "Association Control."

To enable connection control

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **MAC Filtering**.
3. Select the **Enable connection control** check box.
4. If you do not want unspecified clients to connect to the base station, in the drop-down list box, click **Deny**. In this case, any client whose MAC address is not listed in the MAC Address table will not be able to connect to the base station or access the Internet.
5. If you clicked **Deny** in step 4, in the MAC Address table, specify the MAC address of any clients that you want to connect to the base station, and then select the **Allow Connection** check box.
6. To save your changes, click **Apply**.

When you enable connection control, be sure you do not prohibit your own computer from connecting to the base station. If you deny unspecified MAC addresses from connecting, type the MAC address of your adapter into the MAC Address table and select the **connection control** check box.

If you do block your own access to the base station, you must restore the factory default settings by using the reset button on the physical device, and then reconfigure the base station. For information about how to do this, see "Resetting the Base Station" in Chapter 1.

Association Control

You can use association control to control which wireless clients can establish a wireless link with the base station. Association control is not applicable to wired clients.

When a wireless client is allowed to associate with the wireless network and connect to the base station, it has full access to the Internet and network resources.

When a wireless client is allowed to associate with the wireless network, but not connect to the base station, it can communicate with other clients on the wireless network, but it cannot communicate with wired clients on the network or connect to the Internet.

When a wireless client is not allowed to associate with the wireless network, it cannot:

- Connect to the base station.
- Communicate with any wired or wireless clients on the network.
- Connect to the Internet.

To enable association control

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **MAC Filtering**.
3. Select the **Enable association control** check box.
4. If you do not want unspecified wireless clients to establish a wireless link with the base station, in the drop-down list box, click **Deny**. In this case, any wireless client whose MAC address is not listed in the MAC Address table will not be able to associate with the base station, access the Internet, or communicate with clients on the network.
5. If you clicked **Deny** in step 4, in the MAC Address table, specify the MAC address of any wireless clients that you want to connect to the base station, and then select the **Allow Association** check box.
6. To save your changes, click **Apply**.

For more information about MAC filtering options, see the Broadband Network Utility Help.

Note
If you set the Broadband Networking Wireless Base Station to bridging mode, the client filtering settings in the Base Station Management Tool will be unavailable.

Client Filtering

You can use client filtering to control the Internet access of each client on your network. This feature is particularly useful if, for example, you want to restrict the time that your children spend surfing the Web.

To configure client filtering, you must have the following information:

- The private IP address assigned to the client computer. To determine the IP address assigned to the client computer, check the DHCP client list on the **Home** page of the Base Station Management Tool.
- The ports for the type of application data to which you want to control access.

For example, if you want to control Web browsing, you specify TCP Port 80 on client 192.168.2.*XX*.

It is recommended that you assign static IP addresses to each of the client devices whose access to the Internet you want to control.

To enable client filtering

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Client Filtering**.
3. In the appropriate box, type the IP address of the client device whose access to the Internet you want to control.
4. In the **Outbound port(s)** boxes, type the outbound port protocol and port number for the data that you want to control.
5. In the appropriate boxes, specify the date and time range when you want to block access to this data. If you want to filter access on a particular day, for example, every Sunday, enter the same time and the same date for the start and end period. If you want to block access all the time, click **Always**.
6. Select the **Block** check box, and then click **Apply** to apply the client filtering.

Base Station Log

You can access the base station log for your network from the **Security** section of the Base Station Management Tool. This log records general base station activity and time stamps each log file entry. If you have any concerns about unusual activity on your network, review the base station log.

The base station log can maintain up to 256 lines of data. When the base station log reaches maximum capacity, the base station deletes the oldest log entries.

To view the base station log

1. Open the Base Station Management Tool, and then click **Security**.
2. On the **Security** menu, click **Base Station Log**.

7 troubleshooting.

Basic Troubleshooting

This chapter will help you solve the most common installation and setup problems that you may have with the Microsoft® Broadband Networking Wireless Base Station. Issues are covered for the following areas:

- Software
- Hardware
- Networks
- Internet connections

If the problem you are experiencing is not covered in this chapter, you can find more troubleshooting information in Broadband Network Utility Help, or on the Microsoft Broadband Networking Web site at http://www.microsoft.com/broadbandnetworking/.

Software

This section will help you solve the most common installation and setup problems for the Microsoft Wireless Base Station software.

Note
For computers that are running Microsoft Windows 2000 or Microsoft Windows XP, you must be logged on as an administrator to perform installations. If you do not have administrative rights, see Windows Help.

I'm having problems running the Broadband Network Utility Setup Wizard.

- Verify that your desktop or notebook computer conforms with the minimum system requirements for a Microsoft Wireless Base Station.

  During a typical installation, the Broadband Network Utility is automatically installed when you set up your network; however, if you do not have the minimum system requirements, the software may not install fully or at all. If you are using a computer that is running Microsoft Windows® 2000, the Broadband Network Utility must be installed for WEP support. If WEP is not supported on one of the computers, then the network and other devices on the network cannot communicate with the computer that does not support WEP.

- Turn off any virus detection software.
- Make sure that you are installing the software before installing the hardware.

I'm having problems running an online application.

- This might be due to the firewall feature of the base station. To configure the base station to allow specific applications to function through the firewall, see Chapter 6.

I'm getting an error message during installation or setup.

Follow the instructions in the error message screen to try to solve the problem. The following table contains more information about the error messages that can appear, including possible causes and solutions for the errors. Click Help on the error message screen for more information.

Error message	Details
Setup was unable to detect your base station	For a wired connection, make sure that the cable connections are not loose, the correct type of Ethernet cable (straight-through versus crossover) is being used, cables are connected to the correct ports, and the base station is receiving power. For a wireless connection, make sure that your broadband modem is connected to the base station **To Modem** port through an Ethernet cable, the base station power adapter is securely connected to an electrical outlet, there is no interference from other devices, and that the network settings are correct. If none of the above fix the problem, try restoring the base station to factory defaults by pressing the Reset button for at least 5 seconds. For more details about restoring the base station to factory defaults, see Chapter 1. **Action:** Click Help on the error message screen.
Setup was unable to detect your network adapter	Make sure that the cable connections are not loose, that cards are properly seated, and that the adapter is receiving power and is connected to a USB port. If none of the above fix the problem, try connecting the adapter to another USB port or seating the PC Card in another slot if available. **Action:** Click Help on the error message screen.

continued

Error message	Details
Setup was unable to detect a connection to the Internet	Make sure your broadband modem is turned on and working. **Action:** Click Help on the error message screen.

Hardware

This section will help you solve the most common installation and setup problems for the Microsoft Wireless Base Station.

My computer is not detecting my base station.

- Make sure that both the base station and the computer that it is connected to with a wired connection are powered, and that a link light is illuminated on each device. For more information about the indicator lights on the base station, see Chapter 1.
- Make sure that the correct ends or the correct cables in your network are securely fastened to the correct ports.

  For more information about the indicator lights on the base station, see Chapter 3.

  Check all of the following connections: power cables, cables between the base station and computers, and cables between the base station and the modem.

  Incomplete or incorrect connections prevent devices from communicating with each other and therefore generate problems in your network. By checking the physical connections, you can determine if the problem is associated with network settings.

  Ethernet cables look very similar to standard residential telephone cables. However, Ethernet cables have a wider and thicker connector (RJ-45) on the end than residential telephone connectors (RJ-11). Although a standard residential telephone connector can be inserted into an Ethernet port, the port will not function and the cable may damage your Ethernet device.

My broadband modem has a built-in router that conflicts with my Microsoft Wireless Base Station.

- Turn off Network Address Translation (NAT) on the modem.

  If you have more than one component that is running NAT on your network, some of your applications may not connect to the Internet, some features in certain applications may not work, and some components may appear as unavailable in the Broadband Network Utility. For instructions for turning off NAT on your modem, see the documentation for your modem.

- Enable bridging mode in the base station.

  For more information about bridging mode and how to enable it, see Chapter 6.

Networks

This section will help you solve the most common installation and setup problems for a Microsoft Wireless Base Station on a network.

I get all the way through setup and it says it was successful, but some network tasks do not work.

- If you cannot access the Internet, open the Broadband Network Utility and check the status of the connection between the base station and the modem. For more troubleshooting information about this problem, see Broadband Network Utility Help.
- If you cannot access files or folders that have been made available to the network, make sure that you are logged on to your computer and the network, and that the files or folders have been made available to you. For more information about making files and folders available to the network and how to verify access privileges, see Chapter 4. For more troubleshooting information about this problem, see Broadband Network Utility Help.
- If you cannot print to a network printer, make sure that the printer has been made available to the network. For more information about making a printer available to the network and verifying network availability of a printer, see Chapter 4. For more troubleshooting information about this problem, see Broadband Network Utility Help.
- If you cannot use your e-mail application the same way as you did before installing the base station and the Broadband Network Utility, make sure that your POP3 and news settings in your e-mail application are correct.

  In your e-mail application, verify that you are using a full Internet designation, such as pop3.email.msn.com, for your mail client rather than a local designation, such as mail. For more information about obtaining a full Internet designation for your ISP, see the ISP documentation. For more troubleshooting information about this problem, see Broadband Network Utility Help.

My network isn't working.

- Verify that the base station is plugged into a power source.
- Verify that the correct cables and cards are securely fastened to the correct ports.

- Verify that you have the correct network settings.

  Incorrect network settings will inhibit networked computers from communicating properly. For example, a computer may try to detect a network by using the wrong name or by using a different communication protocol than all of the other computers on the network. You can view and modify network settings in the Broadband Network Utility.

My wireless network connection works occasionally.

- Verify that your computer is within the recommended range of the base station and that there is no interference from other wireless devices.

  Signals that are transmitted between the base station and a wireless adapter or PC Card are affected by interference from other wireless devices—including 2.4 GHz cordless phones, microwave ovens, and neighboring wireless networks. Move the other devices as needed, and refrain from using them while you are using the network. Alternatively, you can move the network. To minimize interference from another wireless network, try changing channels. For more information about changing your network channel, see Chapter 6.

- Verify that other devices on your network that may be running NAT and/or DHCP servers have NAT and DHCP servers disabled.

  Devices such as your modem may have NAT and/or Dynamic Host Configuration Protocol (DHCP) servers running at the same time as the base station. If this is the case, the devices will interfere with each other and cause intermittent failures. For instructions for disabling NAT and DHCP servers on the other device, see the documentation for the other device.

My computer is within the recommended range of the base station; however, it can't detect the network.

- Verify that physical barriers and other forms of interference are limited.

  Physical barriers between the computer and the base station, and interference from microwave ovens and other wireless devices—including 2.4 GHz cordless phones and neighboring wireless networks—affect the signals that are transmitted between the base station and a wireless adapter or PC Card. If this occurs, move your network components closer to the base station.

Internet Connections

This section will help you solve the most common installation and setup problems for sharing an Internet connection.

My computer can't find the Internet.

- Check the IP address in network settings on another computer in the network.

  The IP address is available in the Broadband Network Utility.

  If your computer can't find the Internet, it may be looking for the wrong IP address. Although the IP address may have been correct previously, if you changed ISPs, then all of the IP addresses in your network changed as well. See the documentation that you received from your ISP for the correct IP address.

- If you are using Microsoft Internet Explorer, verify that the Internet Explorer proxy setting is turned off.

  For more information about the Internet Explorer proxy setting, see Internet Explorer Help.

- Check the status of the connection to the base station and to the Internet in the Broadband Network Utility.

If you are still unable to resolve the problem, see Broadband Network Utility Help.

My shared Internet connection is slow.

- Verify that your computer is within the recommended range of the base station. For more information about the recommended range, see Chapter 1.

  Factors that affect shared Internet connection speed:

  - The number of computers that are sharing the connection
  - The range between your computer and the base station
  - Interference from other wireless devices

reference.

Visit Us on the Web

Please visit our Web site at http://www.microsoft.com/broadbandnetworking/.

Click Help in the Broadband Network Utility

Click **Help** in the Microsoft® Broadband Network Utility for detailed troubleshooting information.

Technical Support

Product Name:	Microsoft Broadband Networking Wireless Base Station
Support Info Online:	http://support.microsoft.com/directory/productsupportoption.asp. In Canada, visit http://www.microsoft.ca/support/.
Online Support:	Work with a Microsoft Support Professional over the Internet. Submit your issue online: http://support.microsoft.com/directory/onlinesr.asp.
Phone Support:	Toll-free support for U.S. customers: (800) 936-3900. For customers in Canada: (800) 668-7975. These numbers are only for support of Microsoft Broadband Networking products. Please do not use these phone numbers for support of other Microsoft products.
TTY Users:	Microsoft text telephone (TTY/TDD) services are available at (425) 635-4948 in Washington state or (800) 892-5234 in the U.S. Call (905) 568-9641 in Canada.
Worldwide:	The support terms listed here are available in the United States only. Support outside the United States may vary. Please visit http://support.microsoft.com/default.aspx?scid=/international.aspx? for regional contact details.
Conditions:	Microsoft's support services are subject to then-current prices, terms, and conditions, which are subject to change without notice.

Regulatory Information

United States Radio and TV Interference Regulations

This device complies with Part 15 of the U.S. Federal Communications Commission (FCC) rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The Microsoft hardware device(s) that accompanies this software can radiate radio frequency (RF) energy. If not installed and used in strict accordance with the instructions given in the printed documentation and Online User's Guide, the device may cause harmful interference with other radio-communications devices (for example AM/FM radios, televisions, baby monitors, cordless phones, etc.). Any cable that is connected to the device must be a shielded cable that is properly grounded. There is, however, no guarantee that RF interference will not occur in a particular installation.

Your Microsoft hardware device has been tested, and it complies with the limits for a Class B digital device in accordance with the specifications in Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful RF interference in a residential installation.

To determine if your hardware device is causing interference to other radio-communications devices, disconnect the device from your computer. If the interference stops, it was probably caused by the device. If the interference continues after you disconnect the hardware device, turn the computer off and then on again. If the interference stopped when the computer was off, check to see if one of the input/output (I/O) devices or one of the computer's internal accessory boards is causing the problem. Disconnect the I/O devices one at a time and see if the interference stops.

If this hardware device does cause interference, try the following measures to correct it:

- Relocate the antenna of the other radio-communications device (for example AM/FM Radios, televisions, baby monitors, cordless phones, etc) until the interference stops.
- Move the hardware device farther away from the radio or TV, or move it to one side or the other of the radio or TV.
- Plug the computer into a different power outlet so that the hardware device and radio or TV are on different circuits controlled by different circuit breakers or fuses.
- If necessary, ask your computer dealer or an experienced radio-TV technician for more suggestions. You may find helpful information in the booklet "The Interference Handbook" (1995), published by the FCC. The booklet is available from the FCC at 1-888-CALL FCC or at http://www.fcc.gov/cib/Publications/tvibook.html.

Note

Any changes or modifications not expressly approved by Microsoft could void the user's authority to operate this device.

For use with UL Listed and GS approved personal computers.

Not intended for use in machinery or industrial applications.

Tested to comply with FCC standards. For home and office use.

Model Number: MN-100, MN-110, MN-120, MN-130, MN-150, MN-500, MN-510, MN-520.

In addition, the following models have been approved under FCC certification rather than under the FCC Declaration of Conformity Process:

MN-500, FCC ID: HEDACC300568;

MN-510, FCC ID: HEDACCWN330168;

MN-520, FCC ID: HEDACC3501D68

Microsoft Corporation
One Microsoft Way
Redmond, WA 98052-6399.
(800) 426-9400 (United States)
(800) 933-4750 (Canada)

Canadian Radiocommunication Regulations

This Class B digital apparatus complies with Canadian ICES-003

The term ''IC:'' before the certification/registration number only signifies that the Industry Canada technical specifications were met.

Cet appareil numérique de la classe B est conforme aux normes NMB-003 du Canada.

L'expression «IC:» avant le numéro d'homologation/enregistrement signifie seulement que les spécifications techniques d'Industrie Canada ont été respectées.

Limited Warranty

PLEASE READ THIS MANUFACTURER'S GUARANTEE CAREFULLY TO UNDERSTAND YOUR RIGHTS AND OBLIGATIONS

MANUFACTURER'S GUARANTEE AND LIMITATION OF LIABILITY

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Limited Warranty Continued

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Technical Specifications

Base Station

Standards	IEEE 802.11b, Wi-Fi compliant, TCP/IP, NAT, DHCP, UDP, FTP, PPPoE, PPTP, L2TP, HTTP, DNS, IPSec/VPN Pass through
Ports	**LAN:** ▪ Four 10/100 Mbps Switched Ethernet/IEEE 802.3 ports ▪ RJ-45 Connectors ▪ UTP/STP CAT 3 or better cabling required for 10-BaseT operation ▪ UTP/STP CAT 5 or better required for 100-BaseTX operation **WAN:** ▪ One 10 Mbps Ethernet/IEEE 802.3 port ▪ RJ-45 Connector ▪ UTP/STP CAT 3 or better cabling required for 10-BaseT operation
Data Rate	1, 2, 5.5, 11 Mbps with Auto-fallback support
Modulation	CCK, DBPSK, DQPSK
Range	**Data Rate** / **Open Environment** / **Closed Environment** 11 Mbps / up to 900 feet / up to 160 feet 5.5 Mbps / up to 1300 feet / up to 200 feet 2.0 or 1 Mbps / up to 1500 feet / up to 300 feet Please see the Microsoft Broadband Networking Web site for the latest data: www.microsoft.com/broadbandnetworking/.
Frequency Range	ISM Band (2.400 to 2.4835 GHz)
Channels	1-11 United States, Canada Approved for use only in the United States and Canada.
Wireless Security (WEP)	Off, 64-bit, and 128-bit
Indicators	**LAN (1-4):** Link/Activity LED for each port **To Modem:** Link/Activity LED **Wireless:** Status LED including Activity indication **Power:** Power/Reset Dual Color LED
Transmit Power	Greater than +15 dBm; Less than +20 dBm
Operating Temperature	0 to 40 deg C
Storage Temperature	-20 to 60 deg C
Humidity	10 to 95 percent non-condensing
Emissions	FCC Part 15 Class B; Canada RSS-210
Safety	UL
Physical Dimensions	1.2" x 5.3" x 6.8" (30.5 x 134.6 x 172.7 mm)
Weight	10.55 oz (299 g) without power supply

System Requirements

To use the Microsoft Broadband Networking Wireless Base Station:

- Computer with a network adapter to configure Base Station
- External broadband (cable, DSL, or other) modem with Ethernet port (not compatible with dial-up modems)
- Microsoft Internet Explorer 5.0 or Netscape Navigator 4.7 or later to view and use Base Station HTML configuration screens
- Available 120V AC power outlet

Additional requirements for using the Microsoft Broadband Networking Setup Wizard and Microsoft Broadband Network Utility:

- Personal computer with processor running Microsoft Windows 98, Windows 98 SE, Windows Millennium Edition (Windows Me), Windows 2000* Professional, Windows XP Professional, or Windows XP Home Edition operating system
- Microsoft Internet Explorer 5.0 or later; setup will install Internet Explorer 6.0 browser components if needed, but will not displace your primary browser
- 28 MB of available hard-disk space if you already have Internet Explorer 5.5 or 6.0; 132 MB of available hard-disk space if you are installing Internet Explorer for the first time
- 4x or faster CD-ROM drive
- VGA or higher resolution monitor

*Setup features and functionality are limited on Windows 2000

Recommended:

- Personal computer with Ethernet network adapter for easiest Base Station setup
- Microsoft Mouse or compatible pointing device
- 3.5" high-density disk drive

Not all ISPs allow you to share a broadband connection. Please check with your ISP.

glossary.

This glossary contains common terms for wired and wireless networking.

100Base-T Also known as “Fast Ethernet,” an Ethernet cable standard with a data transfer rate of up to 100 Mbps.

10Base-T An older Ethernet cable standard with a data transfer rate of up to 10 Mbps.

802.11, 802.11b A family of IEEE-defined specifications for wireless networks. Includes the 802.11b standard, which supports high-speed (up to 11 Mbps) wireless data transmission. Microsoft® Broadband Networking wireless products comply with the 802.11b standard.

802.3 The IEEE-defined specification that describes the characteristics of Ethernet connections.

access point See **wireless access point**.

ad hoc network A solely wireless computer-to-computer network. Unlike an infrastructure network, an ad hoc network does not include a central base station, router, or gateway.

adapter See **network adapter**.

base station A device (also known as a router or gateway) that acts as a central point for networked devices, receives transmitted messages, and forwards them. Microsoft Broadband Networking base stations can link many computers on a single network, and can share a secure Internet connection with wired and wireless devices.

broadband connection A high-speed connection, typically 256 Kbps or faster. Broadband services include cable modems and DSL.

broadband modem A device that enables a broadband connection to access the Internet. The two most common types of broadband modems are cable modems, which rely upon cable television infrastructure, and DSL modems, which rely upon telephone lines operating at DSL speeds.

cable modem See **broadband modem**.

CAT 5 cable Abbreviation for “Category 5 cable.” A type of Ethernet cable that has a maximum data rate of 100 Mbps.

client Any computer or program that connects to, or requests the services of, another computer or program on a network. For a local area network or the Internet, a client is a computer that uses shared network resources provided by a server.

client/server network A network of two or more computers that rely upon a central server to mediate the connections or provide additional system resources. This dependence upon a server differentiates a client/server network from a peer-to-peer network.

computer name A name that uniquely identifies a computer on the network so that all its shared resources can be accessed by other computers on the network. One computer's name cannot be the same as any other computer or domain name on the network.

crossover cable See **Ethernet cable**.

DHCP Acronym for "Dynamic Host Configuration Protocol." A TCP/IP protocol that automatically assigns temporary IP addresses to computers on a local area network. Microsoft Broadband Networking base stations support the use of DHCP which, combined with ICS, allows you to share one Internet connection with multiple computers on a network.

dial-up connection An Internet connection of limited duration that uses a public telephone network rather than a dedicated circuit or some other type of private network. The Microsoft Broadband Networking hardware does not support the use of a dial-up connection to the Internet.

DNS Acronym for "Domain Name System." A data query service chiefly used on the Internet for translating host names into Internet addresses. The DNS database maps DNS domain names to IP addresses, so that users can locate computers and services through user-friendly names.

domain In a networked computer environment, a collection of computers that share a common domain database and security policy. A domain is administered as a unit with common rules and procedures, and each domain has a unique name.

driver Within a networking context, mediates communication between a computer and a network adapter installed on that computer.

DSL Acronym for "Digital Subscriber Line." A constant, high-speed digital connection to the Internet that uses standard copper telephone wires.

DSL modem See **broadband modem**.

duplex A mode of connection; full-duplex transmission allows for the simultaneous transfer of information between the sender and the receiver. Half-duplex transmission only allows for the transfer of information in one direction at a time.

dynamic IP address The IP address assigned (using the DHCP protocol) to a device that requires it. A dynamic IP address can also be assigned to a router by an ISP.

encryption The process of encoding data to prevent unauthorized access, especially during transmission. Microsoft wireless hardware relies upon encryption to ensure that data transmissions cannot be accessed by users outside the network. Also see **WEP**.

Ethernet A networking standard that uses cables to provide network access.

Ethernet cable A type of cable that facilitates network communications.

firewall A security system that protects a network from external threats, such as hacker attacks, originating outside the network. A hardware firewall is a connection routing device with specific data checking settings, that protects all of the devices connected to it. The Microsoft Broadband Networking Base Station includes a hardware firewall. A software firewall resides on a single computer, protecting that computer from external threats. See Microsoft Windows® XP Help for more information about the Internet Connection software firewall.

firmware Software information stored in non-volatile memory on a device.

gateway See **base station**.

gateway address The IP address used when making a connection outside your immediate network.

host name The DNS name of a device on a network, used to simplify the process of locating computers on a network.

hub A device with multiple ports that serves as a central connection point for communication lines from all devices on a network. When data arrives at one port, it is copied to the other ports.

ICS Acronym for “Internet Connection Sharing.” A software feature in Microsoft Windows that allows computers on a network to access online services through a single Internet connection. Microsoft Broadband Networking hardware replaces software ICS.

infrastructure network A network configuration in which wireless devices connect to a wireless access point (such as a base station) instead of connecting to each other directly.

Internet domain See **domain**.

IP address Acronym for “Internet Protocol” address. IP is the protocol within TCP/IP that is used to send data between computers over the Internet. An IP address is an assigned number used to identify a computer that is connected to a network through TCP/IP. An IP address consists of four numbers (each of which can be no greater than 255) separated by periods, such as 192.168.1.1.

ISP Acronym for “Internet Service Provider.” A company that provides individuals or companies access to the Internet.

LAN Acronym for “local area network.” A group of computers and other devices dispersed over a relatively limited area (for example, a building) and connected by a communications link that enables any device to interact with any other on the network.

MAC address Acronym for “media access control” address. The address that is used for communication between network adapters on the same subnet. Each network adapter is manufactured with its own unique MAC address.

Mbps Abbreviation of “megabits per second.” A unit of bandwidth measurement that defines the speed at which information can be transferred through a network or Ethernet cable. One megabyte is roughly equivalent to eight megabits.

modem A device that facilitates the transmission and reception of information between computers.

NAT Acronym for “network address translation.” The process of converting between IP addresses used within a private network and Internet IP addresses. NAT enables all of the computers on a network to share one IP address. The Microsoft Broadband Networking Base Station supports NAT, which provides an extra layer of network security by masking the actual IP addresses of the computers using a base station.

network A collection of two or more computers that are connected to each other through wired or wireless means. These computers can share access to the Internet and the use of files, printers, and other equipment.

network adapter Also known as a “network interface card” (NIC). An expansion card or other device used to provide network access to a computer, printer, or other device.

PC Card A peripheral that adds memory, mass storage, modem capability, or other networking services to portable computers.

peer-to-peer network A network of two or more computers that communicate without using a central server. This lack of reliance upon a server differentiates a peer-to-peer network from a client/server network.

Plug and Play A set of specifications that allows a computer to automatically detect and configure various peripheral devices, such as monitors, modems, and printers.

port A physical connection through which data is transferred between a computer and other devices (such as a printer, monitor, or modem), a network, or another computer. Also, a software channel for network communications.

PPPoE Acronym for “Point-to-Point Protocol over Ethernet.” A specification for connecting users on an Ethernet network to the Internet using a broadband connection (typically through a DSL modem). Microsoft Broadband Networking hardware supports PPPoE for connections that require it.

protocol A set of rules that computers use to communicate with each other over a network.

RJ-11 connector An attachment used to join a telephone line to a device such as a modem.

RJ-45 connector An attachment found on the ends of all Ethernet cables.

router See **base station**.

server A computer that provides shared resources, such as storage space or processing power, to network users.

shared folder A folder on a computer that has been made available for other people to use on a network.

shared printer A printer connected to a computer that has been made available for other people to use on a network.

sharing To make the resources associated with one computer available to users of other computers on a network.

SSID Acronym for “Service Set Identifier,” also known as a “wireless network name.” An SSID value uniquely identifies your network and is case sensitive.

static IP address A permanent Internet address of a computer (assigned by an ISP).

straight-through cable See **Ethernet cable**.

subnet A distinct network that forms part of a larger computer network. Subnets are connected through routers and can use a shared network address to connect to the Internet.

subnet mask Determines whether two computers on a network can communicate with each other directly. Similar in form to an IP address and typically provided by an ISP. An example of a subnet mask value is 255.255.0.0.

switch A central device that functions similarly to a hub, forwarding packets to specific ports rather than broadcasting every packet to every port. A switch is more efficient when used within a high volume network.

TCP/IP Acronym for “Transmission Control Protocol/Internet Protocol.” A networking protocol that allows computers to communicate across interconnected networks and the Internet. Every computer on the Internet communicates using TCP/IP.

USB Acronym for “universal serial bus.” A hardware standard for easily connecting peripherals to a computer system.

USB adapter A device that connects to a USB port; the Microsoft Broadband Networking Wireless USB Adapter is a type of USB adapter.

USB connector The end of the USB cable that is plugged into a USB port.

USB port A rectangular slot in a computer into which a USB connector is inserted.

WAN Acronym for “wide area network.” A geographically widespread network that might include many linked local area networks (LANs).

WEP Acronym for “Wired Equivalent Privacy,” also known as “Wireless Security.” A wireless network encryption mechanism that protects data transmitted over wireless networks. If you are operating a wireless network, it is strongly recommended that you enable WEP.

Wi-Fi A commonly used term to mean the wireless 802.11b standard.

wireless access point A device that exchanges data between wireless computers or between wireless computers and wired computers on a network.

wireless network name See **SSID**.

WLAN Acronym for “wireless local area network.” A network that exclusively relies upon wireless technology for the device connections.

workgroup A group of users working on a common project and sharing computer files, typically over a LAN. A user who has a home network that is not being controlled by a domain controller can be a member of a workgroup.

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