

Experiment # 1:

Creating an Ad hoc Network in Windows XP

Building an ad hoc 802.11b/g wireless network using the graphical user interface (GUI) in Windows XP takes just a few minutes. Because it's powered by wireless zero configuration, you won't need to run a single cable.

We will need at least two computers to start our experiment. We will build the ad hoc wireless network in three steps:

1. The first step will be to install an 802.11 wireless card in the first computer and configure it as a computer-to-computer (ad hoc) wireless connection.
2. The second step will be to install a wireless card in a second computer.
3. Configuring the Wireless Equivalency Protocol (WEP).

As you read through the procedures below, note that the accompanying images are captured from both the host and client computers and that the screen shots of the host computer contain a light title bar, while the client computer screen shots contain a dark title bar.

Configuring the Host Computer

After you install an 802.11b/g adapter, if the computer is in an environment where other wireless networks are in range, Windows should display a list of available networks automatically. However, if no wireless networks are in range, the wireless connection icon may display a red "X" and may not automatically open a **View Wireless Networks** window. To open this window, click the icon for the wireless connection.

Do not select an available network at this time if any are displayed in the **Available networks** listing. If your computer previously connected to a preferred access point, remove all preferred access points. This will ensure that a connection is made only to the ad hoc network that you are trying to configure. Follow the steps on Figure 1, **Start > Setting> Network Connections** then right click on **Wireless Network Connection** and Click on **Properties**, the window in Figure 2 will pop up.

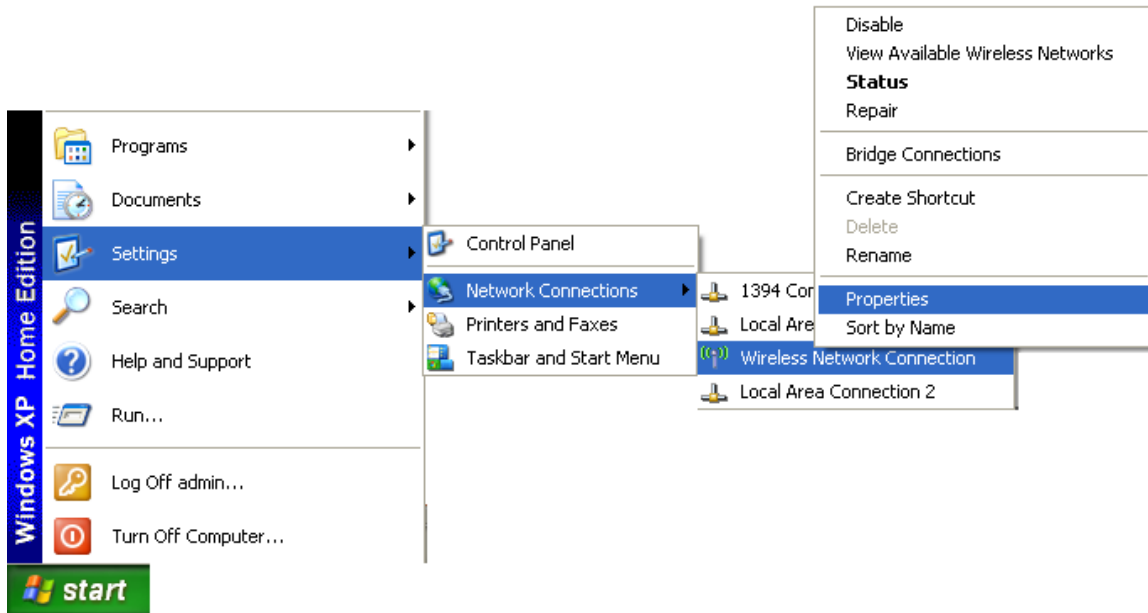


Figure 1

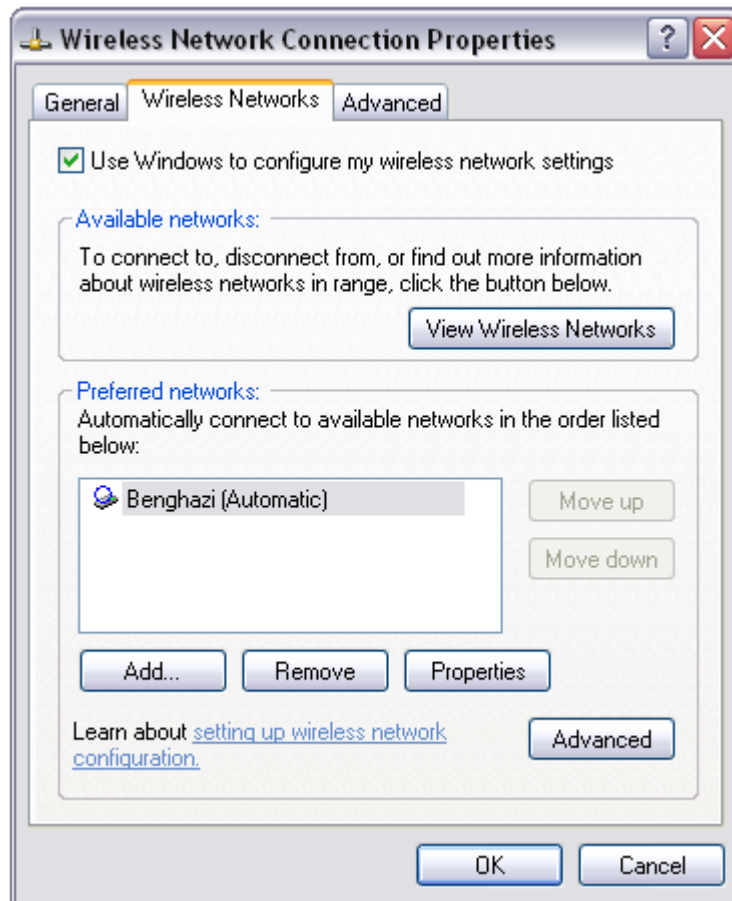


Figure 2

next, click the **Advanced** tab at the bottom of the window. Select **Computer to computer (ad hoc) networks only** and clear the **Automatically connect to non-preferred networks** box if it is selected, see Figure 3. This setting, along with removing preferred networks, ensures connection to the ad hoc network only.

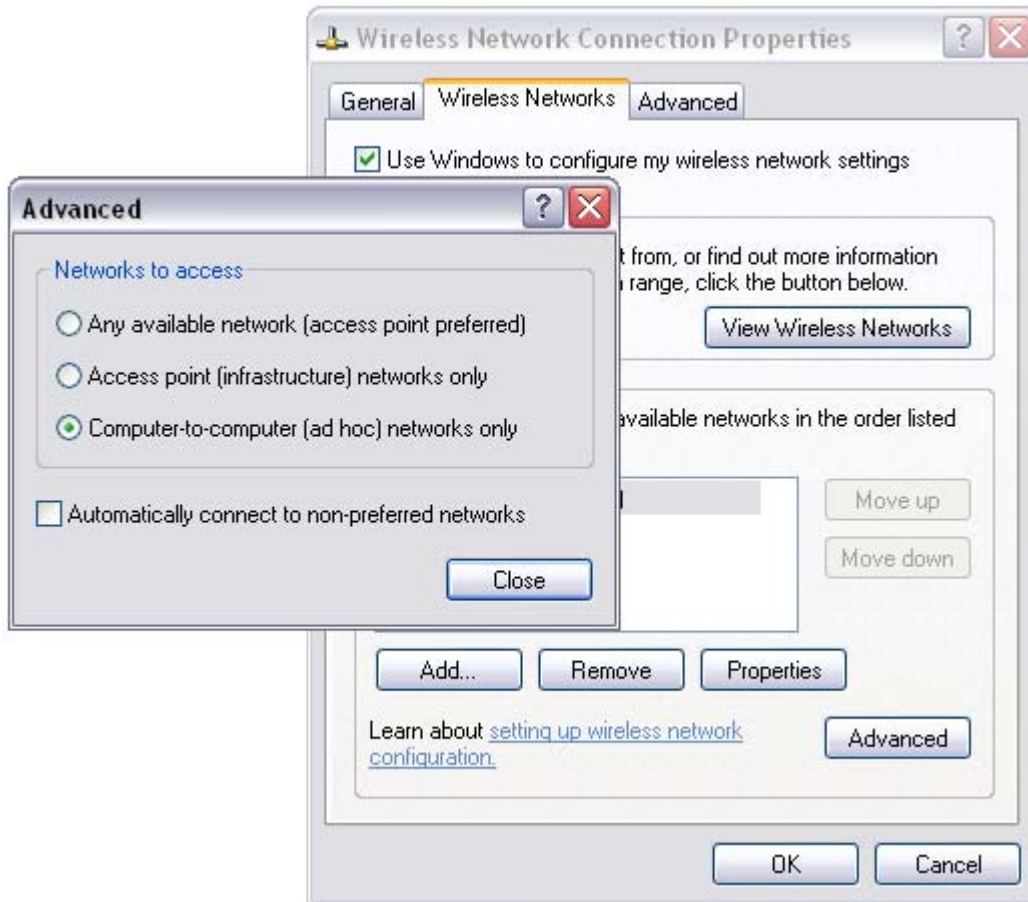


Figure 3

Click the **Wireless Networks** tab again. Under Preferred Networks, click **Add**, as shown in Figure 4. In the **Wireless Network Properties** dialog box, specify a **Network name (SSID)**. Use any name desired, but be sure to use it to configure all computers, in our example we chose the network name as KFUPM. Note that the network type is already marked as a computer-to-computer network and that this cannot be changed since it has already been specified that a connection should be made to only ad hoc networks.

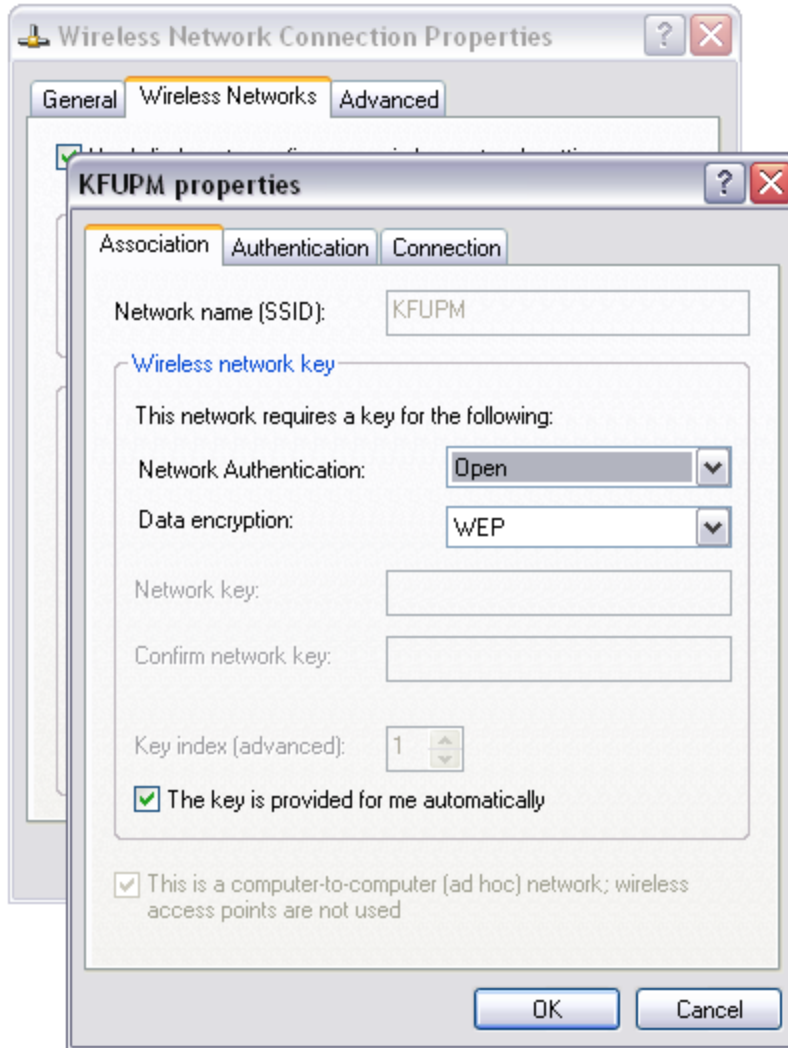


Figure 4

Wireless Equivalency Protocol (**WEP**) settings are not being configured at this time because it's easier to get an ad hoc wireless network running smoothly before attempting to configure WEP data encryption. The decision on whether or not to use WEP should be based on your environment. In most cases, for optimum protection and security, after your ad hoc network is running properly, you should return to **Wireless Network Properties** and specify WEP settings.

After configuring the network name (SSID) in the Wireless Network Properties dialog box, the new ad hoc network will be displayed with a PC Card icon to designate that this is a computer-to-computer network.

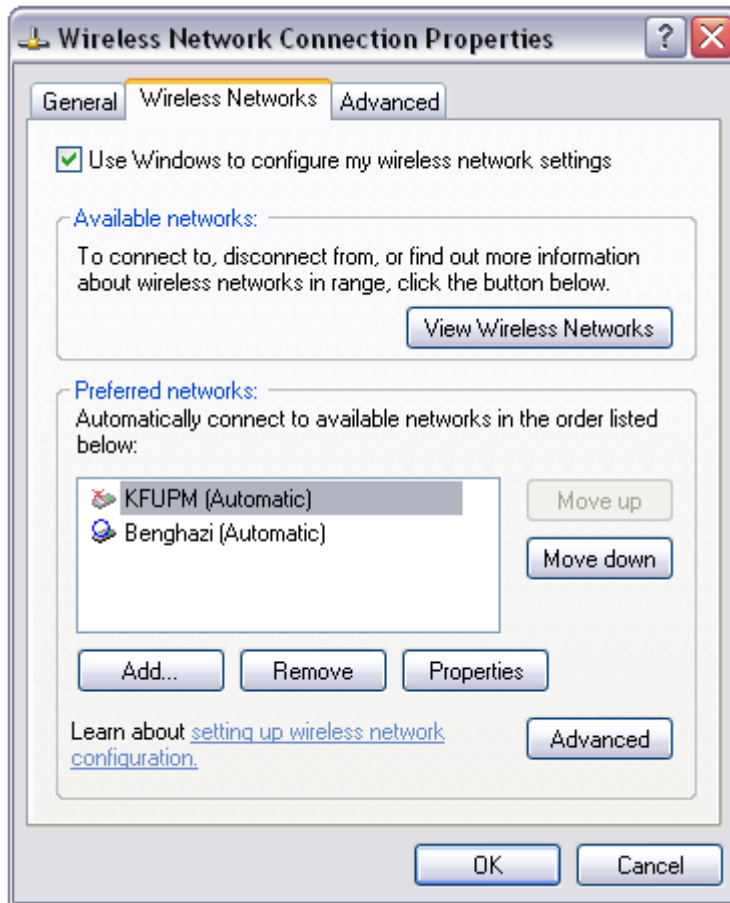


Figure 5

Note the red **X** (Figure 5). When a second computer is in range and the new ad hoc network is connected, the display changes to show a working computer-to-computer network without the **X**.

Configuring a Client Computer

After installing wireless card in a second computer, the Wireless Networks tab displays a list of in-range wireless access points or ad hoc wireless networks.

The new ad hoc network **KFUPM** is listed (and is identified by the PC Card icon). Highlight the network name, and then click **Configure**. Because WEP will not be configured at this time, click **OK**.

After the client computer joins the ad hoc KFUPM network, the wireless network on both host and client should look like in Figure 6.



Figure 6

If you double click on the wireless network, you should see something like in Figure 7.

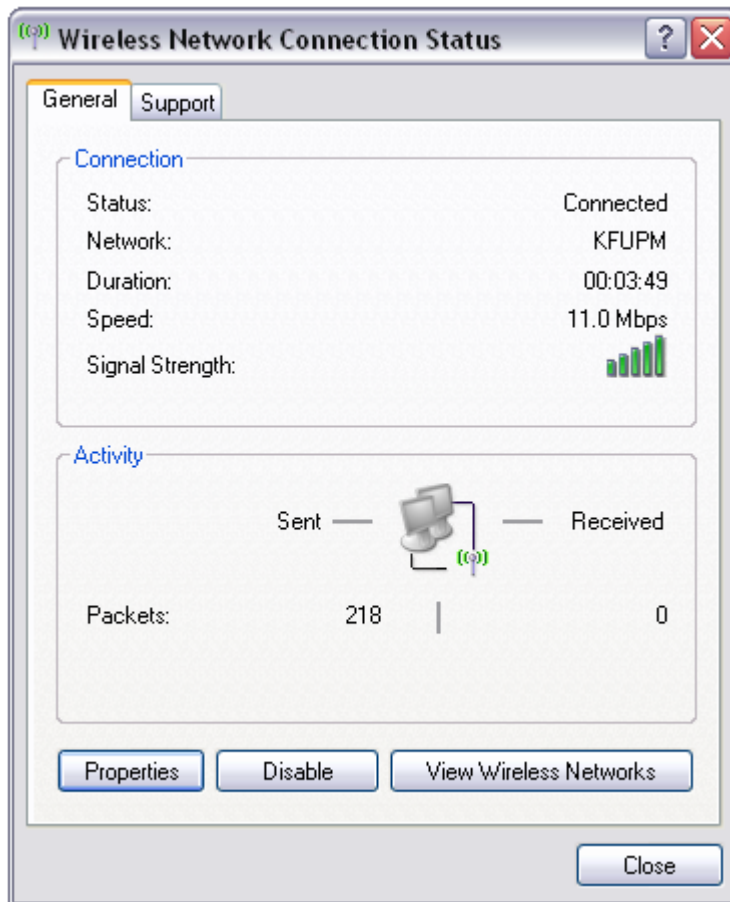


Figure 7

Configuring WEP

As connectivity has now been established successfully, the next step is to return to **Network Properties** and configure **WEP** settings to ensure the best security possible for the ad hoc network.

On the host computer, open the **Wireless Network Properties** dialog box. On **Network Authentication field**: select **Open**, and on **Data encryption field**: select **WEP**. Uncheck the checkbox of the key is provided for me automatically, see Figure 8.

Consult the documentation provided by your wireless card manufacturer for the key format and key length.

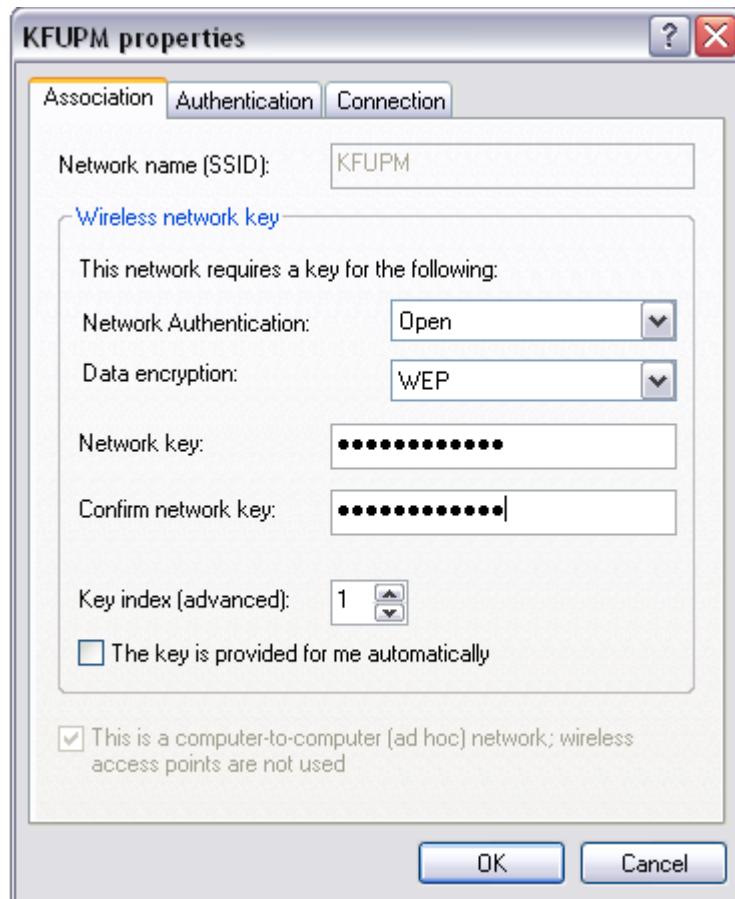


Figure 8

Use the highest level of encryption possible (key length) that is supported by your hardware and drivers. Using the latest drivers and firmware, Windows XP actually automatically detects that this hardware only supports 64-bit encryption and will not

allow setting the key to 128 bit. Be sure that if you use an ASCII network key that you pick random characters and letters that can't be easily guessed. The final step is to use the same key and encryption settings and configure the client computer(s). Note: for additional security, consider changing the key on a regular weekly basis.

Instant Private Networking

Not only does ad hoc wireless networking provide a lower cost method to share an Internet connection than a more expensive wireless router/router plus separate access point solution, but it affords a fast and simple way of establishing a means to share data and documents for groups with no external LAN or Internet connection. With no available DHCP server, Windows XP provides an automatic private IP address between 169.254.0.0 and 169.254.255.255 to network adapters. If you're sitting around a conference table with a group of colleagues and find that everyone is in desperate need of a Power Point presentation on an associate's computer on the other side of the room, setting up an instant ad hoc wireless network can be the solution, allowing everyone to copy the file to their computers over the wireless network. You'll need to have the same workgroup configured with appropriate permissions for file and print sharing, and you'll never have to wait again to get connected to the Internet or a corporate LAN to receive copies of urgently needed documents.

References:

http://www.microsoft.com/windowsxp/using/networking/expert/bowman_02april08.mspx