Broadcom BCM94301MPL Internal 802.11b Mini PCI Card User's Guide

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Introduction
Completing the Setup
Using the Broadcom BCM94301MPL Wireless Utility
Specifications
Regulatory Information
Troubleshooting
Glossary

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Introduction: Broadcom BCM94301MPL Mini PCI Card User's Guide

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Before you begin
Things you should know
BCM94301MPL network

Before you begin

Obtain the following information from your network administrator (if you are a home user, obtain this information from the person that installed your wireless access point):

- Network names (SSID) of the specific wireless networks that you want to connect to.
- WEP (Wired Equivalent Privacy) key information (if any) for the networks you want to connect to.
- For Microsoft® Windows® networking, your customer name and workgroup name.
- For your network account, your user name and password.
- Your IP address (if not using a DHCP server)

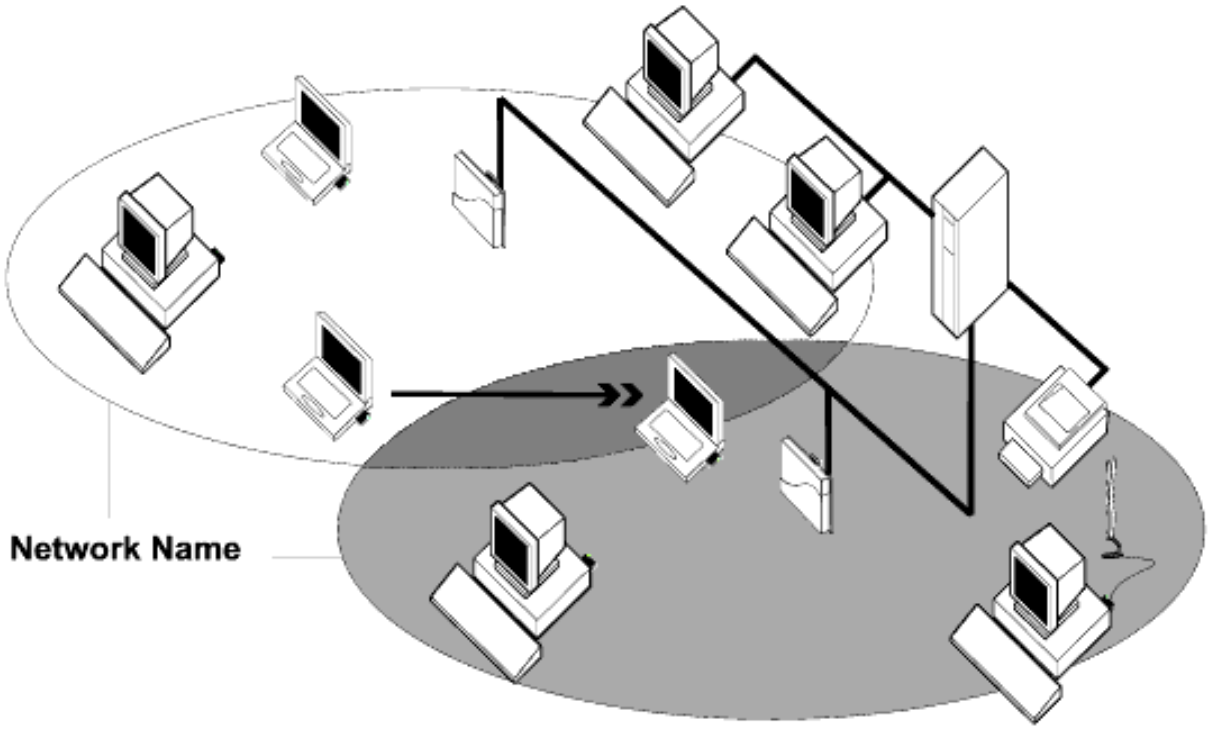
Things you should know

When you start your computer, your Broadcom BCM94301MPL internal 802.11b Mini PCI card detects certain wireless networks that are within range. Before you can connect to these and other wireless networks, you must configure a profile for each network using the information you obtained from your network administrator. Instructions for configuring a network profile are provided in Completing the setup.

WEP is a security protocol for wireless local area networks (defined in the IEEE 802.11b standard) that encrypts data sent over radio waves. The use of the WEP key is optional and can be enabled or disabled. If the network you are connecting to has enabled WEP, you must also enable WEP in the network profile and set the WEP key to match the WEP key used by the network. Otherwise, you cannot connect to the network.

Broadcom BCM94301MPL network

The Broadcom BCM94301MPL solution allows you to make a wireless connection to a network, as illustrated below.



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Completing the Setup: Broadcom BCM94301MPL Mini PCI Card User's Guide

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NOTE—Before you begin, be sure you have the required network information from your network administrator (see Before you begin in the **Introduction** section).

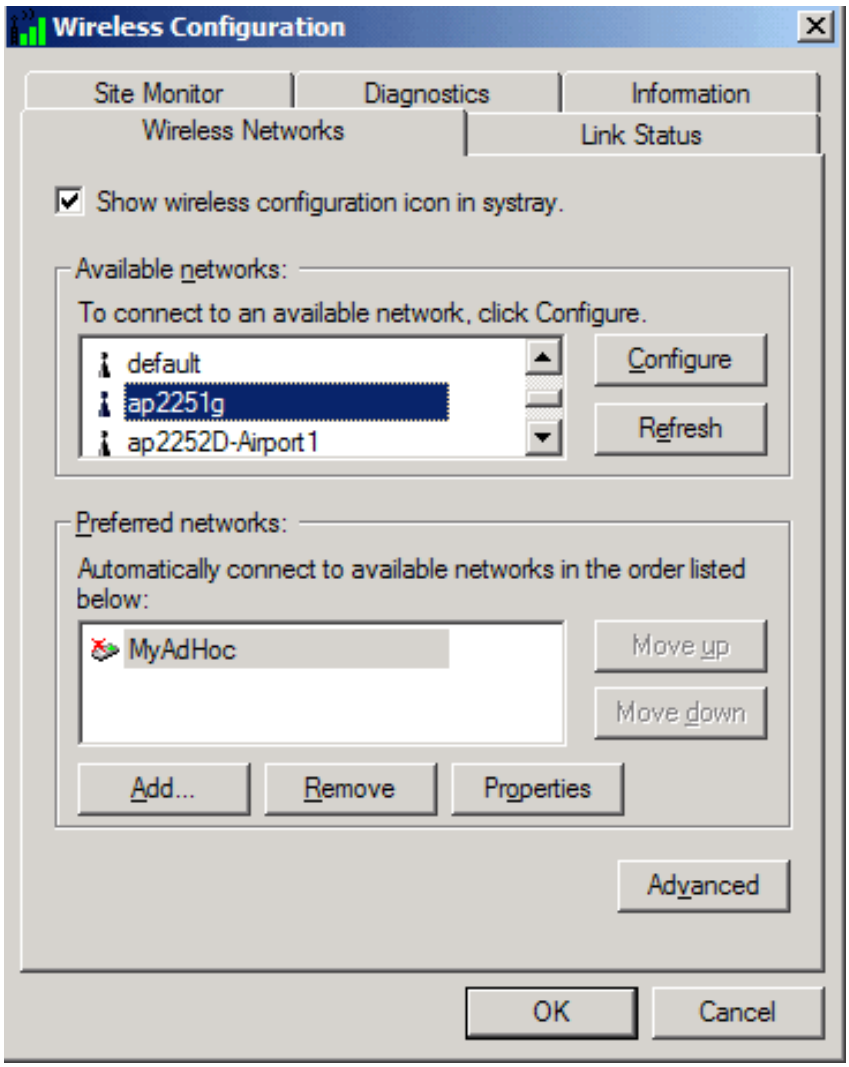
Configuring a network profile (Windows® 2000 environment)
Configuring a network profile (Windows® XP environment)

Configuring a network profile (Windows® 2000 environment)

Before you can connect to a wireless network, you must configure a network profile for that network on your computer using the BCM94301MPL wireless utility. If you purchased your portable computer with the Broadcom BCM94301MPL internal 802.11b Mini PCI card already installed and set up at the factory, follow the network profile configuration instructions provided below. If this is not the case, first verify that the Broadcom BCM94301MPL card has been properly installed in your computer according to the installation instructions. Then proceed with the following instructions for configuring your network profiles. The instructions explain how to open the utility and how to use it to configure a network profile.

Opening the utility

1. From the desktop, click the **Start** button, point to **Settings**, and click **Control Panel**.
2. Double-click the **BCM94301MPL Wireless Utility** icon .
3. If the **Wireless Networks** tab in the **Wireless Configuration** box is not on top, click the **Wireless Networks** tab.

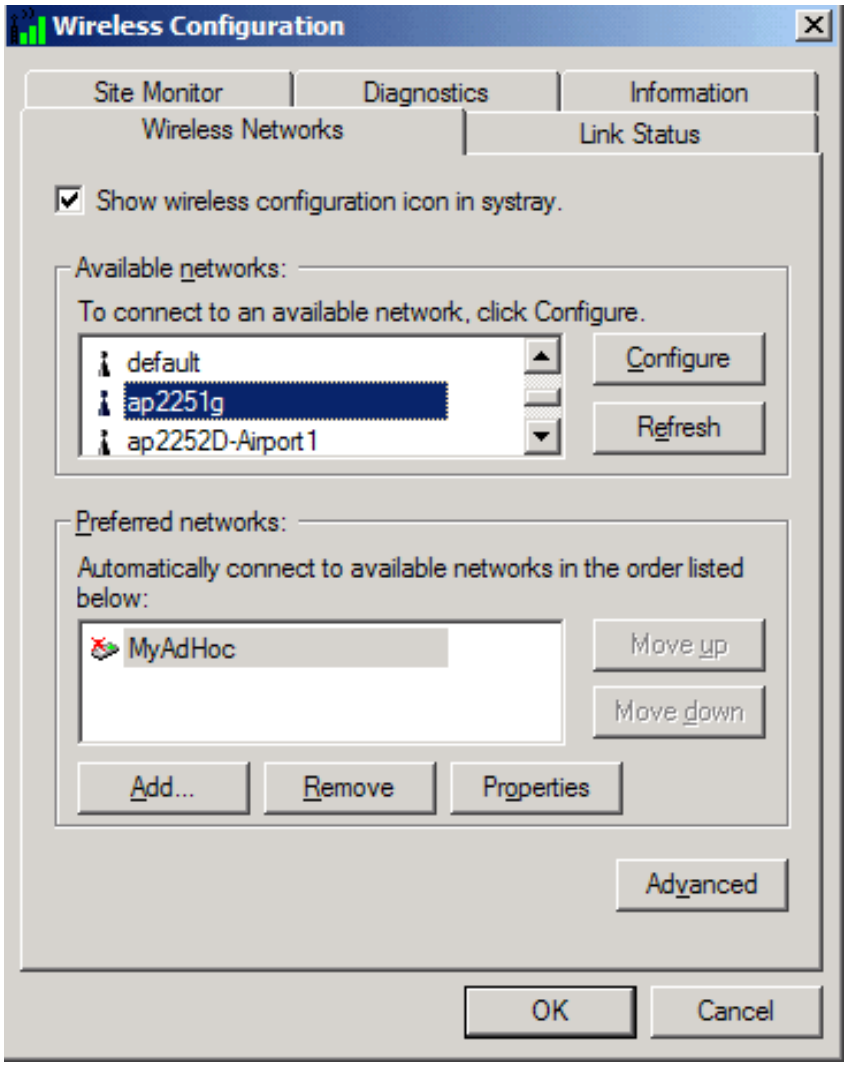


You can configure a network profile for networks that are listed in the **Available networks** list as well as networks that are not listed. When you have completed configuring a network profile, the network name and icon appear at the top of the **Preferred networks** list. Your computer automatically connects to the network at the top of the **Preferred networks** list. Follow the applicable instruction set below, based on whether or not the network is listed and whether or not the network requires a WEP key (check with your network administrator to see if a WEP key is required). NOTE—Both the network name and the network key are case-sensitive.

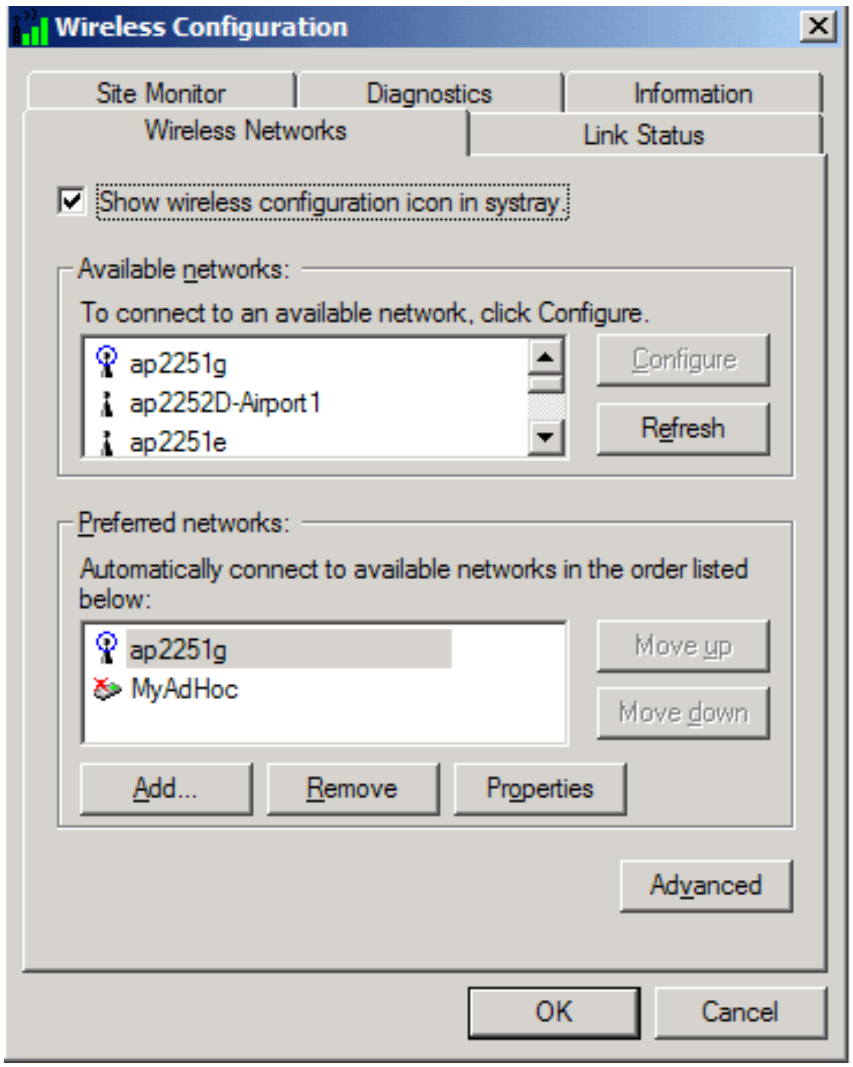
- Configuring a profile for a listed network that does not require a WEP key
- Configuring a profile for a listed network that requires a WEP key
- Configuring a profile for an network that is not listed and does not require a WEP key
- Configuring a profile for an network that is not listed and requires a WEP key

Configuring a profile for a listed network that does not require a WEP key (Windows 2000 environment)

1. After opening the utility, select the network from the **Available networks** list and click **Configure**.

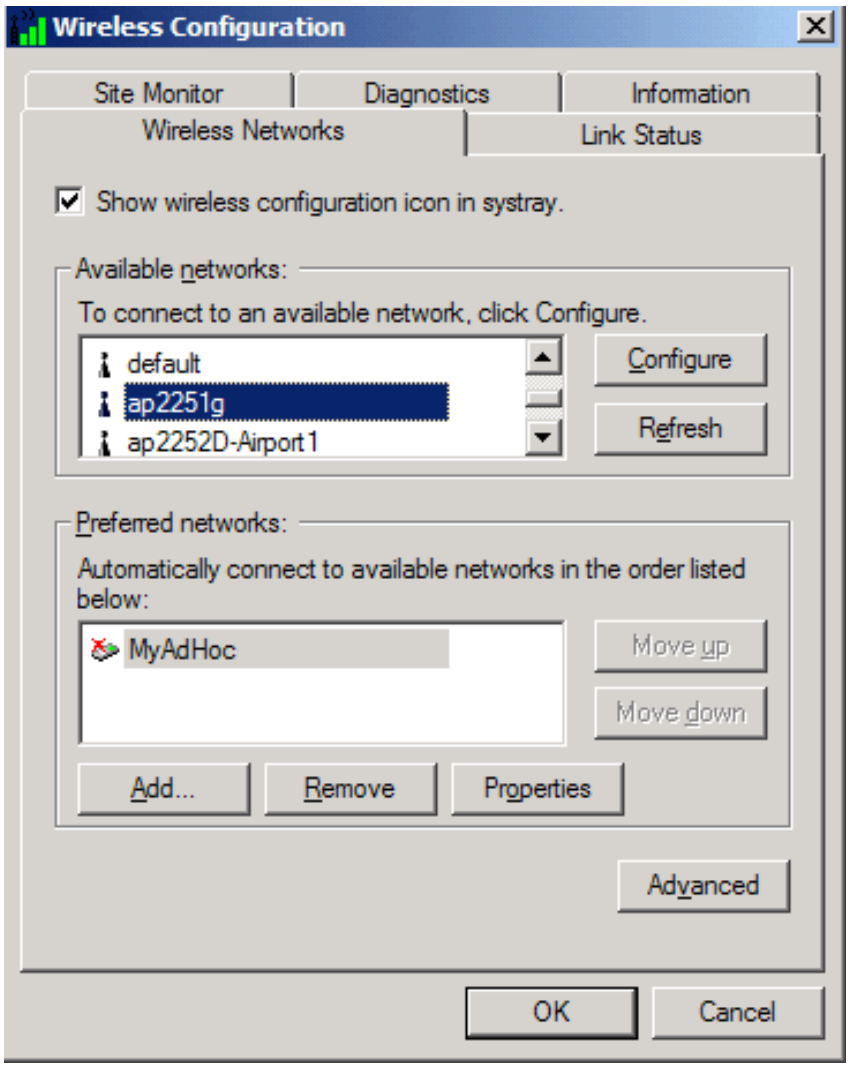


2. Click **OK** in the **Wireless Network Properties** box.
3. The network name and icon appear at the top of the **Preferred networks** list. Wait up to one minute for the network connection to be made. Your computer is connected to the selected network when you see a blue bubble on top of the icon for that network. If the bubble does not appear, try to access a Web page to verify that you are connected to the Internet.



Configuring a profile for a listed network that requires a WEP key (Windows 2000 environment)

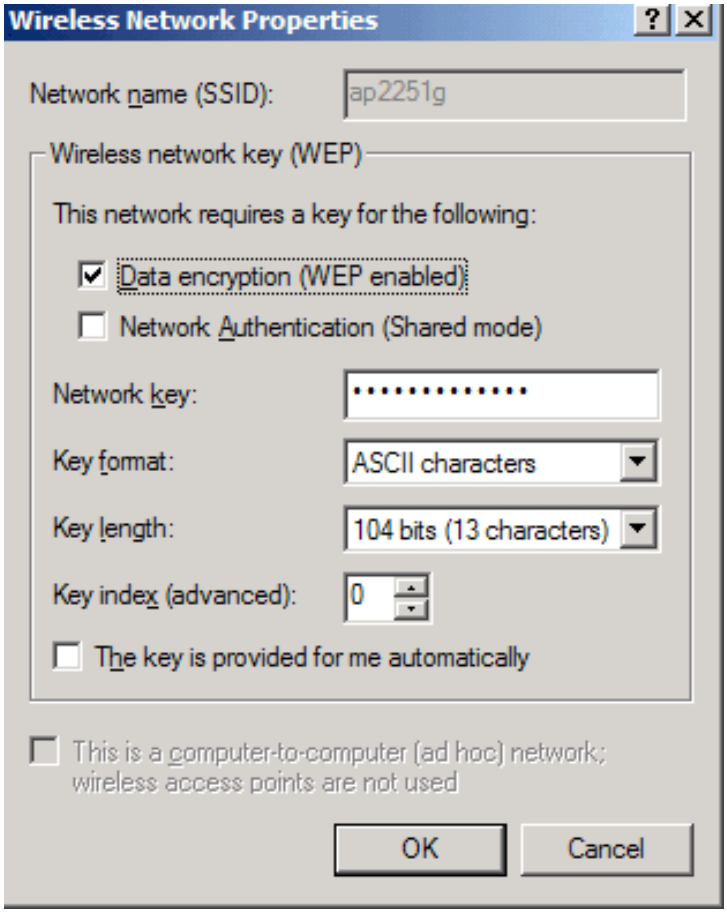
1. After opening the utility, select the network from the **Available networks** list and click **Configure**.



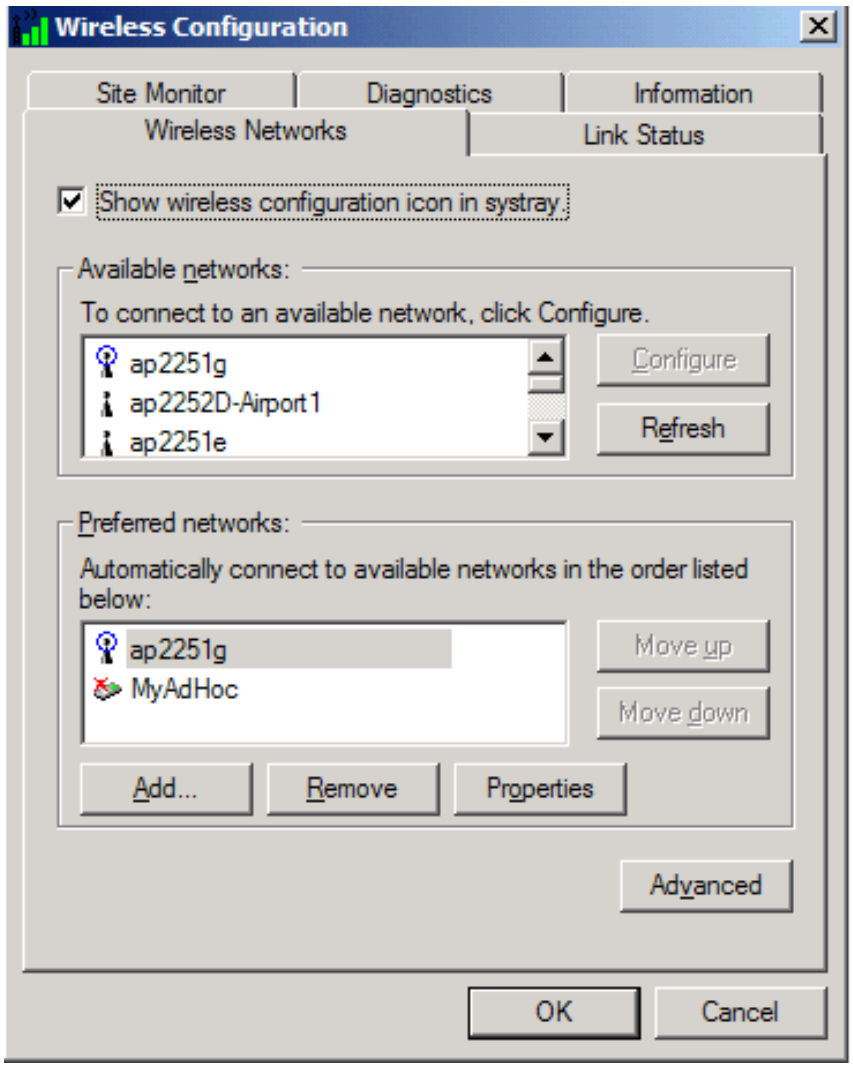
2. Select the **Data encryption (WEP enabled)** box.
3. Clear the **The key is provided for me automatically** box.
4. Type the network key in the **Network key** box.

   NOTE—You do not need to select the **Key format** or the **Key length** before typing the network key. These settings automatically change to the appropriate setting as you type the network key.

5. Click **OK**.

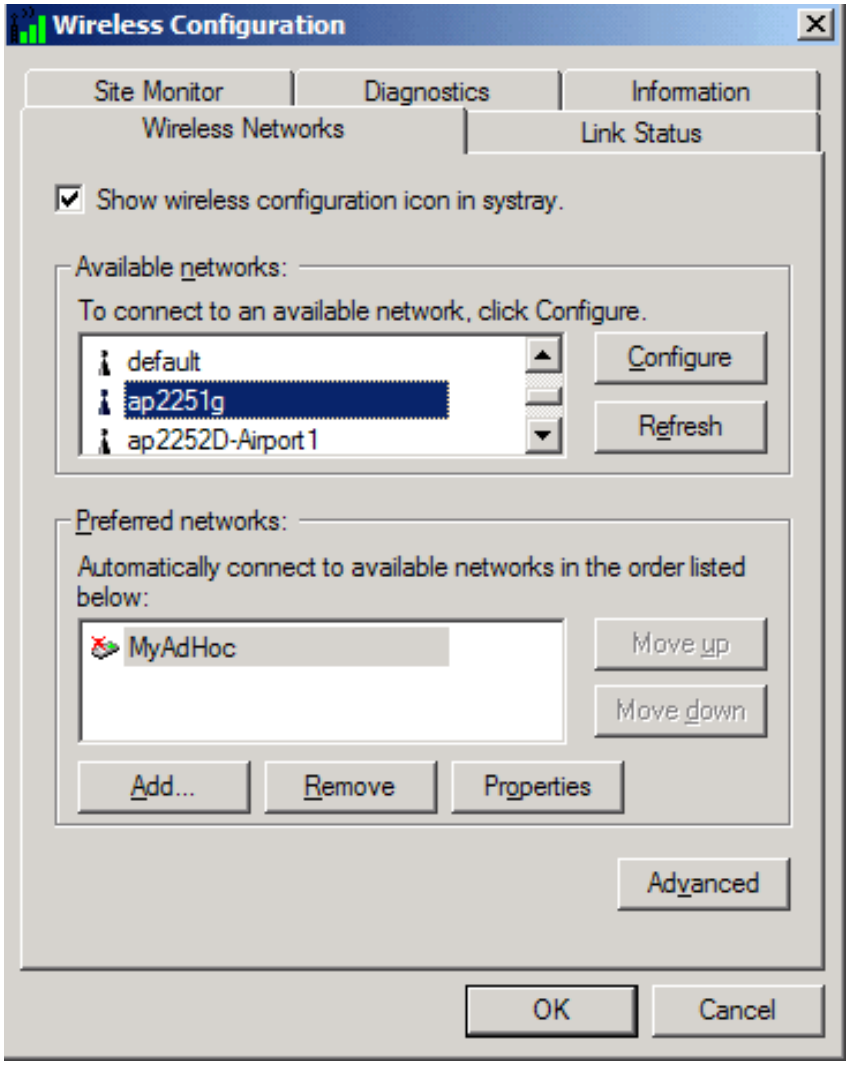


6. The network name and icon appear at the top of the **Preferred networks** list. Wait up to one minute for the network connection to be made. Your computer is connected to the selected network when you see a blue bubble on top of the icon for that network. If the bubble does not appear, try to access a Web page to verify that you are connected to the Internet.

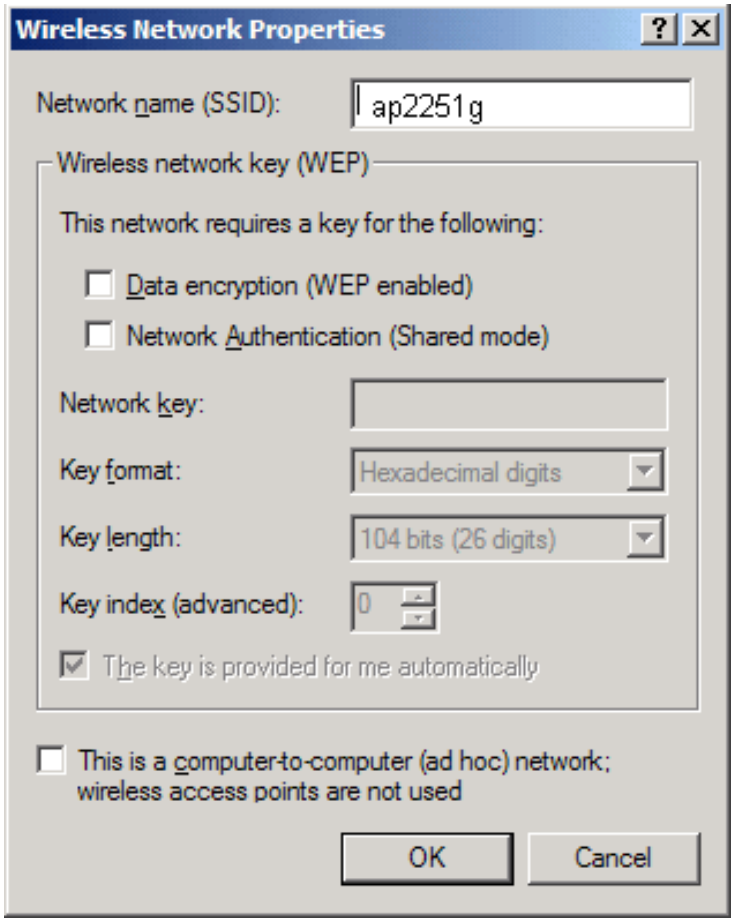


Configuring a profile for a network that is not listed and does not require a WEP key (Windows 2000 environment)

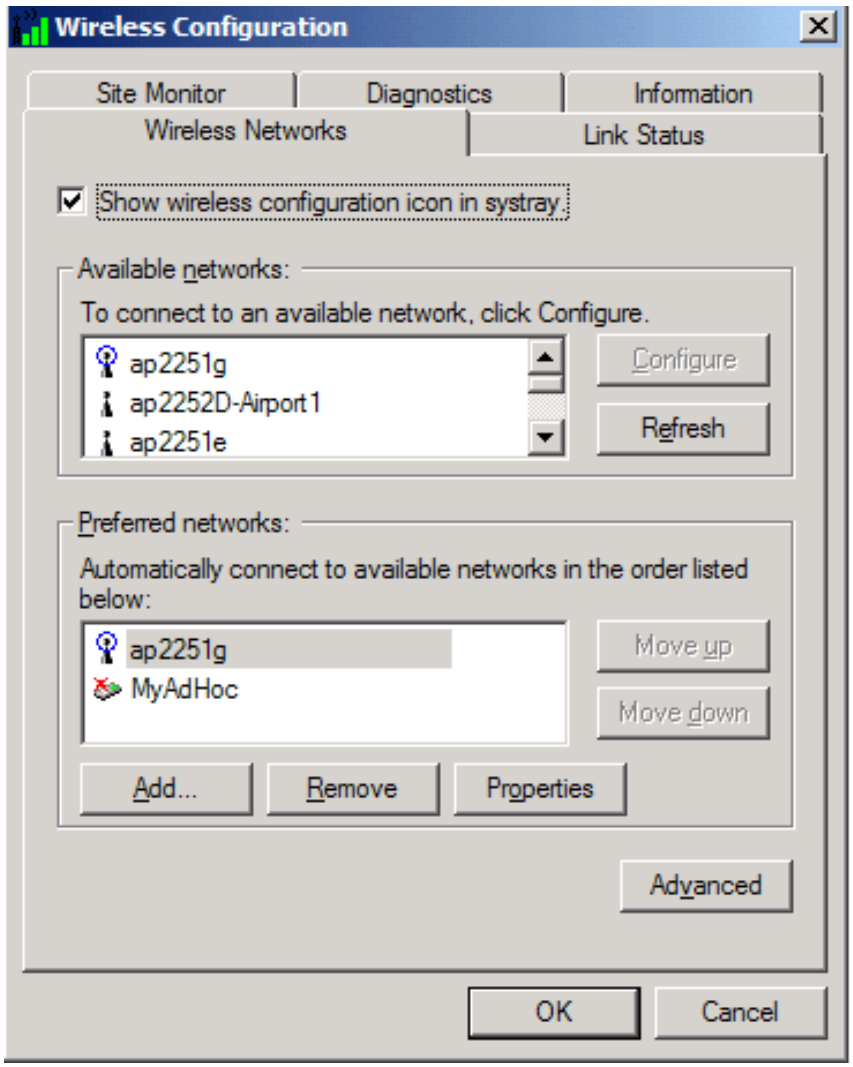
1. After opening the utility, click **Add**.



2. Type the network name in the **Network name (SSID)** box.
3. Click **OK**.

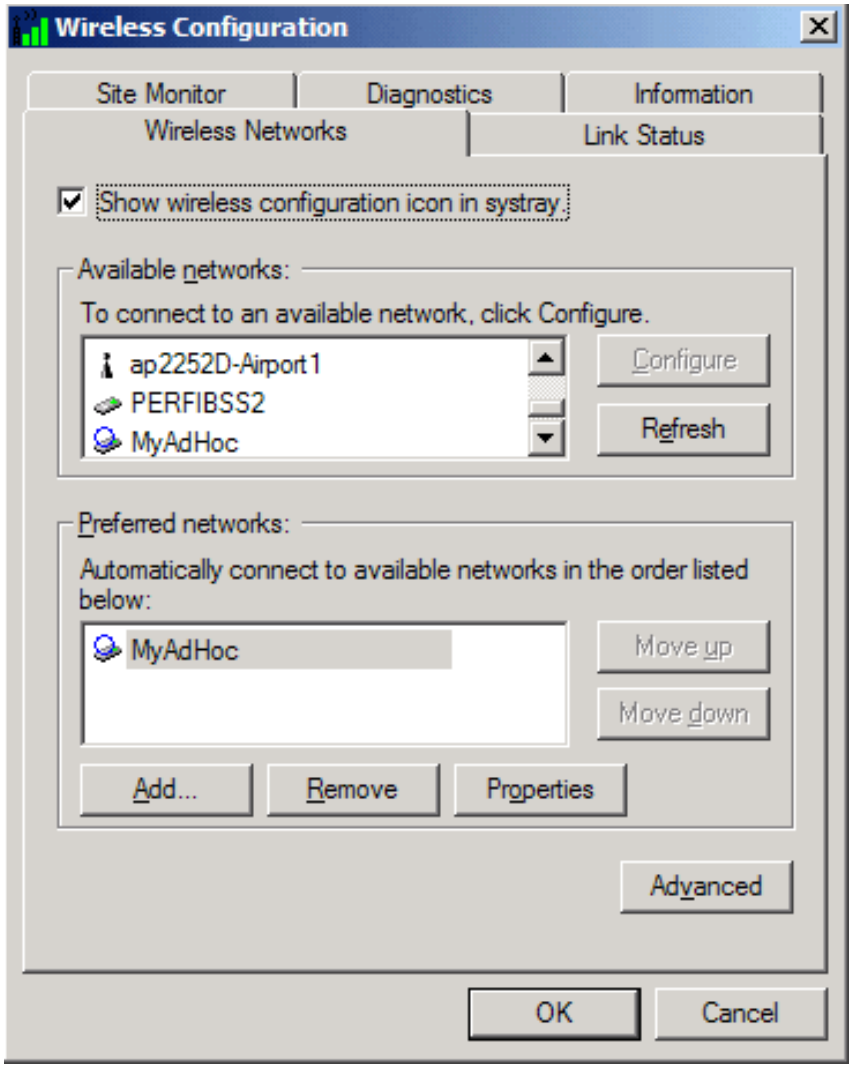


4. The network name and icon appear at the top of the **Preferred networks** list. Wait up to one minute for the network connection to be made. Your computer is connected to the added network when you see a blue bubble on top of the icon for that network. If the bubble does not appear, try to access a Web page to verify that you are connected to the Internet.



Configuring a profile for a network that is not listed and requires a WEP key (Windows 2000 environment)

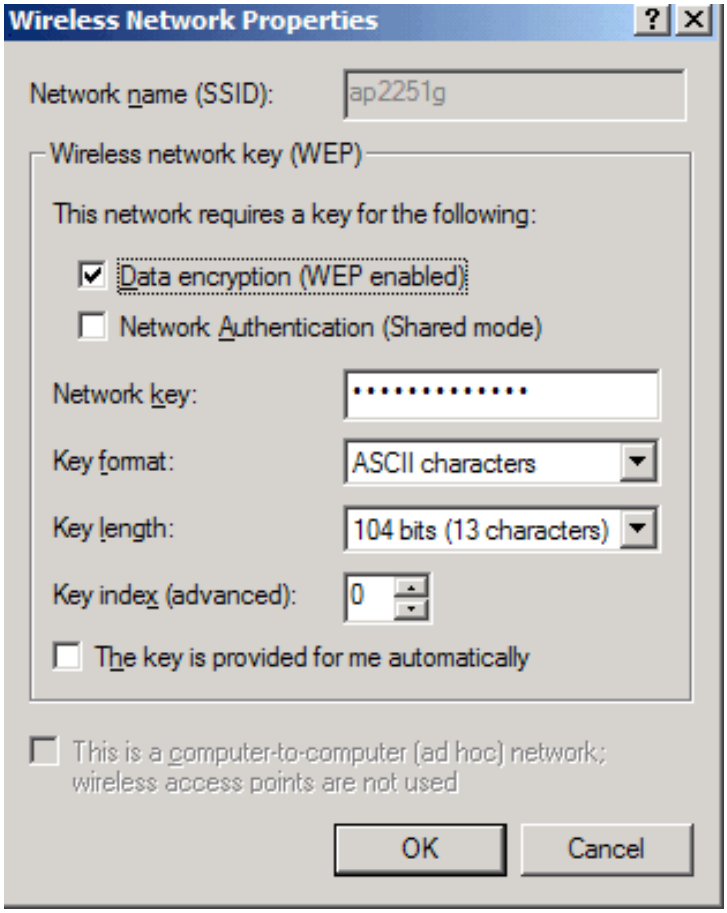
1. After opening the utility, click **Add**.



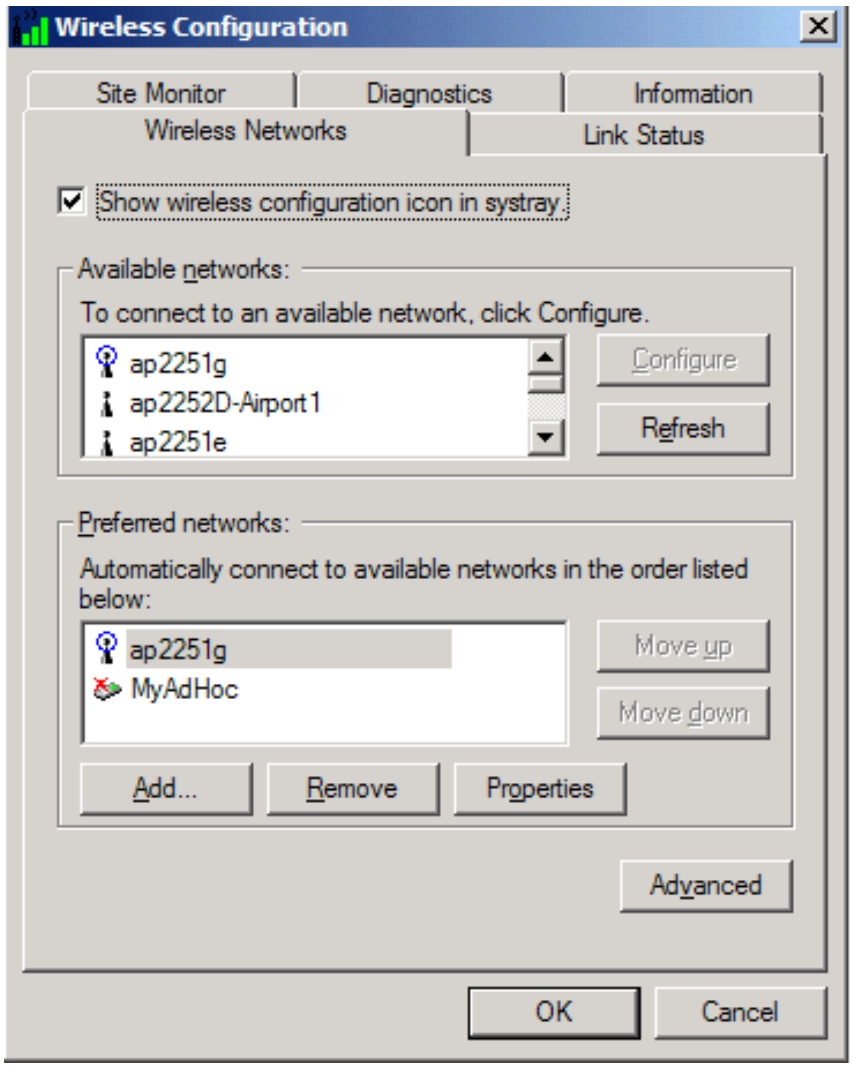
2. Type the network name in the **Network name** (SSID) box.
3. Select the **Data encryption (WEP enabled)** box.
4. Clear the **The key is provided for me automatically** box.
5. Type the network key in the **Network key** box.

   NOTE—You do not need to select the **Key format** or the **Key length** before typing the network key. These settings automatically change to the appropriate setting as you type the network key.

6. Click **OK**.



7. The network name and icon appear at the top of the **Preferred networks** list. Wait up to one minute for the network connection to be made. Your computer is connected to the added network when you see a blue bubble on top of the icon for that network. If the bubble does not appear, try to access a Web page to verify that you are connected to the Internet.



Configuring a network profile (Windows® XP environment)

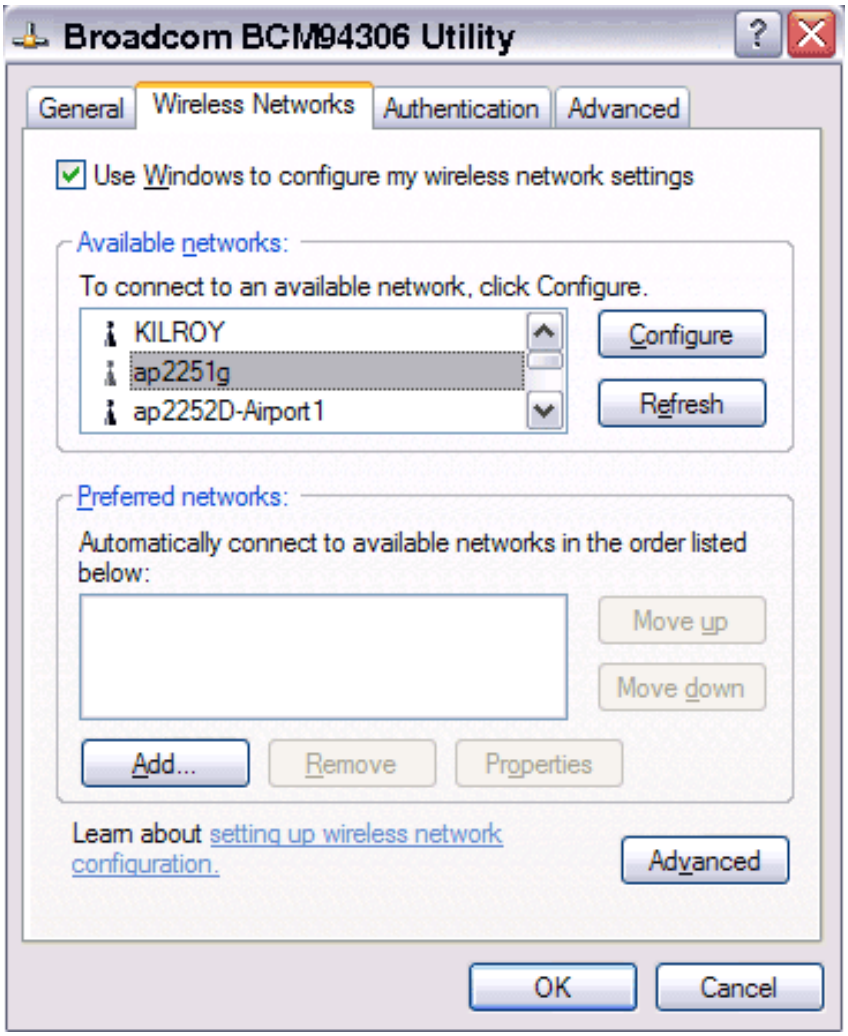
Before you can connect to a wireless network, you must configure a network profile for that network on your computer using the BCM94301MPL wireless utility. If you purchased your portable computer with the Broadcom BCM94301MPL internal 802.11b Mini PCI card already installed and set up at the factory, follow the network profile configuration instructions provided below. If this is not the case, first verify that the Broadcom BCM94301MPL card has been properly installed in your computer according to the installation instructions. Then proceed with the following instructions for configuring your network profiles. The instructions explain how to open the utility and how to use it to configure a network profile.

NOTE—For more information on how to configure a network profile and 802.1x authentication, click **Learn about setting up wireless network configuration** at the bottom of the **Wireless Networks** tab of the utility.

Opening the utility

1. From the desktop, click the **Start** button and click **Control Panel**.
2. If you are looking at the Category View of Control Panel, click **Switch to Classic View**. If you are looking at the Classic View of Control Panel, go to the next step.
3. Double-click the **Network Connections** icon.
4. Right-click **Broadcom BCM94301MPL Internal 802.11b Mini PCI Card** in the **LAN or High-Speed Internet** area and click **Properties**.

5. If the **Wireless Networks** tab is not on top, Click the **Wireless Networks** tab.
6. Verify that the **Use Windows to configure my wireless network settings** box is selected. If it is not, select it.

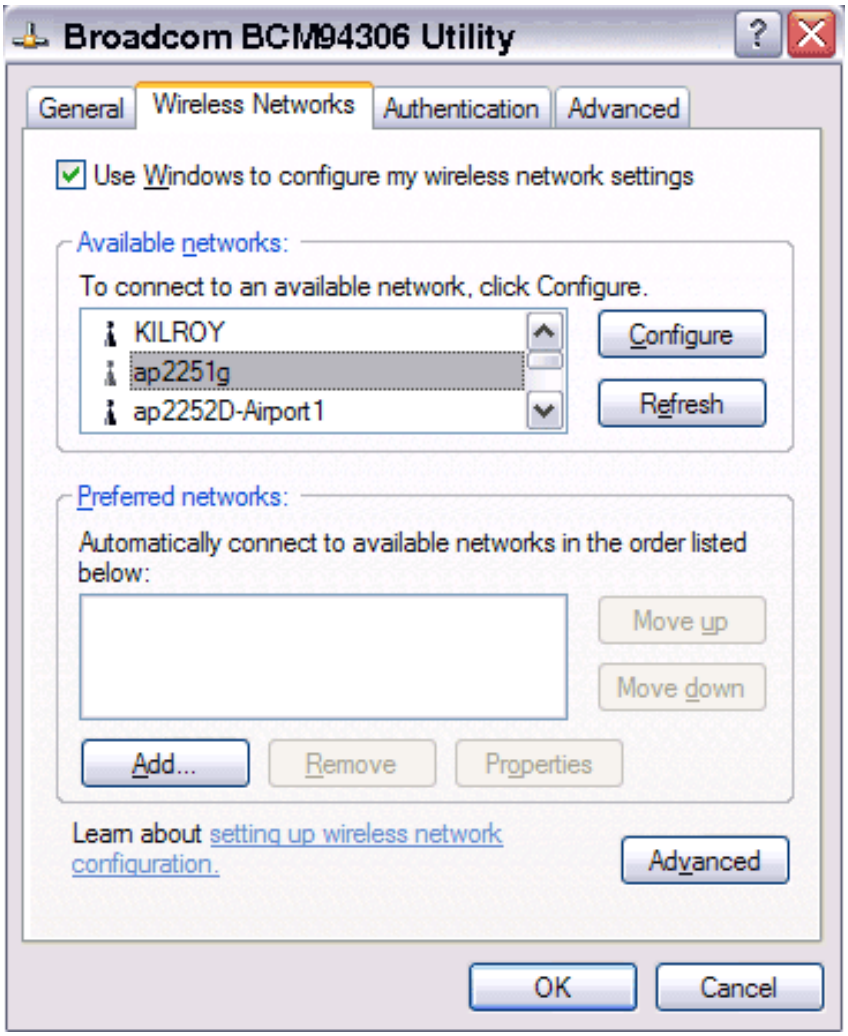


You can configure a network profile for networks that are listed in the **Available networks** list as well as those that are not listed. When you have completed configuring a network profile, the network name and icon appear at the top of the **Preferred networks** list. Your computer automatically connects to the network at the top of the **Preferred networks** list. Follow the applicable instruction set below, based on whether or not the network is listed and whether or not the network requires a WEP key (check with your network administrator to see if a WEP key is required). NOTE—Both the network name and the network key are case-sensitive.

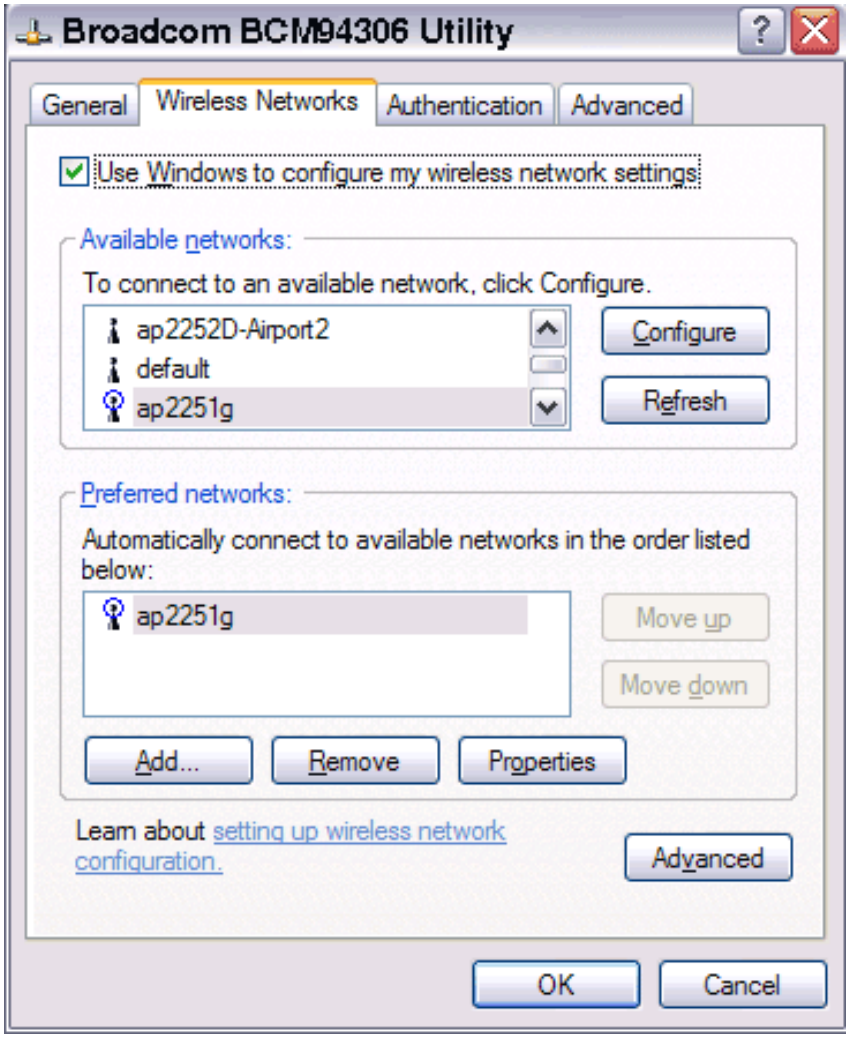
- Configuring a profile for a listed network that does not require a WEP key
- Configuring a profile for a listed network that requires a WEP key
- Configuring a profile for an network that is not listed and does not require a WEP key
- Configuring a profile for an network that is not listed and requires a WEP key

Configuring a profile for a listed network that does not require a WEP key (Windows XP environment)

1. After opening the utility, select the network from the **Available networks** list and click **Configure**.

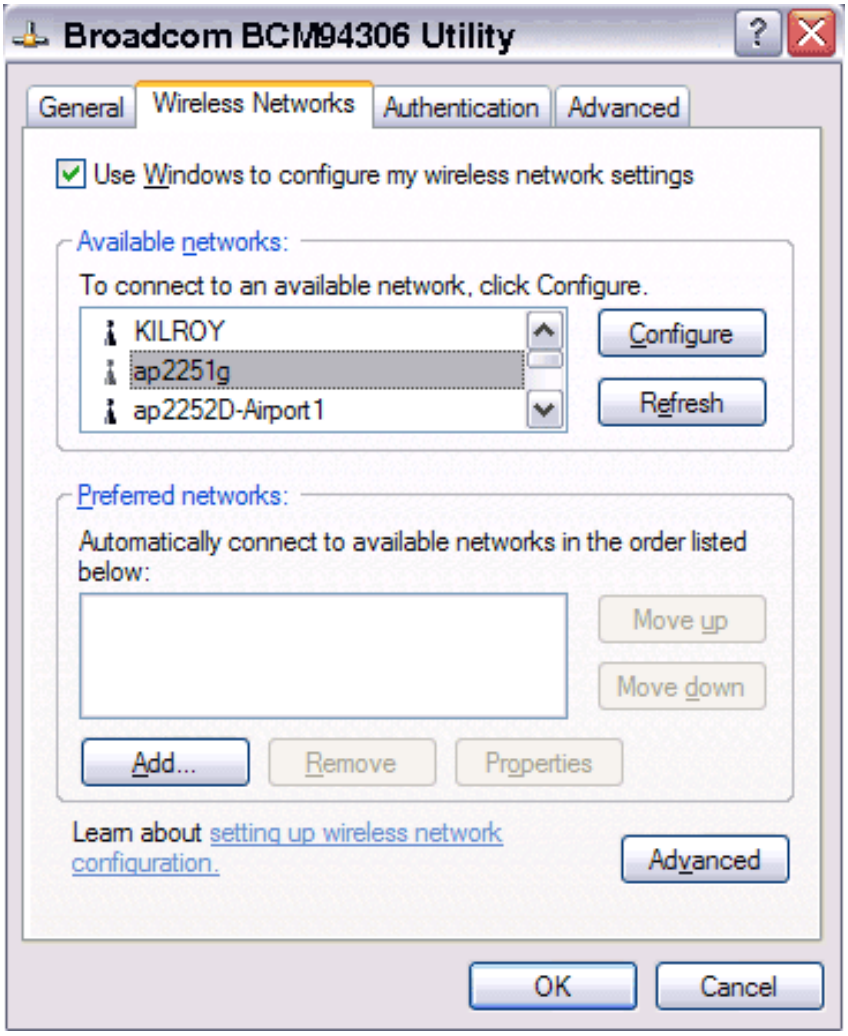


2. Click **OK** in the **Wireless Network Properties** box.
3. The network name and icon appear at the top of the **Preferred networks** list. Wait up to one minute for the network connection to be made. Your computer is connected to the selected network when you see a blue bubble on top of the icon for that network. If the bubble does not appear, try to access a Web page to verify that you are connected to the Internet.



Configuring a profile for a listed network that requires a WEP key (Windows XP environment)

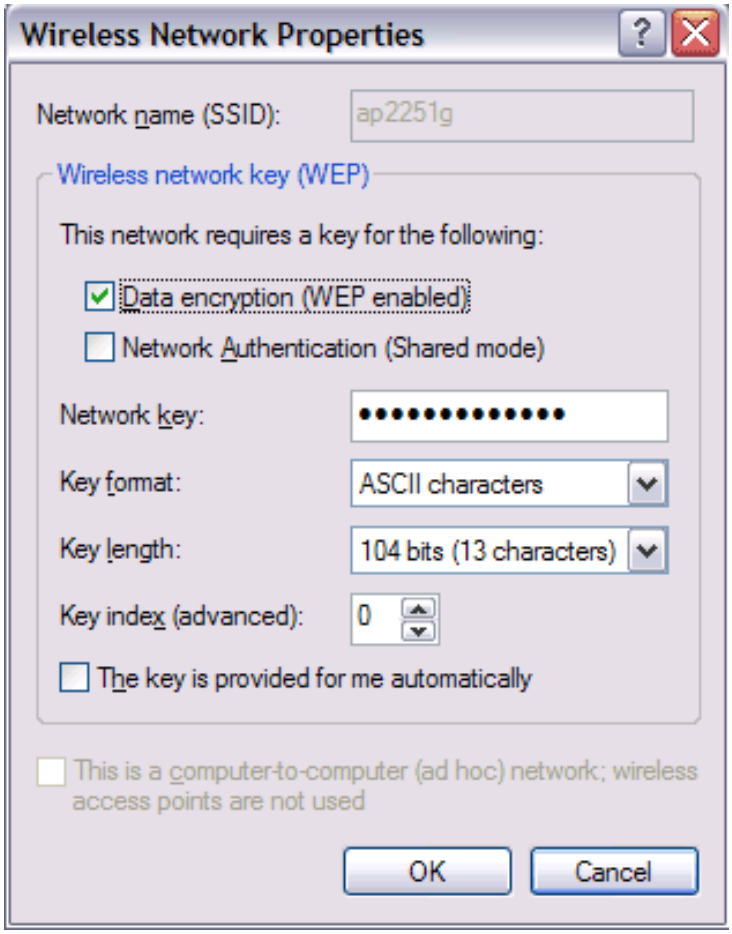
1. After opening the utility, select the network from the **Available networks** list and click **Configure**.



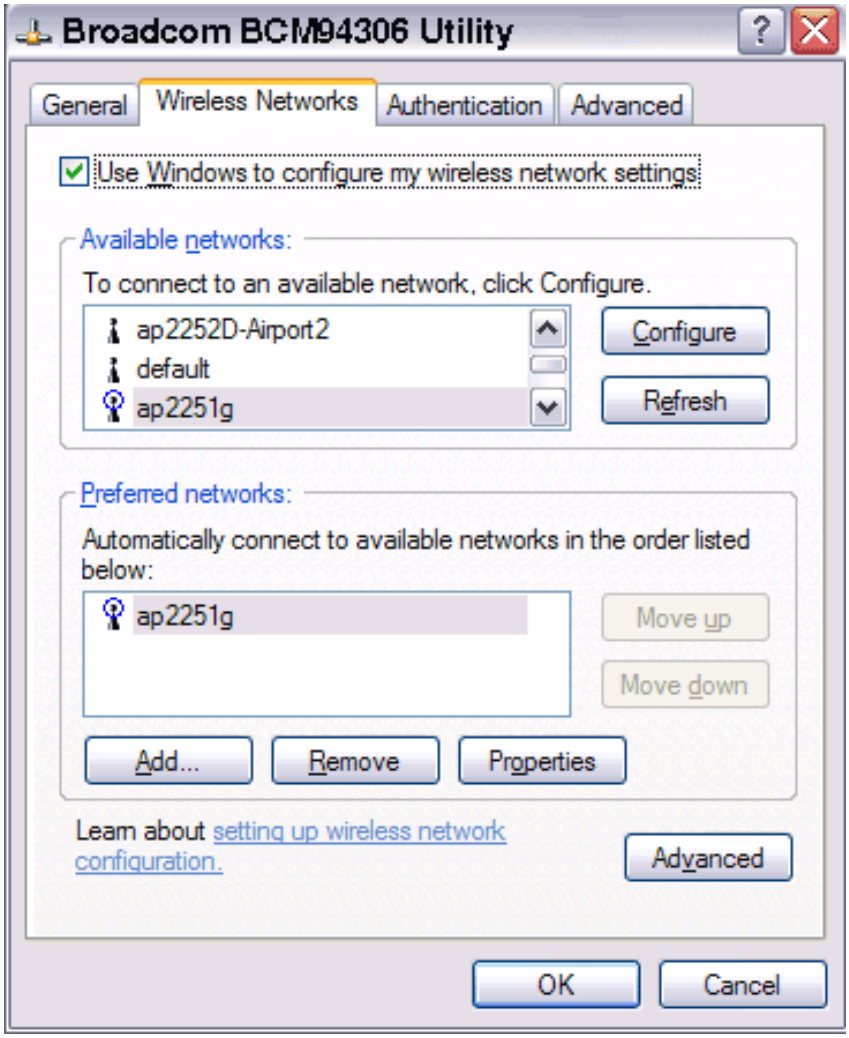
2. In the Wireless Network Properties box, select the **Data encryption (WEP enabled)** box.
3. Clear the **The key is provided for me automatically** box.
4. Type the network key in the **Network key** box.

   NOTE—You do not need to select the **Key format** or the **Key length** before typing the network key. These settings automatically change to the appropriate setting as you type the network key.

5. Click **OK**.

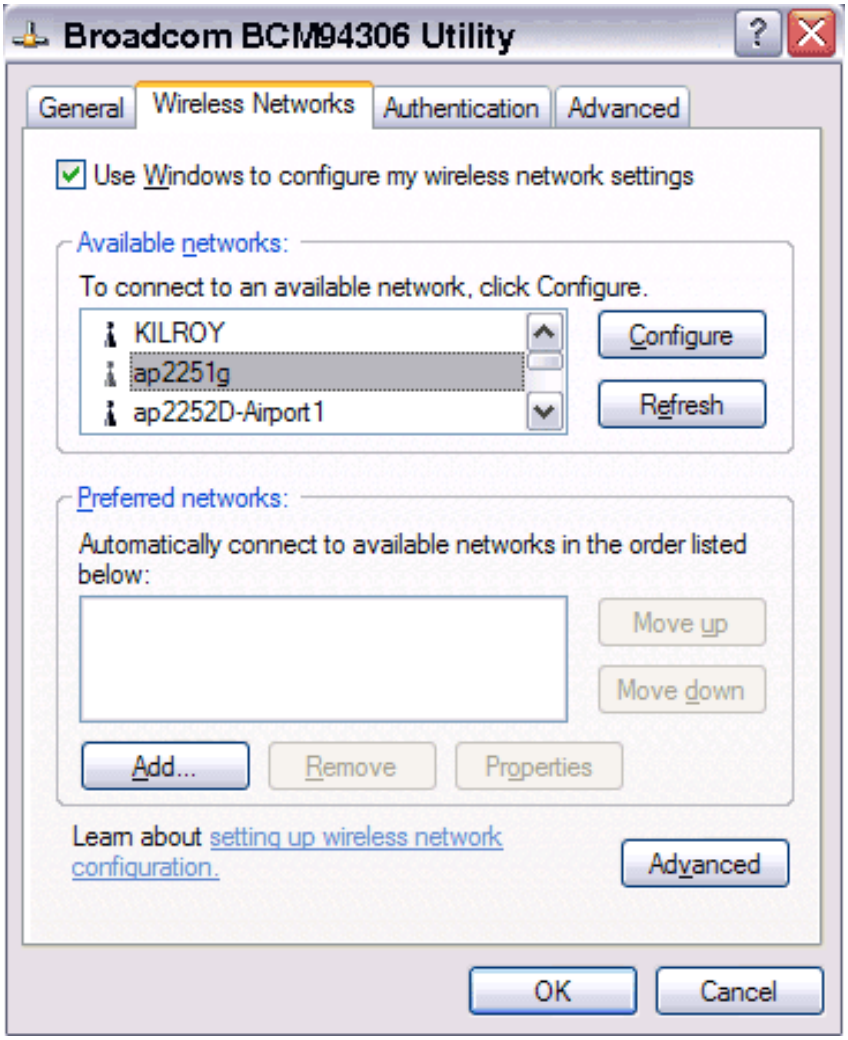


6. The network name and icon appear at the top of the **Preferred networks** list. Wait up to one minute for the network connection to be made. Your computer is connected to the selected network when you see a blue bubble on top of the icon for that network. If the bubble does not appear, try to access a Web page to verify that you are connected to the Internet.

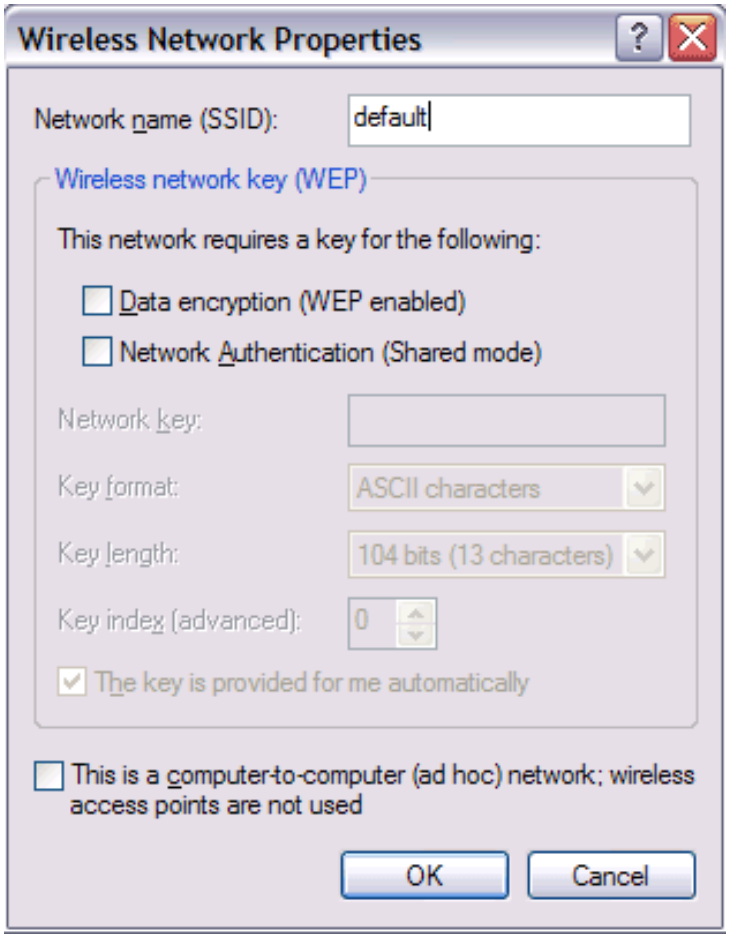


Configuring a profile for a network that is not listed and does not require a WEP key (Windows XP environment)

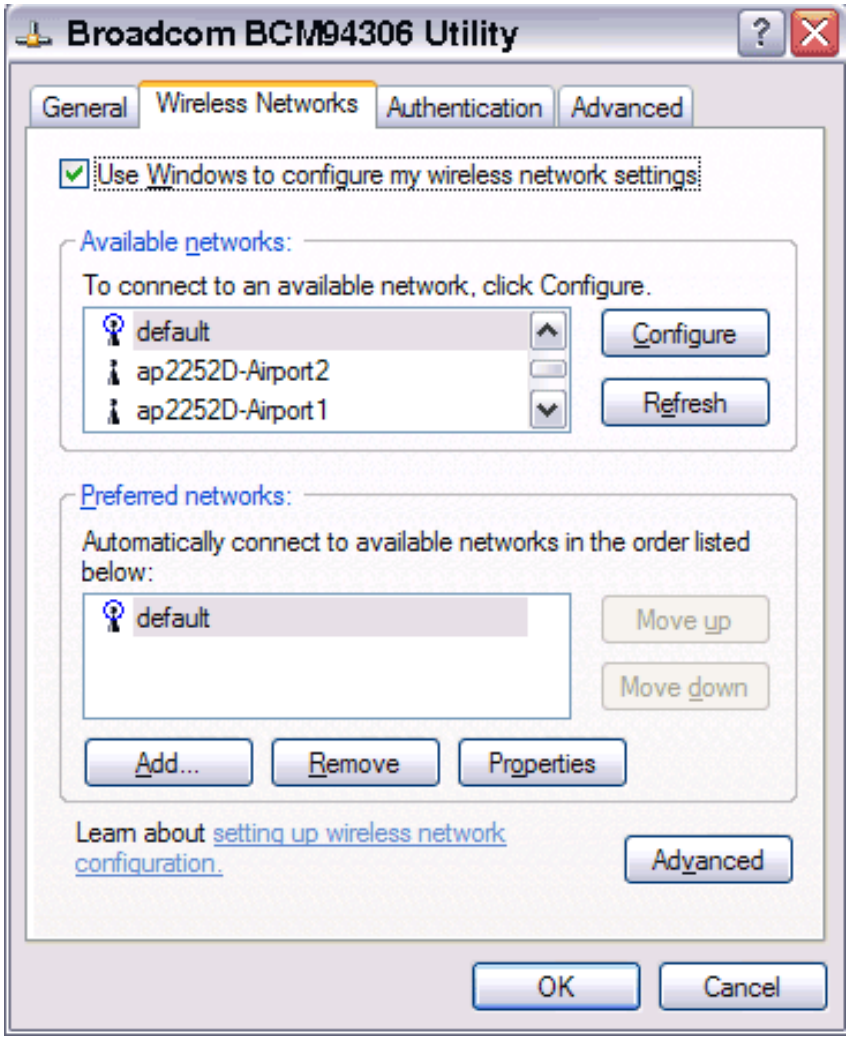
1. After opening the utility, click **Add**.



2. Type the network name in the **Network name (SSID)** box.
3. Click **OK**.

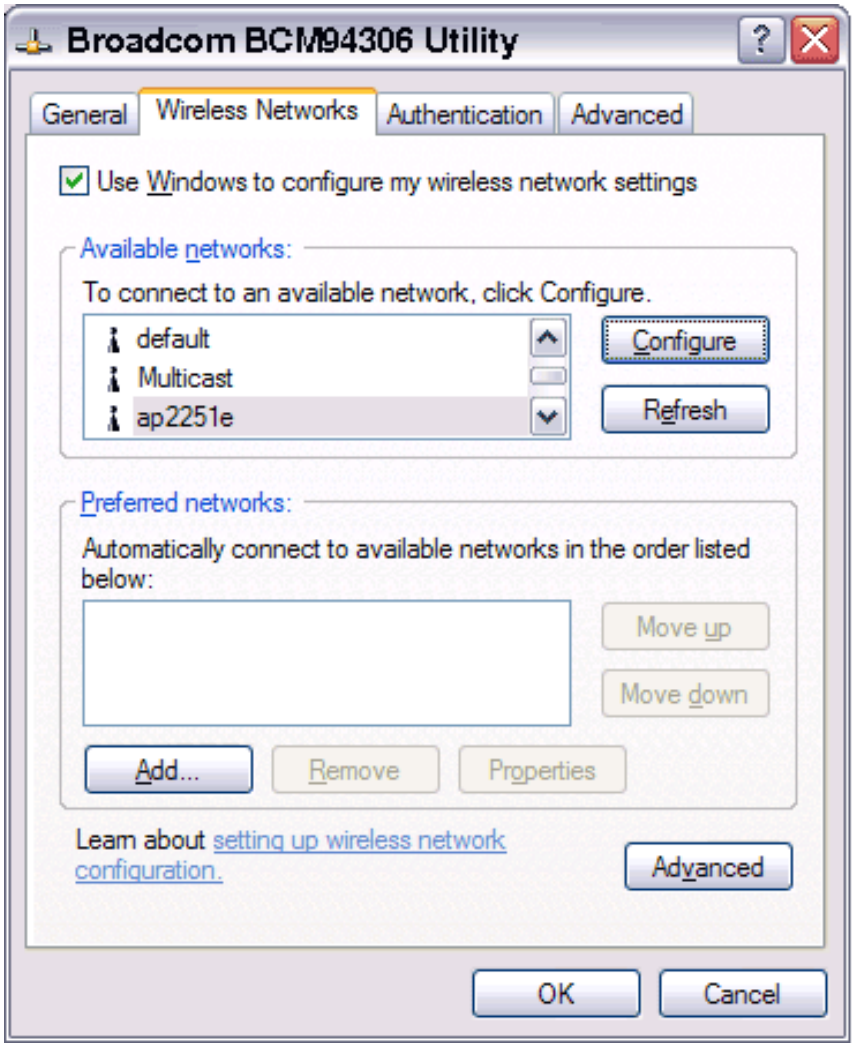


4. The network name and icon appear at the top of the **Preferred networks** list. Wait up to one minute for the network connection to be made. Your computer is connected to the added network when you see a blue bubble on top of the icon for that network. If the bubble does not appear, try to access a Web page to verify that you are connected to the Internet.



Configuring a profile for a network that is not listed and requires a WEP key (Windows XP environment)

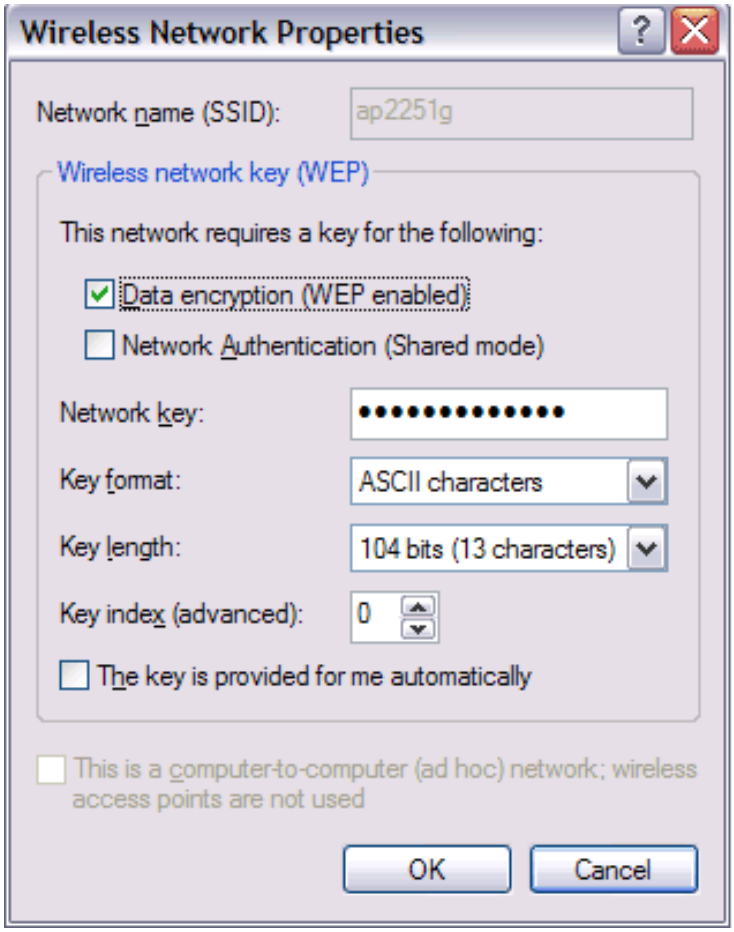
1. After opening the utility, click **Add**.



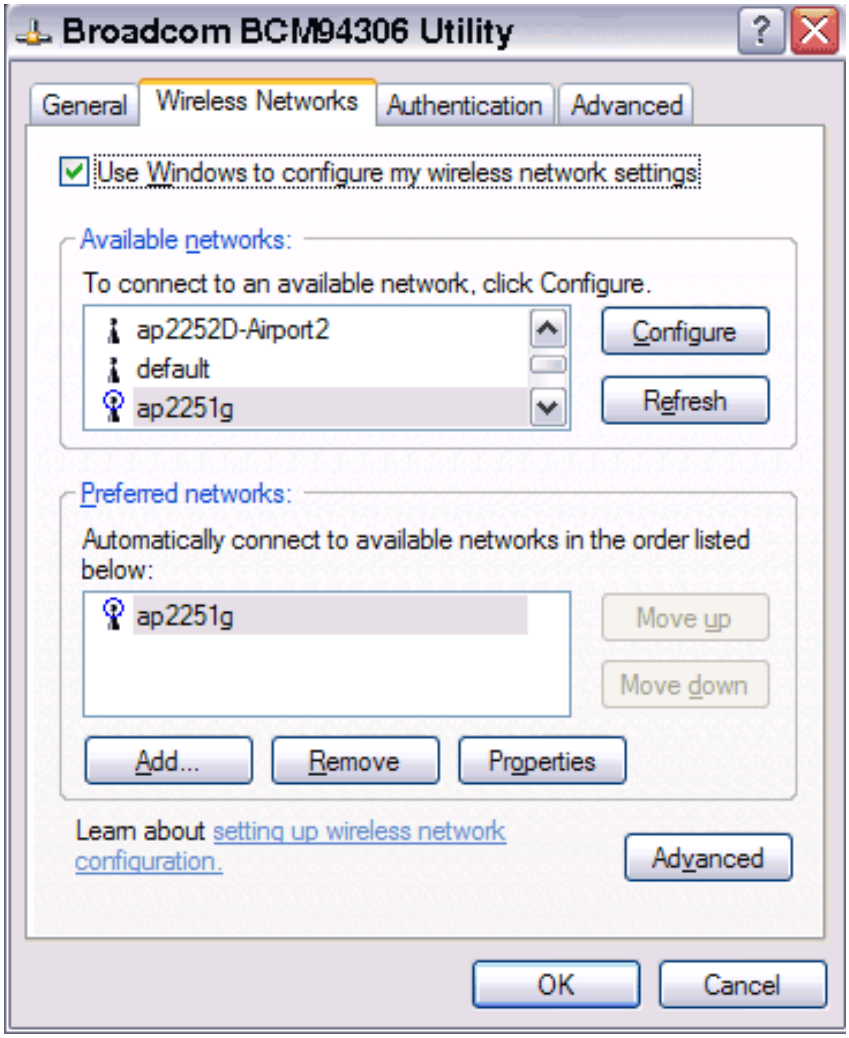
2. Type the network name in the **Network name (SSID)** box.
3. Select the **Data encryption (WEP enabled)** box.
4. Clear the **The key is provided for me automatically** box.
5. Type the network key in the **Network key** box.

   NOTE—You do not need to select the **Key format** or the **Key length** before typing the network key. These settings automatically change to the appropriate setting as you type the network key.

6. Click **OK**.



7. The network name and icon appear at the top of the **Preferred networks** list. Wait up to one minute for the network connection to be made. Your computer is connected to the added network when you see a blue bubble on top of the icon for that network. If the bubble does not appear, try to access a Web page to verify that you are connected to the Internet.



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Using the BCM94301MPL Wireless Utility: Broadcom BCM94301MPL Mini PCI Card User's Guide

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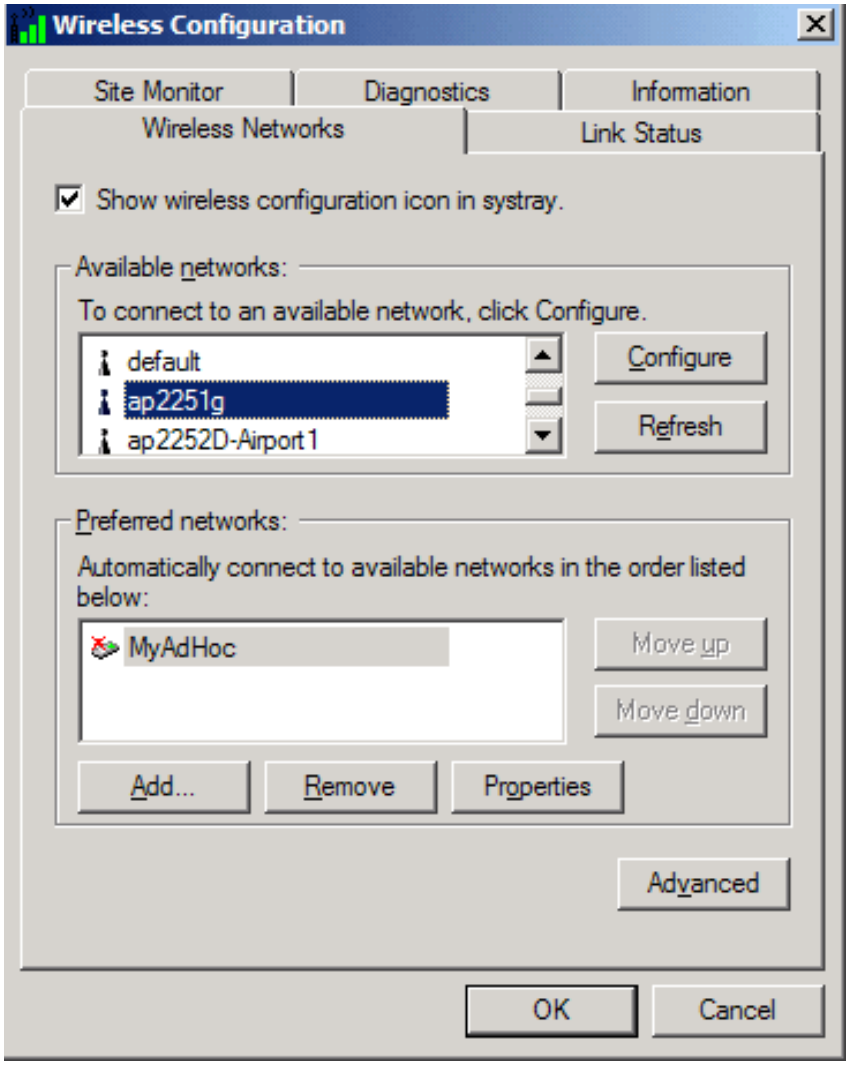
Adding a new network to the list of preferred networks
Viewing the link status of your wireless connection
Viewing or modifying the wireless network properties
Setting up an ad hoc (peer-to-peer) group network for connecting to the Internet
Adding an ad hoc network
Disabling the radio
Diagnostics

Opening the utility

The BCM94301MPL wireless utility starts automatically every time you start your computer. When the system startup process is complete, the utility icon appears in the system tray of the Windows® task bar at the bottom right of your screen. If the utility icon is not in the system tray, you can have it appear by selecting **Show wireless configuration icon in systray** from the **Wireless Networks** tab in the **Wireless Configuration** box that appears when the utility is open.

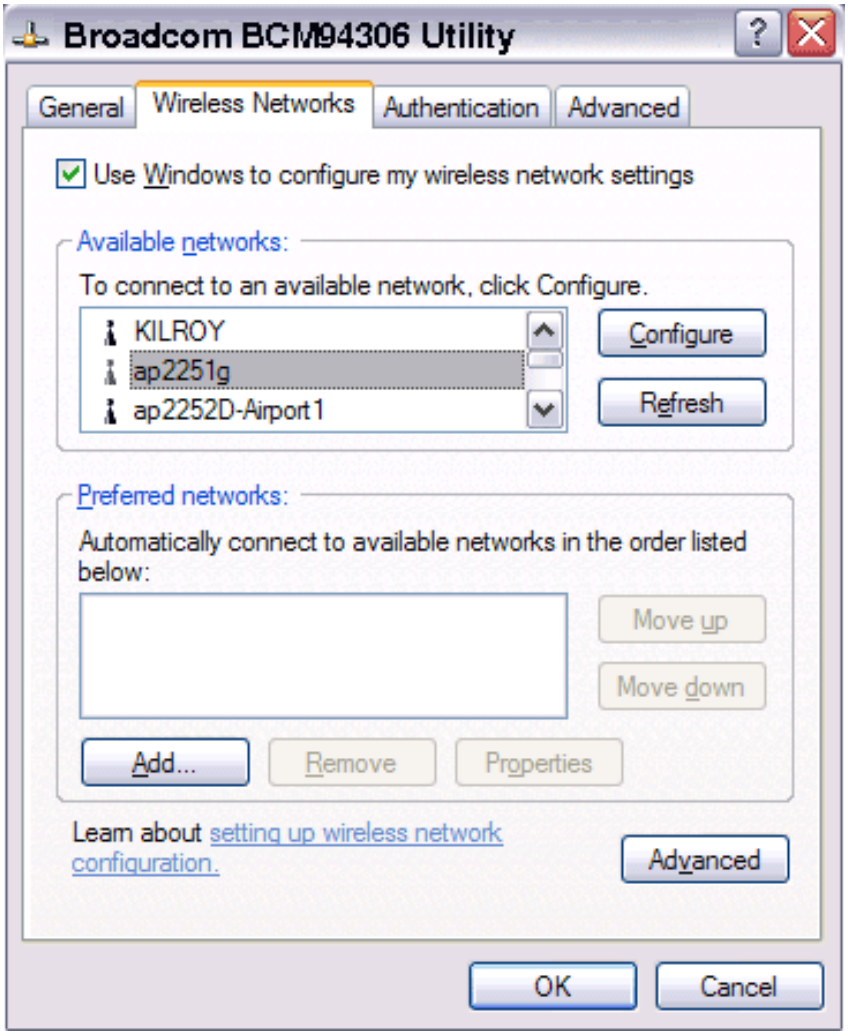
To open the utility in the Windows® 2000 environment

1. From the desktop, click the **Start** button, point to **Settings**, and click Control Panel.
2. Double-click the **BCM94301MPL wireless utility** icon .



To open the utility in the Windows XP environment

1. From the desktop, click the **Start** button and click **Control Panel**.
2. If you are looking at the Category View of Control Panel, click **Switch to Classic View**. If you are looking at the Classic View of Control Panel, go to the next step.
3. Double-click the **Network Connections** icon.
4. Right-click **Broadcom BCM94301MPL Internal 802.11b Mini PCI Card** in the **LAN or High-Speed Internet** area and click **Properties**.



Adding a new network to the list of preferred networks

Your computer automatically connects to the network at the top of the **Preferred networks** list. You must configure a network profile for each network that you want to add to the **Preferred networks** list.

To add a new network to the list of preferred networks in the Windows 2000 environment, first check to see if the new network is listed in the Available networks list of the Wireless Networks tab of the utility. If it is, follow the applicable instructions below according to which operating system your computer is running and whether or not the network requires a WEP key.

- See Configuring a profile for a listed network that does not require a WEP key (Windows 2000 environment) in Completing the setup.
- See Configuring a profile for a listed network that requires a WEP key (Windows 2000 environment) in Completing the setup.
- See Configuring a profile for a listed network that does not require a WEP key (Windows XP environment) in Completing the setup
- See Configuring a profile for a listed network that requires a WEP key (Windows XP environment) in the Completing the setup.

If the network you want to add to the Preferred networks list is not listed in the Available networks list, follow the applicable instructions below according to which operating system your computer is running and whether or not the network requires a WEP key.

- See Configuring a profile for a network that is not listed and does not require a WEP key (Windows 2000 environment) in

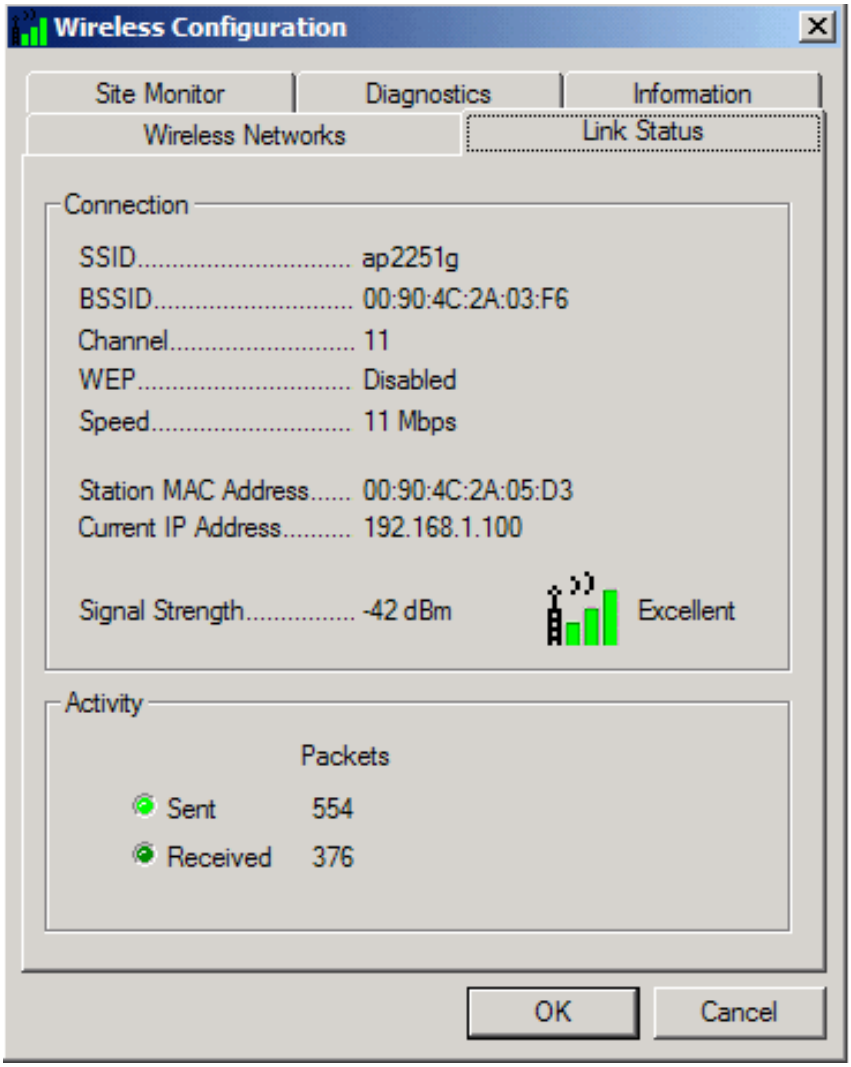
Completing the setup.

- See Configuring a profile for a network that is not listed and requires a WEP key (Windows 2000 environment) in Completing the setup.
- See Configuring a profile for a network that is not listed and does not require a WEP key (Windows XP environment) in Completing the setup
- See Configuring a profile for a network that is not on listed and requires a WEP key (Windows XP environment) in the Completing the setup.

Viewing the link status of your wireless connection

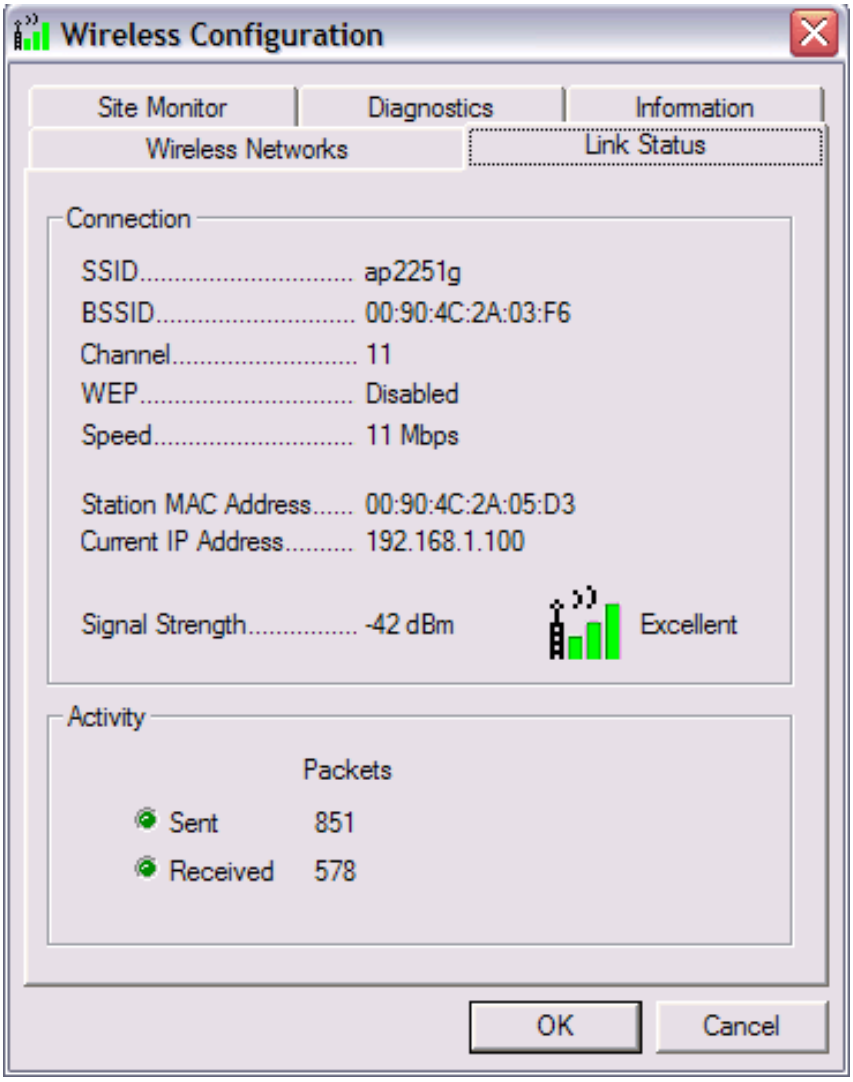
To view the link status (Windows 2000 environment)

1. Open the BCM94301MPL wireless utility.
   a. From the desktop, click the **Start** button, point to **Settings**, and click Control Panel.
   b. Double-click the **BCM94301MPL Wireless Utility** icon.
2. Click the **Link Status** tab in the **Wireless Configuration** box.



To view the link status (Windows XP environment)

1. Open the BCM94301MPL wireless utility
    a. From the desktop, click the **Start** button and click **Control Panel**.
    b. If you are looking at the Category View of Control Panel, click **Switch to Classic View**. If you are looking at the Classic View of Control Panel, go to the next step.
    c. Double-click the **Network Connections** icon.
    d. Double-click **Broadcom BCM94301MPL Internal 802.11b Mini PCI Card** in the **LAN or High-Speed Internet** area.
2. Click the **Link Status** tab in the **Wireless Configuration** box.



The quality of the connection (signal strength) is indicated graphically by the color of the vertical bars in the **BCM94301MPL Wireless Utility** icon and is indicated verbally by the description (in this case, **Excellent**).

Three vertical green bars indicate that the signal strength is **very good** or **excellent**.

Two vertical green bars indicate that the signal is **good**.

Two vertical yellow bars indicate that the signal strength is **marginal**.
Suggested action: move closer to the access point.

A single vertical red bar indicates that the signal strength is **very weak**
Suggested action: save your files and move closer to the access point.

Uncolored vertical bars indicate that there is **no signal** being received.
Probable causes:

- The computer is trying to establish an initial connection.
- You have moved out of range of the network.
- You have disabled the radio.

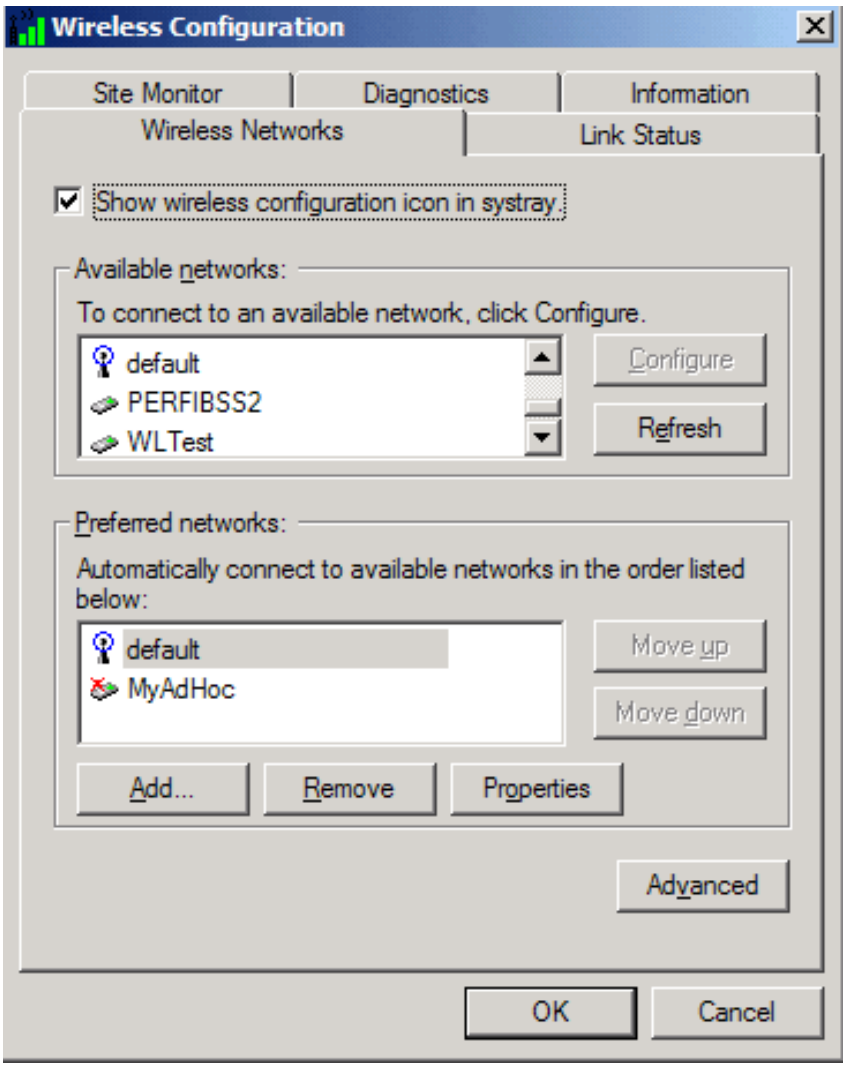
These graphical link status indicators are also shown on the BCM94301MPL icon in the system tray. The verbal description of the signal strength appears when you hover the cursor over the icon.

If the signal strength indications are anything other than very good or excellent, you should take the appropriate suggested action.

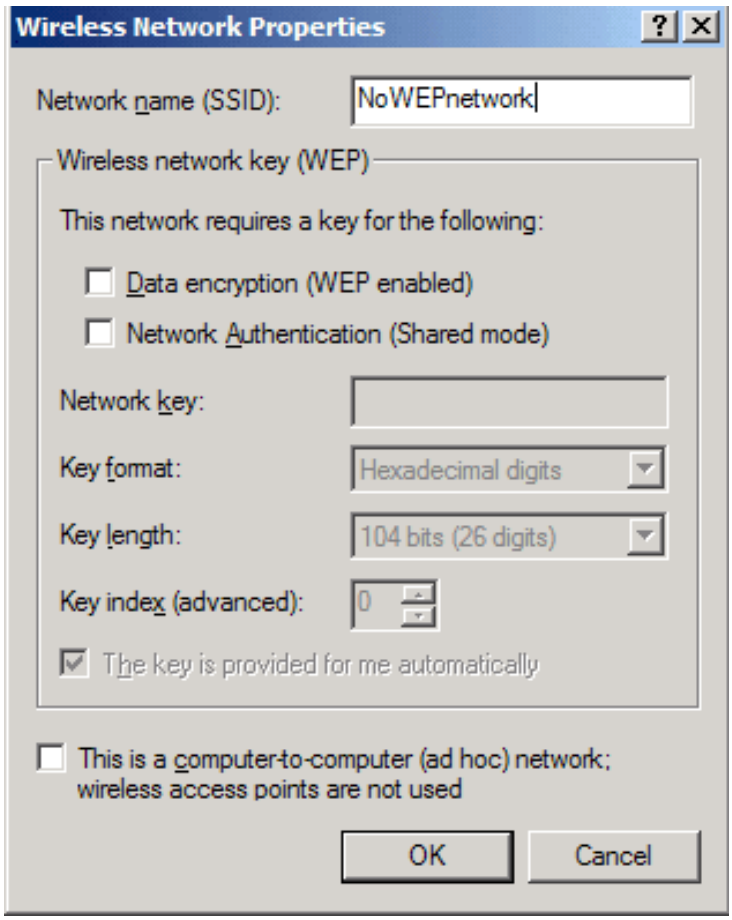
Viewing or modifying the wireless network properties

To view or modify the wireless network properties (Windows 2000 environment)

1. Open the BCM94301MPL wireless utility.
   a. From the desktop, click the **Start** button, point to **Settings**, and click **Control Panel**.
   b. Double-click the **BCM94301MPL Wireless Utility** icon .
2. If it is not already on top, click the **Wireless Networks** tab.
3. Select the network from the **Preferred networks** list and click **Properties**.

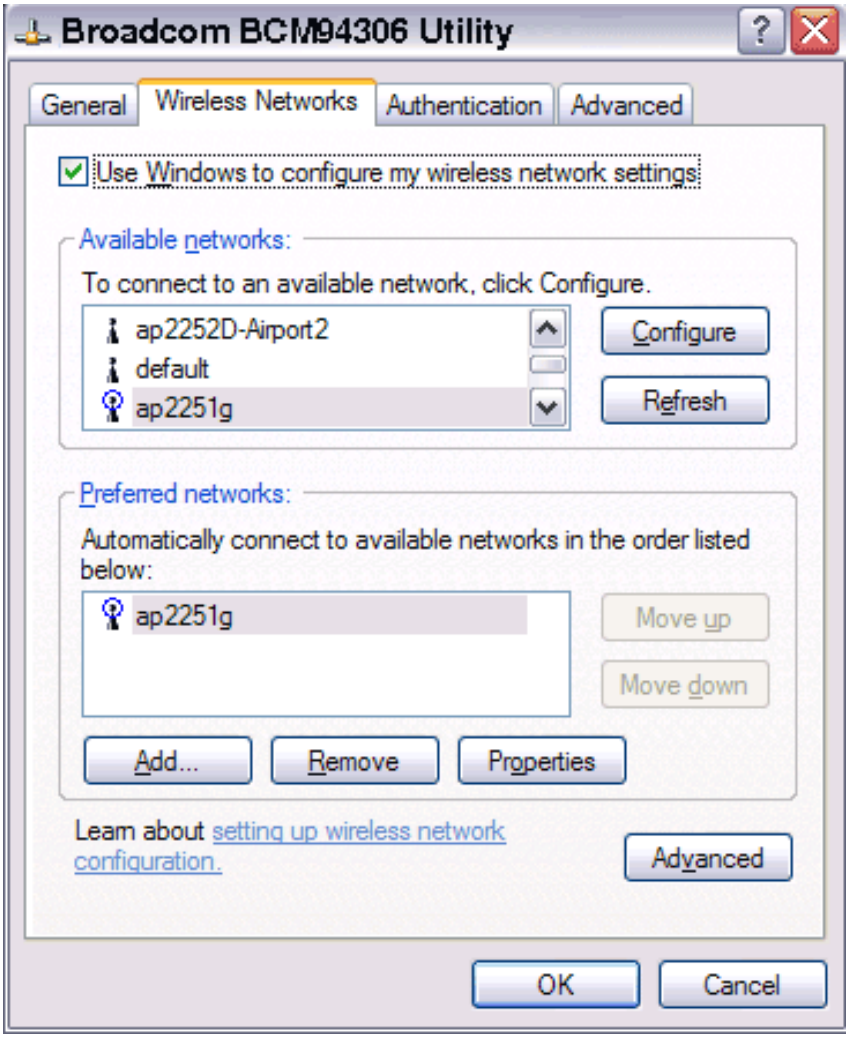


4. From the **Wireless Network Properties** box, you can enable or disable WEP data encryption and change the network name and network key (see the Completing the setup section for instructions).

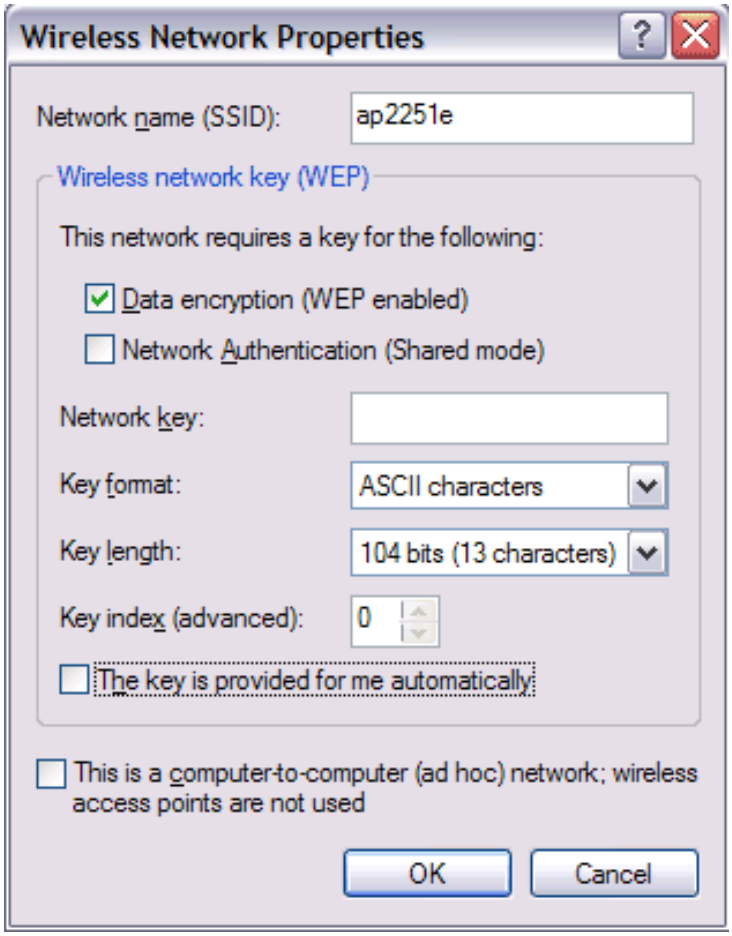


To view or modify the wireless network properties (Windows XP environment)

1. Open the BCM94301MPL wireless utility.
    a. From the desktop, click the **Start** button and click Control Panel. If you are looking at the **Category View** of Control Panel, click **Switch to Classic View**.
    b. Double-click the **Network Connections** icon.
    c. Right-click **Broadcom BCM94301MPL Internal 802.11b Mini PCI Card** in the **LAN or High-Speed Internet** area and click **Properties**.
2. If it is not already on top, click the **Wireless Networks** tab.
3. Select the network from the **Preferred networks** list and click **Properties**.



4. From the **Wireless Networks Properties** box, you can enable or disable WEP data encryption and change the network name and the network key (see the Completing the setup section for instructions).



Setting up an ad hoc (peer-to-peer) group network for connecting to the Internet

To connect the computers in an an-hoc group network to the Internet, you must install the Windows Internet connection sharing (ICS) component. *ICS installation is not required, however, for communication among a group of computers that have a Broadcom BCM94301MPL Mini PCI card installed in each computer*. You must also add an ad hoc network to the **Preferred networks** list on the **Wireless Networks** tab of the **Wireless Configuration** box that appears when the BCM94301MPL wireless utility is open.

Select one of your desktop computers to serve as the host computer (all other computers are called clients). The host computer must be running either the Windows 2000 or Windows XP operating system. The host computer is the only computer that connects directly to the Internet. Broadcom recommends that the host computer be the desktop computer having the fastest microprocessor and the most memory.

NOTE—Internet connection sharing requires that the host computer have either a modem or another network adapter in addition to a wireless network adapter. The modem or the additional network adapter is used to access the Internet. Your Broadcom BCM94301MPL Mini PCI card is used to share the Internet connections with other clients.

Setting up Internet connection sharing (ICS) on the host computer

To set up ICS in the Windows XP environment

1. Connect the host computer to the Internet.
2. From the host computer, click the **Start** button.

3. Click **Help and Support**.
4. Perform a search on Internet Connection Sharing.
5. From the **Pick a task** list, click **Enable Internet Connection Sharing on a Network Connection**.
6. Follow the instructions on the screen to complete setting up ICS.

To set up ICS in the Windows 2000 environment

1. Connect the host computer to the Internet.
2. From the host computer, click the **Start** button, point to **Settings**, and click Control Panel.
3. Double-click **Network and Dial-up Connections**.
4. If the host computer is connected to the Internet using a dial-up connection, double-click **Dial-up Connection**, click **Properties**, click **Sharing**, and then ensure that both **Enabled Internet Connection Sharing for this connection** and **Enabled on-demand dialing** are selected.
5. If the host computer is connected to the Internet using a cable or DSL modem, double-click **Local Area Connection**.
6. In the **Local Area Connection Status** box, click **Properties**.
7. Click the **Sharing** tab and select **Enable Internet Connection Sharing for this connection**.
8. Click **OK**

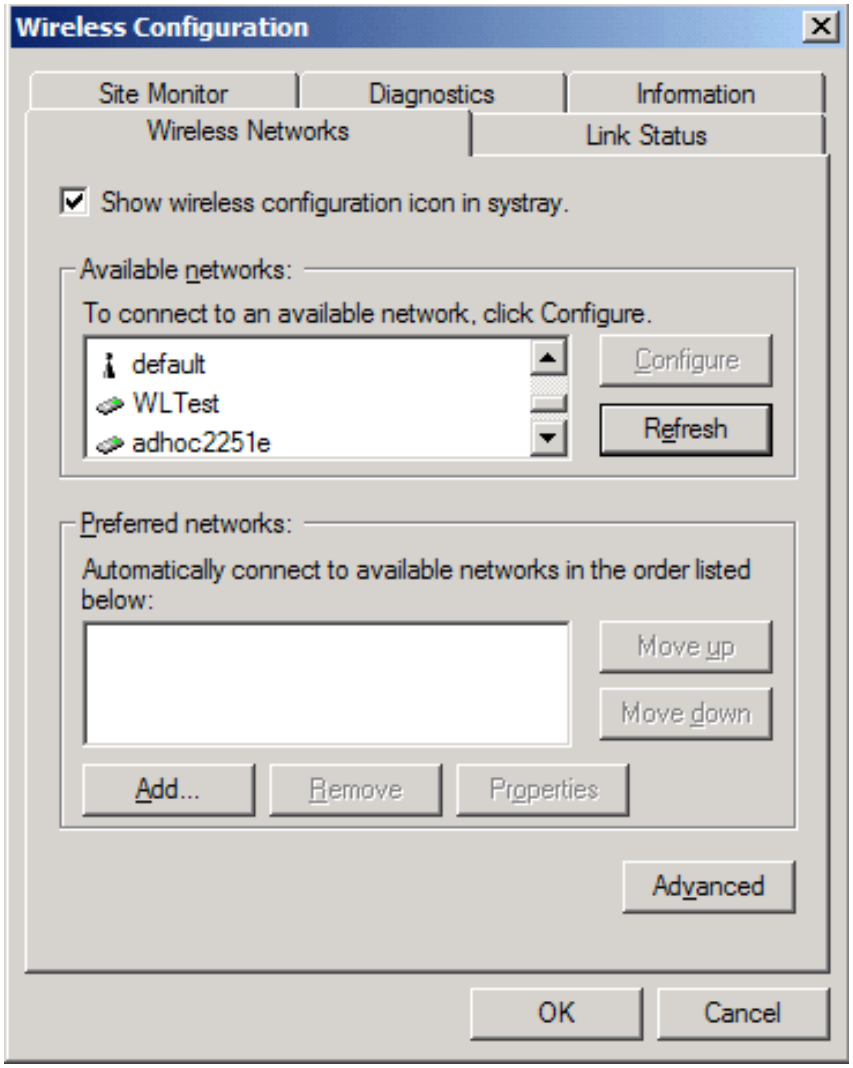
Adding an ad hoc network

You can add an ad hoc network (for peer-to-peer communicating) that either requires a WEP key or does not. Instructions for adding and configuring an ad hoc network for both types of ad hoc networks are provided below:

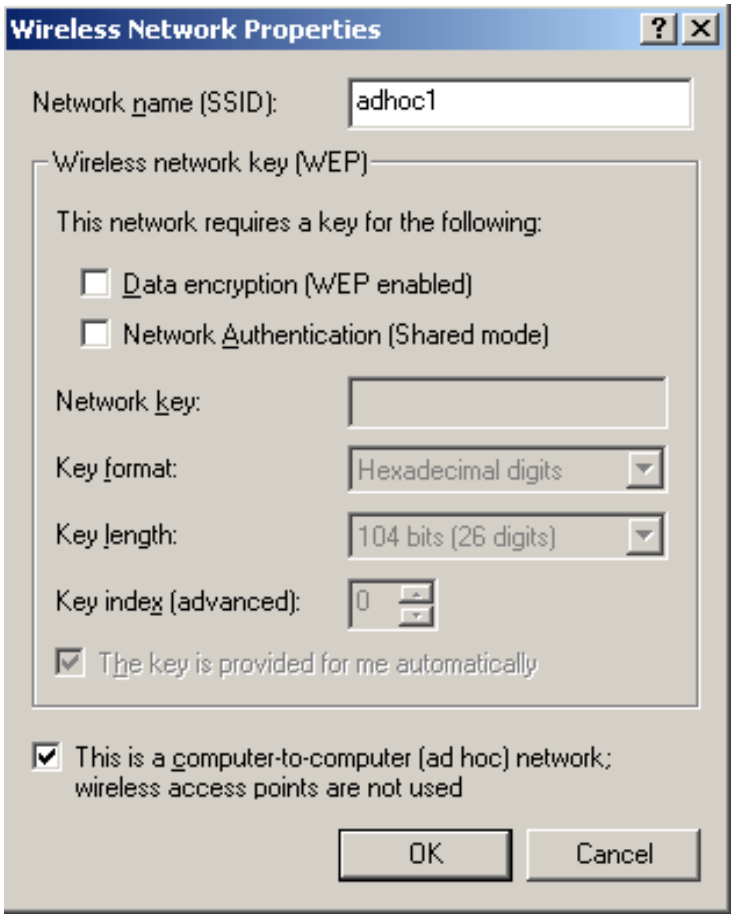
- Adding an ad hoc network that does not require a WEP key (Windows 2000 environment)
- Adding an ad hoc network that requires a WEP key (Windows 2000 environment)
- Adding an ad hoc network that does not require a WEP key (Windows XP environment)
- Adding an ad hoc network that requires a WEP key (Windows XP environment)

Adding an ad hoc network that does not require a WEP key (Windows 2000 environment)

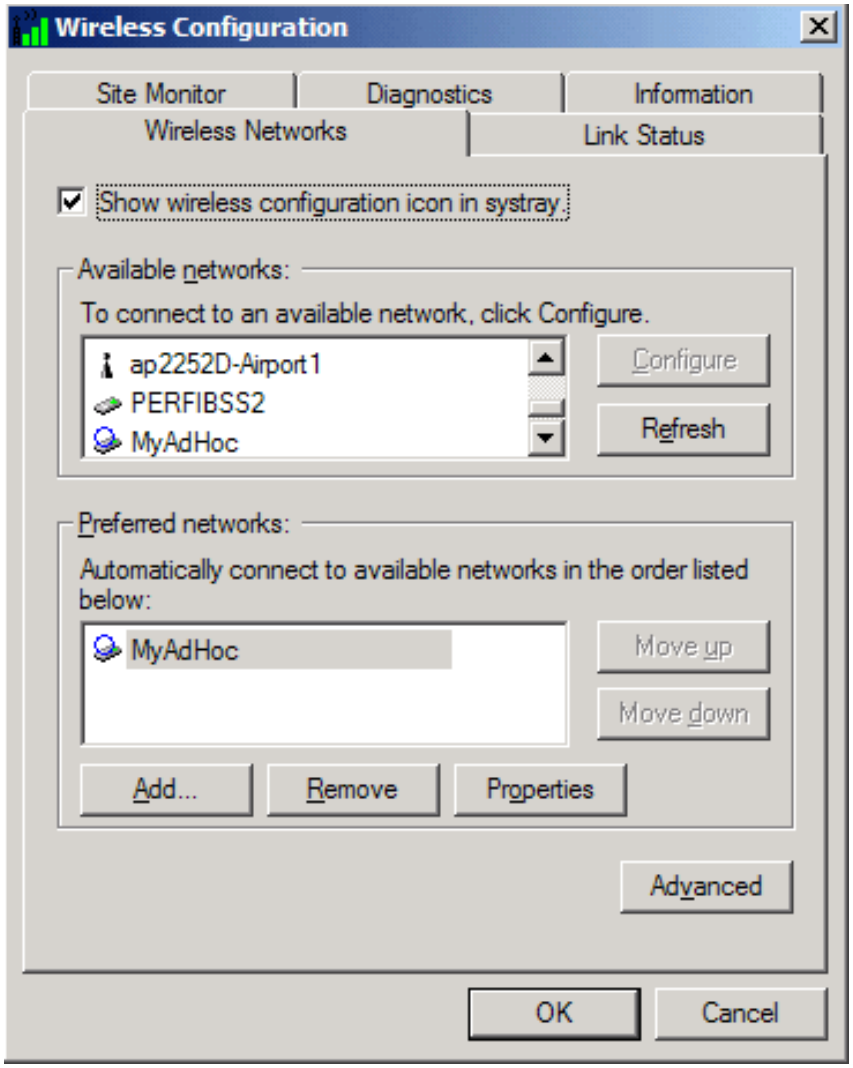
1. To add an ad hoc network to the **Preferred networks** list, open the BCM94301MPL wireless utility.
    a. From the desktop, click the **Start** button, point to **Settings**, and click **Control Panel**.
    b. Double-click the **BCM94301MPL Wireless Utility** icon .
2. If the **Wireless Networks** tab is not already on top, click the **Wireless Networks** tab.
3. Click **Add**.



4. Type the network name in the **Network name (SSID)** box.
5. Select the **This is a computer-to-computer (ad hoc) network: wireless access points are not used** box.
6. Click **OK**.

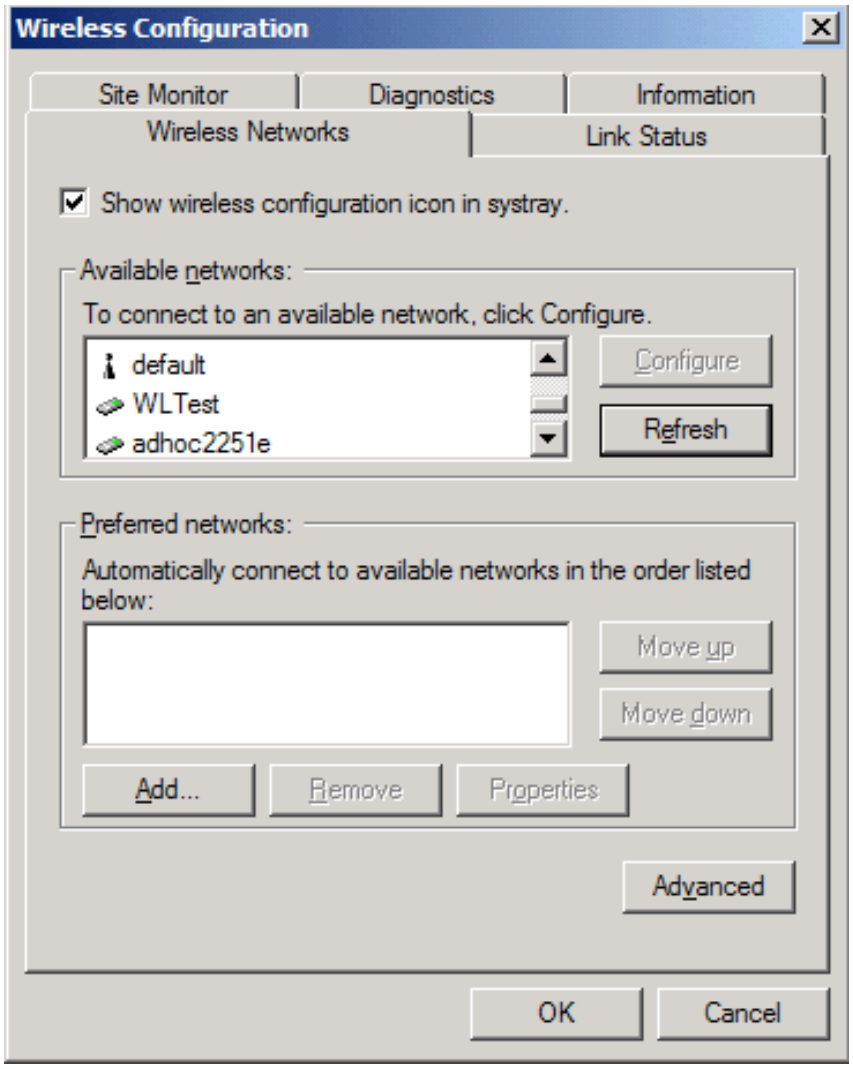


7. Wait up to one minute for the network connection to be made. Your computer is connected to the added network when you see a bubble on top of the icon for that network.



Adding an ad hoc network that requires a WEP key (Windows 2000 environment)

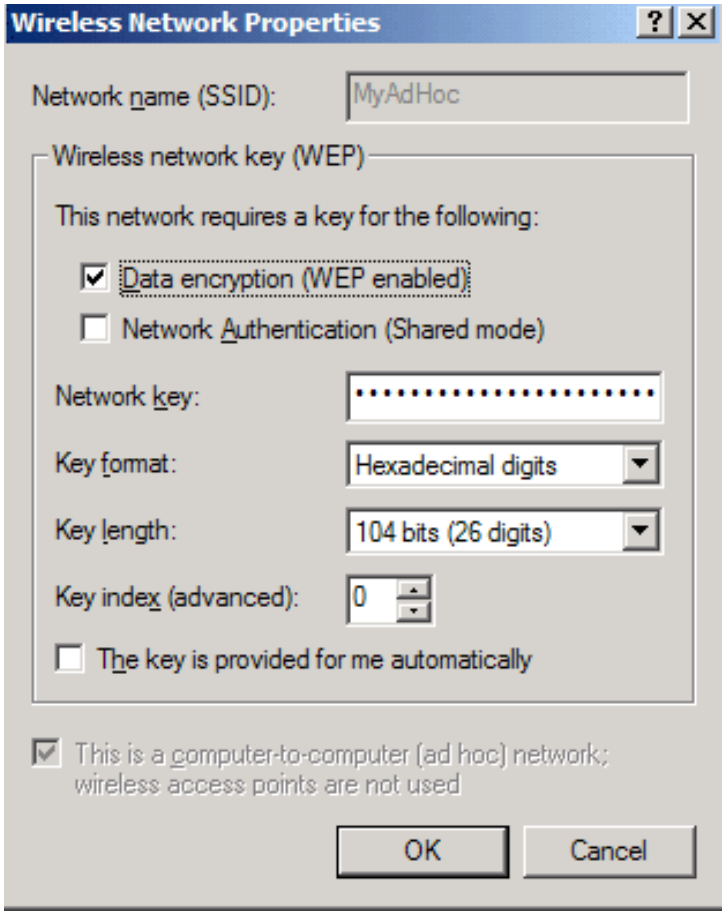
1. To add an ad hoc network to the **Preferred networks** list, open the BCM94301MPL wireless utility.
   a. From the desktop, click the **Start** button, point to **Settings**, and click **Control Panel**.
   b. Double-click the **BCM94301MPL Wireless Utility** ico .
2. If the **Wireless Networks** tab is not already on top, click the **Wireless Networks** tab.
3. Click **Add**.



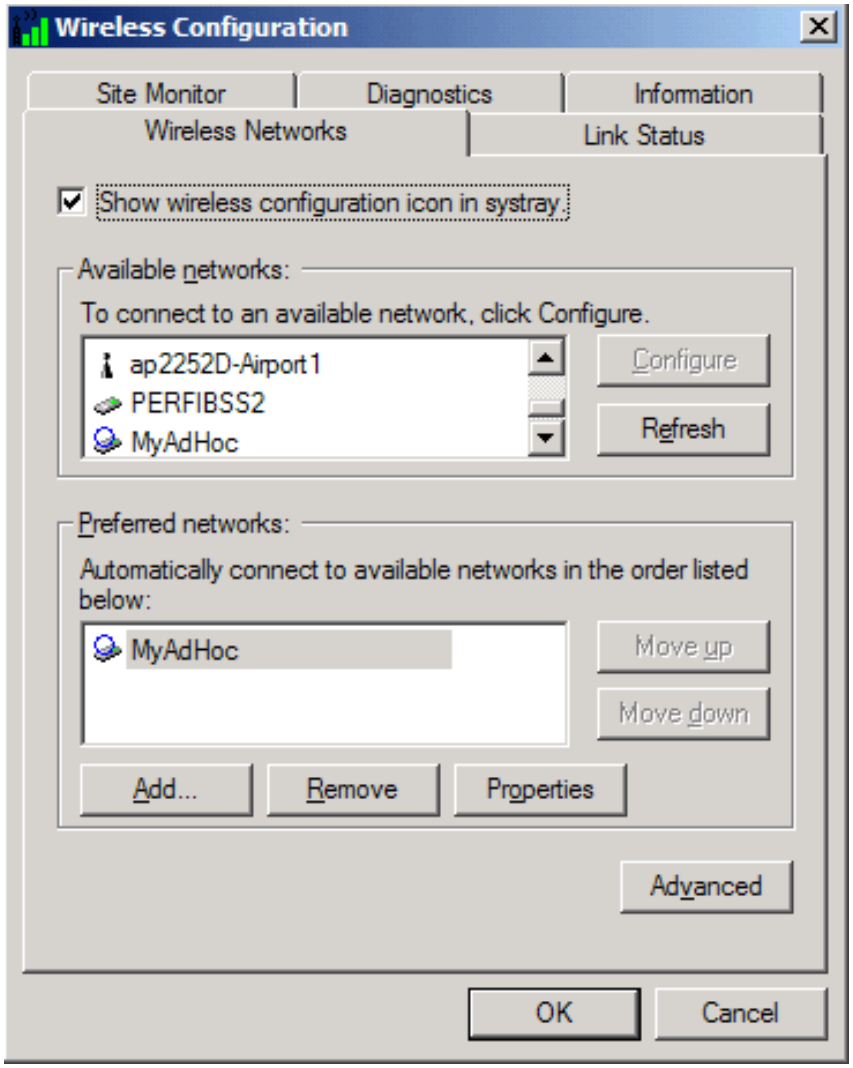
4. Type the network name in the **Network name** (SSID) box.
5. Select the **Data encryption (WEP enabled)** box.
6. Clear the **The key is provided for me automatically** box.
7. Type the network key in the **Network key** box.

   NOTE—You do not need to select the **Key format** or the **Key length** before typing the network key. These settings automatically change to the appropriate setting as you type the network key.

8. Select the **This is a computer-to-computer (ad hoc) network: wireless access points are not used** box.
9. Click **OK**.

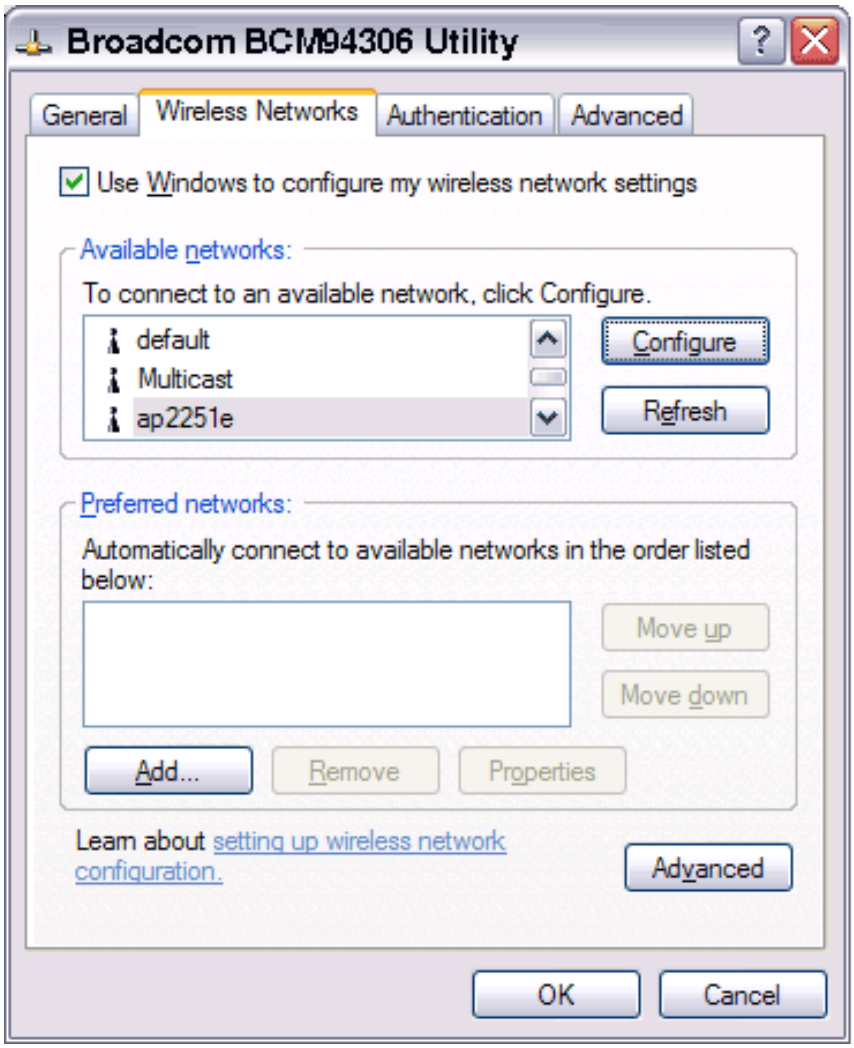


10. Wait up to one minute for the network connection to be made. Your computer is connected to the added network when you see a blue bubble on top of the icon for that network.

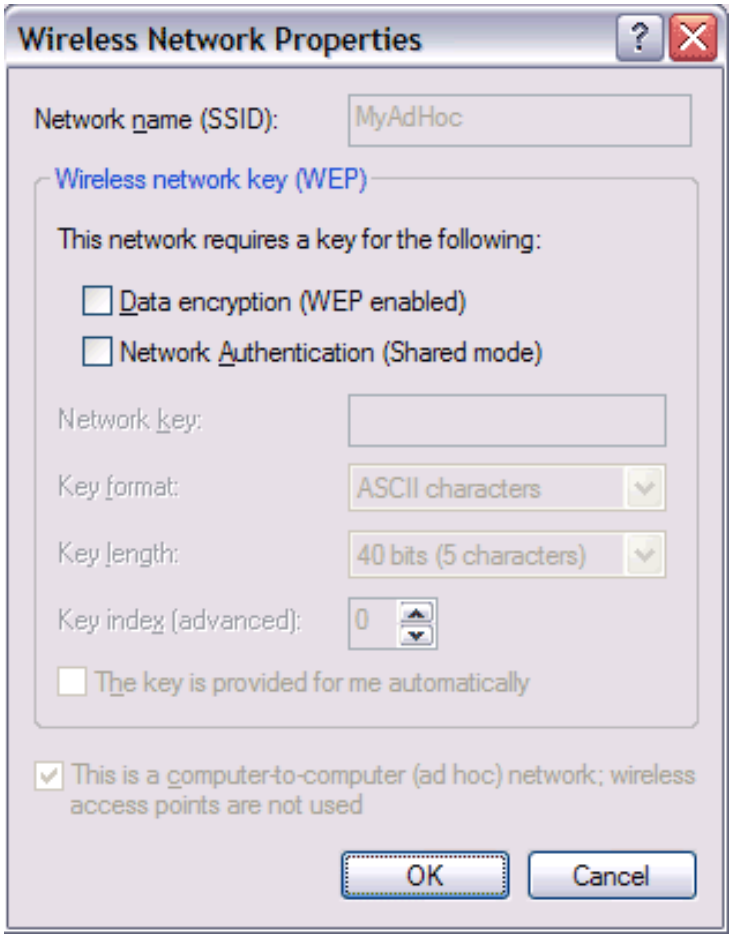


Adding an ad hoc network that does not require a WEP key (Windows XP environment)

1. To add an ad hoc network to the **Preferred networks** list, open the BCM94301MPL wireless utility.
    a. From the desktop, click the **Start** button and click Control Panel. If you are looking at the **Category View** of Control Panel, click **Switch to Classic View**.
    b. Double-click the **Network Connections** icon.
    c. Right-click **Broadcom BCM94301MPL Internal 802.11b Mini PCI Card** in the **LAN or High-Speed Internet** area and click **Properties**.
2. If the **Wireless Networks** tab is not already on top, click the **Wireless Networks** tab.
3. Verify that the **Use Windows to configure my wireless network settings** box is selected. If it is not, select it.
4. Click **Add**.



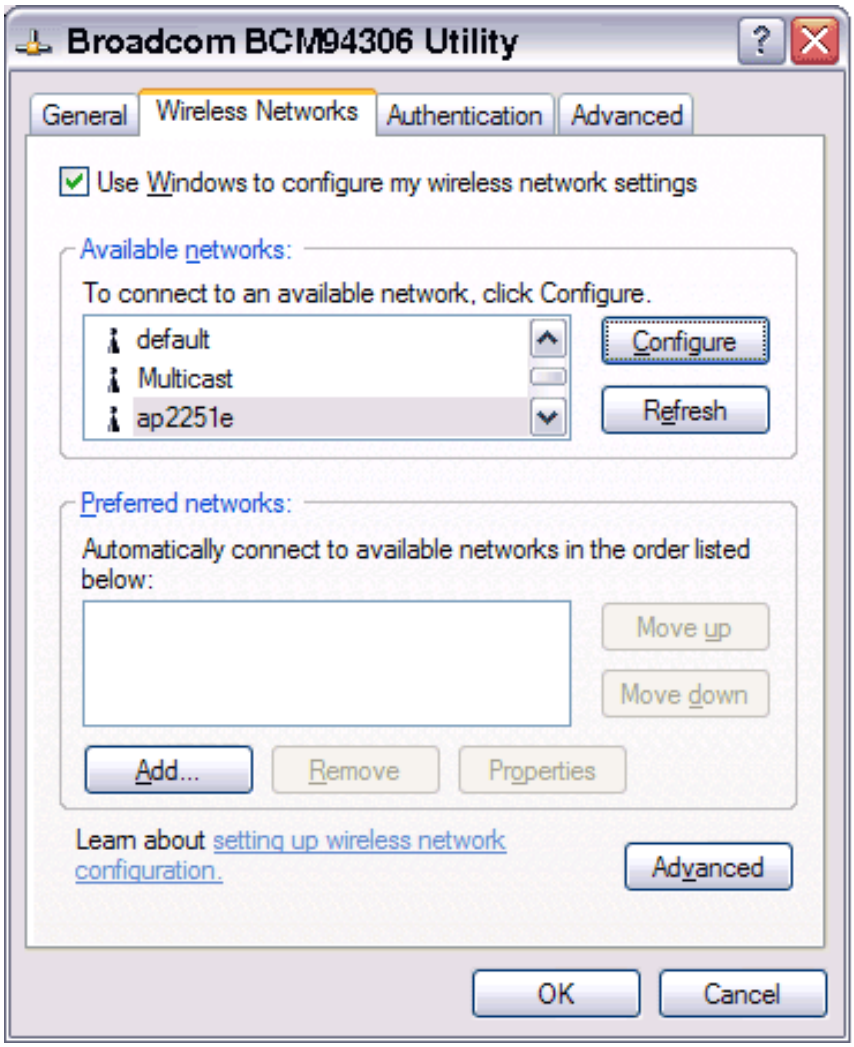
5. Type the network name in the **Network name (SSID)** box.
6. Select the **This is a computer-to-computer (ad hoc) network: wireless access points are not used** box.
7. Click **OK**.



8. Wait up to one minute for the network connection to be made. Your computer is connected to the added network when you see a blue bubble on top of the icon for that network.

Adding an ad hoc network that requires a WEP key (Windows XP environment)

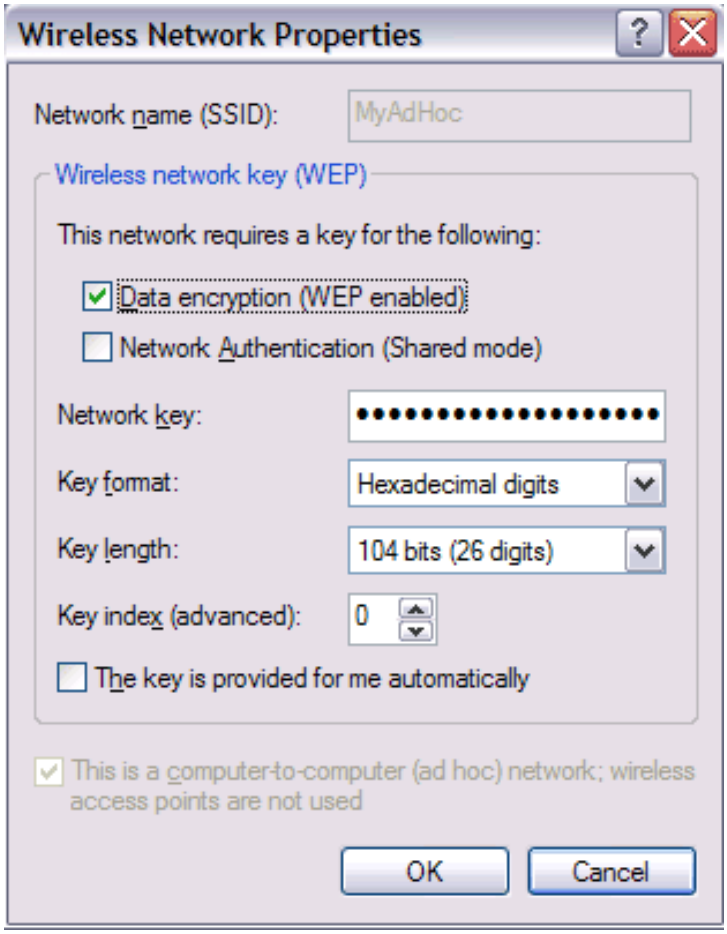
1. To add an ad hoc network to the **Preferred networks** list, open the BCM94301MPL wireless utility.
    a. From the desktop, click the **Start** button and click Control Panel. If you are looking at the **Category View** of Control Panel, click **Switch to Classic View**.
    b. Double-click the **Network Connections** icon.
    c. Right-click **Broadcom BCM94301MPL Internal 802.11b Mini PCI Card** in the **LAN or High-Speed Internet** area and click **Properties**.
2. If the **Wireless Networks** tab is not already on top, click the **Wireless Networks** tab.
3. Verify that the **Use Windows to configure my wireless network settings** box is selected. If it is not, select it.
4. Click **Add**.



5. Type the network name in the **Network name (SSID)** box.
6. Select the **Data encryption (WEP enabled)** box.
7. Clear the **The key is provided for me automatically** box.
8. Type the network key in the **Network key** box.

   NOTE—You do not need to select the **Key format** or the **Key length** before typing the network key. These settings automatically change to the appropriate setting as you type the network key.

9. Select the **This is a computer-to-computer (ad hoc) network: wireless access points are not used** box.
10. Click **OK**.



11. Wait up to one minute for the network connection to be made. Your computer is connected to the added network when you see a blue bubble on top of the icon for that network.

Disabling the radio

To disable the radio on your Broadcom BCM94301MPL internal 802.11b Mini PCI card, right-click the **BCM94301MPL wireless utility** icon in the system tray and click **Disable Radio**. To enable the radio, right-click the utility icon and click **Enable Radio**.

Diagnostics

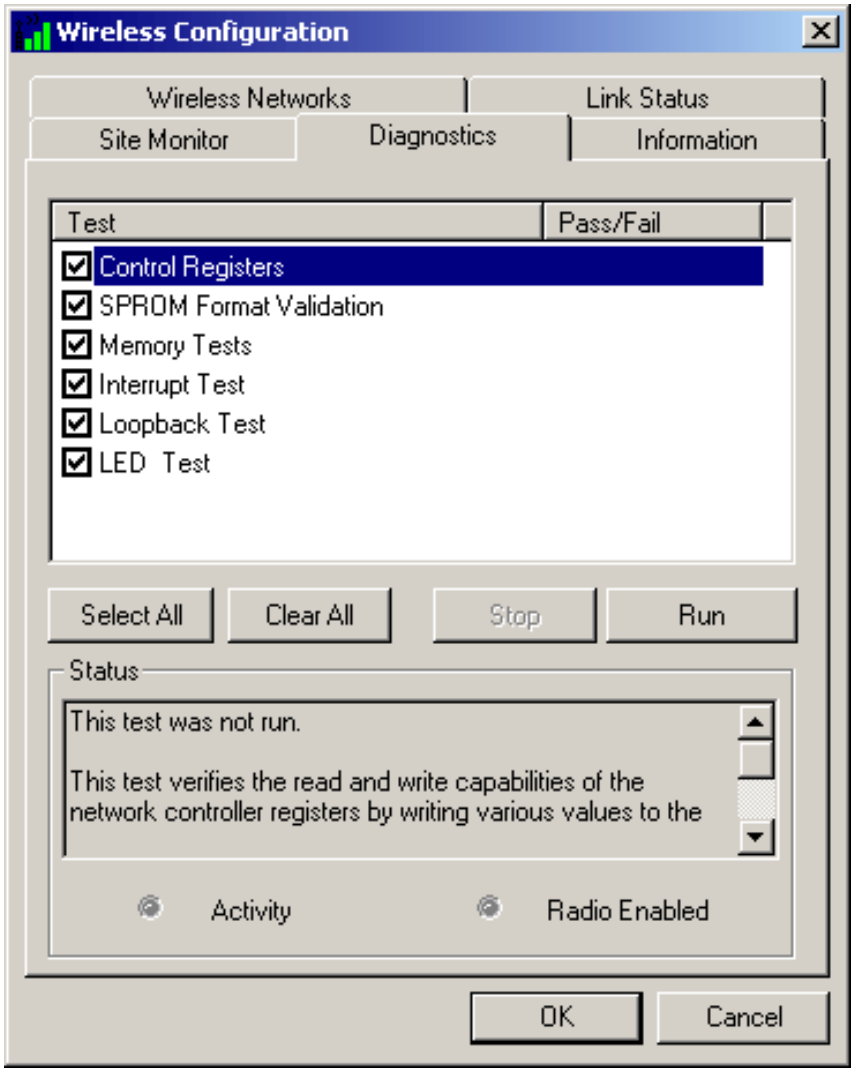
You can run a number of diagnostics on your Broadcom BCM94301MPL wireless device to verify its operational and functional status. NOTE—Your network connection is lost when you run the diagnostics. When the test run is over, your network connection is automatically reestablished.

Diagnostics (Windows 2000 environment)

1. To begin running the diagnostics, open the BCM94301MPL wireless utility.
   a. From the desktop, click the **Start** button, point to **Settings**, and click **Control Panel**.

b. Double-click the **BCM94301MPL wireless utility** icon .

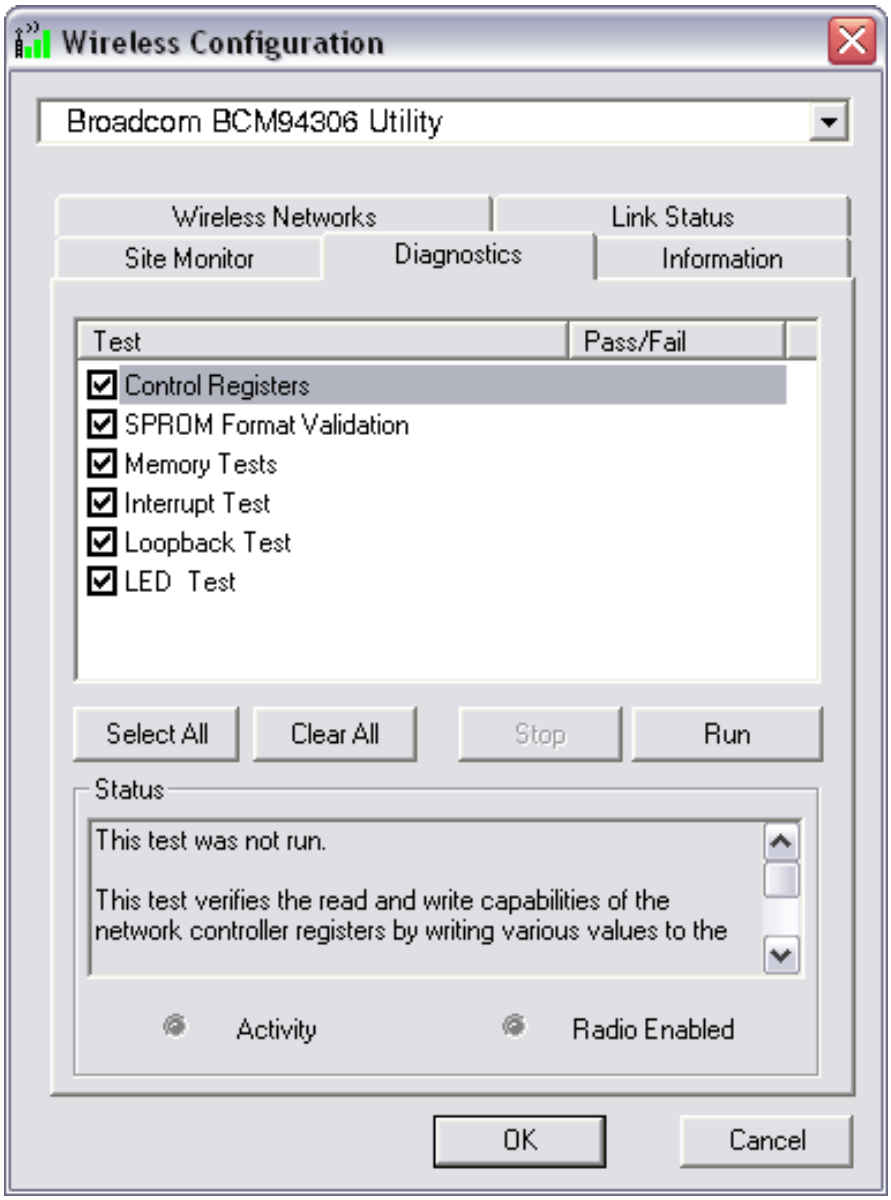
2. Click the **Diagnostics** tab.
3. To see a description of the test, click each test and look in the **Status** area.
4. All tests are selected by default. To run an individual test or some but not all of the tests, clear the check box for those tests that you do not want to run.
5. Click **Run**.



6. If your Broadcom BCM94301MPL internal 802.11b Mini PCI card fails any of the diagnostics tests, see the Troubleshooting section.

Diagnostics (Windows XP environment)

1. To begin running the diagnostics, open the BCM94301MPL wireless utility.
   a. From the desktop, click the **Start** button and click Control Panel. If you are looking at the **Category View** of Control Panel, click **Switch to Classic View**.
   b. Double-click the **BCM94301MPL Wireless Utility** icon.
2. Click the **Diagnostics** tab.
3. To see a description of the test, click each test and look in the **Status** area.
4. All tests are selected by default. To run an individual test or some but not all of the tests, clear the check box for those tests that you do not want to run.
5. Click **Run Tests**.



6. If your Broadcom BCM94301MPL internal 802.11b Mini PCI card fails any of the diagnostics tests, see the Troubleshooting section.

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Troubleshooting: Broadcom BCM94301MPL Mini PCI Card User's Guide

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Cannot connect to the network
Performance and connectivity problems
Getting help

Cannot connect to the network

If your Broadcom BCM94301MPL wireless device appears to be functioning properly but you cannot connect to the network, the problem may be that there is a mismatch between the **Network name (SSID)** and **Wireless network key (WEP)** settings in your Wireless Network Properties and the name and WEP key of the network you are trying to connect to. As explained in Completing the setup, the network name and WEP key are case sensitive. Verify that the spelling and case of these parameters are correct and that the settings are exactly the same on all computers on the network.

If you have verified that the spelling and case of these parameters are correct and that the settings are exactly the same on all computers on the network and you are still unable to connect to the network, see Performance and connectivity problems.

Performance and connectivity problems

Problem or symptom	**Possible solution**	
The computers seem to be communicating, but they do not appear in the **My Computer** window or in the **My Network Places** window.	**Windows 2000 environment**	**Windows XP environment**

	Verify that File and Printer Sharing is enabled on all the computers on your network. 1. From the desktop, click the **Start** button, point to **Settings**, and click Control Panel. 2. In Control Panel, double-click the **Network and Dial-up Connections** icon. 3. In the **Network and Dial-up Connections** window, double-click the **Local Area Connection** icon. 4. In the **Local Area Connection Status** box, click **Properties**. 5. In the **Local Area Connection Properties** box, verify that the **File and Printer Sharing for Microsoft Networks** check box is selected. If the check box is cleared, select it. If the check box is not present, click **Install**. In the **Select Network Component Type** box, select **Service** and click **Add**. In the **Select Network Service** box, select **File and Printer Sharing for Microsoft Networks** and click **OK**. Close the **Local Area Connection Properties** box. 6. Close the **Local Area Connection Status** box. 7. Close the **Network and Dial-up Connections** window.	Verify that File and Printer Sharing is enabled on all the computers on your network. 1. From the desktop, click the **Start** button and click Control Panel (if you are looking at Category View, slick **Switch to Classic View**). 2. In Control Panel, double-click the **Network Connections** icon. 3. In the **LAN or High-Speed Internet** area, right-click **Wireless Network Connection** and click **Properties**. 4. In the **Wireless Network Connection Properties** box, if the **General** tab is not on top, click the **General** tab. 5. In the **This connection uses the following items** list, verify that the **File and Printer Sharing for Microsoft Networks** check box is selected. If the check box is cleared, select it. If this item is not present, click **Install**. In the **Select Network Component Type** box, select **Service** and click **Add**. In the **Select Network Service** box, select **File and Printer Sharing for Microsoft Networks** and click **OK**. Close the **Wireless Network Connection Properties** box. 6. Close the **Network Connections** window.
Data transfer is sometimes very slow.	Microwave ovens and some cordless phones operate at the same radio frequency as the BCM94301MPL Mini PCI cards. When the microwave oven or cordless phone is in use, it interferes with the wireless network. Therefore, keep computers having the BCM94301MPL Mini PCI card at least 20 feet away from your microwave oven and any cordless telephone that operates at a frequency of 2.4 GHz.	
Data transfer is always very slow.	Some homes and most offices are steel-framed structures. The steel in such buildings may interfere with your network's radio signals, thus causing a slowdown in the data transmission rate. Try moving your computers to different locations in the building to see if performance improves.	
Computers are not communicating with the network.	If your network has an AP1100 access point, check all cables and make sure the power LED on the front of the AP1100 is green.	
In Microsoft® Windows® 2000, I get the following error message: **Medium cable disconnected**. Also, there is a red X on my network icon in the system tray.	This indicates that your computer is not properly configured to connect to the network. Verify that all of the wireless network properties settings are correct (see Viewing or modifying the wireless network properties). Also, make sure that your computer is receiving a good signal from the access point. See Viewing the link status of your wireless connection.	
Network performance is really slow when the system is docked to a docking station that has an active Ethernet port. NOTE—For Windows 2000 only.	This condition occurs if you dock your system into a docking station that has an active Ethernet port while your Broadcom BCM94301MPL internal Mini PCI card is still active and connected to an access point. This happens because Windows 2000 must now handle two active network connections. You need to either disconnect the Ethernet cable from your docking station, or disable the radio on your Mini PCI Card. To disable the radio on your Mini PCI Card, right click on the Broadcom BCM94301MPL utility icon icon in the system tray and click **Disable Radio**. NOTE—The radio is not automatically enabled when you computer next starts. To enable the radio, right-click on the Broadcom BCM94301MPL wireless utility icon and click **Enable Radio**.	

Getting help

Technical support is available online from Broadcom at http://support.Broadcom.com

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Regulatory Information: Broadcom BCM94301MPL Mini PCI Card User's Guide

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Information for the user
Regulatory information

Information for the user

Wireless interoperability

The Broadcom BCM94301MPL products are designed to be interoperable with any wireless LAN product that is based on direct sequence spread spectrum (DSSS) radio technology and to comply with the following standards:

- IEEE Std. 802.1b-1999. Standard on Wireless LAN.
- Wireless Fidelity (WiFi) certification, as defined by the WECA (Wireless Ethernet Compatibility Alliance).

The Broadcom BCM94301MPL Mini PCI card and your health

The Broadcom BCM94301MPL Mini PCI card, like other radio devices, emits radio frequency electromagnetic energy. The level of energy emitted by this device, however, is less than the electromagnetic energy emitted by other wireless devices such as mobile phones. The Broadcom BCM94301MPL wireless device operates within the guidelines found in radio frequency safety standards and recommendations. These standards and recommendations reflect the consensus of the scientific community and result from deliberations of panels and committees of scientists who continually review and interpret the extensive research literature. In some situations or environments, the use of the Broadcom BCM94301MPL wireless devices may be restricted by the proprietor of the building or responsible representatives of the applicable organization. Examples of such situations include the following:

- Using the Broadcom BCM94301MPL equipment on board airplanes, or
- Using the Broadcom BCM94301MPL equipment in any other environment where the risk of interference with other devices or services is perceived or identified as being harmful.

If you are uncertain of the policy that applies to the use of wireless devices in a specific organization or environment (an airport, for example), you are encouraged to ask for authorization to use the Broadcom BCM94301MPL wireless device before you turn it on.

Regulatory information

The Broadcom BCM94301MPL wireless network device must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. For country-specific approvals, see Radio approvals.

Broadcom Corporation is not responsible for any radio or television interference caused by unauthorized modification of the devices included with this Broadcom BCM94301MPL kit, or the substitution or attachment of connecting cables and equipment other than that specified by Broadcom Corporation. The correction of interference caused by such unauthorized modification, substitution or attachment is the responsibility of the user. Broadcom Corporation and its authorized resellers or distributors are not liable for any damage or violation of government regulations that may arise from the user failing to comply with these guidelines.

Canada—Industry Canada (IC)

This device complies with RSS210 of Industry Canada.

Europe—EU Declaration of Conformity

This equipment complies with the essential requirements of the European Union directive 1999/5/EC.

Cet équipement est conforme aux principales caractéristiques définies dans la Directive européenne RTTE 1999/5/CE.

Die Geräte erfüllen die grundlegenden Anforderungen der RTTE-Richtlinie 1999/5/EG.

Questa apparecchiatura è conforme ai requisiti essenziali della Direttiva Europea R&TTE 1999/5/CE.

Este equipo cumple los requisitos principales de la Directiva 1999/5/CE de la UE, "Equipos de Terminales de Radio y Telecomunicaciones".

Este equipamento cumpre os requisitos essenciais da Directiva 1999/5/CE do Parlamento Europeu e do Conselho (Directiva RTT).

O exoplismos autos plhroi tis basikes apaits ths koinotikhs odhgias EU R&TTE 1999/5/E.

Deze apparatuur voldoet aan de noodzakelijke vereisten van EU-richtlijn betreffende radioapparatuur en telecommunicatie-eindapparatuur 1999/5/EG.

Dette udstyr opfylder de Væsentlige krav i EU's direktiv 1999/5/EC om Radio- og teleterminaludstyr.

Dette utstyret er i overensstemmelse med hovedkravene i R&TTE-direktivet (1999/5/EC) fra EU.

Utrustningen uppfyller kraven för EU-direktivet 1999/5/EC om ansluten teleutrustning och ömsesidigt erkännande av utrustningens överensstämmelse (R&TTE).

Tämä laite vastaa EU:n radio- ja telepäätelaitedirektiivin (EU R&TTE Directive 1999/5/EC) vaatimuksia.

France

Some areas of France have a restricted frequency band. The worst case maximum authorised power indoors is:

10 mW for the entire 2.4 GHz band (2400 MHz–2483.5 MHz)

100 mW for frequencies between 2446.5 MHz and 2483.5 MHz (NOTE—Channels 10 through 13 inclusive operate in the band 2446.6 MHz to 2483.5 MHz)

There are few possibilities for outdoor use: On private property or on the private property of public persons, use is subject to a preliminary authorisation procedure by the Ministry of Defence, with maximum authorised power of 100 mW in the 2446.5–2483.5 MHz band. Use outdoors on public property is not permitted.

In the departments listed below, for the entire 2.4 GHz band:

- Maximum authorized power indoors is 100 mW
- Maximum authorized power outdoors is 10 mW

Departements in which the use of the 2400–2483.5 MHz band is permitted with an EIRP of less than 100 mW indoors and less than 10 mW outdoors:

01	Ain Orientales	36	Indre	66	Pyrénées
02	Aisne	37	Indre et Loire	67	Bas Rhin
03	Allier	41	Loir et Cher	68	Haut Rhin
05	Hautes Alpes	42	Loire	70	Haute Saône
08	Ardennes	45	Loiret	71	Saône et Loire
09	Ariège	50	Manche	75	Paris
11	Aude	55	Meuse	82	Tarn et Garonne
12	Aveyron	58	Nièvre	84	Vaucluse
16	Charente	59	Nord	88	Vosges
24	Dordogne	60	Oise	89	Yonne
25	Doubs	61	Orne	90	Territoire de Belfort
26	Drôme	63	Puy du Dôme	94	Val de Marne
32	Gers	64	Pyrénées Atlantique		

This requirement is likely to change over time, allowing to use your wireless LAN card in more areas within France. Please check with ART for the latest information (www.art-telecom.fr)

NOTE—Your Broadcom BCM94301MPL wireless LAN Mini PCI card transmits less than 100 mW, but more than 10 mW.

Italia A license is required for indoor use. Outdoor use is prohibited.

E' necessaria la concessione ministeriale anche per l'uso interno. Verificare con i rivenditori la procedura da seguire. L'uso per installazione in esterni non e' permessa.

USA—Federal Communications Commission (FCC)

This device complies with Part 15 of the FCC Rules. Operation of the device is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference that may cause undesired operation.

NOTE—The radiated output power of this Broadcom BCM94301MPL wireless network device is far below the FCC radio frequency exposure limits. Nevertheless, the Broadcom BCM94301MPL wireless network device should be used in such a manner that the potential for human contact during normal operation is minimized. To avoid the possibility of exceeding the FCC radio frequency exposure limits, you should keep a distance of at least 20 cm (8 inches) between you (or any other person in the vicinity) and the

antenna.
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Interference statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If the equipment is not installed and used in accordance with the instructions, the equipment may cause harmful interference to radio communications. There is no guarantee, however, that such interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception (which can be determined by turning the equipment off and on), the user is encouraged to try to correct the interference by taking one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

NOTE—This Broadcom BCM94301MPL wireless network device must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. Any other installation or use will violate FCC Part 15 regulations.

Radio approvals

To determine whether you are allowed to use your wireless network device in a specific country, please check to see if the radio type number that is printed on the identification label of your device is listed on the radio approval list posted on the general Broadcom support site.

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Glossary: Broadcom BCM94301MPL Internal 802.11b Mini PCI Card User's Guide

access point	A stand-alone wireless hub that allows any computer that has a wireless network adapter to communicate with another computer and to connect to the Internet.
available network	One of the networks listed in the **Available networks** list on the **Wireless Networks** tab of the **Wireless Configuration** box that appears when the BCM94301MPL wireless utility is open. Any wireless network that is broadcasting and is within receiving range of the Broadcom BCM94301MPL internal 802.11b Mini PCI card appears on the list.
BER	Bit error rate. The ratio of errors to the total number of bits being sent in a data transmission from one location to another.
client computer	The computer that gets its Internet connection by sharing either the host computer's connection or the access point's connection.
dBm	A unit for expression of power level in decibels with reference to a power of 1 milliwatt.
DBPSK	differential-binary-phase-shift keying.
DQPSK	differential-quadrature-phase-shift keying. A compression technique that transmits only the differences between the values of the phase of the sine wave rather than the full absolute value.
DSSS	direct sequence spread spectrum. A type of radio technology.
Dynamic Host Configuration Protocol (DHCP)	A mechanism for allocating IP addresses dynamically so that addresses can be reused when hosts no longer need them.
file and printer sharing	A capability that allows a number of people to view, modify, and print the same file(s) from different computers.
GHz	gigahertz. A unit of frequency equal to 1 000 000 000 cycles per second.
host computer	The computer that is directly connected to the Internet via a modem or network adapter.
IEEE	Institute of Electrical and Electronics Engineering
Internet Protocol (IP) address	The address of a computer that is attached to a network. Part of the address designates which network the computer is on, and the other part represents the host identification.
LAN	local area network
m	meter
MHz	megahertz. A unit of frequency equal to 1 000 000 cycles per second.
Mbps	megabits per second. Transmission speed of 1 000 000 bits per second.
ns	nanosecond. 1 billionth (1/1 000 000 000) of a second.

peer-to-peer network	A communication configuration in which every computer has the same capabilities and any computer can initiate a communication session.
preferred network	One of the networks that you have configured. Such networks appear in the **Preferred networks** list on the **Wireless Networks** tab of the **Wireless Configuration** box when the BCM94301MPL wireless utility is open.
Service Set Identifier (SSID)	A value that controls access to a wireless network. The SSID for your wireless network card must match the SSID for any access point that you want to connect with. If the value does not match, you are not granted access to the network. You can have up to three SSIDs. Each SSID can be up to 32 characters long and is case-sensitive.
Wired Equivalent Privacy (WEP)	A form of data encryption. You must set the WEP key information in the client to match the WEP key used by the access point. The WEP key can be enabled or disabled. The WEP key is case-sensitive.

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