How to manage Wireless Connections using Windows XP SP2

This document provides information to help you manage wireless network connections using Windows XP Service Pack 2 and the Wireless Zero Configuration service of Windows XP. Most of the information also applies to Service Pack 3.

Table of Contents

Information you will need...

About your wireless network

You will need to know:
- The Service Set ID (SSID or name) of the wireless network you want to join.
- Passphrase (if using WPA) or key (if using WEP).

You may also need to know:
- If the SSID is hidden (wireless network not broadcasting)
- The type of wireless encryption (none, WEP or WPA).
- Whether wireless MAC filtering is in use.

If using WEP, you should also know:
- The passphrase used to generate your key
- WEP encryption strength (64-bit or 128-bit). This determines the length of your WEP key: either 10 or 26 hexadecimal characters.
- WEP key index if not the default (0 or 1).

If in doubt check your router's configuration using the manufacturer's documentation or ask your network administrator.

About your computer

You should know:
- Where the wireless switch is on your computer if it came with a builtin wireless network adapter.
- Whether your computer is set up to use third-party firewall software or wireless configuration software other than Windows XP Wireless Zero Configuration (WZC). See Windows cannot configure.
- Your Windows XP Service Pack level. Check Start >> Control Panel >> Classic View >> System. The service level is listed on the General tab of the System Properties.

If in doubt check your computer manufacturer's documentation.

You should also check your computer manufacturer's support web site for any available software updates that might be needed (device drivers, and firmware or BIOS updates).

System Notification Area / Menu Options

Locating the Wireless Connection icon

Locate the "Wireless Network Connection" icon in the System Notification Area (a.k.a. The "System tray"), which is usually located at the right-hand end of the Windows Taskbar adjacent to the Clock:

Wireless Connection icon states

Mousing over the Wireless connection icon will show the connection status at any time:

- Wireless networks detected
- Not connected
- Acquiring
- Connected (lists the network name)
- Limited or no connectivity.

If you are not sure which icon to use then hover your mouse pointer over each icon for a second or so and see what messages pop up.

Notes:
1. If you are using Windows XP Service Pack 2 the Wireless connection icon looks like a single computer screen.

2. If you are using Windows XP Service Pack 1 the icon looks like two computer screens joined together.

3. If you still can't find your Wireless connection icon in the System tray then:

4. See [Wireless Connection Properties / General tab](#).

5. Check Start >> Control Panel >> Classic View >> Network Connections, then ...

6. Right-mouse click on the Wireless Connection icon, and click on Properties. The last section of the General tab in the Wireless Network Connection Properties contains two checkboxes used to control the display of the icon: "Show icon in notification area when connected" and "Notify me when this conenction has limited or no connectivity". Normally these should both be checked.

7. If the icon for the Wireless Connection has a red "X" over it you may need to enable the connection or the device. To enable the connection, right-mouse click on the icon, and click on "Enable". (You can disable and then re-enable the connection here at any time in order to restart it and re-initialize it).

8. To check the device status, go Start >> Control Panel >> Classic View >> System >> Hardware >> Device Manager and look for an icon for your 802.11 wireless device under "Network Adapters". Right-mouse click on the icon for the device, then click on Properties. The device status is listed near the top of the General tab. It should say "This device is working properly". If necessary, do a web search to help you interpret any code that find here.

9. If the device shows in Device Manager but the icon has a red "X" next to, or a black exclamation mark on a yellow shield, then:

10. The device may be disabled and you will have to enable it (click on "Enable" in the Device Properties and follow the prompts).

11. The device driver might not be installed properly (click on the Drivers tab and try "Update driver").

12. If you don't have a Wireless connection icon under Start >> Control Panel >> Network Connections then there is no such connection. Either you do not have a wireless network adapter or some other prerequisite is not installed properly. If your wireless network adapter is an add-on device (PCMCIA card or USB), make sure the unit is plugged in properly, shutdown the computer (turn it off), and then restart and retry. Otherwise, check in Device Manager for any icons that look like a yellow question mark. Try running the Add Hardware wizard from Control Panel (Classic View), or try to install individual drivers manually.

Wireless networks detected
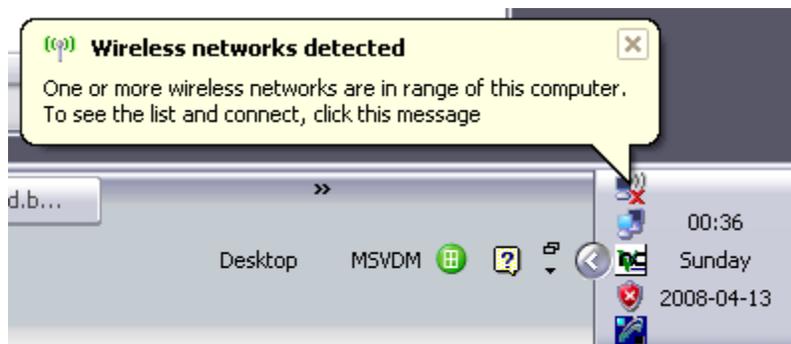
This is the initial state of the wireless connection. Handle this the same way as "Wireless connection not connected" (next section).

Wireless connection not connected
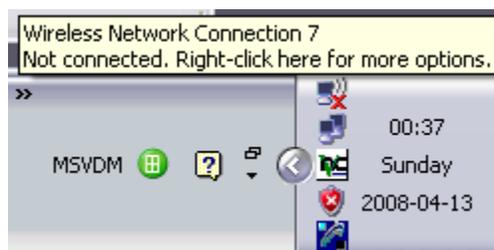
The red cross shows that the Wireless connection icon is not connected.

Right mouse click on the icon to view the menu of actions you can perform:

Now click on "View Available Wireless Networks".

View available wireless networks

If the Windows "Wireless Zero Configuration" service is managing your wireless network connection then "View Available" will show you a list of wireless networks in range which are also broadcasting:
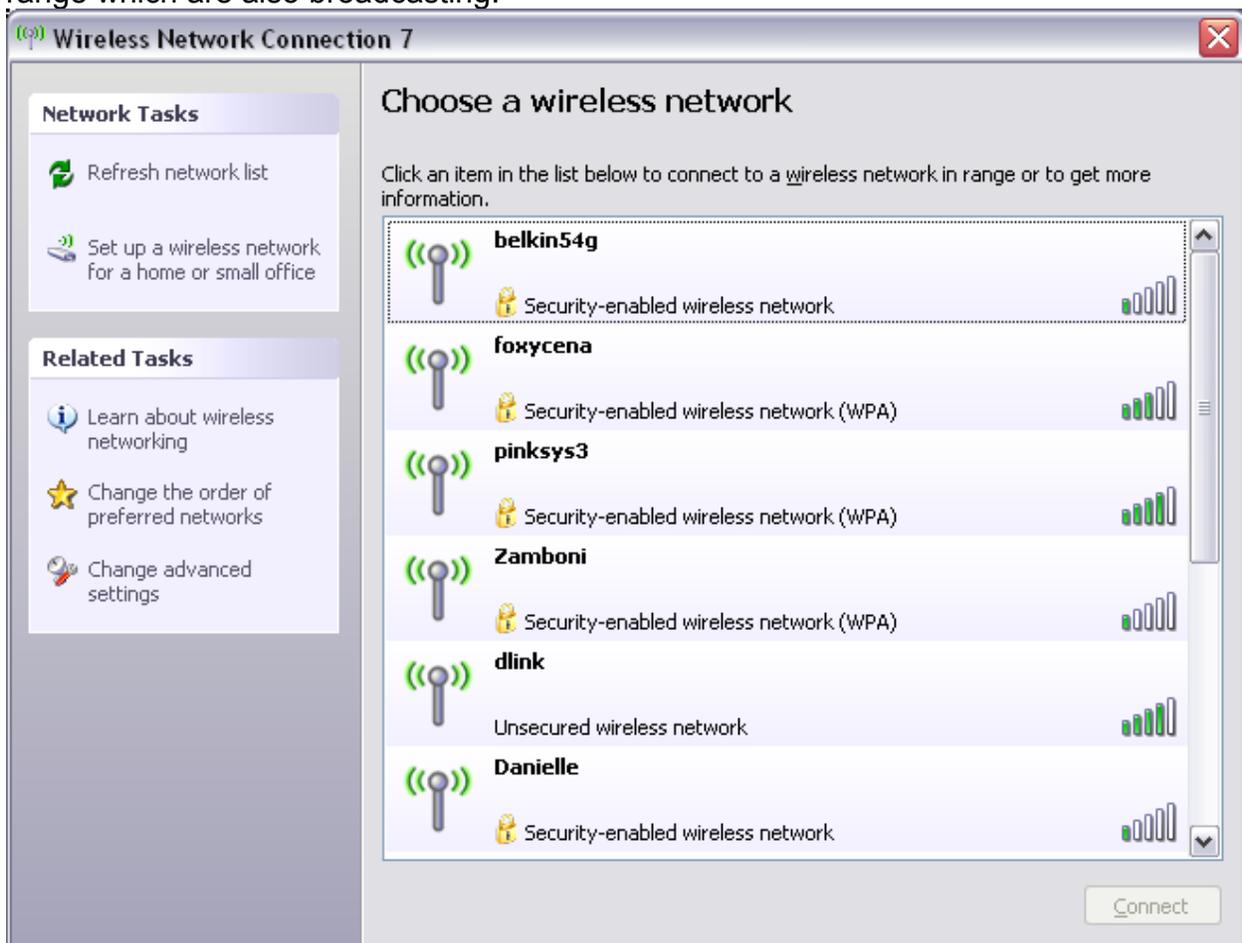
Select the network you want to connect to (single left mouse click to highlight it), and then click on the "Connect" button, and provide either your WEP key or your WPA passphrase when prompted. Usually this will be all that you need to do to get

connected. The rest of this document goes into more detail, especially about what can go wrong.

Connecting

From "View available wireless networks", if you see one or more wireless networks listed, select the network you want to connect to (use a single left mouse click to highlight it in the list), and then click on "Connect". You should then be prompted to enter your WEP key or WPA passphrase:

If you are not prompted for a key or passphrase then you may be using one that was stored previously. Handle this as in note 4 below. Otherwise the network might not be protected using encryption.

Notes:
1. Since WPA does not usually externalize its key, if the router is using WPA you need to enter your WPA passphrase.
2. You cannot use a WEP passphrase here with Windows XP SP2.
3. When using a 128-bit WEP key (26 hexadecimal characters long), a useful tip is to first type up the key in clear using a word processor program (for example Notepad, Wordpad, Word, or even your e-mail program), check the text, and then copy it and paste it at the prompts.
4. When the passphrase field contains black dots:
    a) The number of dots shown does not indicate the actual length of the key or passphrase.
    b) The key or passphrase was stored previously. You can try re-entering the key or passphrase, and this may work, but sometimes the Preferred Network profile is corrupt and you may need to go into the Wireless Connection Properties to remove the existing Preferred Network profile before re-trying. See Preferred networks.

Disconnect button

If you are offered a "Disconnect" button instead of "Connect" there is already a radio association with some network:
- Windows can connect you automatically to a nearby unprotected network. This is the default behaviour. Check that you are connected to the right network: mouse over the wireless connection icon and look for the network name in parentheses.
- You may already have acquired a working connection to your network, or ...
- You may have only associated with the network at the radio layer: check your IP address. See Connection Status.

- You can make sure Windows does not automatically connect you to a particular network by first connecting to it, and then unsetting "Connect automatically.." on the Connections tab in the Preferred network profile for that network. See [Preferred networks](#).

You can click on "Disconnect" to refresh the list, then select the network to join, and click on "Connect" and provide your key or passphrase as above.

Windows cannot configure this wireless network

Using [View_Available](#), if you see an error message "Windows cannot configure ..." then your computer is set up to use some other software to manage your wireless connections. For example you might need to use one of:
- Belkin utility
- Dell Wireless LAN Card Utility
- Intel ProSet Wireless
- Linksys Wireless LAN Manager
- Netgear WG111 utility
- SMC EZ Connect wireless configuration utility.

In this case, to find the right program to use, check other icons in the System Notification Area, or on your Desktop, or click Start >> All Programs and look throughout the list.

This document does not describe how to use such third-party software, and you may need to refer to the documentation provided by your computer manufacturer. Check their web site, or perform a Web search.

In general, use the wireless configuration software provided by your computer manufacturer. It will allow you to:
- Scan for available wireless networks.
- Select a network to join.
- Provide a security key if required.

Third party wireless configuration software may also require you to provide additional connection infomation such as:
- Type of security (usually either WEP or WPA)
- Authentication type (usually "Open" when using WEP)
- WEP encryption strength, key or passphrase.

Third party wireless configuration software may require you to manually save connection profiles for future reuse.

If you need to check what 802.11 wireless device(s) you have installed on your computer, check Start >> Control Panel >> Classic View >> System >> Hardware >> Device Manager under Network adapters.

If you do not see an error message "Windows cannot configure ..." and no networks are listed then, most likely, either your 802.11 wireless network adapter is turned off, or no networks are broadcasting in range.

If the network you want to join is not broadcasting then you can manually create a Preferred network profile (see Preferred networks below), or use Windows XP's Wireless Network Setup Wizard, usually found in Control Panel.

Please wait while Windows connects ...

This is a temporary state. Check the Wireless connection icon status in the System Notification area.

Acquiring network address ...
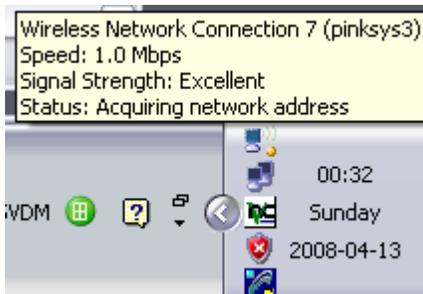
From View Available, after clicking on the Connect button and entering your security key you should usually be connected within 20 seconds. During this time the connection makes a radio association with the wireless access point and then (usually) acquires a dynamic IP address from the DHCP server on the router. If this takes too long, for example you are using an invalid security key, the connection attempt will time out, you will get a self-assigned IP address like 169.254.*.*, and still not be able to access the router or the Internet. Check your IP address. See Connection Status.
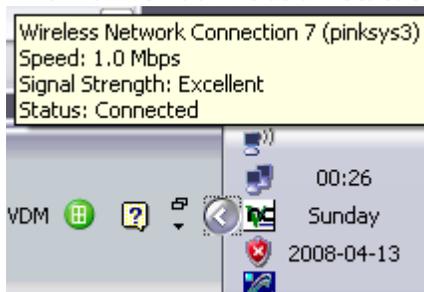
Wireless connection already connected

Sometimes the wireless connection may connect automatically, for example when reconnecting to a preferred wireless nework:
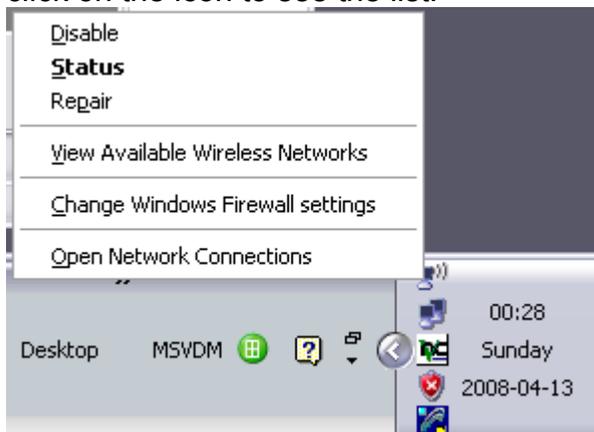
Check that you are connected to the right wireless network, and see if you can connect to the Internet.

The normal connection status looks like this:

Once the connection is established the menu options for the icon change. Right-mouse click on the icon to see the list:

Notes:
1. The speed reported in megabits per second (Mbps) will fluctuate.
2. When Windows XP indicates that the Wireless connection is "Connected" this does not necessarily mean that you can use the connection.
3. Windows may have connected at the radio layer, but still not be able to encrypt/decrypt successfuly, so that you do not get a valid IP address. If this happens you can try to re-enter your WEP key or WPA passphrase, but you may need to delete and then recreate the Preferred network profile for the target network. See Preferred networks.
4. Sometimes the problem is not that encryption/decryption failed. For example, your DHCP request may be blocked by a misconfigured firewall or by Wireless MAC filtering.

Wireless Connection Status

Status / General tab

If the wireless connection is the connected state, then you can double-click on the icon to view the Wireless Network Connection Status.
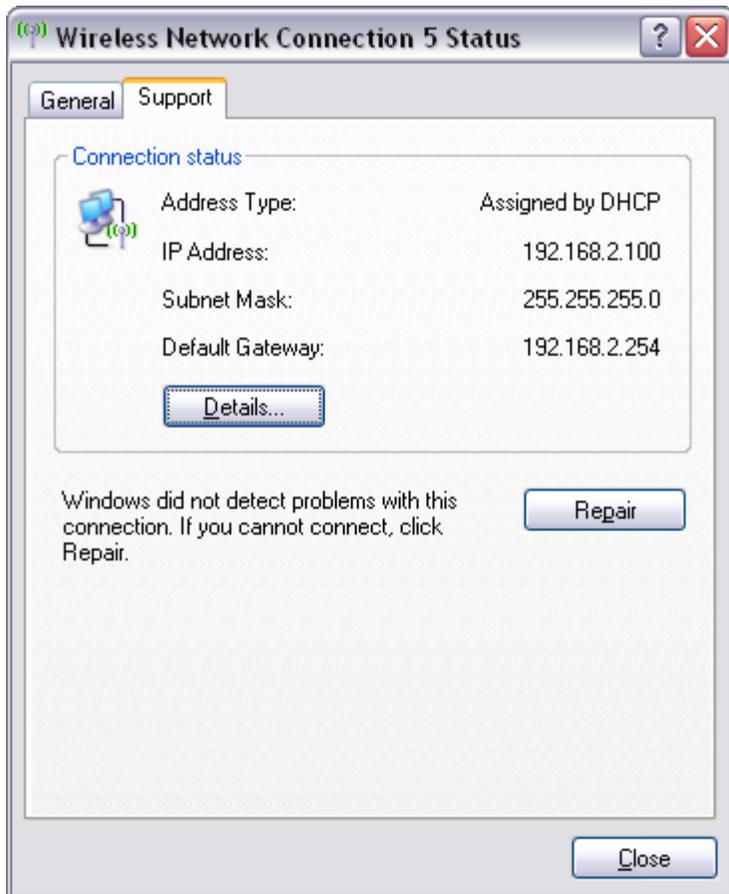
Alternatively go Start >> Control Panel >> Classic View >> Network Connections, right-mouse click on the icon for the Wireless Connection, and click on Status.
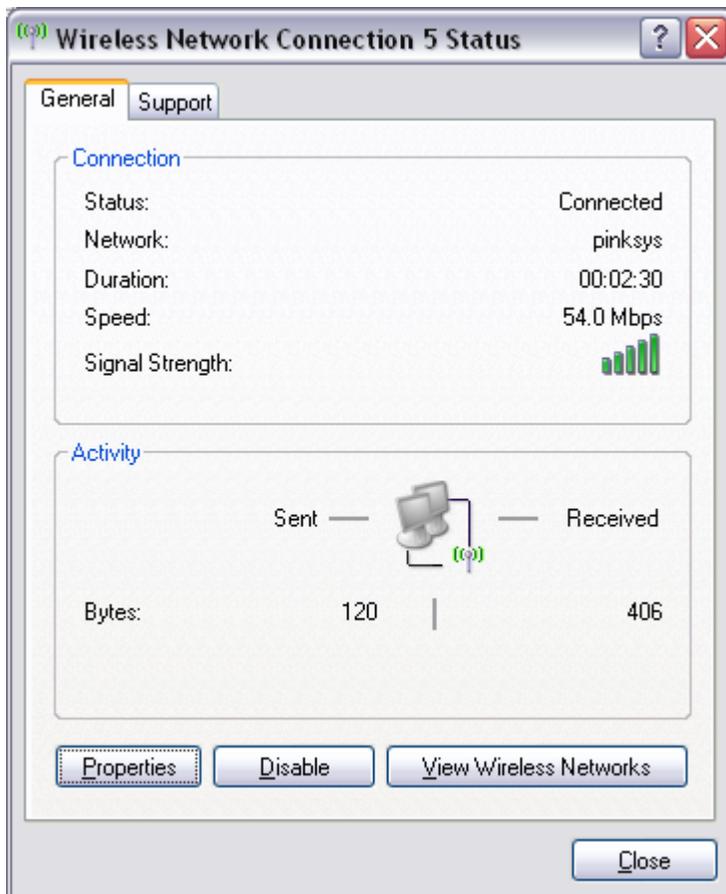
Click on the Support tab for the IP address.

Status / Support

Click on the Details button for the MAC address, etc.

Checking your IP address

Notes:
1. Valid non-routable or "private" IP address ranges provided by the router are: 10.*.*.*, 172.15.*.*-172.31.*.*, and 192.168.*.* where star or asterisk means numerals zero through nine in the range 0-254.
2. An IP address 169.254.*.* is a private self-assigned address which mean that the adapter was not able to negotiate a DHCP address with the router. Possible causes include: bad key or passphrase, misconfigured firewall, corrupt device driver, "Winsock error", or DHCP client service not running (go Start >> Control Panel >> Classic view >> Administrative Tools >> Services).
3. An IP address 0.0.0.0 indicates that the network adapter is in a temporary state. Possible causes include a faulty adapter, a corrupt device driver, corrupt TCP/IP stack, or "Winsock error". Usually this can be resolved by uninstalling the device, then shutting down the computer and restarting. You might need to manually reinstall the device driver. See also the Appendix.
4. The IP address 192.168.0.1 suggests that Internet Connection Sharing is turned on, but this feature is not used with a router.
5. Click on "Details" for physical or MAC address and DNS server addresses.

Wireless network connection properties

Wireless connection properties / General tab
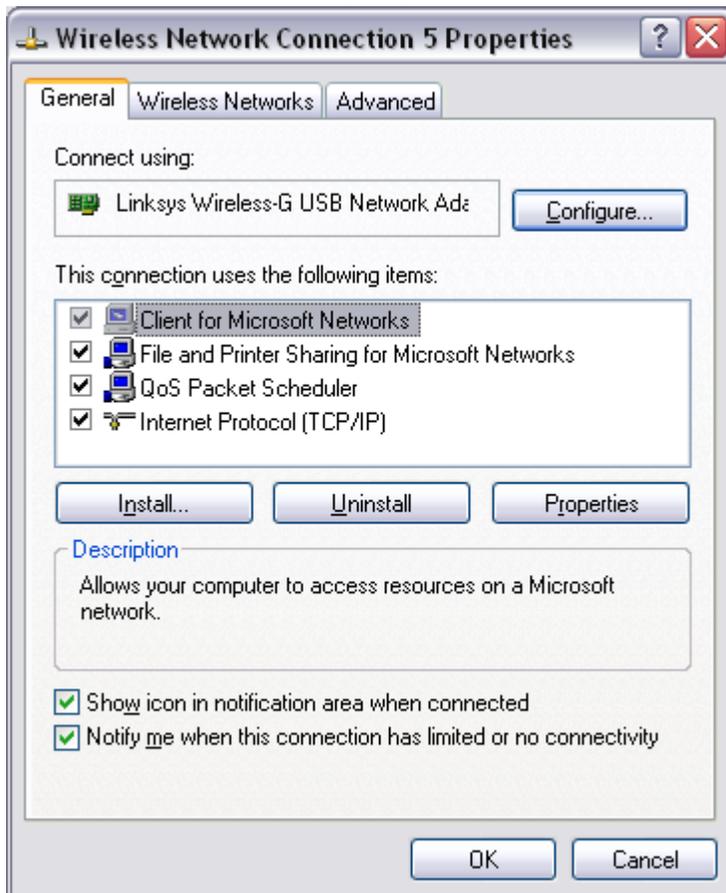
Be careful not to uncheck the boxes which are used to select protocols.

Note the last two checkboxes, which control the display of the icon in the system tray.

To check TCP/IP properties, select "Internet Protocol (TCP/IP)" and click on Properties. In most cases you want to obtain your IP and DNS server addresses automatically, and these are the default settings on the General tab of the Internet Protocol properties (no picture here).

Wireless connection properties / Wireless Networks tab

If the Wireless networks tab is not present then the Wireless Zero Configuration service is not running on your computer. See Control Panel / Classic View / Administrative Tools / Services, but this usually means that your computer is set up to use some other wireless network configuration software. See View Available Wireless Networks above.
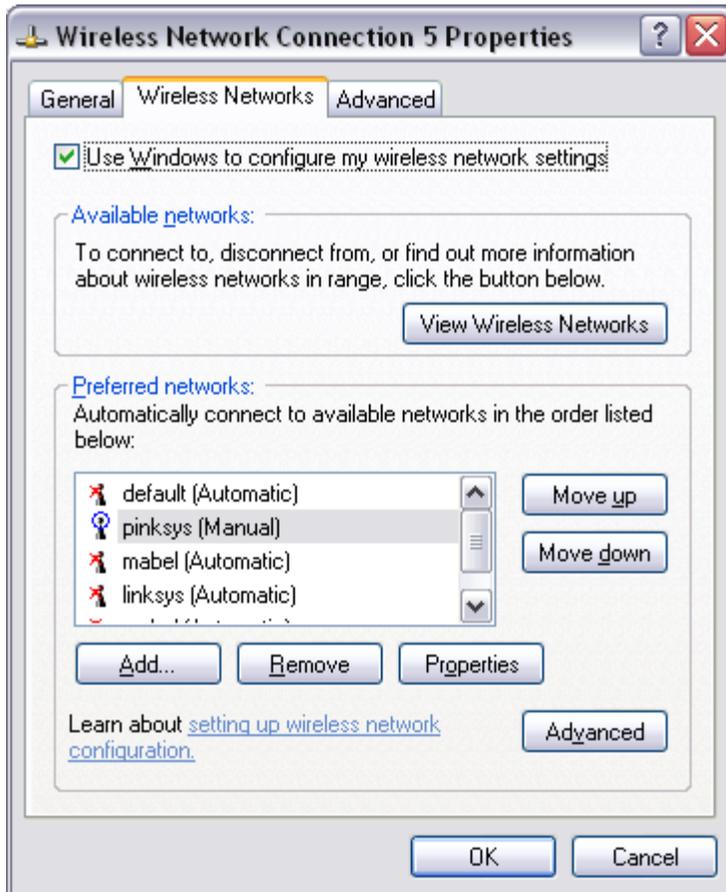
Preferred networks

Preferred networks profiles:

- Contain wireless security and authentication information for a network.
- Are created automatically and saved when you connect to networks using "View Available".
- Control whether a network can be reconnected automatically (this is the default behaviour: see the "Connections" sub-tab below).
- Can be removed or reordered (use "Move up" and "Move down").
- Can be created manually (click on "Add", and complete the "Association" tab).
- Can become corrupted and may need to be deleted and recreated (use "Remove", then "Add").

Advanced button

This is the default setting, which need not be changed:
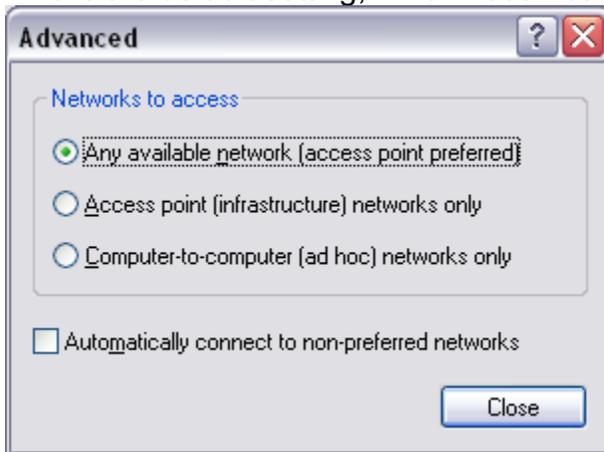
Preferred network properties / Association tab

When creating a new Preferred network profile:
1. Complete the SSID field.
2. If using WEP set "Network Authentication" to "Open" and "Data encryption" to "WEP"
3. If using WPA, set "Network Authentication" to "WPA" and "Data encryption" to "TKIP" (for example)
4. Uncheck "The key is provided for me automatically".
5. Enter either the network key for WEP, or the passphrase for WPA.
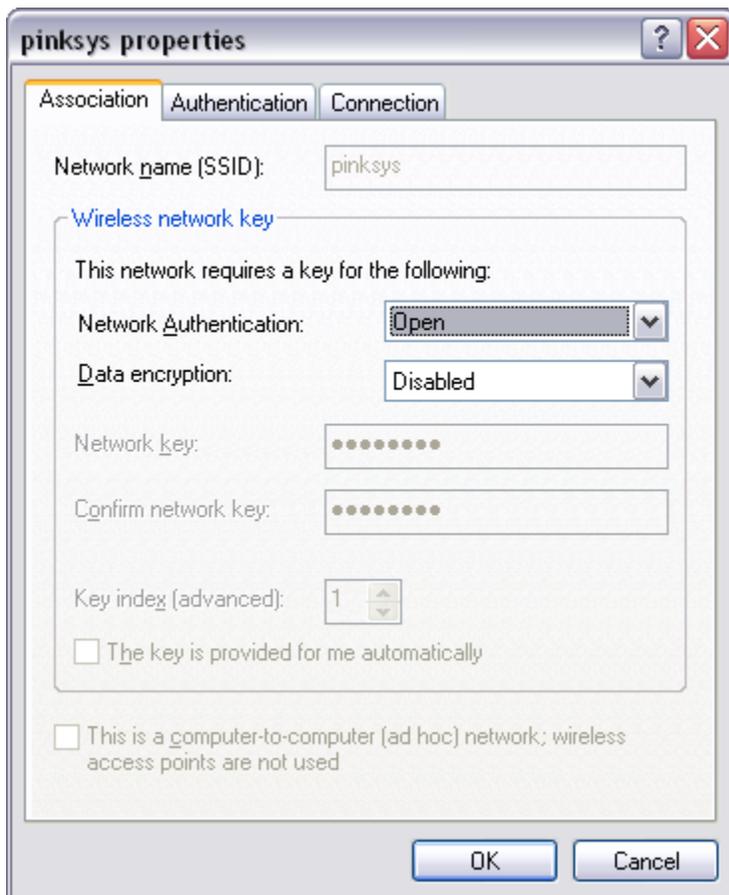
Preferred network properties / Authentication tab

In most cases, such as when using WEP or WPA on a residential or public network, the Authentication tab is not used.

Preferred network properties / Connection tab

Usually you will want to connect when the network is in range:

pinksys properties

Association | Authentication | Connection

Automatic connection

Whenever this network is detected, Windows can connect to it automatically.

☑ Connect when this network is in range

OK | Cancel

You can uncheck this box to prevent your computer automatically connecting to a preferred network.

Wireless connection properties / Advanced tab

This tab (no picture) provides controls for the Windows Firewall and Internet Connection Sharing.

Windows Firewall

The Windows Firewall may be on or off. Sometimes it can be useful to turn off your firewall, as a misconfigured firewall can cause you to get an invalid IP address like 169.254.*.*.

Internet Connection Sharing

Do not try to use Internet Connection Sharing on a LAN. This option is used to make the connection act as a gateway, such as when sharing a dial-up connection. Selecting Internet Connection Sharing can set the connection to have a static IP address 192.168.0.1 (see Start >> Control Panel >> Network Connections >> Connection Properties >> General tab >> TCP/IP properties).

How-to's

How to check your IP address or MAC address

1. Go into Control Panel Classic View and click on Network Connections.
2. Select the Wireless Connection icon, right mouse click and click on Status
3. Go to the Support tab and the IP address and Default gateway address are listed there.
4. Click on "Details" for physical or MAC address and DNS server addresses.

Valid non-routable or "private" IP address ranges provided by the router are: 10.*.*.*, 172.15.*.*-172.31.*.*, and 192.168.*.* where star or asterisk means numerals zero through nine in the range 0-254.

How to check out your computer (Local Area Connection)

In many "first time" situations, before trying to connect wirelessly, it is a good idea to make sure that you can connect to the router and surf the Internet successfully using your Local Area Connection (wired Ethernet connection). This will confirm that your computer, Internet connection, security software, router, and web browser are all working properly. You may need to purchase an "Ethernet patch cord" of a suitable length to be able to do this.

Your wired connection will usually be much faster and more reliable than your wireless connection, as well as being fully secure. This is especially useful if you are doing initial setup on your computer, for example if you have just reloaded Windows XP, when you will usually need to register and authenticate XP, and download and install multiple updates. See also [About your computer](#).

You need to be able to connect successfully over a wire if you only have one computer, or if your wireless access point stops working, or if you need to reconfigure your router (for example to check wireless security settings). You may need to refer to your router manufacturer's documentation.

Problems which can occur

DHCP client service not running

In some cases the DHCP client service might not be running on the computer. This is unusual, but it can cause IP address 0.0.0.0. To check the status of the DHCP client service go Start >> Control Panel >> Classic view >> Administrative Tools >> Services. Start the DHCP client service if it is not running, and check the service properties to ensure that it starts automatically.

"Duplicate IP address" or "An IP address conflict was detected on the network"

If you see a message "Duplicate IP address" or "An IP address conflict was detected on the network", check the following:

- Wireless connection properties / Advanced tab – unset Internet Connection Sharing.
- Wireless connection properties / General tab / Internet Protocol properties – set the connection to get IP address and DNS servers automatically.

Internet Explorer 7 still fails to connect

1. Go Start >> Control Panel >> Internet options >> Advanced. Restore Advanced Settings and Reset Internet Explorer. Then restart Internet Explorer.
2. Go Start >> Control Panel >> Internet options >> Connection >> LAN Settings and make sure you do not have a proxy set. Then restart Internet Explorer.
3. Misconfigured security software can also block web requests.

IP address 0.0.0.0

An IP address 0.0.0.0 indicates that the network adapter is in a temporary state. Possible causes include DHCP client service not running, faulty network adapter, corrupt device driver, corrupt TCP/IP stack or "Winsock error".

Often this problem can be resolved by uninstalling the device, then shutting down the computer and restarting. You might need to manually reinstall the device driver.

IP address 169.254..**

An IP address 169.254.*.* is a private self-assigned address which mean that the adapter was not able to negotiate a DHCP address with the router. Possible causes include: bad key or passphrase, misconfigured firewall, corrupt device driver or TCP/IP stack, "Winsock error", DHCP client service not running, and Wireless MAC filtering.

IP address 192.168.0.1

A common cause is turning on Internet Connection Sharing on the Advanced tab in the Wireless Connection Properties. This sets the connection to have the static IP address 192.168.0.1 for use as a gateway.

Another cause of this can be choosing the wrong options when running the Internet Connection Setup Wizard. Usually you are connecting through a "home or small office network" or "local area network (LAN)".

Normally this is problem is corrected by making sure that Internet Connection Sharing is turned off, and that DNS and IP address are gotten automatically using DHCP – see Wireless connection properties / General tab.

"TCP/IP stack is corrupt" and/or "TCP/IP reset" is required and/or "Winsock error"

These situations are rare. Do a web search for these terms in order to locate the latest Microsoft support documentation, which you can then use to help you to identify the problem and repair it. You can damage your computer, so be careful.

Wireless MAC filtering

If the network is not encrypted it still might be protected using hardware filtering ("Wireless MAC filtering"), and you will keep getting a 169.* IP address.   For example, you may need to add the physical or MAC (Machine Access Control) address of your wireless network adapter to the router's wireless MAC filter table. To find out the MAC address see [Connection Status](#). To access your router's configuration, refer to the router manufacturer's documentation or your network administrator.

Appendix

Acronyms

LAN – Local Area Network
WEP – Wired Equivalent Privacy
WPA – Wi-Fi Protected Access.

Notice

All information contained in this document is made available "as is". No representation is made that the information is correct today, or that it was correct at any time in the past, or that the information is complete or up-to-date, or that following any instructions contained herein will not damage your system. Use this information at your own risk.

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Skyline Research Technical Bulletin Reference WXPWCSP2V3d

Date / Time / Author / Title / Pages / Paragraphs / Words / Characters
26/06/08 17:51:17 Michael Cook WXP SP2 Wireless Connections V3d.odt 22