

How to Set Up a Small Network with Windows 98 Second Edition

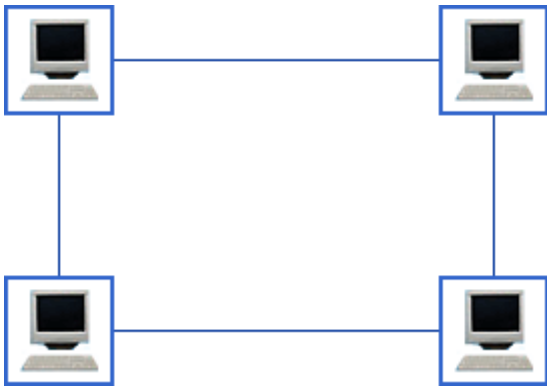


Part 1. Introduction

A small network is practical for home users, and you can set one up quickly. This step-by-step guide explains exactly what you must do. It only takes one day to set up shared access to hard disks, folders, CD-ROM drives, printers, and the Internet.

Your new network can connect up to 10 workstations in a workgroup. The workgroup divides the corresponding tasks among the workstations. As a result, newer computers can provide disk space on their larger hard disks, while older computers can handle print jobs, set up Internet connections, or back up data.

In larger networks, there is a distinction between servers that provide services and clients that use these services. The computers are, therefore, specialized for their specific tasks. Your small network does not require this division of tasks. Every computer can take over server functions and at the same time use the workgroup's resources. Because all the computers have the same rights, this is known as a peer-to-peer network.



In a peer-to-peer network, all the computers share their resources.

Part 2. Buying the Network Hardware

Your computers can only communicate with each other if they are physically connected. For this, you must have some hardware. Many manufacturers offer starter kits that make setting up your first network easier. However, you can also obtain all the components separately.

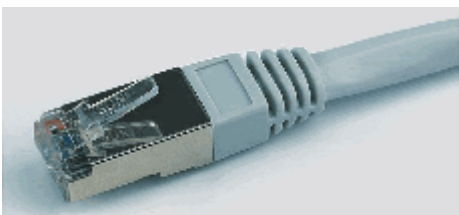
- One network card per computer.

The most frequently used network cards are PCI 10BaseT/100BaseT Fast Ethernet adapters. These Ethernet cards for the PCI bus can automatically switch between transfer rates of 10 megabits per second (Mbps) and 100 Mbps.



- One network cable per computer.

Use CAT5 UTP or STP cables (category 5 unshielded or shielded twisted pair cables with RJ45 connectors on both ends).



- A signal distributor.

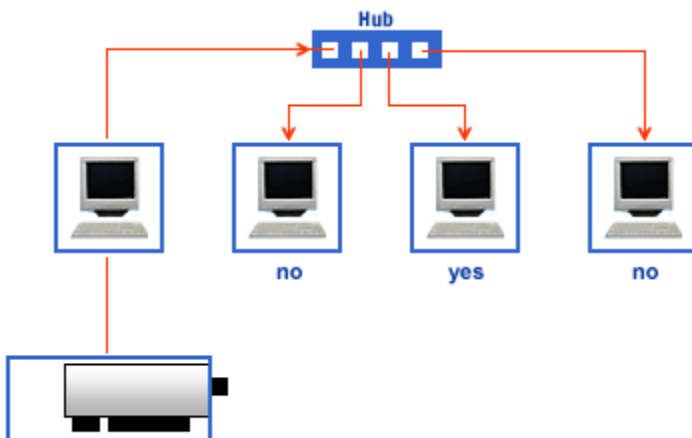
Use either a dual-speed hub or a dual-speed switch. A switch is an element that connects computers to each other, controls data flow, and negotiates data transfer between 10-Mbps and 100-Mbps connections.



Hub or Switch?

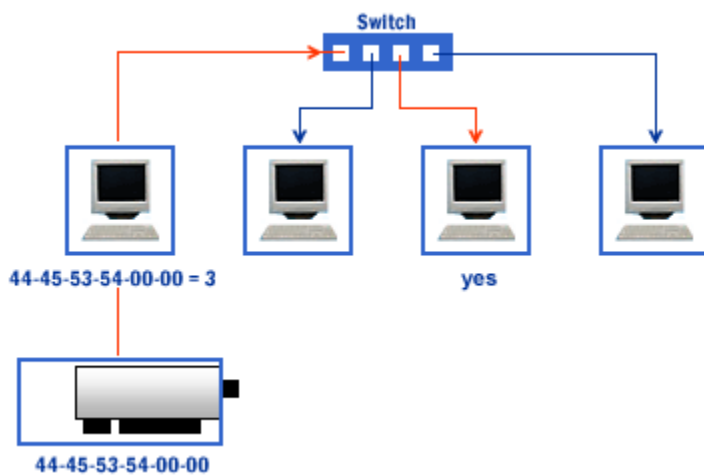
The signal distributor is the central component that connects your network. The network cards in all the computers are connected to the signal distributor through the twisted pair cable. This forms a star structure. The term "star topology" originates from the star structure.

The signal distributor does not just connect the devices. It also guides data packets through the network. A hub is different from a switch. When a hub receives a data packet, it forwards the packet to all the other computers. Each computer must verify whether it is the correct recipient.



A hub forwards data packets to all ports.

A switch is more intelligent. It can recognize which computer is connected to which port based on the MAC address (the network card's hardware address that is assigned by the manufacturer). The switch saves this information in a table. When a switch receives a data packet, it determines the correct recipient and forwards the packet to the correct computer.



A switch forwards data packets only to the recipient.

A switch, therefore, creates significantly less data traffic than a hub. The more computers that you have in your network, the more sense it makes to use a switch. Your signal distributor must have a sufficient number of ports to support the number of computers in your network. Make sure that your signal distributor has extra ports so that you can add more computers later.

Part 3. Connecting the Computers

To connect the computers, follow these steps:

1. Install the network card. To do so:

Warning Internal computer components may be damaged by static electricity, use of too much force for removal or insertion, or the use of inappropriate tools. If you are not very familiar with computer hardware installation, Microsoft recommends that you contact a qualified technician for repair or installation of internal computer components.

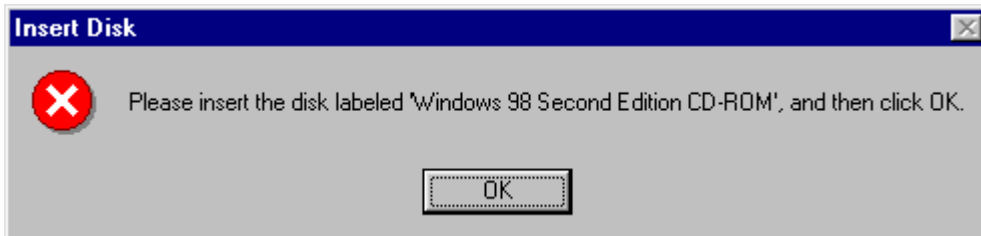
- a) Shut down Windows.
- b) Turn off the computer.
- c) Unplug the power cord.
- d) Open the computer case.
- e) Remove the bracket from a free PCI slot on the back of the computer.
- f) Put the network card vertically in the slot. Push it in firmly, but do not use too much force. You can hear the card snap in place when it is seated correctly in the slot.
- g) Use the screw from the bracket to fasten the card.
- h) Close the case.
- i) Plug the power cord back in.

2. Install the signal distributor. Put it near a power outlet and where all the computers can easily access it.
3. Connect the network cards to the signal distributor. To do so, plug one end of the twisted pair cable into a network card and the other end into the hub or switch.
4. Plug the signal distributor into a power outlet.

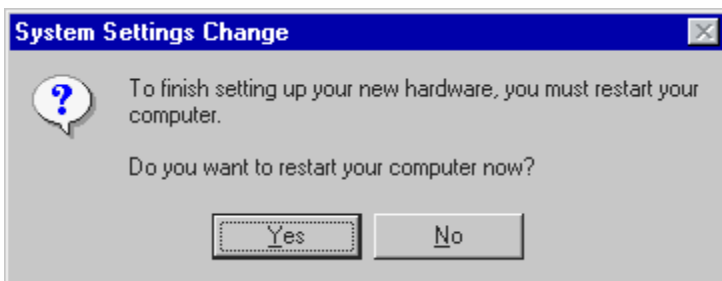
Your small network is almost completely set up. You just have to prepare Windows to operate in a network environment.

Part 4. Installing the Network Card

The network card does not function correctly until you have installed a driver. To install a driver, install the network card, and then restart the computer. Windows typically recognizes the network card and installs the appropriate driver. You only have to insert the Windows CD when prompted to do so.



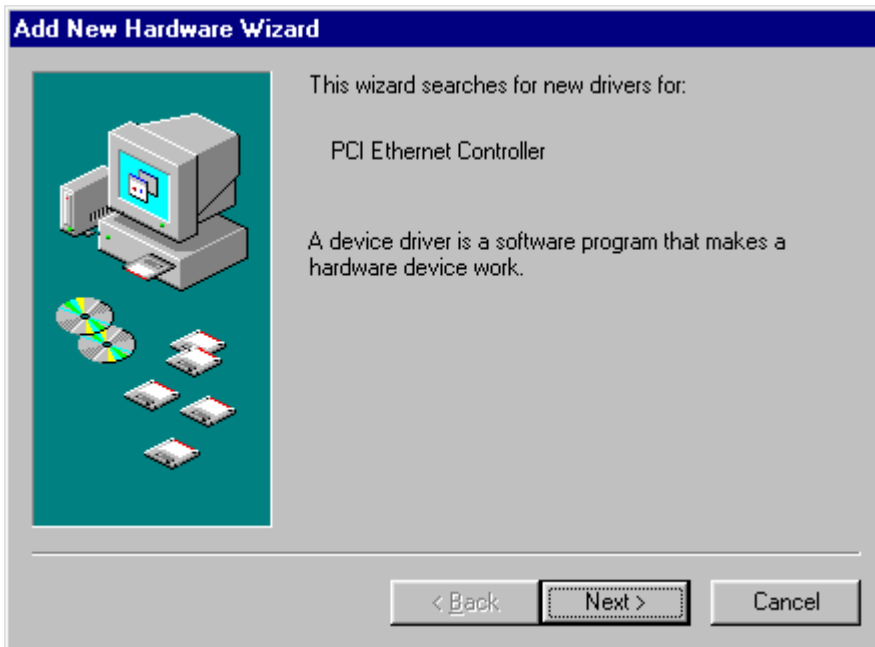
After you restart the computer, the driver and the network software are installed.



If Windows does not recognize the card, the manufacturer delivers the card with the required driver on a CD or floppy disk. If you did not receive a CD or floppy disk, you can generally download the driver from the manufacturer's Web site.

The Hardware Wizard guides you through the installation step-by-step:

1. The Hardware Wizard detects the new hardware. Click **Next**.

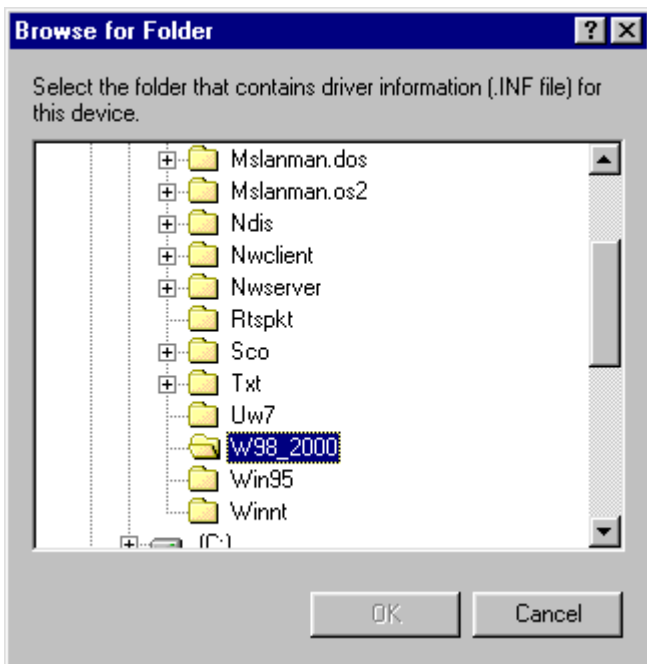


2. Search for the best driver for the device, and then click **Next**.



3. Type the location of the driver, insert the CD or floppy disk, click **Browse**, select the folder, click **OK**, and then click **Next**.

The documentation that the manufacturer supplied with your network card contains the correct location for the driver. You can frequently guess the location because the folder is named after the operating system that is used.



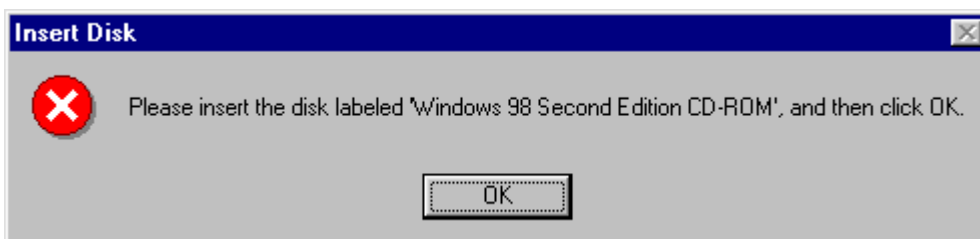
4. In this case, the Wizard found two drivers and selected the more current driver for installation. Click Next when this window appears.



5. The driver listed can now be installed. Click **Next**.



6. Insert the Windows CD when you are prompted, and then click **OK**.



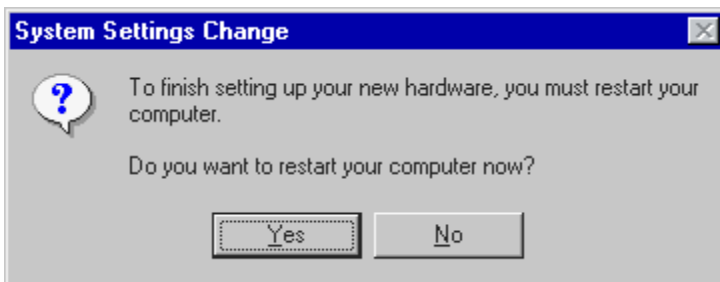
Windows automatically installs Client for Microsoft Networks and the TCP/IP protocol. To make additional changes to the settings, use the Network icon in Control Panel.



7. The installation is complete. Click **Finish**.



8. Remove the driver disk from the drive, and then restart Windows.



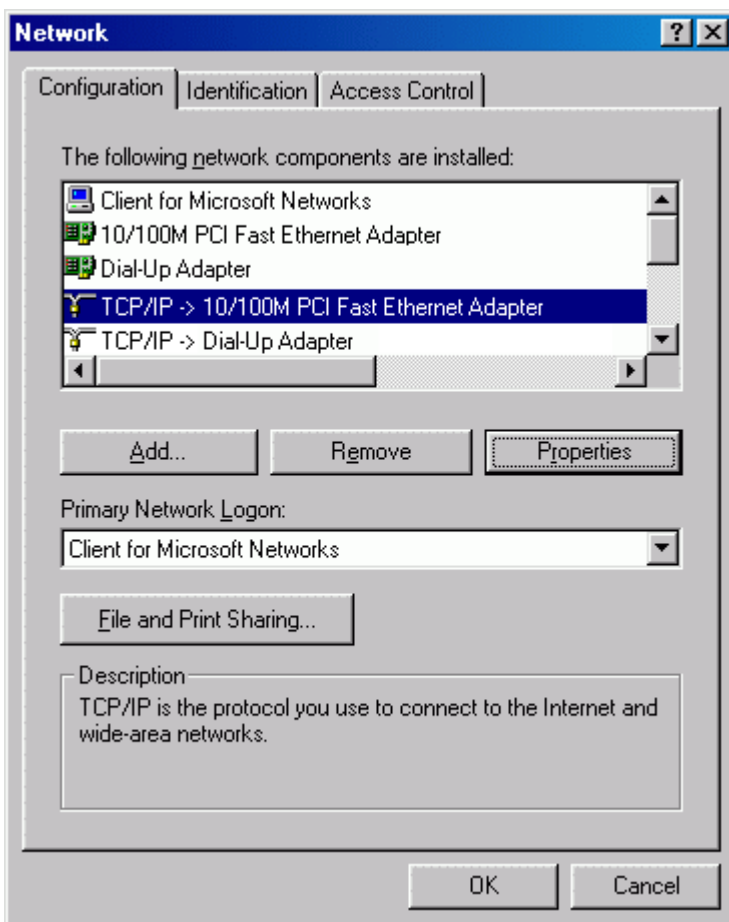
Part 5. Configuring TCP/IP Protocol

Now that you have successfully configured your network card, you must make sure that your computers can communicate with each other. To do so, click **Start**, point to **Settings**, click **Control Panel**, and then double-click the **Network** icon.



This is the control room for your small network. Together with the network card driver, Windows also installed Client for Microsoft Networks (enables the connection to other Windows computers) and TCP/IP protocol.

Windows deployed the dial-up adapter during the default installation. You can use this adapter to establish an Internet connection. At the moment, it is not important.



Tip Because you must set several settings, it is useful to create a shortcut on the desktop. To create a shortcut, open Control Panel, right-click and drag the **Network** icon to the desktop, and then click **Create Shortcut(s) Here**.

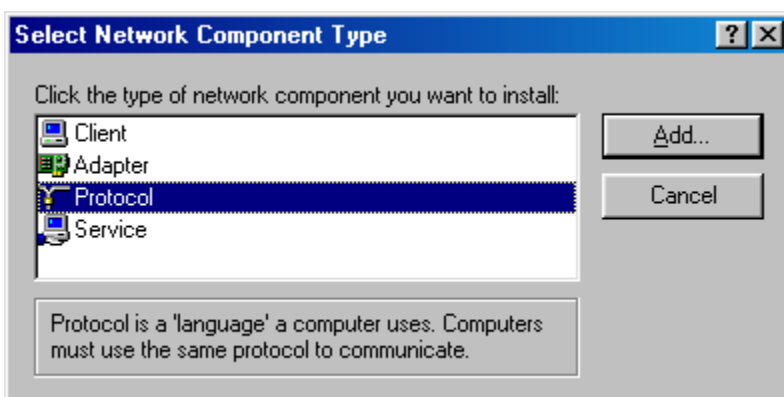
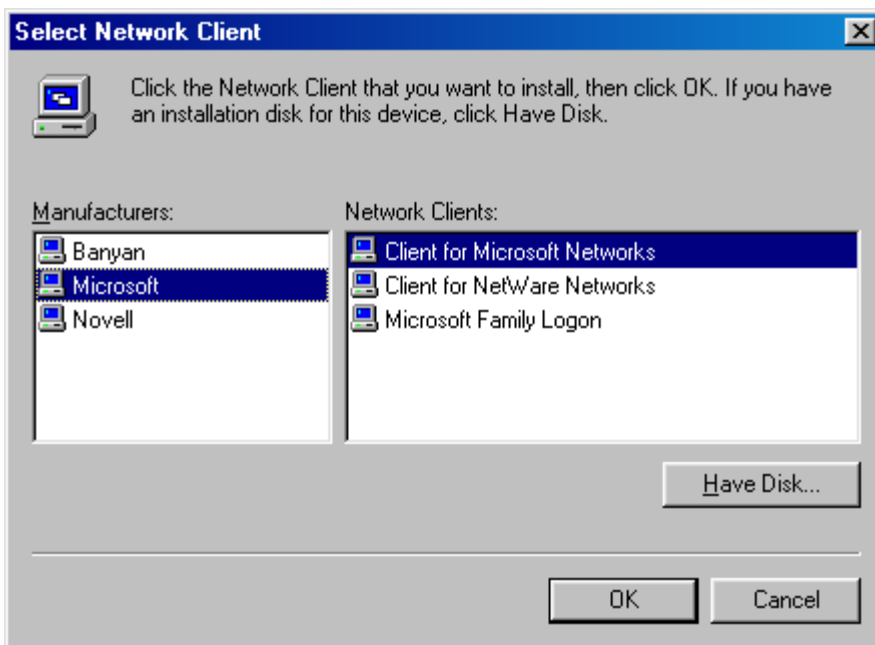
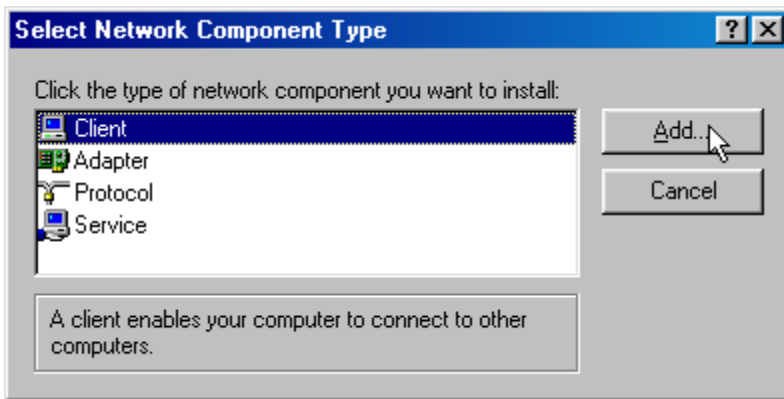
Adding Network Components

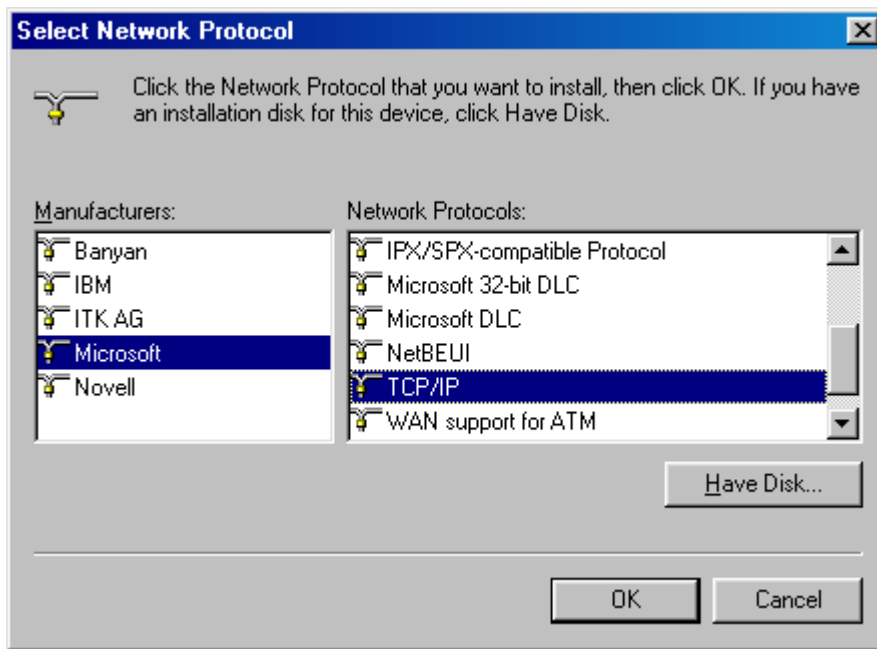
If Client for Microsoft Networks or TCP/IP protocol is not listed under the installed network components, you can configure them now. To do so, follow these steps:

1. Click **Add**, click **Client**, click **Add**, click **Microsoft**, and then click **Client for Microsoft Networks**.

-or-

Click **Add**, click **Protocol**, click **Add**, click **Microsoft**, and then click **TCP/IP**.





2. Click **OK** to close the window, insert the Windows CD, and then restart the computer.

TCP/IP

Network protocols help your computers speak the same language so they can share data. Network protocols define the rules for communication. The TCP/IP protocol is used just about everywhere. After the Internet boom, it became the standard protocol for small networks. To configure this protocol, you must set two settings.

IP Address and Subnet Mask

The most important setting is the IP address. The IP address gives each computer a unique address where it can be accessed in the network. The address has four numbers between 0 and 255 that are separated by periods. All the computers are numbered in a series.

The subnet mask determines the network where the computer is located. This is especially important in large networks that are divided into several subnets. In your small network, all the computers are in the same subnet.

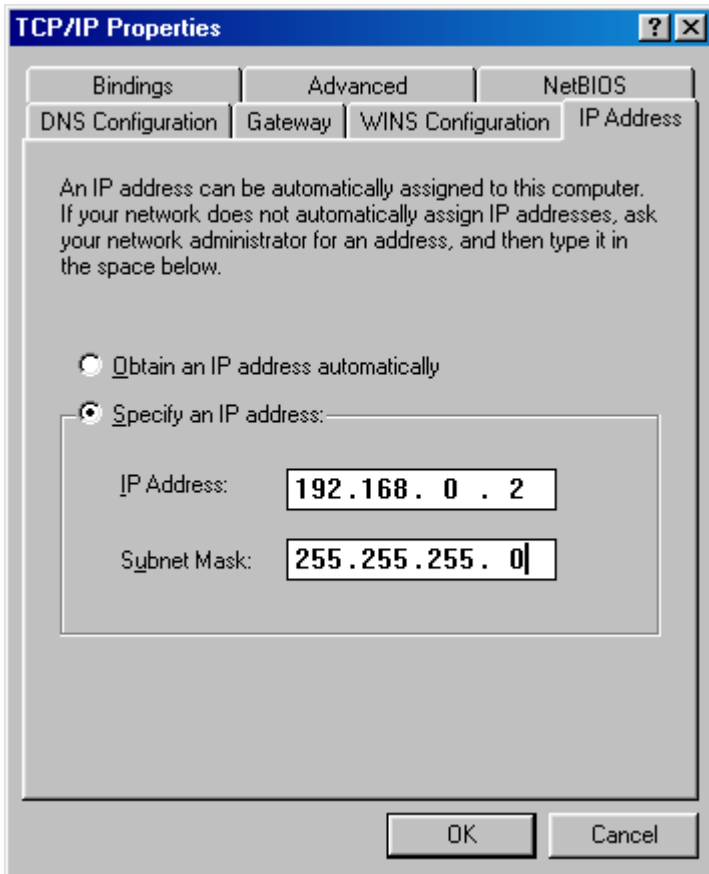
Internet

The Internet is a large TCP/IP network that is based on IP addresses. The addresses must be unique here, too. Two computers cannot use the same IP address. If you want to access the Internet, you must make sure that your small network does not use an address that is already in use in the Internet. Therefore, there are certain address ranges that you can use in your network without problems. For example, you can use 192.168.0.X, where X is a number between 1 and 254. Use 255.255.255.0 for your subnet mask.

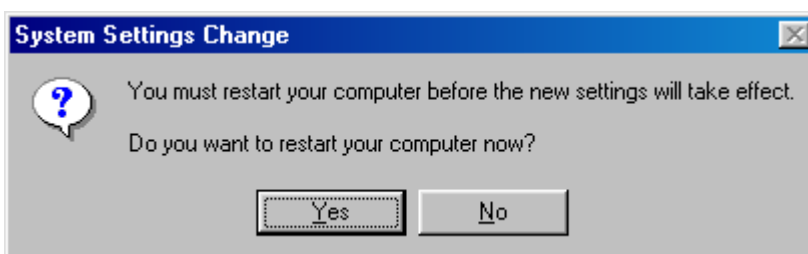
To define the IP address and subnet mask, follow these steps:



1. Reopen the window: Network
2. Select the TCP/IP entry that refers to your network card, and then click **Properties**.



3. Click **Specify an IP address**, and then type the corresponding number combination. If you use 192.168.0.1 for the first computer, use 192.168.0.2 on the second computer, 192.168.0.3 for the third computer, and so on. The subnet mask stays the same for all the computers. Type 255.255.255.0 here.
4. Click **OK**, and then click **OK** again.
5. Restart your computer.



Tip If you want to share Internet access, assign the address 192.168.0.1 to the computer that will establish the Internet connection. However, when you configure Internet Connection Sharing, this IP address is assigned to the computer automatically.

Part 6. Setting the Computer Names and Workgroups

You must name every computer and assign every computer to a workgroup regardless of what protocol you use. As with the IP addresses, each computer name must be unique. In other words, a name can only be used one time in your workgroup.

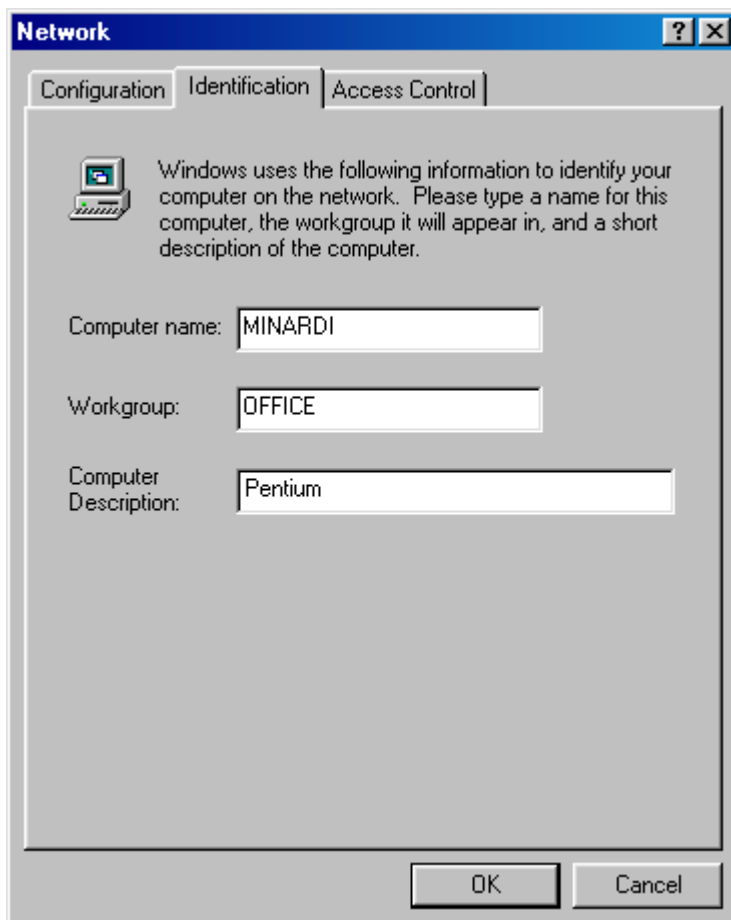
To assign your computers a name and a workgroup, follow these steps:

1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network** icon, or use the previously created shortcut on the desktop.



Network

3. Click the **Network Identification** tab.



4. Assign each computer a meaningful name. The name will appear in the Network Neighbourhood.



5. Assign every computer to the same workgroup.
6. You can type a description that specifies what this computer is used for or who works on it.
7. Click **OK**.
8. Restart your computer.

Now you can configure the resources that you want to share.

Part 7. Sharing Folders

Advantages of Sharing

When you turn on sharing, you can determine what resources are available in the network. All the computers on your network can use everything that you share. You can share the following items:

- Folders
- Drives
- Printers
- Internet access

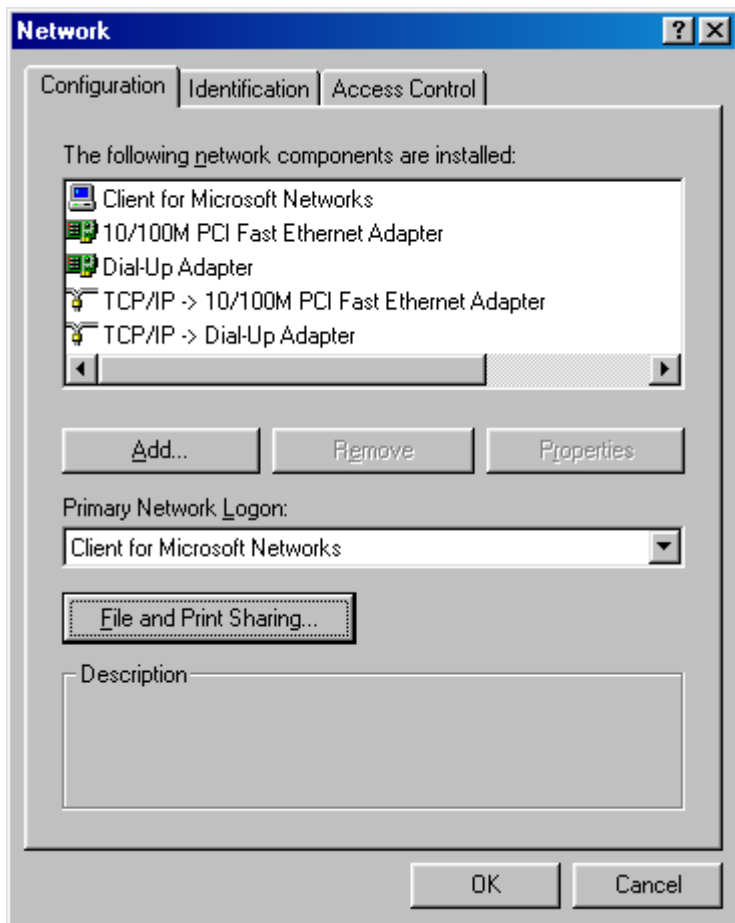
Resources that you do not set up for sharing remain private.

Sharing devices and files brings many advantages:

- You can easily move or copy files from one computer to another. You can share work on files on different computers.
- All the computers can access a single device, such as a printer or a ZIP drive.
- One Internet access is sufficient for several computers to use the Internet at the same time.

Configuring File and Printer Sharing

A computer that allocates resources assumes server functions. Any computer in a peer-to-peer network workgroup can do so. You must configure file and printer sharing for a computer to act as a server.

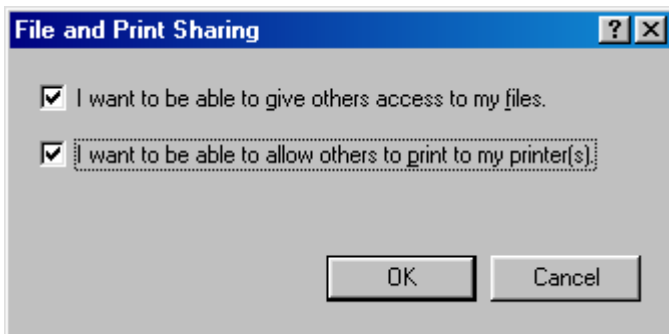


1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click the **Network** icon or use the shortcut that was previously created on the desktop.



Network

3. Click the **Network Configuration** tab.
4. Click **File And Printer Sharing**.



5. Click to select the check boxes for access to files and printer.
6. Click **OK** to close all the windows, insert the Windows CD when prompted to do so, and then restart your computer.

Now you can view all the computers in your workgroup in Network Neighborhood.



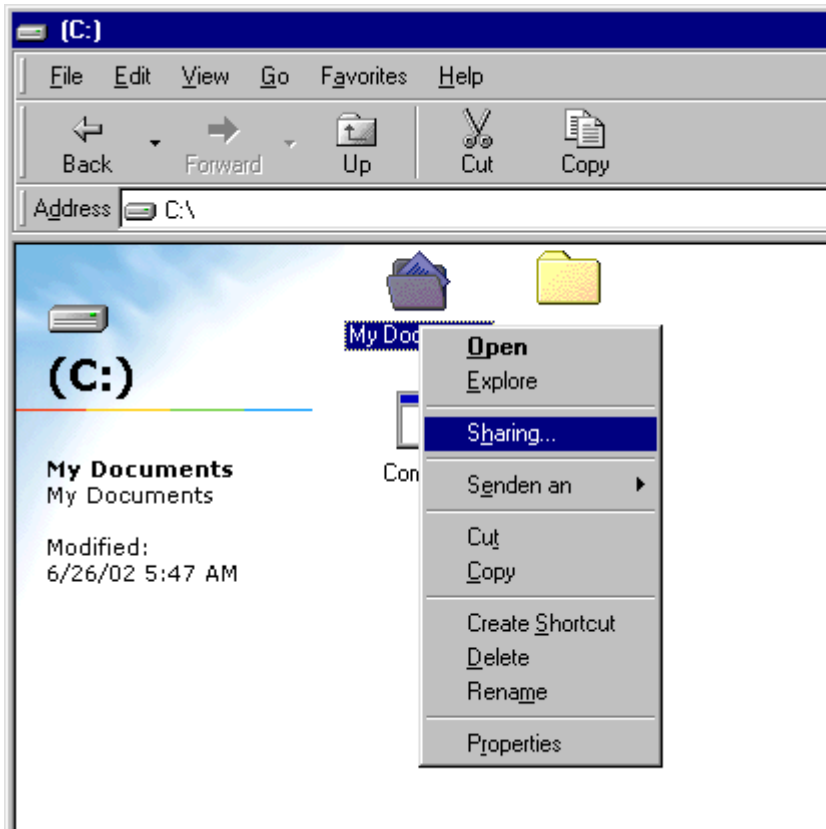
To do so, select the desktop, and then double-click **Network Neighborhood**

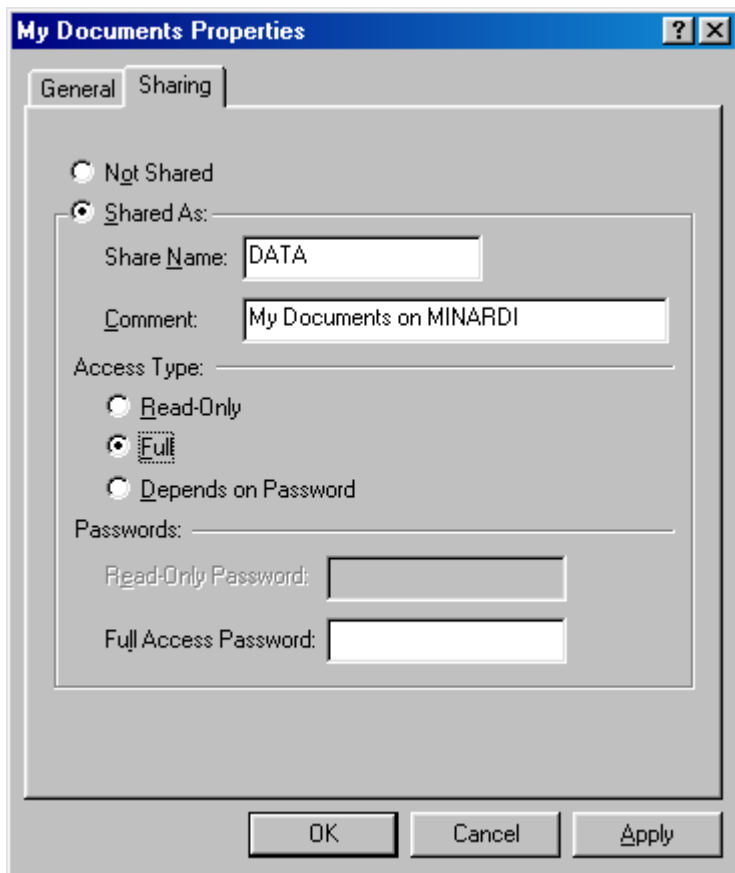


Sharing Folders

After the restart, you can share a file or files that you want to use on other computers.

1. Locate a folder on the computer.
2. Right-click the file, and then click **Sharing**.





3. Enter a share name. The folder appears under this name in **Network Neighborhood**. You can also type a comment that describes the resource.

Note The share name and the folder name do not have to be the same.

4. Determine the user rights.

- Determine whether all the users in the network have access, but have read-only rights.
- Determine whether all the users in the network have full access.
- Determine whether only specific users have access.

If so, you must assign passwords, one for read-only and one for full access.

5. Click **OK**.

The shared folder now appears with a hand:

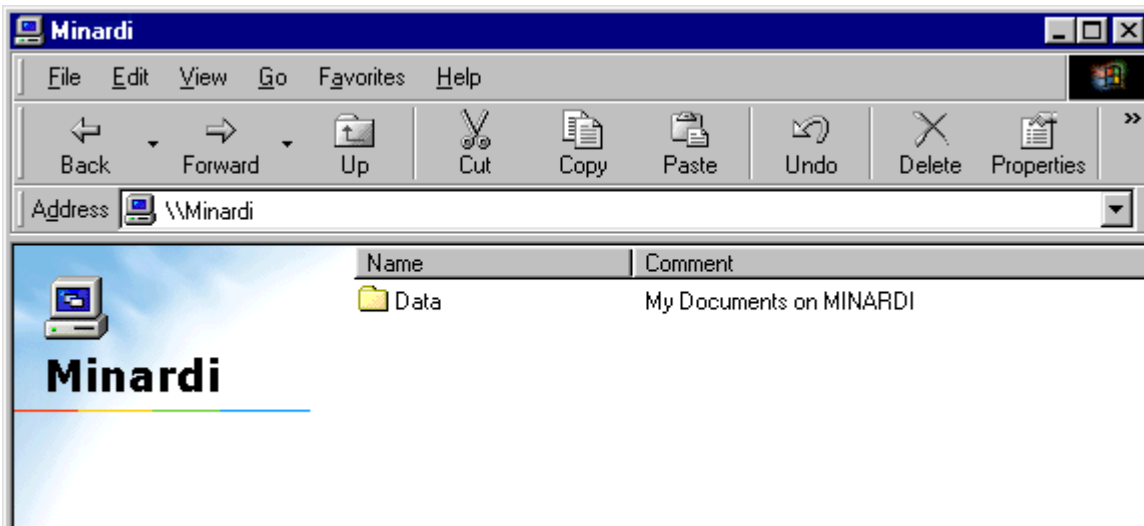


My Documents

You can access the shared folder through **Network Neighborhood**.



If you have selected the Read/write permission option, you can view, copy, move, change and delete files in this folder on any computer in this network. You can add new files and access subfolders and files.



You can also stop sharing in the same menu. To do this, click **Not Shared**. The folder will not appear in the network anymore.

You can share whole drives the same way. For example, you can share the following drives:

- Hard disks or partitions
- CD ROM drives
- ZIP drives

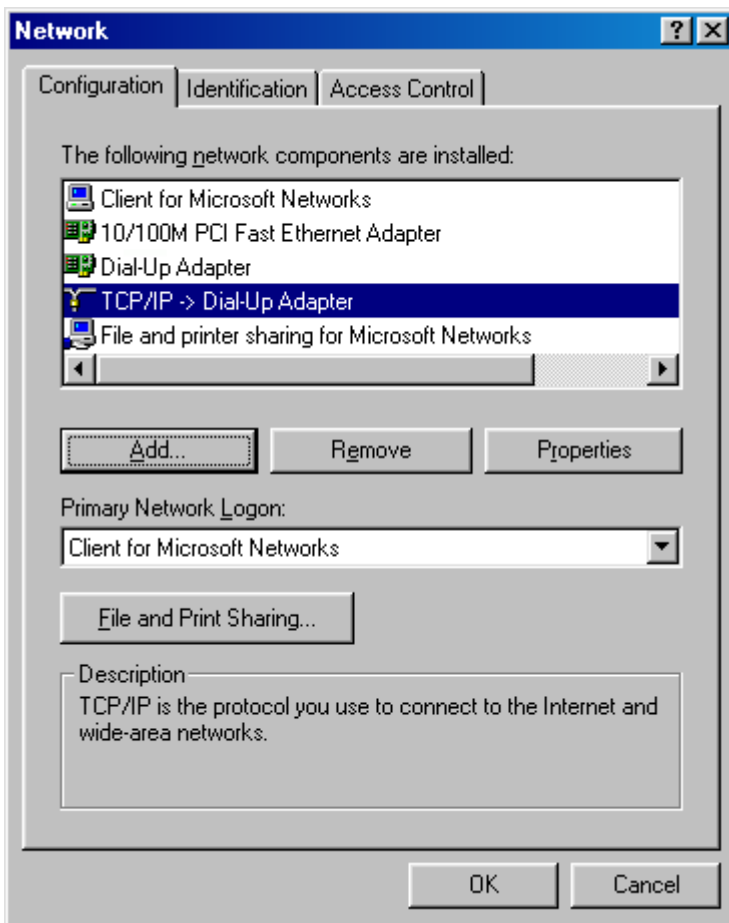
Your network is now fully functional. Take a minute to optimize the configuration. Remove file and printer sharing and the Client for Microsoft Networks from the dial-up connection (only here). A dial-up connection to the Internet does not use these services. Additionally, this provides some protection against malicious users.

To optimize the configuration, follow these steps:

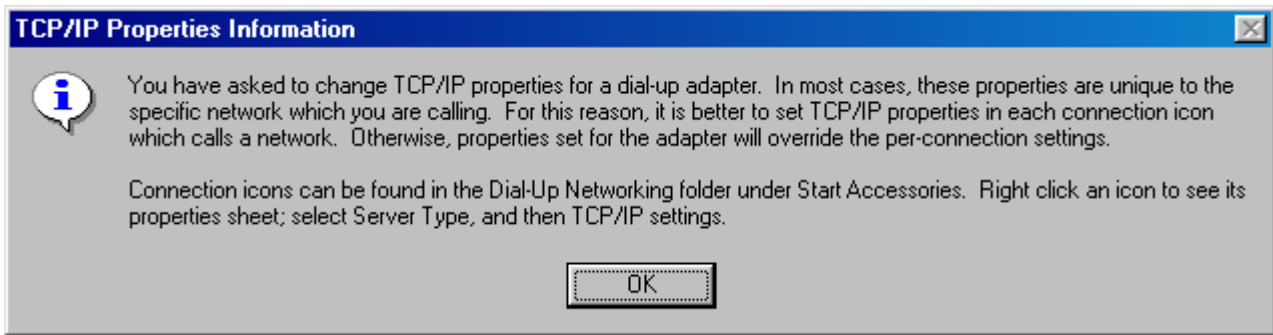
1. Click **Start**, point to **Settings**, and then click **Control Panel**.
2. Double-click **Network** or use the shortcut previously created on the desktop.



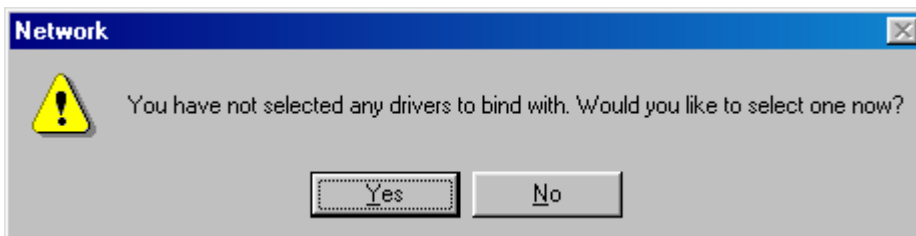
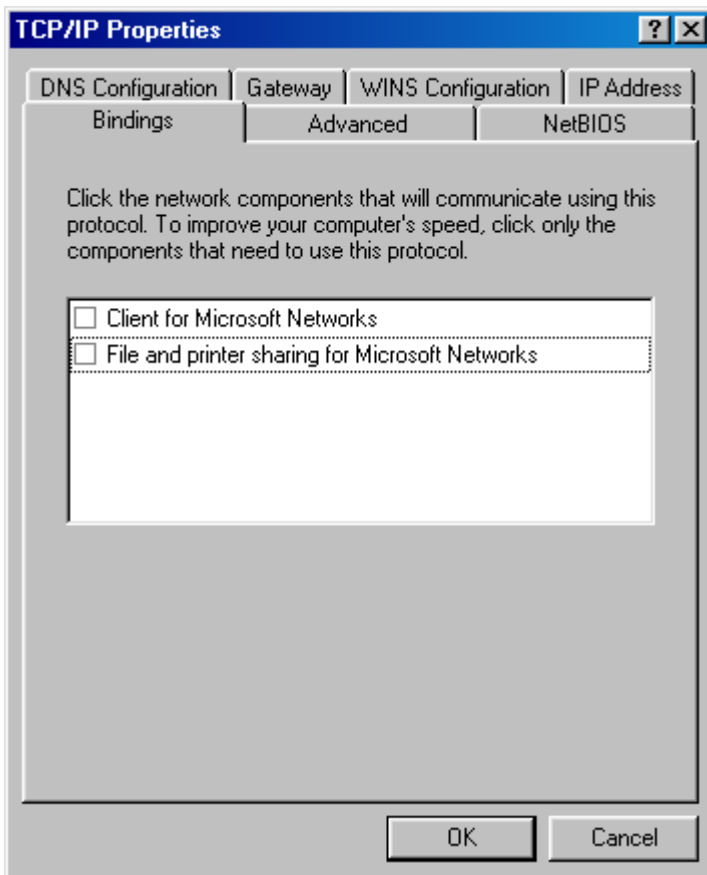
3. Click the **Network Configuration** tab.



4. Click **TCP/IP**, click **Dial-Up Adapter**, click **Properties**, ignore the warning, and then click **OK**.



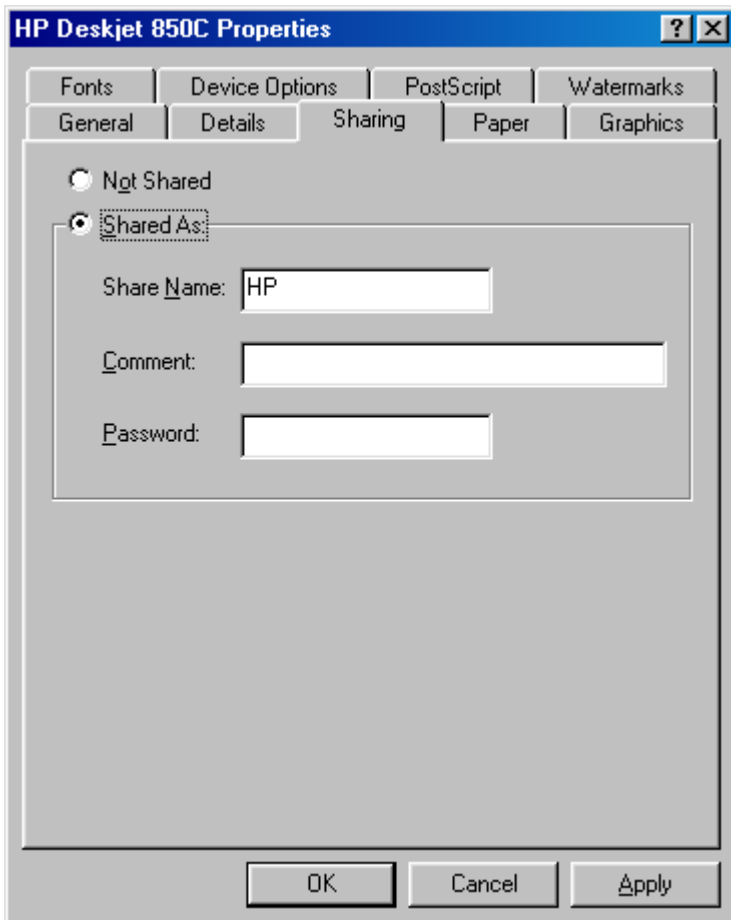
5. Click the **Bindings** tab.
6. Clear the check boxes next to **Client for Microsoft Networks** and **File and printer sharing**.
7. Click **OK**, click **No**, click **OK**, and then restart your computer.



Part 8. Sharing a Printer

You share a printer the same way you share a file. To share a printer, follow these steps:

1. Click **Start**, point to **Settings**, and then click **Printer**.
2. Right-click the printer, and then click **Sharing**.
3. Click **Shared As**.
4. Type a share name. You can also type a comment and a password.
5. Click **OK**.



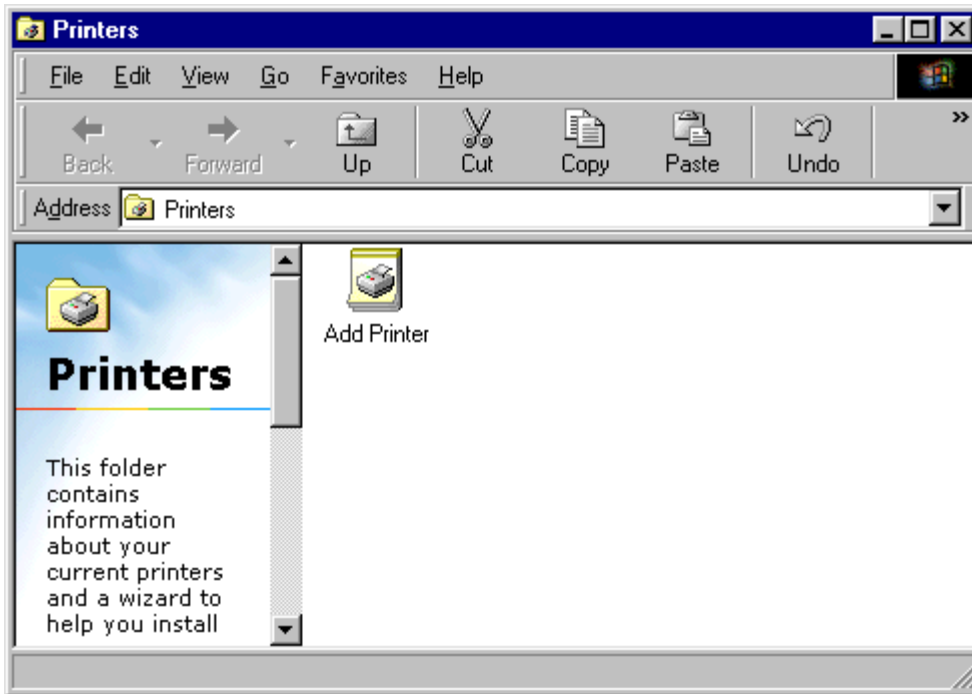
6. The printer is now shared:



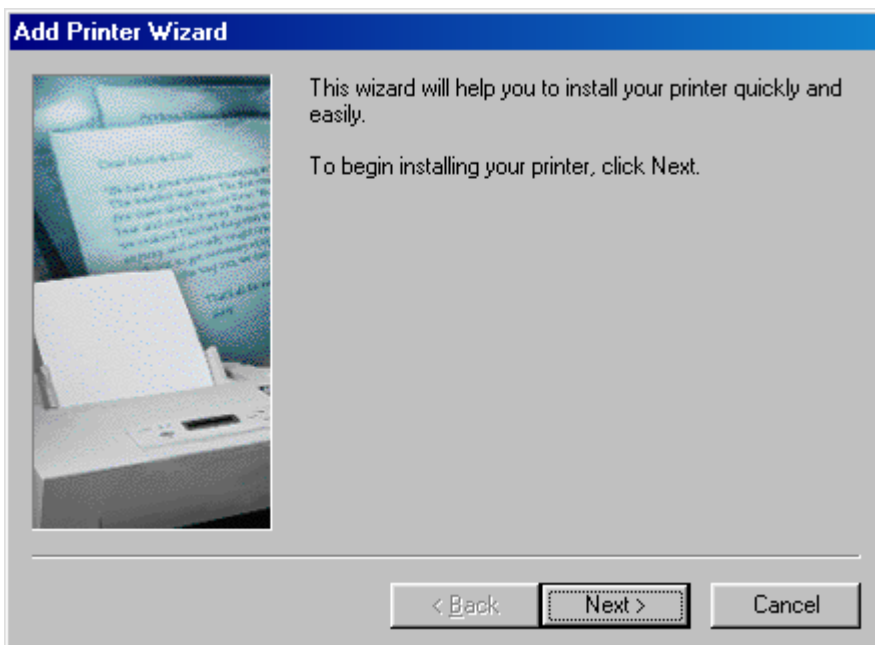
HP DeskJet 850C

To install a network printer on the other computers, follow these steps:

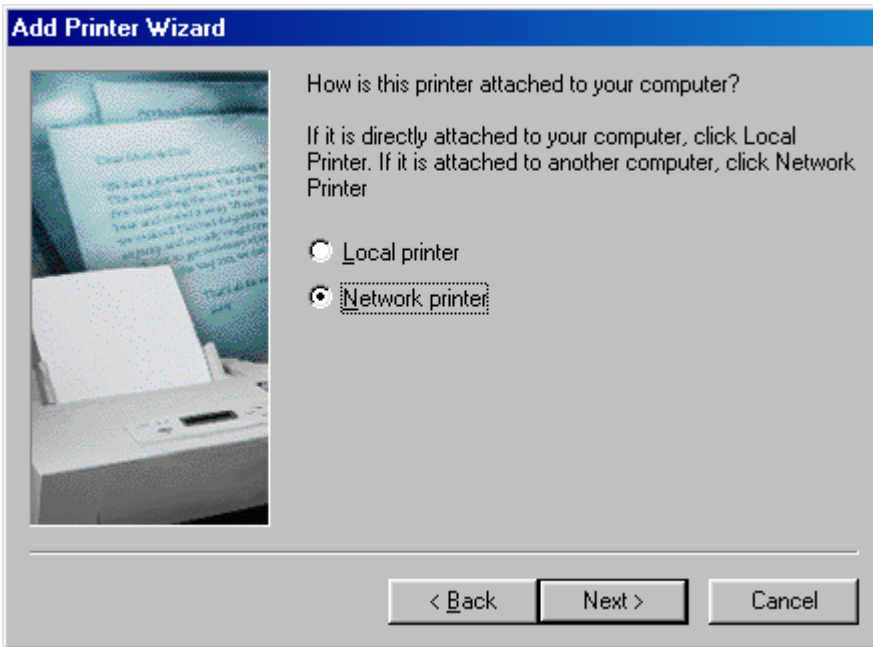
1. Click **Start**, point to **Settings**, and then click **Printer**.
2. Double-click **Add Printer**.



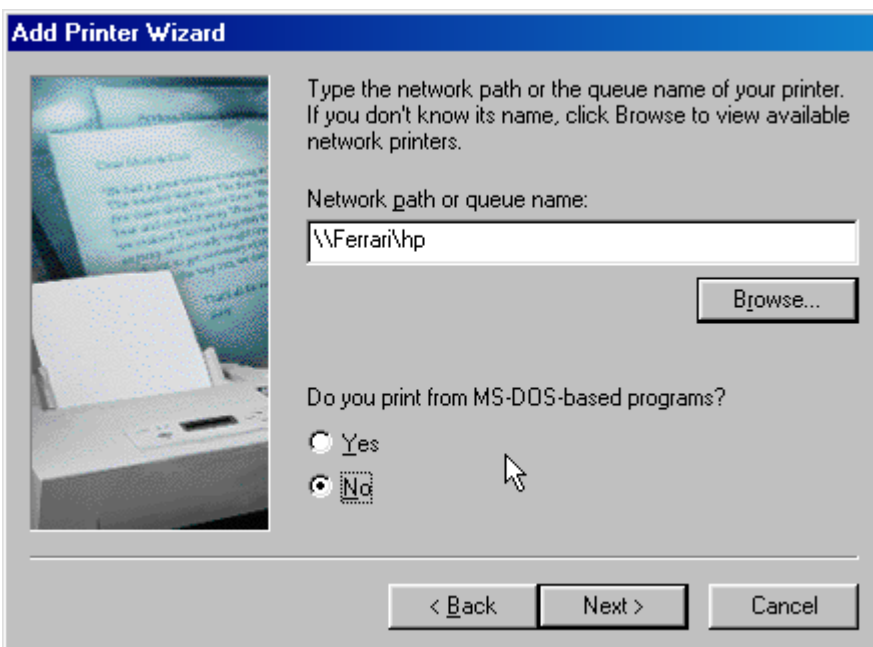
3. The Add Printer Wizard starts. Click **Next**.



4. Click **Network printer**, and then click **Next**.

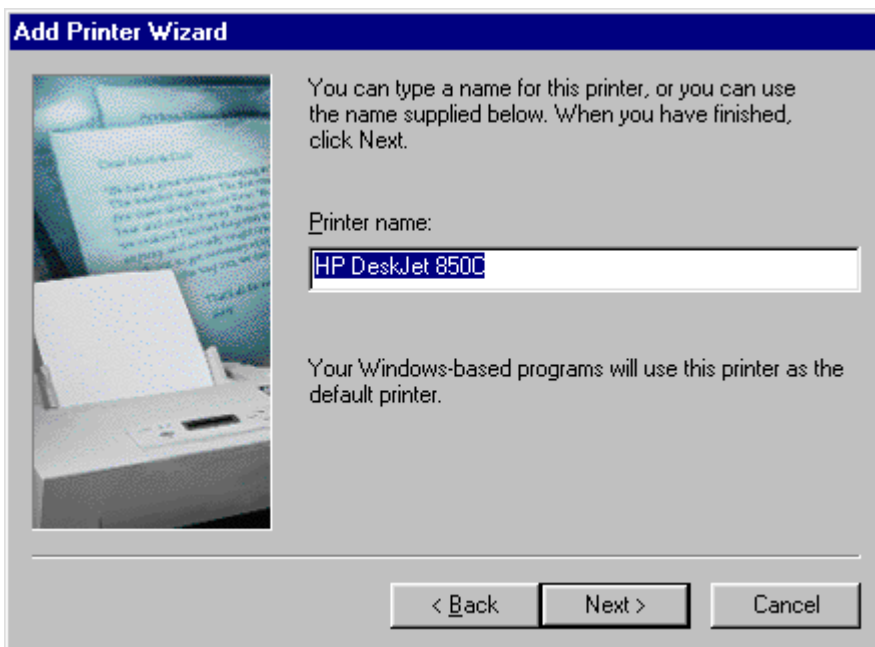


5. Click **Browse** to find the shared printer in the network. Locate the printer, and then locate the share name.
6. Click **OK**, and then click **Next**.



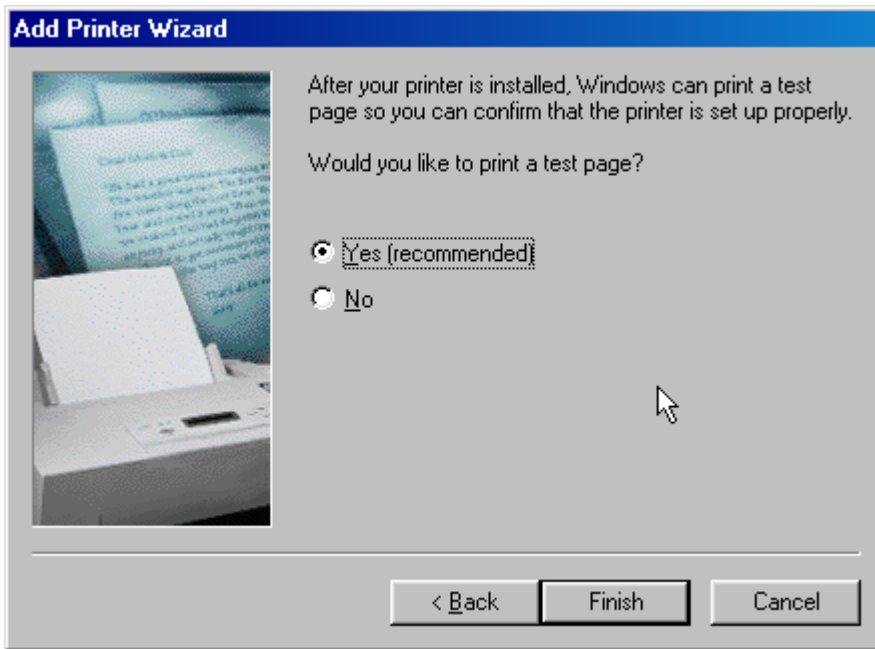


7. Set the printer name, and then click Next.



8. Print a test page, and then click **Finish**.

Windows configures your printer and copies the printer driver through the network.



Your printer now appears:



HP DeskJet 850C

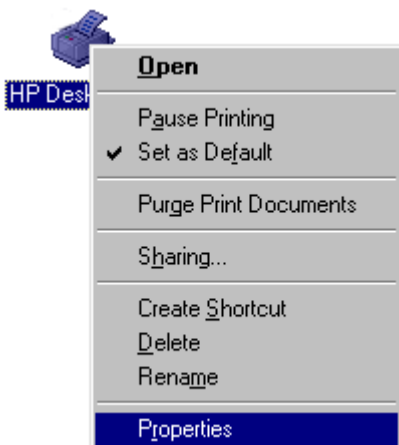
You can use the network printer like a local printer if the corresponding computer is turned on.

Tip If you use different Windows versions, install the intended network printer as a local printer on LPT1 first. This way, the correct drivers will be installed for the operating system. You do not have to connect the printer to the printer port to do this. Therefore, you do not have to move things. You just cannot print a test page.

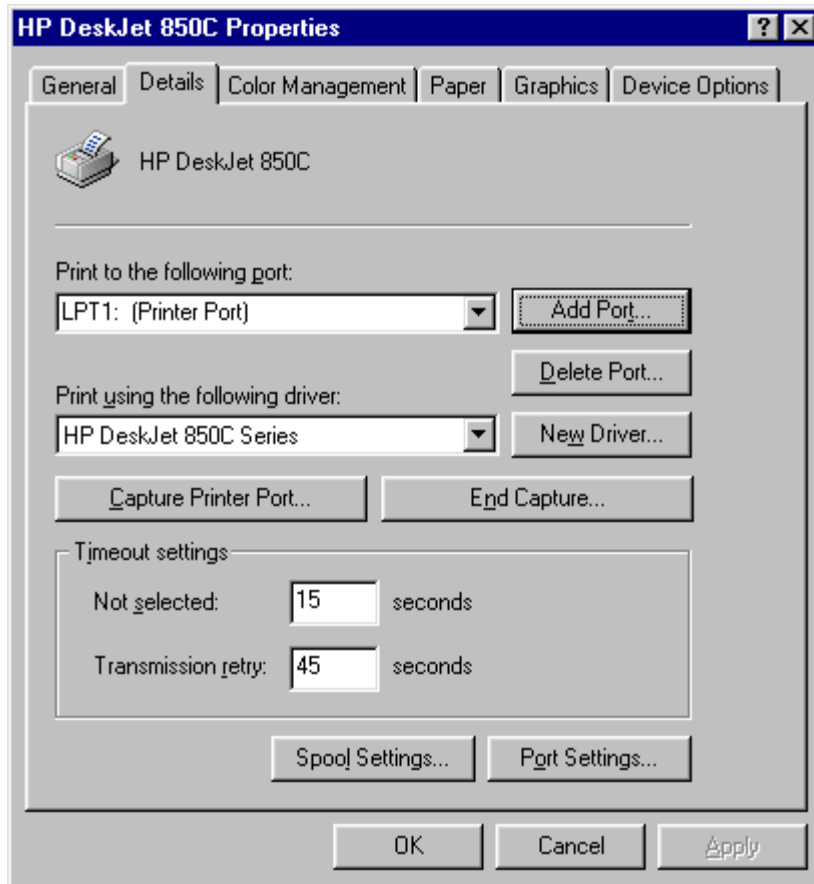
To assign the printer to the correct port later:

1. Right-click the locally installed printer.
2. Click Properties.

Note The following screenshots are from Windows 95, but the process is almost the same in all Windows versions.

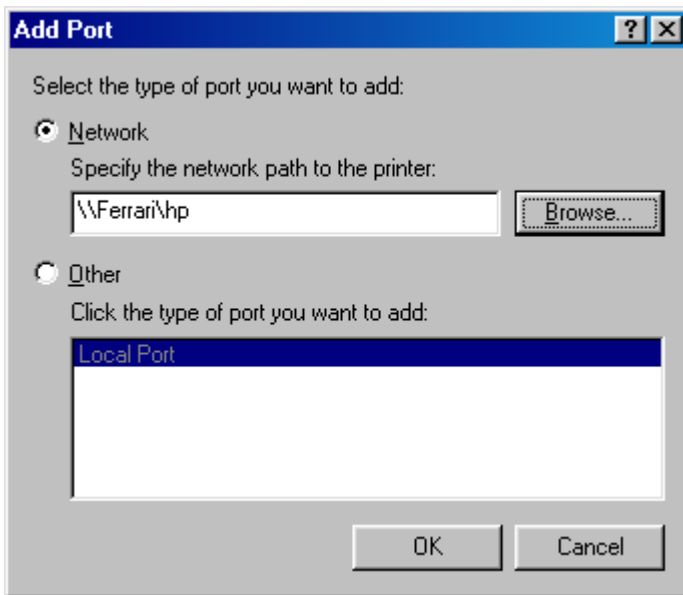


3. The **Printer Properties** tab varies based on the model of your printer. Look for the tab that manages the port for printer output, and then click **Add Port**.



4. Type the network path for the printer, click **Browse** to find the shared printer in the network, look for the printer, and then look for the share name.

5. Click **OK** to close all the windows.



You can also install Internet Connection Sharing now if you want to. Before you can do this, you must configure an Internet connection. You can find step-by-step instructions on how to do so in a different guide.