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User Guide

10/100 PCI Network Interface Cards

3C905CX For Complete PC Management
3C905C For Complete PC Management
3C905B
3C900B

http://www.3com.com/
http://www.3com.com/productreg

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1 Learning About the NICs

This guide describes how to use *EtherCD* version 5.4 to install, configure, and troubleshoot the following 3Com® PCI network interface cards (NICs):

NIC	Model Number
10/100 PCI For Complete PC Management	3C905CX-TX-M 3C905C-TX-M
10/100 PCI	3C905B 3C905B-TX-M 3C905B-TX-NM 3C905B-COMBO
100 PCI Fiber	3C905B-FX
10 PCI Fiber	3C900B-FL
10 PCI	3C900B-TPO 3C900B-COMBO

NOTE: Unless specifically indicated, information in this user guide refers to all NIC models.

This guide is intended for those who install and configure Ethernet NICs. Some familiarity with Ethernet networks and NICs is assumed.

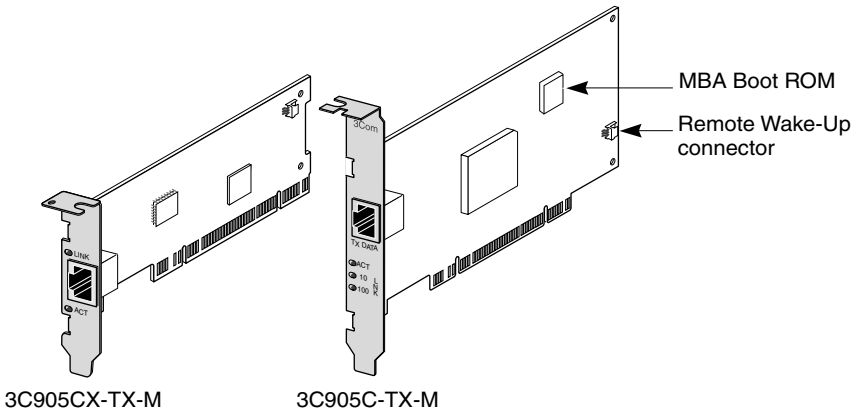
3C905CX-TX-M and 3C905C-TX-M NICs

The 3C905CX-TX-M and 3C905C-TX-M NICs connect your PCI-compliant PC to either a 10 Mbps Ethernet network or a 100 Mbps Fast Ethernet network.

The NICs support a suite of desktop and network management features, including:

- Remote Wake-Up
- Managed PC Boot Agent (MBA) software
- 3Com Connection Assistant software
- Dynamic*Access* LAN Agent for traffic prioritization and remote monitoring (RMON and RMON2)
- Desktop Management Interface (DMI) 2.0s
- Remote System Alerts

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The following table outlines the features of the 3C905CX-TX-M and 3C905C-TX-M NICs.

Features Supported	3C905CX-TX-M NIC	3C905C-TX-M NIC
■ RJ-45 connector for 10BASE-T or 100BASE-TX	✔	✔
■ Remote Wake-Up	✔	✔
■ 3Com Connection Assistant software	✔	✔
■ DMI 2.0s	✔	✔
■ Integrated boot ROM with Managed PC Boot Agent (MBA) software	✔	✔
■ Traffic prioritization	✔	✔
■ Remote monitoring (RMON and RMON2)	✔	✔
■ Efficient multicast control	✔	✔
■ Remote system alerts	✔	✔

3C905B NICs

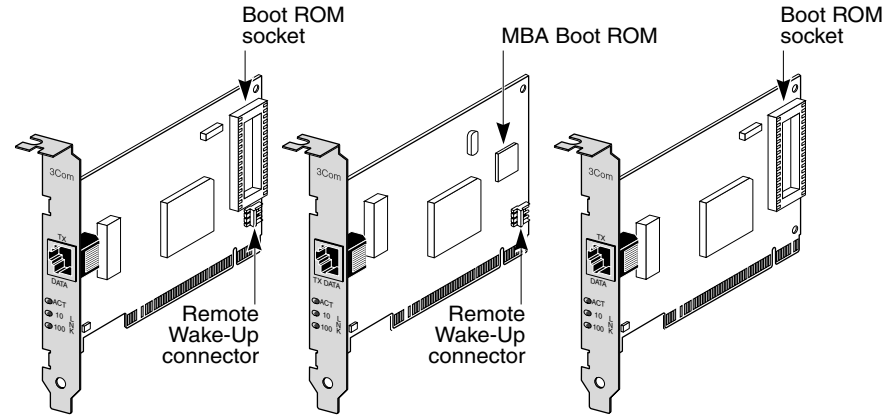
The 3C905B NICs connect your PCI-compliant PC to either a 10 Mbps Ethernet network or a 100 Mbps Fast Ethernet network.

The 3C905B NICs support a suite of desktop and network management features, including:

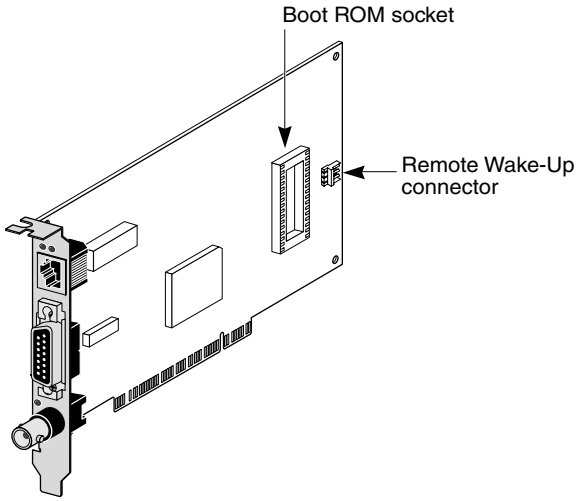
- Remote Wake-Up
- Managed PC Boot Agent (MBA) software
- 3Com Connection Assistant software
- Dynamic*Access* LAN Agent for traffic prioritization and remote monitoring (RMON and RMON2)
- Desktop Management Interface (DMI) 2.0s

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3C905B-TX NICs

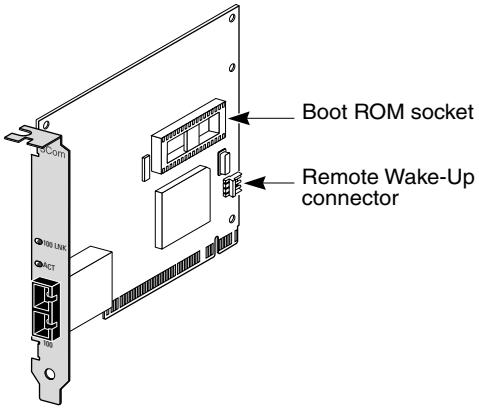


3C905B-COMBO NIC



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3C905B-FX NIC



The following table outlines the features of the 3C905B NICs.

	3C905B NIC Model				
Features Supported	**-TX**	**-TX-M**	**-TX-NM**	**COMBO**	**-FX**
■ RJ-45 connector for 10BASE-T or 100BASE-TX	✔	✔	✔	✔	
■ AUI and BNC connectors for 10BASE5 and 10BASE2				✔	
■ SC connector for 100BASE-FX					✔
■ Remote Wake-Up	✔	✔		✔	✔
■ 3Com Connection Assistant software	✔	✔	✔	✔	✔
■ DMI 2.0s	✔	✔	✔	✔	✔
■ Boot ROM socket	✔		✔	✔	✔
■ Integrated boot ROM with Managed PC Boot Agent (MBA) software[a]		✔			
■ Traffic prioritization	✔	✔	✔	✔	✔
■ Remote monitoring (RMON and RMON2)	✔	✔	✔	✔	✔
■ Efficient multicast control	✔	✔	✔	✔	✔

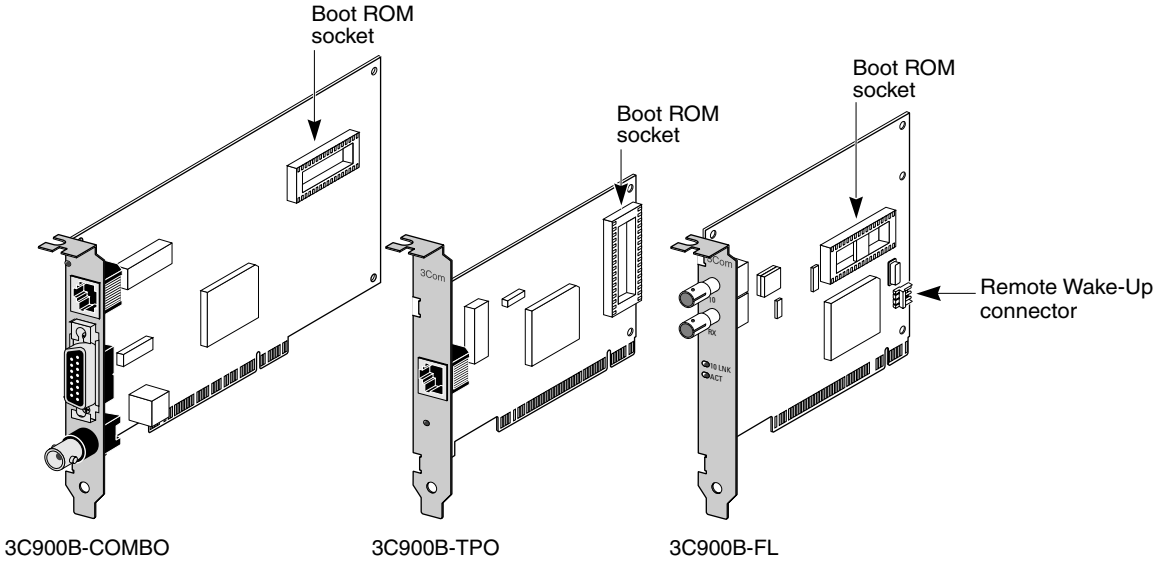
a. A boot ROM with MBA software can be purchased separately for use with the 3C905B-TX, 3C905B-TX-NM, 3C905B-COMBO, and 3C905B-FX NICs.

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3C900B NICs

The 3C900B NICs connect your PCI-compliant PC to a 10 Mbps Ethernet network. The 3C900B NICs support the following desktop and network management features:

- Remote Wake-Up (3C900B-FL only)
- 3Com Connection Assistant Software
- Dynamic*Access* LAN Agent for traffic prioritization and remote monitoring (RMON and RMON2)
- Desktop Management Interface (DMI) 2.0s



The following table outlines the features of the 3C900B NICs.

	3C900B NIC Model		
Features Supported	**COMBO**	**-TPO**	**-FL**
■ RJ-45 connector for 10BASE-T (10 Mbps only)	✔	✔	
■ AUI and BNC connectors for 10BASE5 and 10BASE2	✔		
■ ST connector for 100BASE-FL			✔
■ Remote Wake-Up			✔
■ 3Com Connection Assistant Software	✔	✔	✔
■ DMI 2.0s	✔	✔	✔
■ Boot ROM socket[a]	✔	✔	✔
■ Traffic prioritization	✔	✔	✔
■ Remote monitoring (RMON and RMON2)	✔	✔	✔
■ Efficient multicast control	✔	✔	✔

[a] A boot ROM with MBA software can be purchased separately for use with the 3C900B NICs.

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Remote Wake-Up

Remote Wake-Up is the ability to remotely power-on a PC for after-hours administration.

To use Remote Wake-Up, your NIC must support this feature. (See the tables in the previous section if you are unsure whether your NIC supports Remote Wake-Up.)

Additionally, your PC or server must have a:

- Management application that supports Remote Wake-Up.
- BIOS that supports Remote Wake-Up.
- PCI 2.2-compliant bus (3C905CX-TX-M and 3C905C-TX-M NICS only) or a 3-pin Remote Wake-Up connector on the PC motherboard and a 5-volt standby power supply unit rated at a minimum of 375 milliamperes.

If you are unsure whether your PC meets the requirements listed above, refer to your PC documentation or contact your PC manufacturer.

For more information on Remote Wake-Up, including a list of PCs that currently support this feature, go to:

http://www.3com.com

Remote Wake-Up Cable

A Remote Wake-Up cable is shipped with each NIC that supports this feature.

To order additional Remote Wake-Up cables, contact 3Com:

1-800-527-8677

Multiple NIC Installations and Remote Wake-Up

To use multiple NICs as Remote Wake-Up NICs in the same PC, the PC must have a power supply that can support multiple Remote Wake-Up devices.

Refer to your PC documentation if you are unsure whether your PC power supply can accommodate more than one Remote Wake-Up device.

Managed PC Boot Agent (MBA) Software

The MBA software allows the PC to boot from the server rather than from its local hard drive.

This preboot support allows you a simple and universal way to use currently available management applications to remotely:

- Install and configure a PC that has never been connected to the network.
- Upgrade software.
- Configure or reconfigure multiple systems simultaneously.
- Scan for viruses.
- Back up hard drives and perform disaster recovery tasks.

MBA includes the Preboot Execution Environment (PXE) protocol, the industry standard for network booting and a component of the Wired for Management 2.0 specification.

Previously available only on a boot ROM on the NIC, the MBA software is now available on the *EtherCD*, where it can be used as a bootable CD. When you boot the PC with the *EtherCD*, MBA uses the NIC to do a network boot, allowing the PC to be managed in the preboot stage.

The bootable *EtherCD* feature supports most 3Com PCI NICs, LAN CardBus PC cards, Mini PCI cards, and USB/Ethernet adapters.

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Using the MBA software on the *EtherCD* to boot the PC:

- Eliminates the need to change PC or NIC-specific settings.
- Allows a user with an older version of MBA or PXE embedded in his or her system BIOS to get up and running with the latest version of MBA without waiting for a PC manufacturer's update.
- Enables a PC with a LAN CardBus PC card that does not contain a boot ROM or with a BIOS that does not enable the CardBus when the PC is booting to boot from the network. This includes:
  - PCs with USB but lacking a NIC.
  - The installed base of legacy 3Com 3C509(B) ISA NICs.

For information on configuring the MBA to boot from the network, see "Booting From the Network" on page 33.

3Com Connection Assistant

The 3Com Connection Assistant is an optional Web-based software component that allows users access to a variety of interactive technical support services.

These services can help you:

- Fix NIC installation problems.
- Fix network connection problems.
- Download the latest NIC drivers.
- Access a list of frequently asked questions as well as the 3Com Knowledgebase.

Depending on your network connection, you can obtain self-service support or assisted-service support via the Web:

- Self-service support—installed with the 3Com Connection Assistant software. The self-service support can detect and analyze installed NIC(s), and then run diagnostics tests that check for NIC functionality and network connectivity. If either test fails, step-by-step solutions appear, informing users how to correct the problem.
- Assisted service support—links you directly with 3Com support analysts, where you can receive answers to your support questions as well as help with diagnosing and fixing NIC problems. The assisted service support can capture information about your NIC and your system, and then use that information to automatically correct your NIC problem. The assisted service support is available only with an active Internet connection.

The 3Com Connection Assistant can be installed after you install the NIC driver. For more information, see "Installing and Using the 3Com Connection Assistant" on page 37.

NOTE: The 3Com Connection Assistant is supported on U.S. English PCs only.

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Desktop Management Interface (DMI) 2.0s

DMI 2.0s enables managed PCs and net PCs to report details about themselves and their peripheral devices across the network to a DMI 2.0s-compliant management application. A network administrator can then use this information to configure and manage a client or server PC remotely.

For instructions on installing the 3Com DMI Agent, see "Installing the 3Com DMI Agent" in Appendix C. For more detailed information on DMI, refer to the *3Com DMI Agent User Guide* located with the 3Com DMI Agent software on the *EtherCD*. Information is also available at:

http://www.3com.com

Dynamic*Access* LAN Agent

The Dynamic*Access* LAN agent is advanced network software that improves performance, management, and control of your network.

The Dynamic*Access* LAN agent enables the following features:

- RMON SmartAgents—Enables full RMON reporting on all network segments, including switched networks, without the need to place dedicated RMON probes throughout the network. RMON SmartAgents are for use with the Dynamic*Access* network edge monitor or other remote monitoring applications.
- Traffic prioritization (IEEE 802.1p/Q)—Ensures that business-critical and delay-sensitive traffic (such as multimedia applications) has priority over normal data.
- Fast IP—Eliminates router bottlenecks and improves performance in switched networks.
- Efficient multicast control—Prevents flooding of switched networks by multicast applications such as video training, stock quotes, or online news.

The Dynamic*Access* LAN agent can be installed on a PC running Windows 95, Windows 98, or Windows NT. See "Installing the DynamicAccess LAN Agent" in Appendix B for instructions.

For detailed information on the Dynamic*Access* LAN agent, refer to the *DynamicAccess Technology User Guide* located on the *EtherCD*.

Remote System Alerts

Remote system alerts enable a PC to monitor itself proactively and report detected problems to a management console on the network.

The 3C905CX-TX-M and 3C905C-TX-M NICs can be configured to send two types of remote system alerts:

- Heartbeat alert—the NIC continuously transmits a packet to an alert target management station. If the management station fails to receive the regularly scheduled packet, an alert can be triggered that signals a possible PC power loss or theft.
- Workgroup keep-alive alert—the NIC transmits a packet periodically while the PC is in a sleep state. This packet prevents the PC workstation address from being aged-out of switch and router tables.

NOTE: Only system administrators should configure these features. Refer to the ADVCONFG.TXT file located in the HELP directory on the *EtherCD* for more information.

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2 Installing and Connecting the NIC

This chapter describes how to install the NIC in your PC and connect it to an Ethernet or Fast Ethernet network.

Meeting PC Requirements

Your PC or server must meet the following requirements to install the NIC:

- 80486 or Pentium processor
- Available bus-mastering PCI slot
- Minimum of 640 K of memory

Obtaining Drivers

To obtain the latest drivers, or for a list of additional drivers that are not included on the *EtherCD*, go to the 3Com Web site and search for 3C905C drivers:

http://www.3com.com

Installation Overview

The NIC installation varies depending on your PC operating system. In some instances, you must run a preinstallation program *before* installing the NIC in the PC. Review the following table that summarizes the NIC installation before installing the NIC in the PC.

Operating System	Installation Steps
Windows XP Windows 2000 Windows Millennium Edition (Me)	**1** Install the NIC in the PC and connect it to the network. **2** Start the PC. The operating system detects the NIC and installs the driver. **3** After Windows starts, insert the *EtherCD* in the CD-ROM drive. **4** Update the NIC driver. **5** Reboot the PC.
Windows 98 Windows 95	**1** Run the *EtherCD* preinstallation program *before* installing the NIC in the PC. The preinstallation program prevents conflicts with the NIC and the operating system. It guides you through the installation and must be run before you physically install the NIC in the PC. **2** Install the NIC in the PC. **3** Connect the NIC to the network. **4** Install the NIC driver. **5** Reboot the PC.
Windows NT 4.0	**1** Install the NIC in the PC. **2** Connect the NIC to the network. **3** Install the NIC driver. **4** Reboot the PC.

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Installing Multiple NICs

If you are installing multiple 3Com NICs in a PC or server, follow the instructions in "Installing Multiple NICs" on page 25.

Updating the Network Driver and NIC Software

If you already have a 3Com NIC installed and want to update the driver and/or NIC software, follow the instructions in "Updating the Network Driver and NIC Software" on page 24.

Installing From Diskette

If your PC does not have a CD-ROM drive, access a PC that has a CD-ROM drive and create *installation* diskettes from the *EtherCD*. For instructions, see "Installing From Diskette" in Appendix D.

Running the Preinstallation Program for Windows 95/98

This section applies to Windows 95 and Windows 98 operating systems only.

If you are running Windows 2000, Windows XP, Windows Me, or Windows NT 4.0, go to "Inserting the NIC in the PC" on page 11 to begin the installation.

Before you physically install the NIC in a Windows 95 or 98 PC, run the NIC preinstallation program to properly set up your system environment. The preinstallation program prevents conflicts between the NIC and your operating system. It guides you through the NIC installation and *must be run before* you physically install the NIC in the PC.

To run the NIC preinstallation program:

1. Do not install the NIC in the PC.
2. Turn on the power to the PC and start Windows.
3. Quit any open applications and disable the automatic protection feature of any anti-virus software that may be running.
4. Insert the *EtherCD* in the CD-ROM drive.

   The *EtherCD* Welcome screen appears. If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

   `d:\installs\setup.exe`

   where d:\ represents the letter name of the CD-ROM drive.
5. Click *NIC Software*.
6. Click *NIC Drivers and Diagnostics*.
7. Click *Install NIC Driver*.
   - To install the network driver and the 3Com NIC Diagnostics program, click *Install with Diagnostic Program.*
   - To install the network driver only, click *Install without Diagnostic Program*.

     Files are copied. Do not continue until a message box appears, stating that the installation is complete.
8. Click *OK*.
9. Select your operating system to continue the installation.

   The Completing NIC Installation screen appears.

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10 Click *Done*.

11 Exit the *EtherCD*, shut down Windows, and then turn off the power to the PC.

Do not remove the *EtherCD* from the CD-ROM drive. The next step is to install the NIC in the PC. Go to the next section, "Inserting the NIC in the PC."

Inserting the NIC in the PC

The following instructions apply to installing the NIC in most PCs. If these instructions are not appropriate for your PC, refer to the documentation that accompanied your PC.

NOTE: If you have a Windows 95 or Windows 98 PC, do not install the NIC in your PC until you have run the preinstallation program, as described in the previous section,"Running the Preinstallation Program for Windows 95/98."

Before handling the NIC, touch the bare metal case of your PC to discharge static electricity from your body. While you are handling the NIC, wear a wrist strap grounded to the PC chassis.

To install the NIC in the PC:

1 Remove all jewelry from your hands and wrists. Use only insulated or nonconducting tools.

2 Turn off the power to the PC and unplug the power cord.

3 Remove the cover from the PC.

4 Locate an empty, nonshared bus-mastering PCI slot and remove its slot cover. Save the screw.

NOTE: Do not install the NIC in a shared PCI slot. Avoid any PCI slot next to an ISA slot. This slot is often shared and does not support bus mastering.

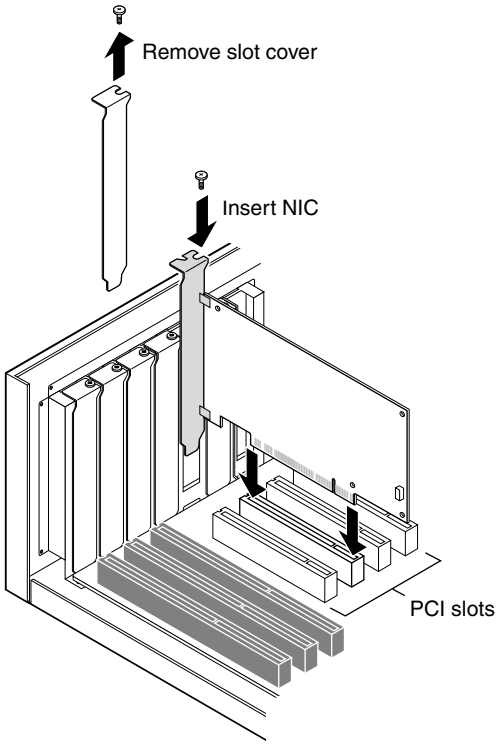
If you are planning to install the Remote Wake-Up cable, choose an empty PCI slot that is close to the matching connector on the PC motherboard. The Remote Wake-Up cable is required only if your NIC supports Remote Wake-Up and you want to use this feature.

If you do not know how to identify a PCI slot, check your PC documentation or ask your system administrator.

5 Carefully insert the NIC in the empty PCI slot.

Press firmly to ensure that the NIC is fully seated in the slot.

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6 Secure the NIC with the screw you removed earlier.

NOTE: If you want to install the Remote Wake-Up cable, go to the next section, "Connecting the Remote Wake-Up Cable," to continue the installation. If you do not want to connect the cable, continue with step 7.

7 Replace the PC cover and plug in the power cord.

Do not turn on the power to the PC. The next step is to connect the NIC to the network. Go to "Connecting the NIC to the Network" on page 14.

Connecting the Remote Wake-Up Cable

This section describes how to connect the Remote Wake-Up (RWU) cable from the NIC to the PC motherboard.

Connecting the Remote Wake-Up cable is optional. Connect this cable only if your NIC supports Remote Wake-Up and you want to use this feature. The following NICs support Remote Wake-Up:

- 3C905CX-TX-M
- 3C905C-TX-M
- 3C905B-TX
- 3C905B-TX-M
- 3C905B-COMBO
- 3C905B-FX
- 3C900B-FL

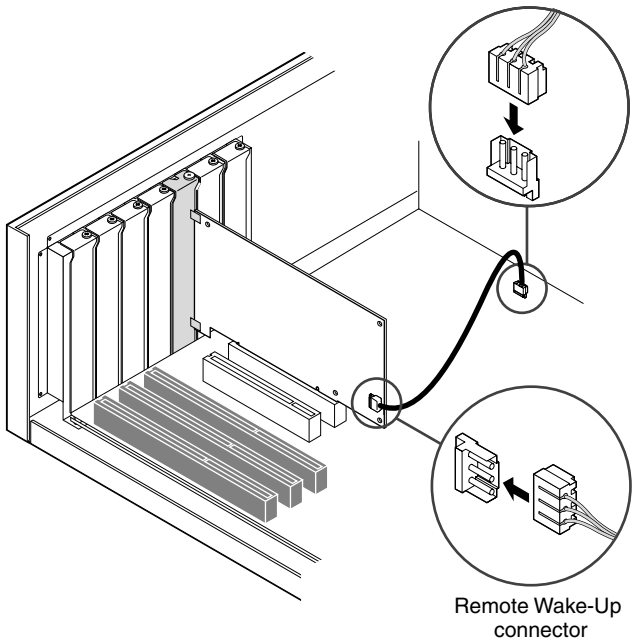
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NOTE: If you have a 3C905CX-TX-M or 3C905C-TX-M NIC and your PC is compliant with PCI 2.2, Remote Wake-Up is automatically enabled through the PCI bus. You do not need to connect the Remote Wake-Up cable.

To connect the Remote Wake-Up cable:

WARNING: Make sure that the PC power cord is unplugged. Only properly trained and authorized personnel should perform service. Consult your PC manufacturer for information about safe service techniques.

1. Make sure that the NIC is properly installed in a PCI slot.
2. Insert the Remote Wake-Up cable into the Remote Wake-Up connector on the NIC.
   Twist the cable twice before attaching the cable to the PC.
3. Attach the other end of the cable to the connector on the PC motherboard.
   Refer to your PC documentation if you need help locating the connector.
4. Replace the PC cover and plug in the power cord.
   Do not turn on the power to the PC. The next step is to connect the NIC to the network. Go to the next section, "Connecting the NIC to the Network."



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Connecting the NIC to the Network

Follow the procedure for the port that matches your NIC and your network environment.

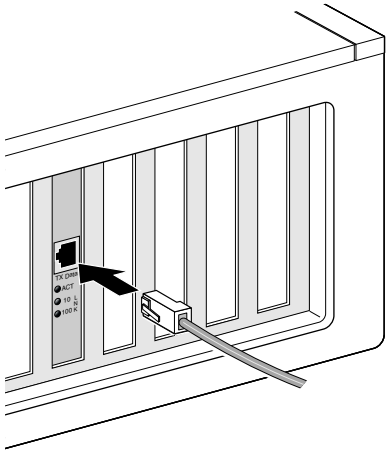
RJ-45 Port

On the 3C905CX-TX-M, 3C905C-TX-M and 3C905B NICs, the RJ-45 port provides a 10 Mbps or 100 Mbps connection automatically, depending on the speed of the connected hub or switch.

On the 3C900B NIC, the RJ-45 port provides a 10 Mbps connection only.

The following table shows the cable requirements and maximum network cable lengths for the RJ-45 port.

Network Environment	Cable Required	Maximum Cable Length
10 Mbps (10BASE-T)	Category 3, 4, or 5 unshielded twisted-pair	100 m (328 ft)
100 Mbps (100BASE-TX)	Category 5 unshielded twisted-pair	100 m (328 ft)



To connect the RJ-45 port:

1. Plug the RJ-45 connector on the twisted-pair network cable into the RJ-45 port on the NIC backplate.
2. Connect the other end of the network cable to an active network port.

   The next step is to install the NIC driver. Go to "Installing the NIC Driver and Software in Windows" on page 19 or "Installing the NetWare Server Driver" on page 27.

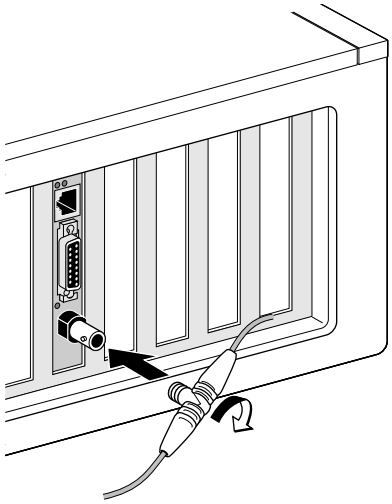
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BNC Port

The BNC port provides a 10 Mbps connection only.

The following table shows the cable requirement and maximum network cable length for the BNC port.

Port	Cable Required	Maximum Network Cable Length
BNC	10BASE2 thin Ethernet coaxial (10 Mbps only)	185 m (607 ft)



To connect the BNC port:

1. Connect the BNC connector on the thin Ethernet cable to the BNC port on the NIC.
2. Connect the other end of the network cable to another PC or to a 50-ohm terminator.

NOTE: If your PC is the last physical device in the network daisy chain, you must connect a 50-ohm terminator to the other end of the BNC T-connector.

The next step is to install the NIC driver. Go to "Installing the NIC Driver and Software in Windows" on page 19 or "Installing the NetWare Server Driver" on page 27.

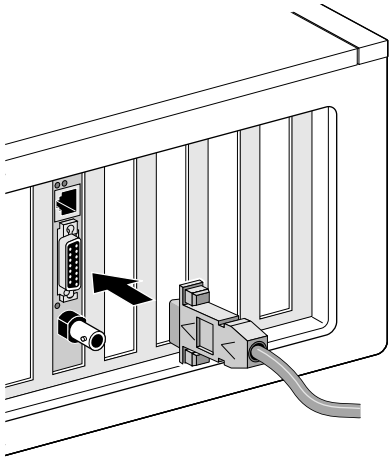
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AUI Port

The AUI port provides a 10 Mbps connection only.

The following table shows the cable requirement and maximum network cable length for the AUI port.

Port	Cable Required	Maximum Network Cable Length
15-pin AUI	10BASE5 thick Ethernet coaxial (10 Mbps only)	500 m (1,640 ft)



To connect the AUI port:

1. Locate the 15-pin AUI port on the NIC and move the slide latch down to the open position.
2. Connect the thick Ethernet coaxial cable to the AUI port on the NIC.
   This connector attaches in only one way. Orient the AUI connector to match the AUI port on the NIC.
3. Move the slide latch up to the closed position to lock the AUI connector in place.
4. Connect the other end of the network cable to an external transceiver.
   The next step is to install the NIC driver. Go to "Installing the NIC Driver and Software in Windows" on page 19 or "Installing the NetWare Server Driver" on page 27.

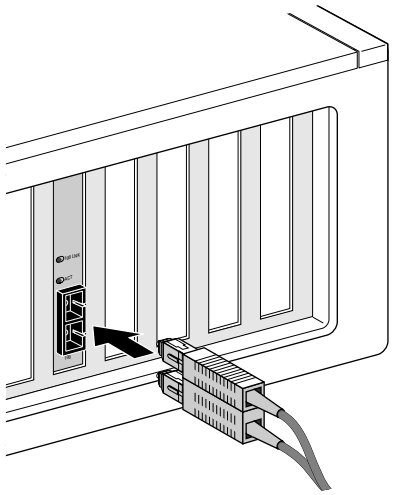
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SC Port

The SC port on the 3C905B-FX NIC provides a 100 Mbps fiber-based connection only.

The following table shows the cable requirements and maximum network cable lengths for the SC port.

Port	Cable Required	Maximum Network Cable Length
SC	Long-wavelength fiber-optic (1300 nm):	
	■ 50 µ/125 µ multimode fiber	Full-duplex: 2,000 m (6,560 ft) Half-duplex: 412 m (1,351 ft)
	■ 62.5 µ/125 µ multimode fiber	Full-duplex: 2,000 m (6,560 ft) Half-duplex: 412 m (1,351 ft)



To connect the SC port:

1. Remove the protective cover from the SC connector on the NIC.
2. Connect the network cable to the SC connector on the NIC.
3. Connect the other end of the cable to an active 100BASE-FX Fast Ethernet network port.

The next step is to install the NIC driver. Go to "Installing the NIC Driver and Software in Windows" on page 19 or "Installing the NetWare Server Driver" on page 27.

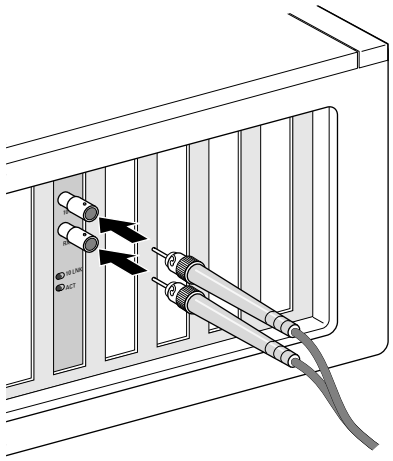
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ST Port

The ST port on the 3C900B-FL NIC provides a 10 Mbps fiber-based connection only.

The following table shows the cable requirements and maximum network cable lengths for the ST port.

Port	Cable Required	Maximum Network Cable Length
ST	Short-wavelength fiber-optic (850 nm):	
	■ 50 µ/125 µ multimode fiber	Full-duplex: 2,000 m (6,560 ft) Half-duplex: 412 m (1,351 ft)
	■ 62.5 µ/125 µ multimode fiber	Full-duplex: 2,000 m (6,560 ft) Half-duplex: 412 m (1,351 ft)



To connect the ST port:

1. Remove the protective covers from the ST connector on the NIC.
2. Connect the network cable to the ST connector on the NIC.

   The cable that you use for the 3C900B-FL NIC consists of two individual cables. You can insert either cable into the transmit (10) and receive (RX) connectors on the NIC.
3. Connect the other end of the network cable to a 10BASE-FL Ethernet network hub or switch.
   - Insert the cable that is connected to the transmit (10) connector on the NIC into the receive (RX) connector on the network hub or switch.
   - Insert the cable that is connected to the receive (RX) connector on the NIC into the transmit (TX) connector on the network hub or switch.

   The next step is to install the NIC driver. Go to "Installing the NIC Driver and Software in Windows" on page 19 or "Installing the NetWare Server Driver" on page 27.

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3 Installing the NIC Driver and Software in Windows

This chapter explains how to install the NIC driver and software using *EtherCD version* 5.4 after you have physically installed the NIC in the PC, as described in Chapter 2.

It also explains how to:

- Install the NIC diagnostics program after you have already installed the driver.
- Update the driver or NIC diagnostics program.
- Install multiple NICs.

To obtain the latest shipping version of a driver, go to:

http://www.3com.com/

The driver can be used in both Microsoft and NetWare network environments.

NOTE: For instructions on creating installation diskettes from the *EtherCD* to install the driver, see "Installing From Diskette" in Appendix D.

Windows XP, Windows 2000, and Windows Me

After you have physically installed the NIC in the PC and connected it to the network, as described in Chapter 2, follow the steps below to install the driver and NIC software.

1. Turn on the power to the PC.

   Windows detects the NIC and installs the driver. The driver that ships with Windows needs to be updated to the latest version on the *EtherCD*.

2. After Windows starts, insert the *EtherCD* in the CD-ROM drive.
3. Click *NIC Software*, *NIC Drivers and Diagnostics*, and then *Update Drivers and Diagnostics*.
4. To install the driver only, click *Update NIC Driver*. To install the driver and the NIC diagnostics program, click *Update with Diagnostics Program*.

   The NIC diagnostics program allows you to run tests that verify if the NIC is functioning correctly in the PC. It also allows you to view and configure NIC settings such as duplex mode and media type.

   You can install other NIC software, such as the 3Com Connection Assistant, DynamicAccess LAN Agent, or DMI Agent, after the NIC driver is installed. See the appropriate sections in this guide for more details:

   - Installing and Using the 3Com Connection Assistant on page 37
   - Installing the DynamicAccess LAN Agent on page 57
   - Installing the 3Com DMI Agent on page 61

5. Follow the prompts on the screen and then exit the *EtherCD* when the update is complete.
6. Reboot the PC.

   The installation is complete. Go to "Verifying Successful Installation" on page 22 to confirm that the NIC is installed properly.

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Windows 95 and Windows 98

Before installing the driver, make sure that:

- You have run the preinstallation program, as described in "Running the Preinstallation Program for Windows 95/98" on page 10.
- The NIC is installed in the PC and that it is connected to the network.
- You have the Windows installation files. These files may be on a CD or diskettes, or they may have been copied to your hard drive when Windows was installed on your PC.

Installing the Driver in Windows 95

To install the network driver and NIC software:

1. Turn on the power to the PC.

   Windows 95 detects the NIC. The Insert Disk dialog box appears, prompting you to insert the *EtherCD*.

   NOTE: If the New Hardware Found screen appears or the Update Device Driver Wizard starts, the NIC preinstallation program was not run on the PC. You can follow the prompts on the screen to install the driver only.

2. Make sure that the *EtherCD* is inserted in the CD-ROM drive.
3. Click *OK*.
4. Open the pull-down menu and select:

   `c:\windows\options\cabs`
5. Click *OK*.

   Files are copied.

   If this is the first time that networking is being installed on your PC, the Identification tab of the Network screen appears. Go to step 6.

   If networking has already been installed, go to step 7.
6. In the specified fields of the Identification tab screen, enter the following information, and then click *OK*:

   Computer Name—Identifies the PC on the network for other users. This entry must be a unique name of 15 characters or fewer, containing no spaces.

   Workgroup—Identifies the group (for example, your department name) to which your PC belongs. If you belong to a peer-to-peer network, this entry must be exactly the same for all the PCs on your network.

   Computer Description—Displays additional details to other users on the network about this PC. For example, you could specify that the PC has a printer attached. Filling in this field is optional.
7. Follow the prompts on the screen to continue the installation.

   If you are prompted to restart the PC, click *Yes*. You must restart the PC to complete the installation.

   NOTE: After Windows restarts, double-click the Network icon in the Windows Control Panel and make sure that the correct configuration settings are selected for your network environment. Contact your system administrator for assistance.

   The installation is complete. Go to "Verifying Successful Installation" on page 22 to confirm that the NIC is installed properly.

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Installing the Driver in Windows 98

To install the network driver and NIC software:

1. Turn on the power to the PC.

   The operating system detects the NIC. The Insert Disk dialog box appears, prompting you to insert the *EtherCD*.

NOTE: If the Add New Hardware Wizard starts, the NIC preinstallation program was not run on the PC. You can follow the prompts on the screen to install the network driver only. For instructions, see the WIN98.TXT file located in the HELP directory on the *EtherCD*.

2. Make sure that the *EtherCD* is inserted in the CD-ROM drive.
3. Click *OK*.
4. Open the pull-down menu and select:

   `c:\windows\options\cabs`
5. Click *OK*.

   Files are copied.

NOTE: If you are prompted for the *EtherCD*, click *OK*. Make sure that the drive letter of the CD-ROM drive (for example, d:\) appears in the dialog box, and then click *OK*.

   You are prompted for the Windows 98 CD.

6. Remove the *EtherCD*, insert the Windows 98 CD, and then click *OK*.

   Files are copied. You are prompted to restart the PC.
7. Remove the Windows 98 CD, and then click *Yes* to restart the PC.

NOTE: You must restart the PC to complete the installation. After Windows restarts, double-click the Network icon in the Windows Control Panel and make sure that the correct configuration settings are selected for your network environment. Consult your system administrator for assistance.

The installation is complete. Go to "Verifying Successful Installation" on page 22 to confirm that the NIC is installed properly.

Windows NT 4.0

After you have physically installed the NIC in the PC and connected it to the network, as described in Chapter 2, follow the steps below to install the driver and NIC software.

1. Turn on the power to the PC.
2. Double-click the My Computer icon, then the Control Panel icon, and then the Network icon.

   The Network window appears.
3. Click the Adapters tab.

   If networking has not been installed on your PC before, Windows NT asks you if you want to install networking. Click *Yes*. Refer to the WINNT.TXT file located on the *EtherCD* or your Windows NT documentation for instructions.
4. Click *Add*.

   The Select Network Adapter dialog box appears.

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5 Click *Have Disk*.

The Insert Disk dialog box appears.

6 Insert the *EtherCD in the CD-ROM drive*.

7 Make sure that the letter name of the CD-ROM drive (for example, d:\) appears in the entry box, and then click *OK*.

The Select OEM Option dialog box appears.

8 Make sure that the *3Com EtherLink PCI NIC* is selected, and then click *OK*.

The Adapters tab of the Network screen appears.

9 Click *Close*.

If the Microsoft TCP/IP Properties screen appears, enter the requested information for your network environment. Consult your system administrator or refer to the Windows NT documentation for assistance.

If the Microsoft TCP/IP Properties screen does not appear, the installation is complete.

10 Click *Yes* to restart the PC.

The network driver installation is complete. Go to the next section, "Verifying Successful Installation," to confirm that the NIC is installed properly.

Verifying Successful Installation

Follow the steps for your operating system.

Windows XP and Windows 2000

To verify successful NIC installation:

1 Right-click the My Computer icon, and then click *Properties*.

2 Select the Hardware tab, and then click *Device Manager* in the middle panel.

3 Double click *Network Adapters* and make sure that the name of the 3Com EtherLink NIC appears.

If a red X or a yellow exclamation point (!) appears by the name of the NIC, the installation was not successful. See "Troubleshooting the NIC Installation" on page 39 for troubleshooting help.

Windows Me, Windows 98, and Windows 95

To verify successful NIC installation:

1 Right-click the My Computer icon, and then click *Properties*.

2 Select the Device Manager tab.

3 Double-click *Network adapters* and make sure that the name of the 3Com EtherLink NIC appears.

If a red X or a yellow exclamation point (!) appears by the name of the NIC, the installation was not successful. See "Troubleshooting the NIC Installation" on page 39 for troubleshooting help.

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Windows NT 4.0

To verify successful NIC installation:

1. Double-click the My Computer icon, then the Control Panel icon, and then the Network icon.
2. Select the Adapters tab.
3. Make sure that the name of the NIC appears in the list of network adapters.

   If the name of the NIC does not appear in the list of network adapters, the installation was not successful. See "Troubleshooting the NIC Installation" on page 39 for troubleshooting help.

Installing the 3Com NIC Diagnostics Program

If you installed the driver only and at a later time want to install the 3Com NIC Diagnostics program, you must run the Update NIC Driver program on the *EtherCD*.

The 3Com NIC Diagnostics program allows you to run tests that determine the status of your network and the NIC. It also allows you to configure the NIC, view network statistics and LEDs, and access support databases.

NOTE: When you install the 3Com NIC Diagnostics program, the network driver is automatically updated to the latest version on the *EtherCD*.

To install the 3Com NIC Diagnostics program:

1. Turn on the power to the PC and start Windows.
2. Insert the *EtherCD* in the CD-ROM drive.

   The *EtherCD* Welcome screen appears.

   If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

   `d:\installs\setup.exe`

   where d:\ represents the letter name of the CD-ROM drive.
3. Click *NIC Software*.
4. Click *NIC Drivers and Diagnostics*.
5. Click *Update NIC Driver.*
6. Click *Update Drivers and Diagnostic Program.*
7. Follow the prompts on the screen, and then exit the *EtherCD* when the update is complete.
8. Restart Windows.

   The installation is complete.

To start the 3Com NIC Diagnostics program:

1. Open the Windows *Start* menu.
2. Select *Programs*, and then *3Com NIC Utilities.*
3. Click *3Com NIC Doctor.*

   For instructions on using the program, see "Running the NIC Diagnostics Tests" on page 47.

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Updating the Network Driver and NIC Software

The latest 3Com drivers can be downloaded from:

http://www.3com.com/

Using Diskettes

To update the driver using diskettes that were downloaded from the Web or that were created using the *EtherCD*:

1. Open the Windows Device Manager.
2. Locate the 3Com NIC under Network Adapters, and then click *Properties*.
3. Select the Driver tab.
4. Click *Update Driver*.
5. Follow the prompts on screen and insert the correct diskette when prompted.

Using the *EtherCD*

To update the driver and NIC diagnostic software using the *EtherCD*:

1. Turn on the power to the PC and start Windows.
2. Insert the *EtherCD* in the appropriate drive in the PC.

   The *EtherCD* Welcome screen appears.

   If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

   `d:\installs\setup.exe`

   where d:\ represents the letter name of the drive your are using.
3. Click *NIC Software*.
4. Click *NIC Drivers and Diagnostics*.
5. Click *Update*.

   To update the network driver only, click *Update Drivers and remove Diagnostics Program*.

   To update the network driver and NIC diagnostics software, click *Update Drivers and Diagnostics Program*.
6. Follow the prompts on the screen.

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Installing Multiple NICs

This section describes how to install multiple 3Com PCI NICs in a PC.

NOTE: You must use these procedures to install multiple NICs. Failure to follow these procedures may lead to problems requiring you to reinstall your operating system.

Windows XP, Windows 2000, and Windows Me

To install multiple NICs in a PC running Windows 2000, Windows XP, or Windows Me, install and configure each NIC individually, following these steps:

1. Install the first NIC in your PC and connect it to the network, as described in "Inserting the NIC in the PC" on page 11.

CAUTION: Do not physically install the second NIC in your PC until you complete the driver installation for the first NIC, following the steps below.

2. Turn on the power to the PC.

   Windows detects the NIC and installs the driver. The driver that ships with Windows needs to be updated to the latest version on the *EtherCD*.

3. After Windows starts, insert the *EtherCD* in the CD-ROM drive.
4. Click *NIC Software*, *NIC Drivers and Diagnostics*, and then *Update Drivers and Diagnostics*.
5. To install the driver only, click *Update NIC Driver*. To install the driver and the NIC diagnostics program, click *Update with Diagnostics Program*.
6. Follow the prompts on the screen and then exit the *EtherCD* when the update is complete.
7. Reboot the PC.
8. After the PC restarts, shutdown Windows and turn the power off to the PC. Make sure that the PC is unplugged.
9. Install the second NIC in your PC and connect it to the network.
10. Plug in the PC power cord, turn on the power to the PC, and then start Windows.

    Windows detects the second NIC. The second NIC uses the same network driver as the first NIC. You are not prompted for the *EtherCD*.

    When Windows starts, the second NIC appears under *Network adapters* in the Device Manager.

11. Repeat the process for each additional NIC to be installed.

Windows 95 and Windows 98

To install multiple NICs in a PC running Windows 95 or Windows 98, install and configure each NIC individually, following these steps:

1. Run the preinstallation program before installing the NICs in the PC, as described in "Running the Preinstallation Program for Windows 95/98" on page 10.
2. Install the first NIC in your PC and connect it to the network, as described in "Inserting the NIC in the PC" on page 11.

CAUTION: Do not physically install the second NIC in your PC until you complete the driver installation for the first NIC, following the steps below.

3. Turn on the power to the PC and start Windows.

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4 Insert the *EtherCD when prompted,* and then click *OK*.

5 Follow the prompts on the screen to install the network driver.

See the "Installing the Driver in Windows 95" or "Installing the Driver in Windows 98" section earlier in this chapter for instructions.

6 After the network driver is installed, restart the PC.

7 After the PC restarts, exit Windows and turn the power off to the PC. Make sure that the PC is unplugged.

8 Install the second NIC in your PC and connect it to the network.

9 Plug in the PC power cord, turn on the power to the PC, and then start Windows.

Windows detects the second NIC. The second NIC uses the same network driver as the first NIC. You are not prompted for the *EtherCD*.

When Windows starts, the second NIC appears under *Network adapters* in the Device Manager.

10 Repeat the process for each additional NIC to be installed.

Windows NT 4.0

To install multiple NICs in a PC running Windows NT 4.0:

1 Install the NICs in your PC and connect each to the network.

2 Turn on the power to the PC and start Windows NT.

3 Double-click the My Computer icon, then the Control Panel icon, and then the Network icon.

The Network screen appears.

4 Select the Adapters tab.

5 Click *Add*.

The Select Network Adapter screen appears.

6 Click *Have Disk*.

7 Insert the *EtherCD*.

8 Make sure that d:\ appears in the entry box (where d:\ represents the letter name of the CD-ROM drive), and then click *OK*.

The Select OEM Option screen appears with the name of one of the NICs selected. Only one NIC appears on this screen.

9 Click *OK*.

Files are copied. The Network screen appears with the name of the first installed NIC.

10 Close the Network screen.

If you are prompted for network information, enter the requested information.

11 Restart the PC.

12 After Windows NT starts, repeat steps 3 through 11 for each NIC that is installed in the PC.

NOTE: You will not be prompted for the *EtherCD* when you install the network driver for the second NIC.

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4 Installing the NetWare Server Driver

This chapter describes how to install the NetWare 3.x, 4.x, and 5.x server drivers. To obtain the latest shipping version of a driver, go to:

http://www.3com.com/

Installing the Server Driver

The \NWSERVER directory on the *EtherCD* contains the network driver file (3C90XC.LAN) to be used for servers running NetWare 3.x, 4.x or 5.x.

Additional files (NetWare Loadable Modules [NLMs]) that are required for servers running NetWare are on the *EtherCD* in the \NWSERVER directory, or they can be obtained from Novell.

NOTE: The 3Com PCI NICs do not support NetWare 3.xx or 4.xx servers that are not updated to the latest driver pack.

Obtaining NetWare Loadable Modules

You can obtain current NLMs for the NetWare servers listed in the table below from the Novell World Wide Web site:

http://www.support.novell.com

Netware Server	NLM Name
NetWare 3.12	ETHERTSM.NLM
	NBI31X.NLM
	MSM31X.NLM
NetWare 4.10, 4.11	ETHERTSM.NLM
	NBI.NLM
	MSM.NLM
NetWare 5.x	ETHERTSM.NLM
	MSM.NLM

NetWare 3.12

To install the driver in a NetWare 3.12 server:

1. Copy the MSM31X.NLM, ETHERTSM.NLM, and NBI31.NLM files from the *EtherCD* to the directory on your hard drive where other NLM files are located.
2. Copy the LAN driver file (3C90XC.LAN) from the *EtherCD* to the same directory.
3. Add the following two lines to the AUTOEXEC.NCF file:

   ```
   load C:\NWSERVER\3C90XC.LAN slot=<slot> NAME=<name>
   FRAME=<frametype>
   bind ipx to <name> net=<number>
   ```

4. Save and exit the file, and then reboot the server.

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NetWare 4.x and 5.x

There are two ways to install the NetWare 4.x or 5.x driver:

- Import the driver when installing the NetWare server software.
- Copy the driver to the server's hard disk, and then load the driver manually.

NOTE: Make sure that you have the latest NetWare Support Pack installed. The support pack changes the LOADER.EXE file and provides the NBI.NLM, MSM.NLM, and ETHERTSM.NLM files. 3Com has provided the latest *.NLM files (at time of testing) on the *EtherCD* in the \NWSERVER directory. Copy these files to the same location as the server driver. Under some circumstances, where NBI.NLM (NBI31x.NLM for 3.x) will be loaded at server startup time, you should also copy the NBI.NLM file to the server startup directory.

Importing the Server Driver

To import the server driver into a NetWare 4.x or 5.x server:

1. Install the NetWare server software.
2. Insert the *EtherCD* in the CD-ROM when the NIC selection menu appears.
3. Press the [Insert] key.
   This key tells the server installation program that you want to add a driver externally.
4. Press the [F3] key.
   This key tells the server installation program that you want to change the path.
5. At the prompt, enter the command:
   `<drive>:\NWSERVER`
   For example:
   `a:\nwserver`
   The installation program gathers the files and prompts you for a NIC selection.
6. Press the [Enter] key to select the driver displayed and continue the installation.

Loading the Driver Manually

To update an existing server driver manually:

1. Copy all of the files from the \NWSERVER subdirectory on the *EtherCD* to the server's hard drive.
2. Boot the server and launch the Install program.
3. Edit the AUTOEXEC.NCF file to add the following line (assuming the server start directory is C:\NWSERVER, where the LAN drivers and NLM files were copied):
   `LOAD C:\NWSERVER\3C90XC.LAN SLOT=<slotnumber>`
   The <slotnumber> variable is the hexadecimal slot number of the PCI NIC. This address can be obtained by issuing a load command, where the driver identifies the slot numbers. Pressing the [Esc] key prevents loading of the driver. Because of the Novell scheme for identifying PCI slots, it is not possible for 3Com to pre-identify the slot number. See "Verifying the PCI Slot Number" on page 29 for instructions on obtaining this number.

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Installing Multiple NICs

To support more than one NIC in a NetWare server, change the AUTOEXEC.NCF file to the following format:

```
load C:\NWSERVER\3C90XC.LAN slot=<slot1> NAME=<name1>
FRAME=<frametype1>
bind ipx to <name1> net=<net1>
load C:\NWSERVER\3C90XC.LAN slot=<slot2> NAME=<name2>
FRAME=<frametype2>
bind ipx to <name2> net=<net2>
```

The values <slot1> and <slot2> are the numbers of the PCI slots in which the NICs are physically installed. To view the numbers of these PCI slots, use the 3Com Configuration and Diagnostic program for DOS. See "Verifying the PCI Slot Number" on page 29 for instructions.

The values <name1> and <name2> are unique names assigned to each NIC by your system administrator. The values <name1> and <name 2> must be different.

The frame parameters <frametype1> and <frametype2> can be one of the following:

- Ethernet_802.2
- Ethernet_802.3
- Ethernet_II
- Ethernet_SNAP

Make sure that the frametype for the server and the workstation is the same. For example, if the server uses Ethernet_802.2, the workstation must also use Ethernet_802.2.

The values <net1> and <net2> are unique numbers assigned by the system administrator to each NIC. Make sure that <net1> and <net2> are different numbers.

Refer to the appropriate Novell NetWare manuals for further information.

Verifying the PCI Slot Number

To verify the PCI slot number in which a NIC is installed:

1. Boot the NetWare server with the -na option.

   This boot prevents the AUTOEXEC.NCF file from loading. For example, enter:

   ```
   server -na
   ```

2. Issue the load command for the NIC LAN driver without a slot parameter.

   For example, enter:

   ```
   load c:\nwserver\3C90XC.LAN
   ```

3. NetWare lists the valid slot number(s) for the NIC, depending on how many NICs are installed. The values appearing in the list are the slot values that you should use.

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5 Configuring the NIC

This chapter describes how to configure the NIC.

NOTE: Before you change the NIC configuration settings, consult your system administrator.

Default NIC Settings

The table below lists the configuration settings for the NIC. The default setting is in **bold** in the Settings column.

Option	Description	Settings
Network Driver Optimization	Specifies how to optimize the network driver for your network by allowing trade-offs between network performance and CPU utilization. ■ *Normal* balances CPU utilization and network performance. ■ *Minimized CPU Utilization* saves CPU resources for other tasks. ■ *Maximized Network Performance* is appropriate if no other applications are making major demands on CPU resources.	■ **Normal** ■ Minimized CPU Utilization ■ Maximized Network Performance
Duplex	Determines if the NIC transmits data across the network in both directions simultaneously (full-duplex) or in one direction at a time (half-duplex). ■ *Auto Select* allows the NIC to automatically connect at the duplex mode of the connected hub or switch. When you select this setting, the *Media Type* is automatically set to *Auto Select*. ■ *Full-Duplex* sets the NIC to operate in full-duplex mode. To use this setting, the switch that you are connected to must support full-duplex. You must also manually set the NIC *Media Type* setting. ■ *Half-Duplex* sets the NIC to operate in half-duplex mode. You must also manually set the NIC *Media Type* setting.	■ **Auto Select** ■ Full-Duplex ■ Half-Duplex
Boot PROM	Enables or disables the NIC's boot ROM (if a boot ROM is installed on the NIC).	■ **Enabled** ■ Disabled
Media Type	Determines the type of media your network is using. ■ *Auto Select* allows the NIC to automatically select the *Media Type* for you. ■ If you set the NIC *Duplex* setting to *Auto Select*, the *Media Type* is automatically set to *Auto Select*. ■ If you set the NIC *Duplex* setting manually, you must set the *Media Type* setting manually.	■ **Auto Select** ■ 10BASE-T (10Mb/s) ■ 100BASE-TX (100Mb/s) ■ AUI ■ BNC ■ 100BASE-FX ■ 10BASE-FL

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Configuration Methods

The NIC can be configured using any of the methods listed in the table below.

NOTE: This chapter describes how to configure the NIC using the 3Com NIC Diagnostics program for Windows. For instructions on using the other methods, see the file or section mentioned in the table.

Method	Description	Requirement(s)
3Com NIC Diagnostics program for Windows	Configure the NIC locally using the 3Com NIC Diagnostics program for Windows: **1** Make sure that the 3Com NIC diagnostics program is installed. See "Installing the 3Com NIC Diagnostics Program" on page 23 for instructions. **2** Open the Windows *Start* menu. **3** Select *Programs*, and then *3Com NIC Utilities*. **4** Click *3Com NIC Doctor*.	Windows 2000, Windows XP, Windows Me, Windows 98, Windows 95, or Windows NT 4.0
Advanced tab in the Windows Device Manager	Configure the NIC locally using the Advanced tab in the Windows Device Manager. Refer to your Windows documentation for instructions.	Windows XP or Windows 2000
3Com Configuration and Diagnostics program for DOS	Configure the NIC locally using the 3Com Configuration and Diagnostics program for DOS: **1** Copy the 3C90xcfg.exe file from the *EtherCD* to a diskette. **2** Reboot the PC using a DOS-bootable diskette. **3** Insert the diskette containing the 3C90xcfg.exe file in the PC. **4** Enter at the DOS prompt: `a:\3c90xcfg.exe` See the DOSDIAG.TXT file located in the HELP directory on the *EtherCD* for more information. Customers running Japanese DOS must switch to U.S. mode DOS before running this program.	DOS, Windows NT 3.51, Windows 3.x, or Windows for Workgroups
DMI 2.0s	Configure the NIC remotely using the 3Com DMI Agent software. See Appendix C, "Installing the 3Com DMI Agent," for more information.	3Com DMI Agent and a DMI-compatible browser or a network management application that supports DMI 2.0s

Changing General NIC Configuration Settings

Before you configure the NIC, make sure that the:

- NIC is installed in the PC and is connected to the network.
- Driver is installed.
- 3Com NIC Diagnostics program is installed.

To change the NIC general configuration settings, such as network driver optimization, duplex mode, and media type:

1. Open the Windows *Start* menu.
2. Select *Programs*, and then *3Com NIC Utilities.*
3. Click *3Com NIC Doctor.*

   The 3Com NIC Diagnostics General screen appears.

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NOTE: Click *Help* to obtain general information about the function of a screen. To obtain specific information about any topic on a screen, click the question mark (?) in the upper right corner of the screen, move it over a topic, and click once.

4 If your PC has more than one NIC installed, open the Network Interface Card (NIC) list box and select the NIC to be configured.

5 Click the Configuration tab.

The Configuration screen appears.

6 Under Network Parameter, select the setting to be changed.

For a description of each setting, click the question mark (?) in the upper right corner of the screen, move it over a setting, and click once.

7 Open the Set Value list box and select a new value from the list of available options.

Repeat the process to change any other configuration setting.

To undo changes and return the settings to their previous values, click *Undo Changes*. To return the settings to the factory default settings, click *Set Factory Defaults*.

8 Click *OK* to save the changes and exit the program.

Booting From the Network

This section explains how to use the Managed PC Boot Agent (MBA) to boot from the network.

NOTE: For detailed information on using, configuring, and troubleshooting the MBA, refer to the *Managed PC Boot Agent User Guide*, located with the MBA software on the *EtherCD*.

The MBA allows the PC to boot from the server rather than from its local hard drive.

Previously available only on a boot ROM on the NIC, the MBA software is now available on the *EtherCD*, where it can be used as a bootable CD. When you boot the PC with the *EtherCD*, MBA uses the NIC to do a network boot, allowing the PC to be managed in the preboot stage.

Using the *EtherCD* to Boot from the Network

These instructions apply to NICs that do not contain a boot ROM.

If the NIC installed in your PC does contain a boot ROM and you want to use the *EtherCD* instead of the boot ROM to boot from the network, you must first either disable the boot ROM on the NIC (see "Enabling or Disabling the Boot ROM Setting" on page 35 for instructions), or place the CD-ROM drive before the boot ROM in the order of boot devices on the PC. (The order of boot devices can be modified through the PC BIOS setup. Refer to your PC documentation for instructions.)

NOTE: The default MBA configuration setting on the *EtherCD* is the PXE boot method. If you need another boot method, you must create a bootable MBA floppy disk or CD containing the new boot method. For instructions, see the "MBA on Disk" section in the *Managed PC Boot Agent User Guide* located with the MBA software on the *EtherCD*.

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To boot from the network using the MBA software on the *EtherCD*:

1. Insert the *EtherCD* in the CD-ROM drive.
2. Reboot the PC.

   The MBA code runs and attempts to boot from the network using the default protocol PXE.

NOTE: To cancel the network boot, press the [Esc] key anytime during the network boot process.

Using the Boot ROM on the NIC to Boot from the Network

The boot process for the MBA boot ROM varies depending on the type of PC you have (BBS BIOS-compatible or non-BBS BIOS-compatible).

If your PC was purchased recently, it may be BBS (BIOS Boot Specification) BIOS-compatible. The BBS determines how the system BIOS identifies boot devices in a PC (such as a CD-ROM drive, a hard drive, or a floppy drive), allows the user to select the boot order of these devices, and then attempts to boot from each device in the specified order.

Refer to your PC documentation if you do not know which type of PC you have.

BBS BIOS-Compatible PCs

To enable a BBS BIOS-compatible PC to boot from the network using the MBA boot ROM:

1. Make sure that the NIC boot ROM setting is *Enabled.*

   See the previous section, "Enabling or Disabling the Boot ROM Setting," for instructions.
2. Set the MBA manually as the first boot device in the PC BIOS.

   Refer to your PC documentation for instructions on accessing and configuring the PC BIOS.
3. Reboot the PC.

   The MBA attempts to boot from the network using the default boot method PXE.

   To change the default method or any other MBA configurations, press the Ctrl+Alt+B keys when the following message appears:

   ```
   Initializing MBA. Press Ctrl+Alt+B to configure...
   ```

   If the network boot fails, the following message appears:

   ```
   Network boot aborted, press any key to continue
   ```

   The BIOS continues to the next device in the boot order (for example, the local hard drive).

NOTE: To cancel the network boot, press the [Esc] key anytime during the network boot process.

Non-BBS BIOS-Compatible PCs

To enable a non-BBS BIOS-compatible PC to boot from the network using the MBA boot ROM:

1. Make sure that the NIC boot ROM setting is *Enabled.*

   See "Enabling or Disabling the Boot ROM Setting" below for instructions.
2. Change the MBA default boot setting from *Local* to *Network*.

   To change the default boot setting or any other MBA configurations, use the MBACFG utility located on the MBA utility diskette or press the Ctrl+Alt+B keys when the following message appears:

   ```
   Initializing MBA. Press Ctrl+Alt+B to configure...
   ```


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NOTE: For more information on using, configuring, and troubleshooting the MBA boot ROM, refer to the *Managed PC Boot Agent User Guide*, located with the MBA software on the *EtherCD*.

Enabling or Disabling the Boot ROM Setting

To enable or disable the boot ROM setting on the NIC:

1. Make sure that the NIC is installed and is connected to the network and that the driver is installed.
2. Open the Windows *Start* menu.
3. Select *Programs*, and then *3Com NIC Utilities.*
4. Click *3Com NIC Doctor.*
   The 3Com NIC Diagnostics General screen appears.
5. Click the Configuration tab.
   The Configuration screen appears.
6. Under Network Parameter, select *Boot PROM*.
7. Open the Set Value list box and select *Enabled* to enable the boot ROM or *Disabled* to disable the boot ROM.
8. Click *OK* to save the setting and exit the program.

Disabling the 3Com Logo

To disable the 3Com logo that appears on the screen when the NIC first connects to the network:

1. Make sure that the NIC, the network driver, and the 3Com NIC Diagnostics program are installed.
2. Open the Windows *Start* menu.
3. Select *Programs*, and then *3Com NIC Utilities.*
4. Click *3Com NIC Doctor.*
   The 3Com NIC Diagnostics General screen appears.
5. On the General screen, make sure that the check box next to *Show 3Com Logo on Startup* is not selected.
6. Exit the 3Com NIC Diagnostics program.

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6 Troubleshooting the NIC

This chapter explains how to:

- Install and use the 3Com Connection Assistant.
- Access 3Com support databases.
- Troubleshoot NIC installation problems.
- Troubleshoot NIC and network connection problems.
- Troubleshoot Remote Wake-Up.
- Remove the NIC diagnostics software.
- Remove the network driver.

NOTE: To access a database of technical information that can help you diagnose and solve NIC installation, configuration, and upgrade problems, go to:

http://knowledgebase.3com.com

Installing and Using the 3Com Connection Assistant

The 3Com Connection Assistant is an optional Web-based software component that allows users access to a variety of interactive technical support services.

These services can help you:

- Fix NIC installation problems.
- Fix network connection problems.
- Download the latest NIC drivers.
- Access a list of frequently asked questions as well as the 3Com Knowledgebase.

System Requirements

To install and use the 3Com Connection Assistant requires:

- Windows 95, Windows 98, Windows Me, Windows 2000, or Windows NT 4.0.
- Internet Explorer version 4.0 or later or Netscape Navigator version 4.06 or later.
- Microsoft Java Virtual Machine (JVM)

  Refer to your PC documentation if you are unsure whether your PC is a Microsoft Java Virtual Machine (JVM).

NOTE: The 3Com Connection Assistant is currently not supported in Windows XP. Check the 3Com Web site for support updates.

Installation

1. Insert the *EtherCD* in the CD-ROM drive.

   The *EtherCD* Welcome screen appears. If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

   `d:\setup.exe`

   where d:\ represents the letter name of the CD-ROM drive.

2. Click *NIC Software*.

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3 Click *3Com Connection Assistant*.

4 Click *Install 3Com Connection Assistant*.

5 Follow the prompts on the screen.

A 3Com Connection Assistant icon appears on your Windows desktop. Double-click the icon to start the program. For help on using the 3Com Connection Assistant, refer to the online help included with the software.

Accessing 3Com Support Databases

In addition to the 3Com support databases listed in this section, refer to the README.TXT and the Help text files located in the HELP directory on the *EtherCD* for troubleshooting information.

Knowledgebase

To access a database of technical information that can help you diagnose and solve NIC installation, configuration and upgrade problems, go to:

http://knowledgebase.3com.com

NIC Help System

To access the 3Com NIC Help system:

1 Make sure that the NIC, its driver, and the 3Com NIC Diagnostics program are installed.
See "Installing the 3Com NIC Diagnostics Program" on page 23 for instructions.

2 Open the Windows *Start* menu.

3 Select *Programs*, and then *3Com NIC Utilities*.

4 Select *3Com NIC Doctor Help*.
The main Help screen appears.

5 Click *Help Topics* to display a list of Help topics or click *Find* to search for a Help topic.

Release Notes and Frequently Asked Questions

To access release notes and frequently asked questions about the NIC:

1 Make sure that the NIC, its driver, and the 3Com NIC Diagnostics program are installed.
See "Installing the 3Com NIC Diagnostics Program" on page 23 for instructions.

2 Open the Windows *Start* menu.

3 Select *Programs*, and then *3Com NIC Utilities.*

4 Click *3Com NIC Doctor.*
The 3Com NIC Diagnostics General screen appears.

5 Click the Support tab.
The Support screen appears.

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6 *Click Support Databases* to display customer support databases about the NIC in three categories:
   - **Release notes**—Display tips about installing and using the NIC.
   - **Frequently asked questions**—Display common questions asked by customers and answered by 3Com support experts.
   - **Knowledgebase topics**—Display NIC compatibility topics.

Troubleshooting the NIC Installation

If you encounter any of the following problems or error messages, follow the steps in "Cleaning Up a Failed Installation" below to resolve the problem.

- A red X or a yellow exclamation point (!) appears by the name of the NIC in the Windows Device Manager.
- The Network Neighborhood icon does not appear on the Windows desktop.
- The NIC does not appear in the Network Configuration or Properties window.
- Error: "This device is not present, not working properly, or does not have all of the driver installed. Code 22."
- Error: "Windows was unable to locate a driver for this device."
- Error: "You have selected a plug and play adapter. Please turn off your machine and install the adapter. Then turn on your machine and reinstall."

Cleaning Up a Failed Installation

If the network driver installation failed, follow the steps below to clean up your system and install the NIC correctly. This procedure:

- Removes all 3C90x NICs from your system.
- Removes the 3Com NIC Diagnostics program.
- Installs the latest network driver only.

You can reinstall the 3Com NIC Diagnostics program after completing this procedure. See "Installing the 3Com NIC Diagnostics Program" on page 23 for instructions.

1 Insert the *EtherCD* in the CD-ROM drive.
   The *EtherCD* Welcome screen appears.
2 Click *NIC Software*.
3 Click *NIC Drivers and Diagnostics*.
4 Click *Installation Utilities*.
5 Click *Undo Broken Installation and Uninstall*.
6 Click *Proceed*.
   A message appears stating that all of the 3Com NICs will be removed from your system.
7 Click *OK*.
   A message appears stating that the NIC has been removed.
8 Click *OK*.
9 Exit the *EtherCD*, and then exit Windows.
10 Reboot the PC.

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11 Install the network driver, as described in "Installing the NIC Driver and Software in Windows" on page 19.

If you are prompted for 3Com files when Windows restarts on Windows 95 and Windows 98 PCs, open the drop-down box and select the following path:

```
\options\cabs
```

To verify successful installation, see "Verifying Successful Installation" on page 22.

Other Installation Problems

3Com has found that some PCI computers require additional configuration steps to install a PCI NIC. 3Com recommends these steps:

1 Determine whether you have the latest BIOS version for your PC. Consult the PC manufacturer to make sure that you are using the latest BIOS.

2 Make sure that the BIOS is set up correctly.

In some PCI computers, you may need to enable the PCI slot using the BIOS Setup program. Enabling the PCI slot is especially common in PCI computers with a Phoenix BIOS.

a After installing the NIC, turn on the PC and enter the Setup program during system initialization (usually by pressing the [F1], [F2], or [Ctrl]+[Alt]+[S] keys). The correct key to press is usually shown on the screen.

b Once in the Setup program, find the entry for PCI slots and set these parameters as shown in the table below. The entry for the PCI slots may be in the main menu, or sometimes in advanced system configuration.

BIOS System Parameters	Setting
PCI Slot Number	Slot where the 3Com PCI NIC is installed (1-3)
Master	ENABLED
Slave	ENABLED
Latency Timer	40
Interrupt	Choose any one of several available interrupts that Setup provides.
Edge or Level	Level Triggered Interrupt

NOTE: The exact wording of each of the parameters varies from computer to computer. Save the changes, exit the Setup program, and continue with the installation.

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Troubleshooting the Network Connection

If you encounter problems with the NIC or connecting to the network, check the table below for troubleshooting tips.

CAUTION: Before inserting or removing the NIC from the PC, turn the PC power off and unplug the power cord.

Tip	Description
Check the NIC installation	On a Windows 98, 95, or NT 4.0 PC, make sure that you have run the preinstallation program, as described in "Running the Preinstallation Program for Windows 95/98" on page 10. This program must be run *before* installing the NIC in a PC with one of these operating systems. Make sure that the NIC is installed correctly in a PCI slot. Check for specific hardware problems, such as broken traces or loose or broken solder connections.
Check the network connection	Inspect all cables and connections. Make sure that the cable complies with length and rating specifications described in "Connecting the NIC to the Network" on page 14.
Check your PC BIOS	Make sure that you are running the latest BIOS for your PC. If your BIOS has not been upgraded in the previous 12 months, consult your PC manufacturer to obtain the current version of your BIOS software.
Run the NIC diagnostic tests	Run the NIC and Network Tests, as described in "Running the NIC Diagnostics Tests" on page 47. If the tests fail, replace the NIC with a known working NIC and run the tests again, using the same configuration settings as those used on the failed NIC. If the working NIC passes all tests, the original NIC is probably defective. For information on product repair, see "Technical Support" in Appendix E.
Run the 3Com Connection Assistant self-service.	Install the 3Com Connection Assistant and run the self-service option. This option analyzes your NIC and system, and guides you through troubleshooting steps to help resolve the problem.
Download the latest NIC driver	Download and install the latest NIC driver from: http://www.3com.com
Run the *Undo Broken Installation and Uninstall* program	The *Undo Broken Installation and Uninstall* program is located on the *EtherCD*. See "Cleaning Up a Failed Installation" on page 39 for instructions.
Check the 3Com support databases	Review the known problems and solutions found in the following areas: ■ 3Com Knowledgebase ■ 3Com NIC Help system ■ Release Notes and Frequently Asked Questions See "Accessing 3Com Support Databases" on page 38 for instructions on using these databases.

Troubleshooting Remote Wake-Up

If your PC does not boot in response to a Remote Wake-Up event, perform these troubleshooting steps:

1. Make sure that the PC meets the Remote Wake-Up requirements listed in Chapter 1.
2. Make sure that you are using the latest driver for the NIC.
   This driver is shipped with the NIC on the *EtherCD*. It can also be downloaded from:
   http://www.3com.com

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3 Check the PC BIOS.

   a Boot the PC and enter the BIOS.

   If you do not know how to enter the BIOS, refer to the reference manual for your PC or consult your PC vendor.

   b Locate the Wake-Up on LAN event setting.

   c Verify that the setting is enabled.

4 Check the Remote Wake-Up cable connection.

NOTE: If you have a 3C905C-TX-M NIC and your PC is compliant with PCI 2.2, the Remote Wake-Up cable is not required. Remote Wake-Up is automatically enabled through the PCI bus.

   a Turn off the power to the PC and remove the PC cover.

   b Make sure that the Remote Wake-Up cable is plugged into the RWU connector on the NIC and into the appropriate connector on the PC motherboard. Unplug and reinsert the cable, if necessary.

   c Replace the Remote Wake-Up cable with a known functioning Remote Wake-Up cable and perform the Remote Wake-Up Test again.

5 If the previous steps have failed, install a known functioning Remote Wake-Up NIC in the PC.

   If Remote Wake-Up works with the new NIC installed, consult your PC vendor for a replacement NIC.

   If Remote Wake-Up does not work with the new NIC installed, there may be a problem with the PC motherboard. Consult your PC manufacturer.

Removing the 3Com NIC Diagnostics Program

The 3Com NIC Diagnostics Program can be removed using the Add/Remove Programs Wizard in Windows, or by using the *EtherCD*. For instructions on using the Add/Remove Programs Wizard in Windows, refer to your Windows documentation.

To remove the 3Com NIC Diagnostics program using the *EtherCD:*

1 Start Windows.

2 Insert the *EtherCD* in the CD-ROM drive.

   The *EtherCD* Welcome screen appears.

   If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

   `d:\installs\setup.exe`

   where d:\ represents the letter name of the CD-ROM drive.

3 Click *NIC Software*.

4 Click *NIC Drivers and Diagnostics.*

5 Click *Installation Utilities*.

6 Click *Remove Diagnostics*.

7 Click *Proceed*, and then follow the prompts on the screen.

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Removing the Driver

To remove the 3Com NIC driver from your PC, follow the steps for your operating system.

Windows XP and Windows 2000

To remove the driver:

1. Right-click the My Computer icon, and then click *Properties*.
2. Select the Hardware tab, and then click *Device Manager* in the middle panel.
3. Double-click *Network Adapters*.
4. Right-click on the name of the NIC, and then select *Uninstall*.

   A warning message appears.
5. Click *OK* to confirm the device removal.

   The network driver is removed.
6. Exit the Device Manager and shut down Windows.

   If you want to physically remove the NIC from the PC, shut down the system and turn the power off before removing the NIC.

   If you want to reinstall the NIC driver and software, restart the PC.

Windows Me, Windows 98, and Windows 95

To remove the driver:

1. Double-click the My Computer icon, then the Control Panel icon, and then the System icon.
2. Click the Device Manager tab.
3. Double-click *Network adapters*.
4. Highlight the name of the NIC.
5. Click *Remove*.
6. Click *OK* to confirm the device removal.

   You are prompted to restart the PC.

   If you are physically removing the NIC from the PC, click *No*. Do not restart the PC until you shut down the system, turn the power off, and remove the NIC from the PC.

   If you are reinstalling the NIC software, click *Yes* to restart the PC.

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Windows NT 4.0

To remove the driver:

1. Double-click the My Computer icon, then the Control Panel icon, and then the Network icon.

   The Network screen appears.

2. Click the Adapters tab.
3. Highlight the name of the NIC in the Network Adapters box, and then click *Remove*.
4. Click *Yes* to confirm the removal.
5. Click *Close* to close the Network screen.

   You are prompted to restart the PC.

   If you are physically removing the NIC from the PC, click *No*. Do not restart the PC until you shut down the system, turn the power off, and remove the NIC from the PC.

   If you are reinstalling the NIC software, click *Yes* to restart the PC.

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7 Running NIC Diagnostics

This chapter explains how to:

- Interpret the NIC LEDs.
- Run the NIC diagnostic tests.
- View network statistics.
- Use the 3Com icon in the Windows system tray.

Interpreting the NIC LEDs

The NICs have light-emitting diodes (LEDs), as described in the following tables, that can assist with network diagnostics and troubleshooting.

Some LNK LED states do not apply to the AUI, BNC, SC, and ST connectors that are present on some NICs, as indicated by *N/A* in the table.

Depending on your NIC model, the NIC may have two or three LEDs.

2-LED Configuration

LED	State	Meaning	Connector				
			RJ-45	AUI	BNC	SC	ST
LNK (link)	**Green**	If drivers are installed, the 10Mbps connection is active.	Yes	N/A	N/A	N/A	N/A
	Amber	If drivers are installed, the 100Mbps connection is active.	Yes	N/A	N/A	N/A	N/A
	Off	Something is preventing the connection between the NIC and the hub or switch.	Yes	N/A	N/A	N/A	N/A
ACT (activity)	**Blinking**	Network traffic is present.	Yes	N/A	N/A	N/A	N/A
	Steady	Heavy network traffic is present.	Yes	N/A	N/A	N/A	N/A
	Off	No network traffic is present.	N/A	N/A	N/A	N/A	N/A

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3-LED Configuration

LED	State	Meaning	Connector				
			RJ-45	AUI	BNC	SC	ST
10 LNK (link)	**On**	If drivers are installed, the 10Mbps connection is active.	Yes	N/A	N/A	N/A	Yes
		If drivers are not installed, the NIC is receiving power.	Yes	Yes	Yes	N/A	Yes
	Off	Something is preventing the connection between the NIC and the hub or switch.	Yes	N/A	N/A	N/A	Yes
	Blinking	The cable polarity is reversed. Try a different network cable or contact your system administrator.	Yes	N/A	N/A	N/A	N/A
100 LNK (link)	**On**	If drivers are installed, the 100Mbps connection is active.	Yes	N/A	N/A	Yes	N/A
		If drivers are not installed, the NIC is receiving power.	Yes	Yes	Yes	Yes	N/A
	Off	Something is preventing the connection between the NIC and the hub or switch.	Yes	N/A	N/A	Yes	N/A
	Blinking	The cable polarity is reversed. Try a different network cable or contact your system administrator.	Yes	N/A	N/A	N/A	N/A
ACT (activity)	**Blinking**	Network traffic is present.	Yes	Yes	Yes	Yes	Yes
	Steady	Heavy network traffic is present.	Yes	Yes	Yes	Yes	Yes
	Off	No network traffic is present.	Yes	Yes	Yes	Yes	Yes

Viewing the NIC LEDs in the Diagnostics Program

In addition to the LEDs that are on the NIC, you can view LEDs in the 3Com NIC Diagnostics program.

1. Make sure that the NIC, the driver, and the 3Com NIC Diagnostics program are installed.
2. Open the Windows *Start* menu.
3. Select *Programs*, *3Com NIC Utilities,* and then *3Com NIC Doctor.*

   The 3Com NIC Diagnostics General screen appears and displays the following LEDs:
   - **Link**—lights if there is a valid connection between the NIC and the network. The color denotes link speed:
     - Yellow: 10 Mbps
     - Green: 100 Mbps
   - **Transmit**—lights if the NIC is transmitting information.
   - **Receive**—lights if the NIC is receiving information.
   - **Duplex**—indicates if the NIC is transmitting data across the network in half-duplex mode (half the LED lights), or in full-duplex mode (the entire LED lights).

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Troubleshooting with the LEDs

If a link (LNK) LED indicates a problem, ensure that:

1. Your network hub or switch and the cable connecting to your NIC comply with the specifications appropriate for your network connection.
2. The hub or switch is powered on.

Running the NIC Diagnostics Tests

The 3Com NIC Diagnostics program for Windows contains tests that can check the status of the following items:

- Network
- NIC

NOTE: To run NIC diagnostic tests on a PC running DOS, Windows NT 3.51, Windows 3.x, or Windows for Workgroups, use the 3Com Configuration and Diagnostics program for DOS. Refer to the DOSDIAG.TXT file located in the HELP directory on the *EtherCD* for instructions.

To run the NIC Test or Network Test:

1. Make sure that the NIC, the driver, and the 3Com NIC Diagnostics program are installed.
2. Open the Windows *Start* menu.
3. Select *Programs*, and then *3Com NIC Utilities.*
4. Click *3Com NIC Doctor.*
   The 3Com NIC Diagnostics General screen appears.

NOTE: Click Help to obtain general information about the function of a screen. To obtain specific information about any topic on a screen, click the question mark (?) in the upper right corner of the screen, move it over a topic, and click once.

5. Click the Diagnostics tab.
   The Diagnostics screen appears.

Network Test

Run the Network Test to check the NIC connectivity to the network. Do not remove the network cable while the Network Test is running.

1. Click *Run Network Test* on the Diagnostics screen.
   The Network Connectivity Test screen appears.
2. Click *Start*.
   If the test passes, the NIC connection to the network is functioning correctly.
3. Click *Close*.
   If the test fails, make sure that the:
   - NIC is properly connected to the network cable.
   - Hub or switch to which the NIC is connected is powered on.
   - Cable complies with the proper length and specifications for your network.

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NIC Test

Run the NIC Test to check the physical components, connectors, and circuitry on the NIC.

1. Click *Run NIC Test* on the Diagnostics screen.
   The NIC Test screen appears.
2. Click *Perform NIC Test*.
   While the test is running, a progress bar indicates test progress. If the test passes, the NIC is functioning correctly. If the test fails, a message indicates the error type. Click *Help* in the error message screen to obtain more information.
3. Click *Close*.

Viewing Network Statistics

To view statistical information about the network:

1. Make sure that the NIC, the network driver, and the 3Com NIC Diagnostics program are installed.
2. Open the Windows *Start* menu.
3. Select *Programs*, and then *3Com NIC Utilities.*
4. Click *3Com NIC Doctor.*
   The 3Com NIC Diagnostics General screen appears.
5. Click the Statistics tab.
   The Statistics screen appears.
   The information is updated by the NIC driver every 5 seconds.
   For a description of each statistic, click the question mark (?) in the upper right corner of the screen, drag it over a statistic and click once. A pop-up box appears, displaying information about the statistic.
6. Click *OK* to exit the diagnostics program. To go to another diagnostics screen, click the associated tab.

Using the 3Com Icon in the Windows System Tray

The 3Com icon, which can be enabled to appear in the Windows system tray, allows you to start the 3Com NIC Diagnostics program. It also allows you to view the NIC's link speed and number of frames sent and received.

Enabling the Icon

To show the 3Com icon in the Windows system tray:

1. Make sure that the NIC, the network driver, and the 3Com NIC Diagnostics program are installed.
2. Open the Windows *Start* menu.
3. Select *Programs*, and then *3Com NIC Utilities.*
4. Click *3Com NIC Doctor.*
   The 3Com NIC Diagnostics General screen appears.

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5 On the General screen, select the check box next to *Show Icon in System Tray*.

6 Close the 3Com NIC Diagnostic program.

The NIC icon appears in the Windows system tray.

When you double-click the icon, the 3Com NIC Diagnostics program starts.

Displaying Network Statistics

When you drag the mouse pointer over the icon (but do not double-click the icon) a network statistics box appears, displaying the following information:

- **Frames Sent and Received**—A count of the number of frames (packets) sent and received through the NIC since the last time statistics were reset.
- **Link Speed**—The speed (10 Mbps or 100 Mbps) at which the NIC is connected to the network.

The information is updated each time you move your mouse pointer over the 3Com icon.

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A Specifications and Cabling Requirements

This appendix lists the specifications, standards conformance, cable requirements, and connector pin assignments for the EtherLink PCI NICs.

3C905CX-TX-M and 3C905C-TX-M NIC Specifications

Hardware	
Bus interface	*PCI Local Bus Specification, Revision 2.2* 32-bit bus
PCI master	Supports bus master scatter-gather DMAs.
Dimensions	**3C905CX-TX-M:** Height: 2.00 in (5.08 cm) Length: 4.75 in (12.07 cm) **3C905C-TX-M:** Height: 3.00 in (7.62 cm) Length: 5.85 in (14.86 cm)
Power requirements	+5 V ±5% @ 375 mA maximum +3.3 V ± 5% @ 375 mA maximum +3.3 V @ 20mA maximum in sleep state with RWU disabled +3.3 V Aux for RWU supplied over PCI 2.2-compliant PCI bus
Network Interface	
10 Mbps Ethernet 10BASE-T	Ethernet IEEE 802.3 industry standard for a 10 Mbps baseband CSMA/CD local area network
100 Mbps Ethernet 100BASE-TX	Ethernet IEEE 802.3u industry standard for a 100 Mbps baseband CSMA/CD local area network
Environment	
Operating temperature	32˚ to 158˚ F (0˚ to 70˚ C)
Storage temperature	–22˚ to 194˚ F (–30˚ to 90˚ C)
Operating humidity	10 to 90% noncondensing
Storage humidity	10 to 90% noncondensing
Altitude	–984 ft to 9,840 ft (–300 to 3,000 m)

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Standards Conformance
■ IEEE 802.3 10BASE-T
■ IEEE 802.3u 100BASE-TX
■ IEEE 802.3x Full Duplex auto-negotiation and flow control
■ NWay 10/100 auto-negotiation
■ IEEE 802.1p/Q
■ IEEE 802.3x
■ RMON-1/RMON-2
■ Microsoft PC99
■ Microsoft PC2001
■ PCI 2.2
■ DMI 2.0s
■ ACPI
■ ASF specification
■ Wired for Management (WfM) 1.1a, 2.0, including: PXE 2.0 and BIS
■ SMBus 2.2
■ Pre-OS boot protocol support (PXE, BootP/DHCP, NCP, RPL)

3C905B NICs Specifications

Hardware	
Bus interface	*PCI Local Bus Specification, Revision 2.1* 32-bit bus
PCI master	Supports bus master scatter-gather DMAs.
Dimensions	**-TX, -TX-M, -TX-NM:** Height: 3.57 in (8.57 cm) Length: 4.75 in (12.07 cm) **-COMBO:** Height: 3.950 in (10.033 cm) Length: 6.874 in (17.459 cm) **-FX:** Height: 3.75 in (9.53cm) Length: 4.75 in (12.07cm)
Power requirement	+5 V ±5% @ 650 mA maximum

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Network Interface	
10 Mbps Ethernet 10BASE-T	Ethernet IEEE 802.3 industry standard for a 10 Mbps baseband CSMA/CD local area network
100 Mbps Ethernet 100BASE-TX	Ethernet IEEE 802.3u industry standard for a 100 Mbps baseband CSMA/CD local area network
100 Mbps Ethernet 100BASE-FX	Ethernet IEEE 802.3q industry standard for 100BASE-FX
Environment	
Operating temperature	32˚ to 158˚ F (0˚ to 70˚ C)
Storage temperature	–22˚ to 194˚ F (–30˚ to 90˚ C)
Operating humidity	10 to 90% noncondensing
Storage humidity	10 to 90% noncondensing
Altitude	–984 ft to 9,840 ft (–300 to 3,000 m)
Standards Conformance	
■ IEEE 803.3x flow control	
■ Microsoft PC98	
■ PCI 2.1	
■ DMI 2.0s	

3C900B NICs Specifications

Hardware	
Memory	4 KB internal RAM
Bus interface	*PCI Local Bus Specification, Revision 2.1* 32-bit bus
PCI master	Supports bus master scatter-gather DMAs.
Dimensions	**-TPO:** Height: 3.00 in (7.62 cm) Length: 4.80 in (12.19 cm) **-COMBO:** Height: 3.95 in (10.03 cm) Length: 6.82 in (17.32 cm) **-FL:** Height: 9.53cm (3.75 in) Length: 12.07cm (4.75 in)
Power requirement	+5 V ±5% @ 650 mA maximum
Network Interface	
10 Mbps Ethernet 10BASE-T	Ethernet IEEE 802.3 industry standard for a 10 MBPS baseband CSMA/CD local area network.

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Environment	
Operating temperature	32˚ to 158˚ F (0˚ to 70˚ C)
Storage temperature	–22˚ to 194˚ F (–30˚ to 90˚ C)
Operating humidity	10 to 90% noncondensing
Storage humidity	10 to 90% noncondensing
Altitude	–984 ft to 9,840 ft (–300 to 3,000 m)
Standards Conformance	
■ IEEE 803.3x flow control ■ Microsoft PC98 ■ PCI 2.1 ■ DMI 2.0 s	

Cabling Requirements

The cable, quality, distance, and connectors must comply with the Electronic Industries Association/Telecommunications Industries Association (EIA/TIA) 568 *Commercial Building Wiring Standard* and the Technical Services Bulletin TSB38 standards.

Twisted-Pair Cable

Twisted-pair cable consists of copper wires surrounded by an insulator. Two wires are twisted together (the twisting prevents interference problems) to form a pair, and the pair forms a circuit that can transmit data. A cable is a bundle of one or more twisted pairs surrounded by an insulator.

Unshielded twisted pair (UTP) is the most commonly used type of twisted-pair cable. Shielded twisted pair (STP) provides protection against crosstalk. Twisted-pair cable is now commonly used in Ethernet, Fast Ethernet, and other network topologies.

The EIA/TIA defines five categories of unshielded twisted-pair cable.

Category	Use
1	Traditional telephone cable.
2	Data transmission up to 4 MHz.
3	Voice and data transmission up to 25 MHz. The cable typically has four pairs of wires. Category 3 is the most common type of installed cable found in older corporate wiring schemes.
4	Voice and data transmission up to 33 MHz. The cable normally has four pairs of wire. This grade of UTP is not common.
5	Voice and data transmission up to 125 MHz. The cable normally has four pairs of copper wire and three twists per foot. Category 5 UTP is the most popular cable used in new installations today.

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10BASE-T Operation

10BASE-T is the Institute of Electrical and Electronics Engineers (IEEE) 802.3 standard for Ethernet signaling over unshielded twisted-pair wire at 10 Mbps.

Ethernet, as the most widely used network protocol, uses 10BASE-T as its primary cabling scheme. Ethernet characteristics include a:

- Data rate of 10 Mbps.
- Broadcast architecture.
- Specific media-access control (MAC) scheme.

The 10BASE-T name indicates a signaling speed of 10 Mbps and twisted-pair wiring. *Base* stands for baseband, which denotes a technique for transmitting signals as direct-current pulses rather than modulating them onto separate carrier frequencies.

A wiring topology using 10BASE-T specifies a wiring hub, cable arranged in a star configuration, and unshielded twisted-pair cable. Each node has a separate cable run that must not exceed 100 meters (328 ft) from the node to the hub.

100BASE-TX Operation

100BASE-TX is the IEEE 802.3u standard for Fast Ethernet signaling over Category 5 UTP or STP wire at 100 Mbps.

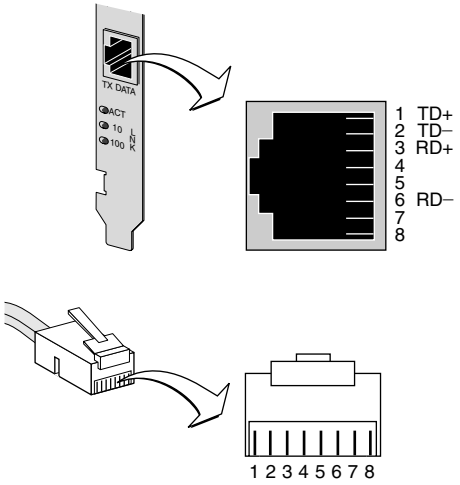
Based on an extension to the IEEE 802.3 Ethernet specification, Fast Ethernet characteristics include a:

- Data rate of 100 Mbps.
- Broadcast architecture.
- Specific media-access control (MAC) scheme.

A wiring topology using 100BASE-TX specifies a wiring hub, cable arranged in a star configuration, and Category 5 UTP or STP wiring. Each node has a separate cable run that must not exceed 100 meters (328 ft) from the node to the hub.

RJ-45 Connector Pin Assignments

The following illustration shows the RJ-45 connector pin assignments for the EtherLink PCI NICs.



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B Installing the Dynamic*Access* LAN Agent

This chapter explains how to install and configure the Dynamic*Access* LAN agent on a PC running Windows 95, Windows 98, or Windows NT.

NOTE: For an overview of the Dynamic*Access* LAN agent, see "DynamicAccess LAN Agent" on page 8. For detailed information on using, configuring, and troubleshooting the Dynamic*Access* LAN agent, refer to the *3Com DynamicAccess Technology User Guide* on the *EtherCD*.

Client PC Requirements

The Dynamic*Access* LAN agent can be installed on a PC running Windows 95, Windows 98, Windows NT 4.0, or Windows NT 3.51.

The Dynamic*Access* LAN agent is not supported on a PC running Windows 2000, Windows XP, or Windows Me.

CAUTION: Do not install the Dynamic*Access* LAN agent on a PC running Windows 98 SE 1. The installation will result in system failure.

CAUTION: If you plan to install the Dynamic*Access* LAN agent on a multiprocessor PC running Windows NT 4.0, Service Pack 4, you must first download and install the appropriate Microsoft patch available at:

http://support.microsoft.com/support/kb/articles/q195/7/25.asp?FR=0

Failure to install the patch will result in system failure.

The following table lists the minimum client requirements and recommended Microsoft Service Packs (if any) for the version of the Dynamic*Access* LAN agent that is included on the *EtherCD*.

Operating System	PC Requirements	Recommended Microsoft Service Pack
Windows 95	486/75 MHz CPU 16 MB RAM (32 MB recommended) 5 MB available hard drive space	Windows 95 OSR2 or Service Pack 1
Windows 98	486/75 MHz CPU 16 MB RAM (32 MB recommended) 5 MB available hard drive space	Any Service Pack except Windows 98 SE 1
Windows NT 4.0	Pentium/100 MHz CPU 32 MB RAM 5 MB available hard drive space	Latest Service Pack available from Microsoft
Windows NT 3.51	Pentium/100 MHz CPU 32 MB RAM 5 MB available hard drive space	Service Pack 5

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Installing the Dynamic*Access* LAN Agent

To install the Dynamic*Access* LAN agent:

1. Make sure that the NIC and the network driver are installed on your PC.

   See "Verifying Successful Installation" on page 22 to confirm that the NIC is properly installed in the PC.

2. Start Windows.
3. Insert the *EtherCD* in the CD-ROM drive.

   The *EtherCD* Welcome screen appears.

   If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

   `d:\installs\setup.exe`

   where d:\ represents the letter name of the CD-ROM drive.
4. Click *NIC Software*.
5. Click *DynamicAccess Technologies*.
6. Click *DynamicAccess LAN Agent*.
7. Click *Install DynamicAccess LAN Agent Now.*
8. Exit the *EtherCD*, and then exit Windows.
9. Restart the PC.

NOTE: You must restart the PC to complete the installation.

Verifying Successful Installation

After the Dynamic*Access* LAN agent is installed, the following changes are visible in the Windows Network control panel:

- For each physical NIC installed in the PC, a virtual NIC entry appears in the list of network adapters.

  All protocols are re-bound to the virtual NIC. The bindings to the physical NIC are still intact.
- A 3Com Dynamic*Access* LAN agent entry appears as a protocol.
- A 3Com Dynamic*Access* LAN agent icon is installed in the Windows Control Panel.

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Configuring the Dynamic*Access* LAN Agent

Consult your system administrator about using Dynamic*Access* technology at your site.

NOTE: The DynamicAccess LAN agent configuration instructions are intended for network administrators who have experience installing software and using management tools for an Ethernet network.

The instructions in this section are for configuring the Dynamic*Access* LAN agent on a local PC. You can obtain the complete configuration instructions by accessing the *3Com DynamicAccess Technology User Guide* on the *EtherCD.*

To configure the Dynamic*Access* LAN agent on a local PC:

1. Double-click the 3Com Dynamic*Access* icon in the Windows Control Panel.
   The Traffic Prioritization tab of the Dynamic*Access* Setup screen appears.
2. Select the tab containing the information you want to configure.
   Traffic Prioritization — Allows you to prioritize applications, which can ease bottlenecks in your network and allow critical applications to take network precedence.
   Fast IP—Allows you to enable and configure Fast IP.
   Administration—Allows you to set Dynamic*Access* control panel access, set VLAN options, enable efficient multicast control, and enable the prioritizing of traffic.

NOTE: For specific instructions on configuring any of the DynamicAccess technology options, click *Help* on the 3Com DynamicAccess screen or go to:

http://www.3com.com/dynamicaccess

Removing the Dynamic*Access* LAN Agent

For instructions on removing the Dynamic*Access* LAN agent from your PC, refer to the *DynamicAccess Software User Guide*. This user guide can be accessed on the *EtherCD*.

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C Installing the 3Com DMI Agent

This appendix explains how to install the 3Com Desktop Management Interface (DMI) Agent on your PC.

The 3Com DMI Agent allows any DMI-compatible browser or network management application that supports DMI 2.0s to remotely manage and configure advanced features of the NIC.

NOTE: For detailed information on the 3Com DMI Agent, refer to the *3Com DMI Agent User Guide* included with the 3Com DMI Agent software on the *EtherCD*.

For more information on DMI, go to:

http://www.3com.com

About the 3Com DMI Agent

The 3Com DMI Agent allows you to obtain basic NIC information, including:

- Node address
- MAC address
- Driver version

Additionally, depending on the features of your NIC, the 3Com DMI Agent allows you to view and configure advanced NIC features, including:

- Managed PC Boot Agent (MBA) software
- Remote Wake-Up events
- Remote system alerts

Each PC that contains a 3Com NIC and the 3Com DMI Agent generates a Management Information Format (MIF) file that contains information about the PC and the NIC. DMI applications use the information from the MIF to manage the PC and the NIC.

The content of the MIF is based on the capabilities of the NIC driver found in the PC. For example, if a NIC with an MBA boot ROM is found, all groups related to the boot ROM are included in the MIF for that particular NIC. This ensures that the network management application does not receive irrelevant information for the NIC.

For a description of each MIF that is supported by the 3Com DMI Agent, refer to the *3Com DMI Agent User Guide* included with the 3Com DMI Agent software on the *EtherCD*.

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System Requirements

This section lists the client PC and network management requirements for installing and using the 3Com DMI Agent.

Client PC Requirements

Your PC requires the following items to use the 3Com DMI Agent:

- DMI Service Provider 2.0s or greater (such as Smart Technologies Service Provider 2.0)
- NDIS 3, 4, or 5 driver
- Windows 95, Windows 98, Windows NT, Windows 2000, Windows Me, or Windows XP using the latest available Service Pack from Microsoft.

Network Management Requirements

Your network management station requires a DMI-compatible browser or a network management application that supports DMI 2.0s, such as:

- Hewlett Packard TopTools
- Tivoli Management Suite
- Dell OpenManage
- Compaq Insight Manager Management Station
- Intel LANDesk Client Manager

Installing the 3Com DMI Agent

This section describes how to install the 3Com DMI Agent. For instructions on how to install the 3Com DMI Agent on a PC running Windows NT 3.51, refer to the *3Com DMI User Guide* included with the 3Com DMI Agent software on the *EtherCD*.

NOTE: Before installing the DMI Agent, log on to the PC with an account that has system administration privileges.

To install the 3Com DMI Agent:

1. Make sure that the PC meets the requirements listed in "Client PC Requirements" above.
2. Make sure that the 3Com NIC is installed in the PC and is connected to the network.
3. Insert the *EtherCD* in the CD-ROM drive.

   The *EtherCD* Welcome screen appears.

   If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

   `d:\setup.exe`

   where d:\ represents the letter name of the CD-ROM drive.
4. Click *NIC Software*.
5. Click *DynamicAccess Technologies*.
6. Click *3Com DMI Agent*.

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7 Follow the prompts on the screen.

8 Restart the PC when prompted.

To verify successful installation, use a DMI-compatible browser or a network management application that supports DMI 2.0s to verify that the 3Com NIC is present. Refer to the *3Com DMI Agent User Guide* or contact your system administrator for instructions.

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D Installing From Diskette

This appendix describes how to create installation diskettes from the *EtherCD.* If your PC does not have a CD-ROM drive, access a PC that has a CD-ROM drive and create installation diskettes from the *EtherCD*.

You can also download the *EtherCD* software and place it on diskettes from the 3Com World Wide Web site:

http://www.3com.com/

NOTE: The installation diskettes allow you to install only the driver. If you want to install the NIC diagnostics or desktop management software, you must install them from the *EtherCD*.

Before you start, make sure that you have two blank, formatted diskettes. Label the diskettes *EtherDisk 1 and EtherDisk 2*.

- *EtherDisk* 1 contains:
  - NDIS 3/4/5 drivers
  - NetWare server drivers
  - Windows for Workgroup drivers
  - NIC preinstallation program
  - README.TXT file
- *EtherDisk* 2 contains:
  - NDIS 2 driver
  - PACKET driver
  - Help text files
  - DOS utilities

To create installation diskettes from the *EtherCD*:

1. Turn on the power to the PC and start Windows.
2. Insert the *EtherCD* in the CD-ROM drive.
   The *EtherCD* Welcome screen appears.
   If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:
   `d:\installs\setup.exe`
   where d:\ represents the letter name of the CD-ROM drive.
3. Click *NIC Software*.
4. Click *NIC Drivers and Diagnostics*.
5. Click *Installation Utilities*.
6. Click *Create Installation Diskettes.*
   The *EtherCD* Diskette Creation Utility Welcome screen appears.

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7 Click *Next*.

8 Insert the blank, formatted diskette labeled *EtherDisk* 1 in the PC, and then click Next.

Files are copied.

9 Remove the disk and insert the disk labeled *EtherDisk* 2 when prompted, and then click *OK*.

Files are copied. The diskette creation is complete.

NOTE: For instructions on using the installation diskettes to install the network driver, refer to the text file for your operating system in the HELP directory on the *EtherCD*.

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E Technical Support

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the most recent information, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Knowledgebase Web Services
- 3Com FTP site

World Wide Web Site

To access the latest networking information on the 3Com Corporation World Wide Web site enter this URL into your Internet browser: **`http://www.3com.com/`**

This service provides access to online support information, such as technical documentation and a software library, as well as support options that range from technical education to maintenance and professional services.

3Com Knowledgebase Web Services

This interactive tool contains technical product information compiled by 3Com expert technical engineers around the globe. Located on the World Wide Web at http://knowledgebase.3com.com, this service gives all 3Com customers and partners complementary, around-the-clock access to technical information on most 3Com products.

3Com FTP Site

Download drivers, patches, software, and MIBs across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: **`ftp.3com.com`**
- Username: **`anonymous`**
- Password: **`<your Internet e-mail address>`**

NOTE: You do not need a user name and password with Web browser software such as Netscape Navigator and Internet Explorer.

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Support from Your Network Supplier

If you require additional assistance, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

Here is a list of worldwide technical telephone support numbers. These numbers are correct at the time of publication. Refer to the 3Com Web site for updated information.

Country	Telephone Number
Asia, Pacific Rim	
Australia	1 800 678 515
Hong Kong	800 933 486
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Belgium	0800 71429
Denmark	800 17309
Finland	0800 113153
France	0800 917959
Germany	0800 1821502
Hungary	06800 12813
Ireland	1800 553117
Israel	1800 9453794
Italy	800 8 79489
Luxembourg	0800 3625
Netherlands	0800 0227788
Norway	800 11376
Poland	00800 3111206
Portugal	0800 831416
South Africa	0800 995014
Spain	900 983125
Sweden	020 795482
Switzerland	0800 55 3072
U.K.	0800 966197
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Mexico	01 800 849CARE
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Central and South America	AT&T +800 998 2112
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Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain an authorization number. Products sent to 3Com without authorization numbers will be returned to the sender unopened, at the sender's expense.

To obtain an authorization number, call or fax:

Country	Telephone Number	Fax Number
Asia, Pacific Rim	+65 543 6500	+65 543 6348
Europe, South Africa, and Middle East	+31 30 6029900	+31 30 6029999
Central and South America	525 201 0075	none
Argentina Bolivia Brazil Caribbean Chile Colombia Ecuador Mexico Paraguay Peru Uruguay Venezuela	0810 222 3266 511 241 1691 0800 133266 or 55 11 5643 2700 525 201 0004 562 240 6200 525 201 0004 525 201 0004 525 201 0004 525 201 0004 511 241 1691 525 201 0004 525 201 0004	none
From the following countries, you may call the toll-free numbers; select option 2 and then option 2:		
Austria Belgium Denmark Finland France Germany Hungary Ireland Israel Italy Netherlands Norway Poland Portugal South Africa Spain Sweden Switzerland U.K.	0800 297468 0800 71429 800 17309 0800 113153 0800 917959 0800 1821502 00800 12813 1800553117 1800 9453794 1678 79489 0800 0227788 800 11376 00800 3111206 0800 831416 0800 995014 900 983125 020 795482 0800 55 3072 0800 966197	none
U.S.A. and Canada	1 800 527 8677	none

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