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# Contents

<b>Safety Information</b> . . . . .	ix
<b>About This Manual</b> . . . . .	xv
<b>Chapter 1. Getting Started</b> . . . . .	1-1
About the Adapter . . . . .	1-1
Installation Checklist/Quick Installation Guide . . . . .	1-2
Contents of the Adapter Kit . . . . .	1-3
The Additional Materials You Need . . . . .	1-4
Installation Aids . . . . .	1-7
<b>Chapter 2. Installing the Adapter Hardware</b> . . . . .	2-1
Installing the Hardware . . . . .	2-1
Understanding the Adapter Labels . . . . .	2-4
Understanding the Adapter LEDs . . . . .	2-5
Installing PCISSETUP . . . . .	2-6
Installing the IBM OS/2 Fix for PCI Support . . . . .	2-7
Using Remote IPL (RIPL) . . . . .	2-8
<b>Chapter 3. Software Installation with LANAIID</b> . . . . .	3-1
Installing LANAIID . . . . .	3-3
Running LANAIID . . . . .	3-3
Adapter Configuration . . . . .	3-4
Software Installation . . . . .	3-5
Error Messages . . . . .	3-5
Command Line Invocation of LANAIID . . . . .	3-5
Related Documentation . . . . .	3-6
<b>Chapter 4. Installing an Adapter Driver</b> . . . . .	4-1
Using the Index to the Driver Installation Instructions . . . . .	4-1
Manually Installing the LAN Driver for NetWare 3.11 . . . . .	4-4
Manually Installing the DOS ODI Client Driver . . . . .	4-8
Manually Installing the OS/2 ODI Client Driver . . . . .	4-10
Manually Installing the LAN Driver for NetWare 3.12 . . . . .	4-12
Installing the DOS ODI Client Driver Using NetWare . . . . .	4-15
Installing the OS/2 ODI Client Driver Using NetWare . . . . .	4-17
Installing the LAN Driver for NetWare 4.x . . . . .	4-19



Installing the NDIS 2.01 Driver for LSP . . . . .	4-25
Installing the NDIS 2.01 Driver for LANManager 2.x . . . . .	4-28
Installing the NDIS 2.01 Driver for Windows for Workgroups 3.1 . . . . .	4-30
Installing an NDIS Driver for Windows for Workgroups 3.11 . . . . .	4-31
Installing the NDIS 3.0 Driver for Windows 95 . . . . .	4-34
Installing the NDIS 2.01 Driver for Artisoft LANtastic . . . . .	4-36
Installing the NDIS 2.01 Driver for OS/2 with LAN Transports . . . . .	4-37
Installing the NDIS 3.0 Driver for Windows NT . . . . .	4-39
Manually Installing the Packet Driver . . . . .	4-41
Installing an NDIS 2.01 Driver Using Other Installation Programs . . . . .	4-46
Manually Installing an NDIS 2.01 Driver . . . . .	4-47
<b>Appendix A. Product Warranty and Notices . . . . .</b>	<b>A-1</b>
Product Warranty . . . . .	A-1
Notices . . . . .	A-5
Electronic Emission Notices . . . . .	A-6
Trademarks . . . . .	A-9
<b>Appendix B. Obtaining Service and Troubleshooting . . . . .</b>	<b>B-1</b>
Obtaining Service and Software Updates . . . . .	B-1
Start of Troubleshooting Procedures . . . . .	B-2
Solving Driver Installation Problems . . . . .	B-3
Testing the Adapter . . . . .	B-5
<b>Appendix C. Adapter Cable Specifications . . . . .</b>	<b>C-1</b>
10BASE-T Cables . . . . .	C-1
AUI Cable . . . . .	C-3
<b>Appendix D. NetWare Server LAN Driver Parameters and Messages . . . . .</b>	<b>D-1</b>
NetWare Server LAN Driver Parameters . . . . .	D-1
Sample AUTOEXEC.NCF Files . . . . .	D-5
NetWare Server LAN Driver Messages . . . . .	D-7
<b>Appendix E. NetWare ODI Client Driver Parameters and Messages . . . . .</b>	<b>E-1</b>
NetWare ODI Client Driver Parameters . . . . .	E-1
Sample DOS AUTOEXEC.BAT and NET.CFG Files . . . . .	E-5
Sample OS/2 NET.CFG Files . . . . .	E-7

NetWare DOS ODI Client Driver Messages . . . . . E-8  
NetWare OS/2 ODI Client Driver Messages . . . . . E-10

**Appendix F. NDIS Adapter Drivers Parameters and Messages** . . . . . F-1

NDIS Adapter Drivers Parameters . . . . . F-1  
Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files . . . . . F-5  
NDIS 2.01 Driver Messages . . . . . F-16  
NDIS 3.0 Driver Messages . . . . . F-19

**Appendix G. Packet Driver Utilities and Messages** . . . . . G-1

Packet Driver Utilities . . . . . G-1  
Packet Driver Messages . . . . . G-7

**Appendix H. RIPL Messages** . . . . . H-1

**Glossary** . . . . . X-1

**Index** . . . . . X-11



## Figures

1-1.	Contents of the Adapter Kit	1-3
2-1.	Connecting the Adapter Cable	2-3
2-2.	The Adapter Labels	2-4
2-3.	The Adapter LEDs	2-5
2-4.	The RIPL Module Location	2-9
C-1.	RJ-45 Connector	C-2
C-2.	Straight-Through Cable Wiring	C-2
C-3.	Crossover Cable Wiring	C-3
C-4.	Adapter AUI Port	C-4
D-1.	Sample AUTOEXEC.NCF Files for the Server LAN Driver	D-6
E-1.	Sample AUTOEXEC.BAT and NET.CFG Files for a DOS Client	E-6
E-2.	Sample NET.CFG Files for an OS/2 Client	E-7
F-1.	Sample Files for LAN Support Program (LSP)	F-6
F-2.	Sample Files for Windows for Workgroups 3.1	F-8
F-3.	Sample Files for Windows for Workgroups 3.11	F-9
F-4.	Sample Files for LANManager	F-11
F-5.	Sample Files for LANtastic	F-13
F-6.	Sample Files for OS/2 with LAN Transports	F-14

## Tables

1-1.	Supported Network Environments	1-4
2-1.	Explaining the Adapter Labels	2-4
2-2.	The Default Meaning of the Adapter LED States	2-5
4-1.	Driver Installation Instructions Index	4-2
4-2.	Parameters for the Packet Driver	4-43
B-1.	Driver Installation Messages	B-3
C-1.	Cabling Specifications for 10BASE-T Link Segments	C-1
C-2.	Pin Assignments for AUI Port	C-4
D-1.	Parameters for the NetWare Server LAN Driver	D-1
E-1.	NetWare ODI Client Driver Parameters	E-1
F-1.	NDIS 2.01 and 3.0 Adapter Driver Parameters	F-1



G-1. Packet Driver Utilities . . . . . G-1



## Safety Information



**Danger:** Before you begin to install this product, read the safety information in *Caution: Safety Information—Read This First*, SD21-0030. This booklet describes safe procedures for cabling and plugging in electrical equipment.



**Varning — livsfara:** Innan du börjar installera den här produkten bör du läsa säkerhetsinformationen i dokumentet *Varning: Säkerhetsföreskrifter—Läs detta först*, SD21-0030. Där beskrivs hur du på ett säkert sätt ansluter elektrisk utrustning.



**Fare:** Før du begynner å installere dette produktet, må du lese sikkerhetsinformasjonen i *Advarsel: Sikkerhetsinformasjon — Les dette først*, SD21-0030 som beskriver sikkerhetsrutinene for kabling og tilkobling av elektrisk utstyr.



**Fare!** Før du installerer dette produkt, skal du læse sikkerhedsforskrifterne i *NB: Sikkerhedsforskrifter—Læs dette først* SD21-0030. Vejledningen beskriver den fremgangsmåde, du skal bruge ved tilslutning af kabler og udstyr.



**Gevaar:** Voordat u begint met de installatie van dit product, moet u eerst de veiligheidsinstructies lezen in de brochure *PAS OP! Veiligheidsinstructies—Lees dit eerst*, SD21-0030. Hierin wordt beschreven hoe u elektrische apparatuur op een veilige manier moet bekabelen en aansluiten.



**Gevaar** Voordat u begint met het installeren van dit product, dient u eerst de veiligheidsrichtlijnen te lezen die zijn vermeld in de publicatie *Caution: Safety Information - Read This First*, SD21-0030. In dit boekje vindt u veilige procedures voor het aansluiten van elektrische apparatuur.





**Vorsicht:** Bevor mit der Installation des Produktes begonnen wird, die Sicherheitshinweise in *Achtung:*

*Sicherheitsinformationen—Bitte zuerst lesen, IBM Form SD21-0030.*

Diese Veröffentlichung beschreibt die Sicherheitsvorkehrungen für das Verkabeln und Anschließen elektrischer Geräte.



危険： 導入作業を開始する前に、安全に関する小冊子SD21-0030 の「最初にお読みください」(Read This First)の項をお読みください。この小冊子は、電気機器の安全な配線と接続の手順について説明しています。



**Danger :** Avant d'installer le présent produit, consultez le livret *Attention : Informations pour la sécurité — Lisez-moi d'abord,* SD21-0030, qui décrit les procédures à respecter pour effectuer les opérations de câblage et brancher les équipements électriques en toute sécurité.



**Danger:** Avant de procéder à l'installation de ce produit, lisez d'abord les consignes de sécurité dans la brochure *ATTENTION: Consignes de sécurité—A lire au préalable,* SD21-0030. Cette brochure décrit les procédures pour câbler et connecter les appareils électriques en toute sécurité.



**Pericolo:** prima di iniziare l'installazione di questo prodotto, leggere le informazioni relative alla sicurezza riportate nell'opuscolo *Attenzione: Informazioni di sicurezza — Prime informazioni da leggere* in cui sono descritte le procedure per il cablaggio ed il collegamento di apparecchiature elettriche.



**Perigo:** Antes de iniciar a instalação deste produto, leia as informações de segurança *Cuidado: Informações de Segurança — Leia Primeiro*, SD21-0030. Este documento descreve como efectuar, de um modo seguro, as ligações eléctricas dos equipamentos.



**Peligro:** Antes de empezar a instalar este producto, lea la información de seguridad en *Atención: Información de Seguridad — Lea Esto Primero*, SD21-0030. Este documento describe los procedimientos de seguridad para cablear y enchufar equipos eléctricos.



**Perigo:** Antes de começar a instalar este produto, leia as informações de segurança contidas em *Cuidado: Informações Sobre Segurança—Leia Isto Primeiro*, SD21-0030. Esse folheto descreve procedimentos de segurança para a instalação de cabos e conexões em equipamentos eléctricos.



**VAARA:** Ennen kuin aloitat tämän tuotteen asennuksen, lue julkaisussa *Varoitus: Turvaohjeet—Lue tämä ensin*, SD21-0030, olevat turvaohjeet. Tässä kirjasessa on ohjeet siitä, miten sähkölaitteet kaapeloidaan ja kytketään turvallisesti.



위험: 이 제품을 설치하기 전에 반드시  
"주의: 안전 정보-시작하기 전에"  
(SD21-0030) 에 있는 안전 정보를  
읽으십시오.



危險：安裝本產品之前，請先閱讀  
"Caution: Safety Information--Read  
This First" SD21-0030 手冊中所提  
供的安全注意事項。這本手冊將會說明  
使用電器設備的纜線及電源的安全程序。



Uwaga:  
Przed rozpoczęciem instalacji produktu należy zapoznać się z instrukcją:  
"Caution: Safety Information - Read This First", SD21-0030.  
Zawiera ona warunki bezpieczeństwa przy podłączeniu do sieci elektrycznej  
i eksploatacji.



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nejprve bezpečnostní informace v pokynech „Bezpečnostní  
informace“ č. 21-0030. Tato brožurka popisuje bezpečnostní  
opatření pro kabeláž a zapojení elektrického zařízení.



**Vigyázat:** Mielőtt megkezdi a berendezés üzembe helyezését,  
olvassa el a "Caution: Safety Information— Read This First,  
SD21-0030 könyvecskében leírt biztonsági információkat. Ez a  
könyv leírja, milyen biztonsági intézkedéseket kell megtenni az  
elektromos berendezés huzalozásakor illetve csatlakoztatásakor.



Pozor: Preden začnete z instalacijo tega produkta  
preberite poglavje: "Opozorilo: Informacije  
o varnem rokovanju-preberite pred uporabo,"  
SD21-0030. To poglavje opisuje pravilne  
postopke za kabliranje,





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---

## About This Manual

This manual contains instructions for installing, configuring, using, and troubleshooting problems with the IBM PCI Ethernet Adapter. The manual is designed for users who are familiar with the computer (hardware and operating system) in which the adapter will be installed.





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## Chapter 1. Getting Started

This manual contains the information you need to install, use, and solve problems with the IBM PCI Ethernet Adapter. You should be familiar with the computer in which the adapter will be installed and the computer's operating system and networking software.

This chapter describes the adapter functions, the contents of the adapter kit, and the additional materials you will need to install the adapter. An installation checklist is provided.

---

### About the Adapter

The IBM PCI Ethernet Adapter provides an efficient, high-speed interface to a 10-Mbps Ethernet network. The 32-bit adapter can be installed in a computer that has a peripheral component interconnect (PCI) system bus. The adapter conforms to the IEEE Standard 802.3 and has an attachment unit interface (AUI) port and a 10BASE-T port.

Special features of the PCI Ethernet Adapter include:

- Full-duplex (FDX) operation, a configurable mode that allows simultaneous transmission and reception of data on the Ethernet LAN.
- Auto-sense, a function that enables the adapter to automatically detect which of its ports is connected to the network and then use that port for communication. This function, which is always active, eliminates the need for a media type parameter and facilitates changing from one media type to another.
- User definable light-emitting diodes (LEDs) that aid in monitoring the status of the adapter and problem solving.
- Optional Remote IPL (RIPL) capability to allow a *diskless* workstation to be initialized (booted up) using files received from a LAN server.
- Support for a variety of network operating systems and network applications.



---

## Installation Checklist/Quick Installation Guide

In order to install this adapter, complete the following steps in order.

### 1 Preparation

- Verify that your adapter kit contains the items listed under “Contents of the Adapter Kit” on page 1-3.
- In addition to the publications shipped with this adapter, you will need other manuals (see “Other Manuals” on page 1-4).
- Your computer must have one of the network operating systems or network applications that is compatible with the IBM PCI Ethernet Adapter installed and functioning (see “Other Software” on page 1-4).
- Make sure that you have the correct type of cable required for attachment to the LAN (see Appendix C on page C-1).

### 2 Install the adapter hardware in your computer according to the instructions in the user manual that came with your computer (or see Chapter 2), and connect the cable to the network.

**Note:** After the adapter has been installed and the computer is reassembled and powered on, if you want to verify that the adapter is correctly installed and connected to the network, go to step 15 of the procedure in “Installing the Hardware” on page 2-1.

### 3 Install PCISSETUP, and, if applicable, the OS/2 fix as described under “Installing PCISSETUP” on page 2-6 and “Installing the IBM OS/2 Fix for PCI Support” on page 2-7.

### 4 Install and configure an adapter driver (see “Installation Aids” on page 1-7)

### 5 Installation is now complete.

---

## Contents of the Adapter Kit

Before beginning the installation process it is important to verify the contents of your adapter kit. Figure 1-1 illustrates the contents of the PCI Ethernet Adapter kit.

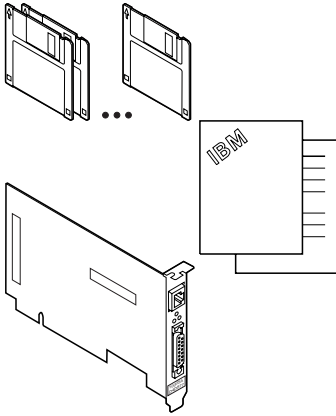


Figure 1-1. Contents of the Adapter Kit

In addition to this document, the adapter kit consists of:

- The IBM PCI Ethernet Adapter
- The PCI Ethernet Adapter Option Diskette (contains adapter drivers and a diagnostic utility)
- The IBM LAN AID Diskette (contains hardware and software installation aids)
- The Options by IBM (OBI) registration card
- *Caution: Safety Information—Read This First* booklet
- *Adapter Support Information* card

If any item is missing or damaged, contact your place of purchase.

---

## The Additional Materials You Need

In addition to the adapter kit, you will need other materials to install the adapter. The following sections describe those materials. Collect them before you begin the installation procedures.

### Other Manuals

In addition to the publications shipped with the adapter, you will need the following manuals:

- The manual provided with your computer
- The manual provided with your network operating system or network application

### Other Software

The adapter can be used in a computer that has a PCI system bus and is equipped with one of a variety of supported network operating systems and network applications. The following types of adapter drivers are shipped with the adapter on the PCI Ethernet Adapter Option Diskette:

- NetWare\*\* LAN server
- NetWare Open Data-Link Interface (ODI)
- Network Driver Interface Specification (NDIS) 2.01 and 3.0
- Packet driver, for environments in which multiple network applications (such as TCP/IP, NetWare, and PC-NFS\*\*) are used

Table 1-1 describes the network environments that are compatible with the adapter and the software required for each environment. Verify that you have the required software for your computer's network environment.

*Table 1-1 (Page 1 of 3). Supported Network Environments*

<b>Environment</b>	<b>Software Needed</b>
NetWare server	Novell** NetWare Version 3.11 or higher OR NetWare from IBM Version 3.11 or higher
NetWare client with DOS	<ul style="list-style-type: none"> <li>• NetWare DOS Requester</li> <li>• DOS Version 3.3 or higher</li> </ul>

*Table 1-1 (Page 2 of 3). Supported Network Environments*

<b>Environment</b>	<b>Software Needed</b>
NetWare client with OS/2	<ul style="list-style-type: none"> <li>• NetWare OS/2 Requester</li> <li>• IBM Operating System/2 (OS/2) Version 1.3 or higher</li> </ul>
LAN Support Program (LSP) with DOS	<ul style="list-style-type: none"> <li>• IBM LAN Support Program Version 1.33 or higher</li> <li>• A network application that uses the IEEE 802.2 or NetBIOS protocol, such as IBM Personal Communications/3270 Version 3.0 or higher and the DOS LAN Requester or Services feature of IBM OS/2 LAN Server</li> <li>• DOS Version 3.3 or higher</li> </ul>
LANManager**	<ul style="list-style-type: none"> <li>• Microsoft** LANManager Version 2.x</li> <li>• DOS 3.3 or higher, or OS/2 Version 1.3 or higher</li> </ul>
Windows** for Workgroups	<ul style="list-style-type: none"> <li>• Microsoft Windows for Workgroups 3.1 or higher</li> <li>• DOS 3.3 or higher</li> </ul>
Windows 95**	<ul style="list-style-type: none"> <li>• Microsoft Windows 95</li> </ul>
LANtastic**	<ul style="list-style-type: none"> <li>• Artisoft** LANtastic Version 6.0</li> <li>• DOS 3.3 or higher</li> </ul>
OS/2 with IBM LAN Transports	<ul style="list-style-type: none"> <li>• IBM LAN Transports feature of one of the following products: <ul style="list-style-type: none"> <li>– IBM LAN Transports</li> <li>– TCP/IP for OS/2</li> </ul> </li> <li>• A network application that uses the IEEE 802.2 or NetBIOS protocol, such as: <ul style="list-style-type: none"> <li>– OS/2 LAN Server</li> <li>– OS/2 Communication Manager</li> </ul> </li> <li>• IBM OS/2 Version 2.0 or higher</li> </ul>
Windows NT**	<ul style="list-style-type: none"> <li>• Microsoft Windows NT Version 3.1, 3.5, or 3.51. The server and the client software are supported.</li> </ul>
Packet driver	<ul style="list-style-type: none"> <li>• A network application, such as TCP/IP, NetWare, and PC-NFS</li> <li>• DOS 3.3 or higher, or Microsoft Windows 3.1 or higher</li> </ul>

*Table 1-1 (Page 3 of 3). Supported Network Environments*

<b>Environment</b>	<b>Software Needed</b>
Other DOS environments	<ul style="list-style-type: none"> <li>• A network application that uses an NDIS-compliant driver (such as IBM TCP/IP Version 2.1 for DOS)</li> <li>• DOS 3.3 or higher</li> </ul>
Other OS/2 environments	<ul style="list-style-type: none"> <li>• A network application that uses an NDIS-compliant driver</li> <li>• IBM OS/2 Version 2.0 or higher</li> </ul>

## Adapter Cable

To connect the PCI Ethernet Adapter to an Ethernet network, you will need an adapter cable. You can obtain such cables and equipment from a qualified cable supplier. Use one of the following cable options, which are described in detail in Appendix C:

- To connect the adapter's 10BASE-T port to a 10BASE-T port on a repeater, use an unshielded twisted-pair (UTP) cable with RJ-45 connectors at both ends.

If the port on the repeater is a crossover port (also known as an *MDI-X port*), use a UTP cable that is wired as a *straight-through cable*. If the port on the repeater is not a crossover port (also known as an *MDI port*), use a UTP cable that is wired as a *crossover cable*.

- To connect the adapter's AUI port to a 10BASE5 segment, use an AUI cable to connect the adapter to the 10BASE5 transceiver.
- To connect the adapter's AUI port to a 10BASE2 or a 10BASE-F segment, use a 10BASE2 or a 10BASE-F transceiver. If needed, you can use an AUI cable to connect the adapter to the transceiver.

---

## Installation Aids

Installation of this adapter requires two basic steps:

1. Physical installation of the adapter in the machine and connection to the network through an appropriate cable assembly (see Chapter 2).
2. Configuration and installation of driver software that is compatible with the network environment.

Configuration and installation of the software is accomplished through different processes depending on the network environment and operating system with which the adapter is being used. In most cases, the installation is automated through facilities provided with the operating system running on the machine in which the adapter is installed. Some drivers can be installed using IBM LANAID 2.0, which assists in the installation and configuration of the adapter hardware and software for the IBM LAN Client environment. See Chapter 3 for details on how to use this program. Other automated and manual facilities are described in Chapter 4.



---

## Chapter 2. Installing the Adapter Hardware

This chapter explains the adapter labels and provides instructions for installing the adapter. This adapter is intended to be installed in a computer that has a PCI bus and is to be connected to an Ethernet LAN.

---

### Installing the Hardware

To install the adapter in a computer and connect it to the network, perform the following steps:

- 1** Stop all applications.
- 2** Switch the computer OFF.
- 3** Disconnect the power cable from the computer.
- 4** Remove the cover from the computer.
- 5** Locate an available PCI bus-master-capable slot in the computer. The connector for a PCI slot is color-coded white. Refer to the documentation that came with the computer if you need help in identifying the PCI slots.
- 6** If the available slot has a blank slot cover, remove it.
- 7** Record the universally administered address from the label on the adapter bracket. See "Understanding the Adapter Labels" on page 2-4 for a description of the label.
- 8** Plug the adapter firmly into the slot.
- 9** Check the PCI slot and the system unit bus to determine whether there are configuration switches. If there are switches, ensure that the switches are set to enable the slot, enable bus mastering for the slot, and assign an interrupt level to the slot. Refer to the documentation that came with the computer for instructions on how to set the switches, if present.



- 10** Connect the adapter cable to the adapter and to the network as shown in Figure 2-1 on page 2-3. See Appendix C for adapter cable specifications.
- 11** If you want to install another PCI Ethernet Adapter in the computer, repeat steps 5 through 10.
- 12** Replace the computer cover.
- 13** Reconnect the power cable to the computer.
- 14** Switch the computer ON. The PCI system BIOS will configure the adapter hardware, which includes assigning the adapter base I/O address and an interrupt level.  
  
Some adapter parameters can also be configured using the LANAID program described in Chapter 3.
- 15** After you have restarted the computer, observe the adapter LEDs. See “Understanding the Adapter LEDs” on page 2-5 for an explanation of the LED states.

- If the adapter’s 10BASE-T port is connected to a correctly functioning 10BASE-T repeater, the lower (nearest to the AUI connector) green LED (LED0 - Link OK) should be on and the amber LED (LED1 - Transmit/Receive) can be off or on depending on the network activity.
- If the adapter’s AUI port is connected to a correctly functioning transceiver, the lower (nearest the AUI connector) green LED (LED0 - Link OK) should be off and the amber LED (LED1 - Transmit/Receive) can be off or on depending on the network activity.

**Note:** Indication of the link status via an LED is valid only for connection to the 10BASE-T port.

If you do not observe the appropriate LED pattern, go to “Testing the Adapter” on page B-5.

- 16** After the adapter has been installed correctly, go to “Installing PCSETUP” on page 2-6.

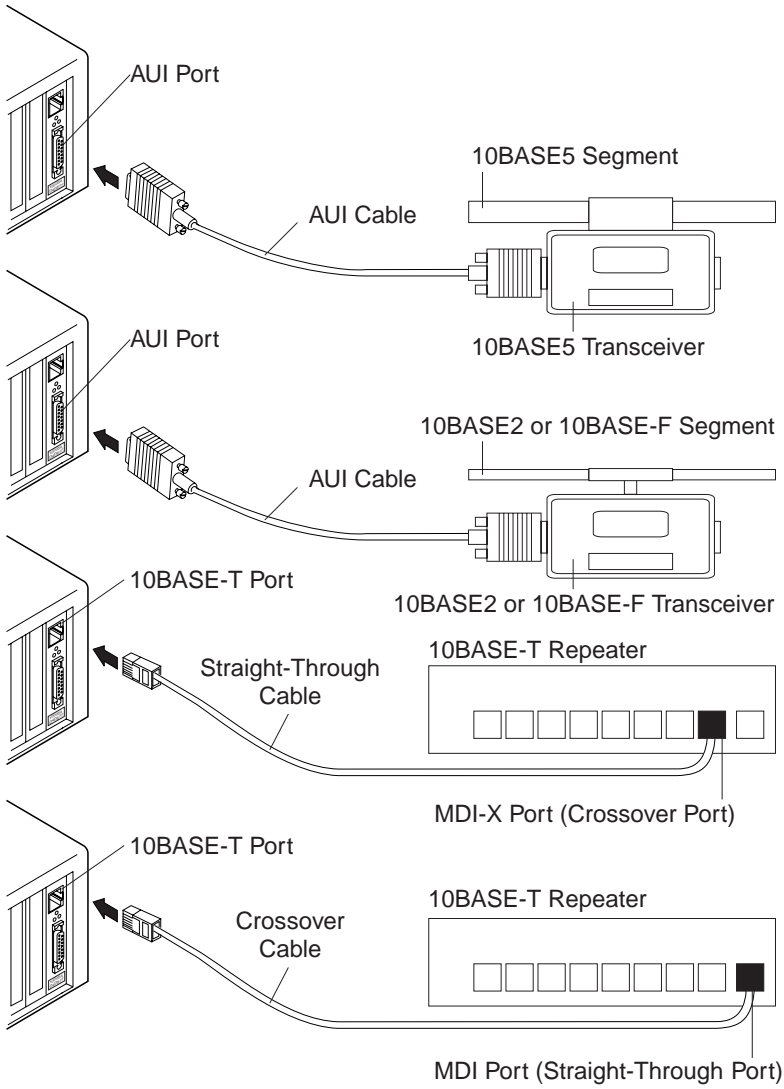


Figure 2-1. Connecting the Adapter Cable

## Understanding the Adapter Labels

Figure 2-2 and Table 2-1 describe the labels on the adapter.

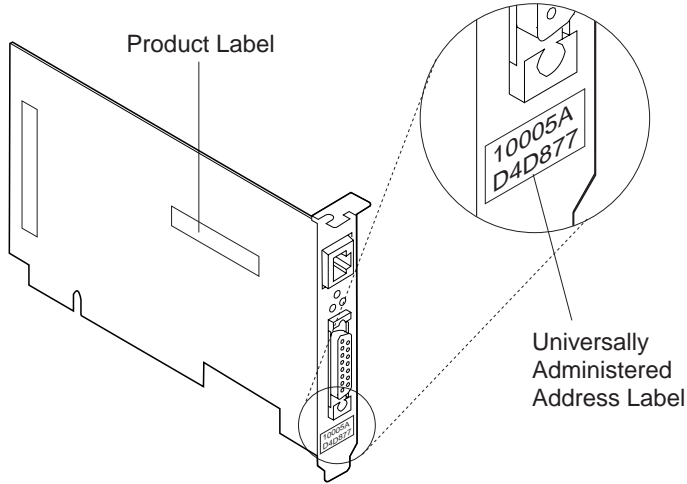


Figure 2-2. The Adapter Labels

Table 2-1. Explaining the Adapter Labels

Label	Explanation
Product	Bears the name of the product, IBM PCI Ethernet Adapter. Use the label to help you distinguish the adapter from others in the computer.
Universally Administered Address	<p>Contains the adapter's universally administered address, a 12-digit, hexadecimal address that was encoded in the adapter memory at the factory. In the illustration, the universally administered address is X'1000 5AD4 D877' in least significant bit (LSB) format, which is also known as <i>canonical format</i>.</p> <p>If you would prefer the adapter to be known on the network by a <i>locally administered address</i>, you must configure the adapter driver or the protocol driver to use a locally administered address.</p>

## Understanding the Adapter LEDs

Figure 2-3 and Table 2-2 describe the adapter LEDs. Options for changing the meaning of each LED are available when the adapter driver is installed.

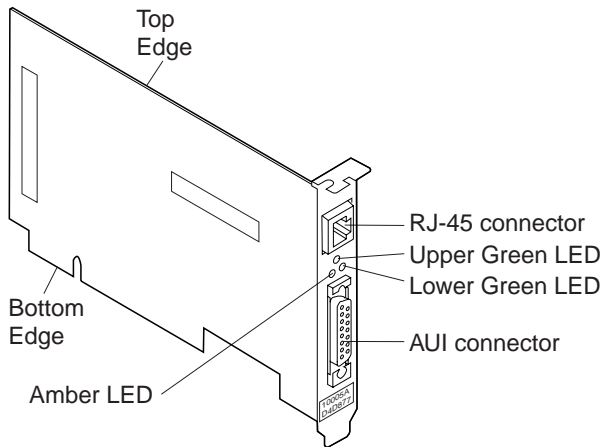


Figure 2-3. The Adapter LEDs

Table 2-2. The Default Meaning of the Adapter LED States

LED	Default Meaning	
Lower Green LED (LED0)	On	A cable with a 10BASE-T repeater at the other end is connected to the adapter's 10BASE-T port, and the adapter can receive a signal from the repeater.
	Off	A cable is not connected to the adapter's 10BASE-T port, or there is a problem with the cable, the port, or the repeater at the other end.
Amber LED (LED1)	On	The adapter is transmitting frames or receiving frames addressed to the adapter through its 10BASE-T port or AUI port.
	Off	The adapter is not transmitting or receiving frames through its 10BASE-T port or AUI port.
Upper Green LED (LED2)	On	The adapter is operating in full-duplex mode.
	Off	The adapter is operating in half-duplex mode.

---

## Installing PCISSETUP

The PCI Ethernet Adapter Option Diskette contains a program, PCISSETUP, that fixes a problem with certain older PCI cache data controllers. Follow the instructions in this section to install the program.

To install PCISSETUP, perform one of the following steps:

- For DOS systems and NetWare servers
  - 1 Copy the PCISSETUP.EXE file from the root directory of the PCI Ethernet Adapter Option Diskette to the root directory of the drive from which the computer is started.
  - 2 Edit the AUTOEXEC.BAT file to add PCISSETUP to the top of the file. PCISSETUP.EXE will load each time the computer is started.
  - 3 Go to Chapter 4 to install the adapter driver.
- For OS/2 systems and NetWare for OS/2 servers
  - 1 Copy the PCISSETUP.OS2 file from the root directory of the PCI Ethernet Adapter Option Diskette to the root directory of the drive from which the computer is started.
  - 2 Edit the CONFIG.SYS file to add DEVICE=PCISSETUP.OS2 to the top of the file. PCISSETUP.OS2 will load each time the computer is started.
  - 3 If your system uses a version of OS/2 that is lower than OS/2 Warp Version 3, go to "Installing the IBM OS/2 Fix for PCI Support" on page 2-7. Otherwise, go to Chapter 4 to install the adapter driver.

- For Windows NT systems
  - 1 From the Program Manager window, select **File** from the menu bar.
  - 2 From the File pull-down menu, select **Run**.
  - 3 Type **A:\PCISSETNT** in the path entry field. Then, select **OK**. PCISSETNT.BAT will install PCISSETUP.SYS as a device driver, which will load each time the computer is started.
  - 4 Go to Chapter 4 to install the adapter driver.

---

## Installing the IBM OS/2 Fix for PCI Support

If your system uses a version of IBM OS/2 that is lower than OS/2 Warp Version 3, you will need the software fix that supports shared interrupts on PCI system buses. In some computers, if this fix is not installed when the PCI Ethernet Adapter driver is initialized, the driver will report that it cannot find the adapter.

The fix that you need depends on the version of OS/2 installed on your computer. If your computer uses OS/2 Version 2.11, obtain an updated OS/2 loader, which is available in the latest OS/2 fix pack. If you have installed an OS/2 fix pack that is level XR\_A058 or higher, you already have the fix. Go to Chapter 4 to install the adapter driver.

If your computer uses OS/2 versions lower than Version 2.11 and the CSD level of the IBM OS/2 Base Operating System is not XR06200 or higher, install the OS/2 manufacturing refresh or install the service pack XR06200 and the latest OS/2 fix pack. To display the version and CSD level, at an OS/2 command prompt, enter **syslevel**.

You can obtain OS/2 fix packs and service packs from one of the following sources:

- Phone the IBM Personal Software Products service center (1-800-992-4777 in the United States and 1-800-465-2222 in Canada). For the OS/2 2.11 fix pack, request APAR PJ14230. For the OS/2 service pack, request service pack XR06200.

- The IBM BBS or Internet FTP server. See "IBM BBS" on page B-1 for the phone numbers and the Internet address. When phoning, select directory 4 (corrective service). When accessing the Internet anonymous FTP server, change to the directory pub/corrective\_service.

**Note:** After you obtain and install the fix, go to Chapter 4 to install the adapter driver.

---

## Using Remote IPL (RIPL)

The RIPL support available with this adapter allows a workstation in which the adapter is installed to be initialized from a LAN server. If the RIPL feature is present, a module will be plugged into the socket indicated in Figure 2-4 on page 2-9. If the feature is not present, it can be obtained and installed on your adapter by ordering the PCI Ethernet RiPL Option kit, P/N 25H4561.

Although RIPL is most applicable when the workstation has no local media from which initialization software can be obtained (such as disk or CD-ROM drives), it can be used in any workstation. If the RIPL feature is installed, the RIPL code is active regardless of the type and status of other devices capable of providing a boot sequence. However, in operation, the user is presented with the opportunity to break out of the RIPL sequence. If this option is not selected within a brief time, the RIPL sequence takes place automatically.

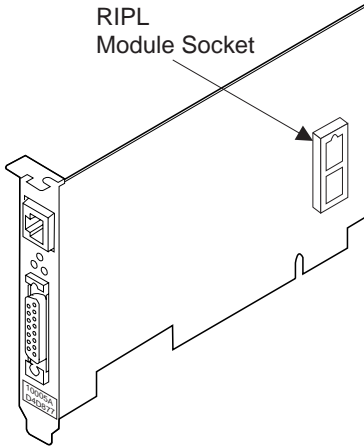


Figure 2-4. The RIPL Module Location

## Configuring LAN Servers for RIPL

In order for RIPL to work, there must be a LAN server on the network that has RIPL support installed and is configured to respond to your adapter. Refer to your LAN server documentation for information on how to install and configure RIPL support.

LAN servers that can be set up to support PCI Ethernet adapter RIPL include:

- IBM OS/2 LAN Server 4.0
- IBM OS/2 LAN Server 3.0
- Novell NetWare 4.x
- Novell NetWare 3.x
- Microsoft LANManager

Please refer to your LAN server documentation for general information on configuring the server for RIPL support. Please refer to the README.RPL file on the PCI Ethernet Adapter Option Diskette for specific information on configuring your LAN server for RIPL support of a requester with the IBM PCI Ethernet Adapter installed.



## Information Displayed During an RIPL

While your computer is executing the RIPL sequence, the following message is displayed when the opportunity to break out of the RIPL sequence to the normal boot sequence is available:

Press <Home> key to boot from the local drive.

This message is displayed for 5 seconds. If the Home key is not pressed, the RIPL continues and the following messages are displayed:

```
To boot from Novell Server,           press 1
To boot from IBM LAN Server 2.x/3.x,  press 2
To boot from IBM LAN Server 4.x,     press 3
To boot from Microsoft LAN Manager 4 press 4
To boot from the first available server, press 5
If no selection within 10 seconds, will use choice 5
Please, make your choice now!
```

Following this selection the following appears:

```
RPL-ROM-ADR: 1000 5A5B 3D52
RPL-ROM-IRQ: 10
RPL-ROM-PIO: 6780
```

```
RPL-ROM-FFC: <decimal value indicating the number of attempts to
find the selected server>
```

The last line above indicates that the adapter is searching for a server. If no servers of the type selected above are found, the adapter will attempt to boot from a local drive.

## RIPL Errors

If the RIPL is unsuccessful, messages will be displayed. See Appendix H for a list and explanation of these messages.

---

## Chapter 3. Software Installation with LANAID

IBM LANAID 2.0 assists in the installation and configuration of the adapter hardware and software for the IBM LAN Client environment.

### About IBM LAN Client

IBM LAN Client prevents excessive consumption of DOS conventional memory in DOS-based computers by drivers and protocol stacks. When IBM LAN Client is used, IBM's LAN adapter drivers and protocol stacks do not require large amounts of DOS memory below 1 MB.

In addition, IBM LAN Client provides support using one adapter-specific LAN device driver for both clients and servers. You select the appropriate device driver and protocol stack for your computer, and the correct modules are automatically loaded.

IBM LAN Client provides support for the following protocols:

- For DOS 5.0 or higher:
  - NetWare Client-32 (IPX/SPX)
  - IEEE 802.2
  - DOS LAN Services
- For Windows 3.1:
  - NetWare Client-32 (IPX/SPX)
  - IEEE 802.2
  - TCP/IP
  - DOS LAN Services
- For Windows for Workgroups 3.11:
  - NetWare Client-32 (IPX/SPX)
  - IEEE 802.2
  - TCP/IP
  - DOS LAN Services

IBM LAN Client provides the following features:

- As little as 2 kB conventional memory required
- Protocol NLMs

These are dynamically loadable and unloadable modules that operate in 32-bit protect mode and implement the various protocol functions.

Supported protocols include 802.2, IPX/SPX, TCP/IP, and NetBIOS.

- New Novell NetWare Client-32 for DOS/Windows
  - 32-bit protect mode client
  - Automatically reconnects an entire network environment, including open files
  - Enhanced cache (large, configurable network cache)
  - Enhanced native installation and configuration utilities
- Provides backwards compatibility for existing DOS 802.2 and NetBIOS applications
- Uses NET.CFG file, consistent with other products
- Concurrent multiple frame types and protocols
- Winsock 1.1 support for TCP/IP

**Note:** Memory consumption does not increase when you combine multiple protocols.

### About LANAIID

LANAIID 2.0 can be used with the following operating systems:

- DOS
- Windows
- Windows for Workgroups

You must install the adapter hardware prior to running LANAIID. See Chapter 2 for details on how to install the adapter hardware. After you have physically installed the adapter hardware, you can use LANAIID to install device driver and protocol software that allows the adapter to function in your particular environment.

LANAID options can be selected in any of three ways:

1. Point and click with a mouse or other pointing device.
2. Tab to your selection and press **Enter**.
3. Press the *hot keys* (Alt + underlined characters in the option name).

---

## Installing LANAID

To use LANAID, it should first be installed on your computer's hard disk. If your computer has no hard disk or insufficient space to install the program, the command line version of LANAID, LANAIDC, can be run from the diskette (see "Command Line Invocation of LANAID" on page 3-5).

In a full-screen DOS environment, set the default drive to **A**. Insert the LANAID diskette in drive A, type **install**, and press **Enter**. LANAID will be installed and will start running automatically. Go to step 2 of "Running LANAID"

---

## Running LANAID

- 1** To run LANAID from either the hard disk or the diskette, make the hard disk or the diskette drive containing the LANAID diskette the default drive. Then, type **lanaid**, and press **Enter**.
- 2** In the first selection window presented by the program, a medium access control (MAC) address is displayed in a pull-down menu. Click on the down arrow at the right of the box to display the list of MAC addresses for all the PCI Ethernet adapters in the computer. If your computer contains more than one PCI Ethernet adapter, highlight the one you want to configure by selecting it. If there is only one, no action is required.

To match the MAC addresses shown in the list to a particular adapter, refer to the address label on the adapter bracket.

**Note:** The *Universally Administered Address Label* (see "Understanding the Adapter Labels" on page 2-4) contains the

adapter's universally administered address. This is the unique MAC address that was encoded in the adapter memory at the factory. If you want the adapter to be known on the network by a locally administered address, you must configure the adapter's device driver or protocol driver to use a locally administered address.

**3** In addition to the address list, three buttons are displayed:

- Adapter Configuration
- Software Installation
- Diagnostics

Select **Adapter Configuration** and continue with the next section.

---

## Adapter Configuration

**1** The adapter configuration panel is displayed in *tab file* format with *tab folders*. The folder names are on the tabs at the top of the panel. To change folders, click on the folder name. The folder named *Configurable* contains all the configuration parameters that apply to your adapter.

**2** Make changes to the parameters presented in this folder by selecting the option button corresponding to the desired setting. When you have finished, select the **Store** button to set the new values.

**3** Select the **Done** button to return to the main LANAIID panel.

**4** If assistance in software installation using LANAIID is desired, select the **Software Installation** button on the primary panel and continue to the next section. Otherwise, see Chapter 4 for software installation procedures not provided by LANAIID.

**Note:** The *PCI* folder provides you with the I/O address, interrupt value, and timer value for your adapter. These PCI BIOS values cannot be changed by LANAIID and are presented for information only.

The *Hardware* folder tells you the MAC address, the adapter number, and whether the adapter is enabled. The values cannot be changed by LANAIID and are presented for information only.

---

## Software Installation

- 1** Select the **Software Installation** button. For each operating system, a list of network environments is presented. Select your operating system, and then select **Overview** for information and recommendations about protocols. You can now choose the environment for which you wish to have software support.
- 2** If software for your choice of environments can be installed by LANAIID, you will have a choice of either **Custom** or **Express** installation. Select one of these and follow the instructions.
- 3** If the Custom or Express buttons are not available, select the **Information** button. The resulting panel provides information specific to the environment you chose. At the end of the text there will be an indication of where detailed installation instructions can be found.

---

## Error Messages

In the event that errors occur during the use of the LANAIID program, refer to the LNCLIENT.TXT text file provided with the LANAIID software for detailed information on the meaning and corrective action associated with each error message.

---

## Command Line Invocation of LANAIID

LANAIIDC is the command line version of LANAIID. It is intended primarily for use by system administrators. Type **lanaidc /h** for more information.

---

## **Related Documentation**

*IBM LAN Technical Reference IEEE 802.2 and NETBIOS API, SC30-3587*

*IBM Transmission Control Protocol/Internet Protocol Version 2.1 for DOS: Programmer's Reference, SC31-7046*

*Novell NetWare DOS Requester*

*Novell Workstation for DOS and MS Windows*

*Microsoft LAN Manager Installation and Configuration Guide*

*IBM LAN Server Command and Utilities, S10H-9686*

*Guide to LAN Server Books, S10H-9688*

*DOS LAN Services and User's Guide, S10H-9684*

---

## Chapter 4. Installing an Adapter Driver

This chapter contains the instructions for installing the driver that the adapter uses for communication with the network operating system or network application running on the computer. Some network operating systems and network applications provide software that automates the installation of adapter drivers. Other network operating systems do not provide automated installation capability. Manual installation procedures are provided for those cases.

**Note:** Before you install the adapter driver, verify that the adapter hardware and PCSETUP have been installed correctly. If you are using a version of OS/2 that is lower than OS/2 Warp Version 3, verify that you have installed the OS/2 fix for shared interrupts on a PCI bus. See Chapter 2 for those installation instructions.

---

### Using the Index to the Driver Installation Instructions

Table 4-1 on page 4-2 is an index to the driver installation instructions in this chapter. Locate the row in the table that describes the network environment for your computer, and then go to the appropriate installation procedure.



*Table 4-1 (Page 1 of 2). Driver Installation Instructions Index*

<b>Environment</b>	<b>Adapter Driver</b>	<b>Automatic</b>	<b>Manual</b>
NetWare 3.11	Server LAN		Page 4-4
	DOS ODI client	Page 3-1	Page 4-8
	OS/2 ODI client	Page 3-1	Page 4-10
NetWare 3.12	Server LAN		Page 4-12
	DOS ODI client	Page 3-1 or 4-15	
	OS/2 ODI client	Page 3-1 or 4-17	
NetWare 4.x	Server LAN	Page 4-19	
	DOS ODI client	Page 3-1 or 4-15	
	OS/2 ODI client	Page 3-1 or 4-17	
LAN Support Program 1.33 or higher	NDIS 2.01	Page 4-25	
LANManager 2.x	NDIS 2.01	Page 4-28	
Windows for Workgroups 3.1	NDIS 2.01	Page 4-30	
Windows for Workgroups 3.11	NDIS 2.01	Page 4-31	
	NDIS 3.0	Page 4-31	
Windows 95	NDIS 3.0	Page 4-34	
LANtastic 6.0	NDIS 2.01	Page 4-36	
OS/2 LAN Transports	NDIS 2.01	Page 4-37	
Windows NT 3.1, 3.5, or 3.51	NDIS 3.0	Page 4-39	
Network application with DOS or Windows	Packet driver		Page 4-41
Other DOS stations	NDIS 2.01 or 3.0	Page 4-46	Page 4-47





*Table 4-1 (Page 2 of 2). Driver Installation Instructions Index*

<b>Environment</b>	<b>Adapter Driver</b>	<b>Automatic</b>	<b>Manual</b>
Other OS/2 stations	NDIS 2.01 or 3.0	Page 4-46	Page 4-47



---

## Manually Installing the LAN Driver for NetWare 3.11

---

**NetWare Server 3.11** Directory: NETWARE

---

**Note:** A prerequisite to this installation procedure is that the ETHERTSM.NLM and MSM31X.NLM modules on the server are at Version 2.5 or higher. If they are not, replace them with the Version 2.5 modules provided on the PCI Ethernet Adapter Option Diskette

- 1** Is NetWare 3.11 installed on this server?
  - If NetWare is installed, go to step 3.
  - If NetWare is not installed, continue with step 2.
  
- 2** To install NetWare 3.11 and the LAN driver, perform the following steps:
  - a** For your convenience, certain NetWare modules are included with the LAN driver (for example, IBMEANWS.LAN) in the NETWARE subdirectory of the PCI Ethernet Adapter Option Diskette. Copy all of the files from the NETWARE subdirectory on the diskette to the directory on the server where the NetWare SERVER.EXE file will be installed (for example, C:\NETWARE or C:\NOVELL).
  
  - b** Follow the instructions in the section on file server installation in *Novell NetWare Version 3.11 Installation*.

When instructed, enter commands to load the NetWare modules and the LAN driver, and bind a protocol to the LAN driver. An example of the required sequence of LOAD and BIND commands is:

```
LOAD C:\NETWARE\PATCHMAN.NLM
LOAD C:\NETWARE\LSLENH.NLM
LOAD C:\NETWARE\MSM31X.NLM
LOAD C:\NETWARE\ETHERTSM.NLM
LOAD C:\NETWARE\IBMEANWS.LAN
BIND IPX TO IBMEANWS NET=1
```

After you enter the LOAD and BIND commands, the LAN driver installation is complete.



- 10** In the AUTOEXEC.NCF file, add statements that load the LAN driver and bind a protocol driver to the LAN driver. An example of those statements is:

```
LOAD C:\NETWARE\PATCHMAN.NLM
LOAD C:\NETWARE\LSLENH.NLM
LOAD C:\NETWARE\MSM31X.NLM
LOAD C:\NETWARE\ETHERTSM.NLM
LOAD C:\NETWARE\IBMEANWS.LAN
BIND IPX TO IBMEANWS NET=1
```

**Note:** The BIND statement must follow the LOAD statements. See "Sample AUTOEXEC.NCF Files" on page D-5 for sample files.

- 11** The LAN driver supports parameters for controlling certain adapter functions. If you want the driver to use a value other than the default value for a parameter, add the parameter and its value to the load statement. See "NetWare Server LAN Driver Parameters" on page D-1 for an explanation of the parameters.
- 12** If more than one PCI Ethernet Adapter is installed in the server, add a statement for each additional adapter. Specify a unique BOARD number and NAME for each adapter. BIND each adapter to the protocol. An example for two adapters is:

```
LOAD C:\NETWARE\IBMEANWS.LAN BOARD=1 NAME=B1
LOAD C:\NETWARE\IBMEANWS.LAN BOARD=2 NAME=B2
BIND IPX TO B1 NET=1
BIND IPX TO B2 NET=2
```

See "Sample AUTOEXEC.NCF Files" on page D-5 for other examples.

- 13** Save the AUTOEXEC.NCF file and exit the install program.
- 14** Issue the DOWN and EXIT commands.



- 15** Restart the server program to load the NetWare modules and the LAN driver.

If LAN driver error messages are displayed or if you later have problems in using the adapter, go to “Start of Troubleshooting Procedures” on page B-2.



---

## Manually Installing the DOS ODI Client Driver

---

**NetWare Client**      Directory: DOS  
**with DOS**

---

**Note:** A prerequisite to this installation procedure is that the LSL.COM file on your system must be at level 2.11 or higher.

- 1** If the NetWare 3.11, 3.12, or 4.x DOS Requester is not already installed on the computer, install it now. Refer to the instructions in the NetWare documentation.
- 2** Find the directory path on the computer's hard disk or boot diskette where the NetWare DOS Requester modules are installed, for example, C:\NWCLIENT.
- 3** Copy the files IBMEANWC.COM and IBMEANWC.INS from the PCI Ethernet Adapter Option Diskette to the NetWare DOS Requester directory.
- 4** Verify that the PATH statement in the AUTOEXEC.BAT file contains the directory path for the NetWare DOS Requester. An example of such a PATH statement is:

```
PATH=C:\DOS;C:\NWCLIENT
```

- 5** To load the NetWare DOS Requester modules and the DOS ODI client driver from the DOS prompt, enter the following commands at the DOS prompt:

```
C:\NWCLIENT\LSL  
C:\NWCLIENT\IBMEANWC  
C:\NWCLIENT\IPXODI  
C:\NWCLIENT\NETX   or   C:\NWCLIENT\VLM
```

- 6** To automatically load NetWare and the driver each time the computer is started, use a text editor to edit the AUTOEXEC.BAT file and add the commands listed in step 5. See "Sample DOS AUTOEXEC.BAT and NET.CFG Files" on page E-5 for a sample AUTOEXEC.BAT file.

- 7** To change the value of an ODI driver parameter from the default value, use a text editor to edit or create a NET.CFG file and specify the parameter value. A sample NET.CFG file is:

```
LINK DRIVER IBMEANWC
    ;Set locally administered address
    NODE ADDRESS A69876543210
    ;Frame type
    FRAME Ethernet_802.3
```

See “NetWare ODI Client Driver Parameters” on page E-1 for explanations of the driver parameters. See “Sample DOS AUTOEXEC.BAT and NET.CFG Files” on page E-5 for sample NET.CFG files.

**Note:** NET.CFG should be in the same directory as LSL.COM

- 8** Restart the computer to load the NetWare modules and the DOS ODI driver.

If DOS ODI driver error messages are displayed or if you later have problems in using the adapter, go to “Start of Troubleshooting Procedures” on page B-2.



---

## Manually Installing the OS/2 ODI Client Driver

---

**NetWare Client**      Directory: OS2  
**with OS/2**

---

**Note:** Use this procedure to manually install the OS/2 ODI client driver for a NetWare 3.11 client. Do not use this procedure for NetWare 3.12 and 4.x clients. This procedure involves manually editing the NET.CFG file, which can cause problems in NetWare 3.12 and 4.x environments. Instead, use the procedure in "Installing the OS/2 ODI Client Driver Using NetWare" on page 4-17 instead.

- 1** If the NetWare 3.11 Requester for OS/2 is not already installed on the computer, install it now. Refer to the instructions in the *Novell NetWare Requester for OS/2* manual.
- 2** Find the directory path on the computer's hard disk or boot diskette where the NetWare Requester for OS/2 modules are installed, for example, C:\NETWARE.
- 3** Copy IBMEANWC.OS2 (the OS/2 ODI driver file) from the OS2 directory of the PCI Ethernet Adapter Option Diskette to the NetWare Requester for OS/2 directory.
- 4** Use a text editor to edit the CONFIG.SYS file to add the following statements (if not already present):  

```
DEVICE=C:\NETWARE\LSL.SYS
DEVICE=C:\NETWARE\DDAEMON.EXE
DEVICE=C:\NETWARE\IBMEANWC.OS2
DEVICE=C:\NETWARE\IPX.SYS
```
- 5** To change the value of an ODI driver parameter from the default value, specify the parameter value in the NET.CFG file. See "NetWare ODI Client Driver Parameters" on page E-1 for explanations of the driver parameters.

**6** Restart the computer to load the NetWare modules and the OS/2 ODI driver.

If OS/2 ODI driver error messages are displayed or if you later have problems in using the adapter, go to “Start of Troubleshooting Procedures” on page B-2.

---

## Manually Installing the LAN Driver for NetWare 3.12

---

**NetWare Server 3.12** Directory: NETWARE

---

**Note:** A prerequisite to this installation procedure is that the ETHERTSM.NLM and MSM31X.NLM modules on the server are at Version 2.5 or higher. If they are not, replace them with the Version 2.5 modules provided on the PCI Ethernet Adapter Option Diskette

- 1** Is NetWare 3.12 installed on this server?
  - If NetWare is installed, go to step 3.
  - If NetWare is not installed, continue with step 2.
- 2** To install NetWare 3.12 and the LAN driver, perform the following steps:
  - a** For your convenience, certain NetWare modules are included with the LAN driver files (IBMEANWS.LAN and IBMEANWS.LDI) in the NETWARE subdirectory of the PCI Ethernet Adapter Option Diskette. Copy all of the files from the NETWARE subdirectory on the diskette to the directory on the server where NetWare SERVER.EXE will be installed (for example, C:\NETWARE or C:\NOVELL).
  - b** Follow the instructions in the section on file server installation in the NetWare installation manual.

When instructed, enter commands to load the NetWare modules and the LAN driver, and bind a protocol to the LAN driver. An example of these statements is:

```
LOAD C:\NETWARE\MSM31X.NLM
LOAD C:\NETWARE\ETHERTSM.NLM
LOAD C:\NETWARE\IBMEANWS.LAN
BIND IPX TO IBMEANWS NET=1
```

After you enter the LOAD and BIND statements, the LAN driver installation is complete.



- 10** In the AUTOEXEC.NCF file, add statements that load the LAN driver and bind a protocol driver to the LAN driver. An example of those statements is:

```
LOAD C:\NETWARE\MSM31X.NLM
LOAD C:\NETWARE\ETHERTSM.NLM
LOAD C:\NETWARE\IBMEANWS.LAN
BIND IPX TO IBMEANWS NET=1
```

**Note:** The BIND statement must follow the LOAD statements. See “Sample AUTOEXEC.NCF Files” on page D-5 for sample files.

- 11** The LAN driver supports parameters for controlling certain adapter functions. You can add or change parameters on the LAN driver (IBMEANWS.LAN) load statement. See “NetWare Server LAN Driver Parameters” on page D-1 for an explanation of the parameters.

- 12** If more than one PCI Ethernet Adapter is installed in the server, add a statement for each additional adapter. Specify a unique BOARD number and NAME for each adapter. Bind the protocol to each adapter. An example of the statements for two adapters is:

```
LOAD C:\NETWARE\IBMEANWS.LAN BOARD=1 NAME=B1
LOAD C:\NETWARE\IBMEANWS.LAN BOARD=2 NAME=B2
BIND IPX TO B1 NET=1
BIND IPX TO B2 NET=2
```

See “Sample AUTOEXEC.NCF Files” on page D-5 for other examples.

- 13** Save the AUTOEXEC.NCF file and exit the install program.
- 14** Issue the DOWN and EXIT commands.
- 15** Restart the server program to load the NetWare modules and the LAN driver.

If LAN driver error messages are displayed or if you later have problems in using the adapter, go to “Start of Troubleshooting Procedures” on page B-2.

---

## Installing the DOS ODI Client Driver Using NetWare

---

**NetWare Client  
with DOS**

Directory: DOS

---

**Note:** This installation procedure is provided as an alternative to LANAIID described in Chapter 3.

A prerequisite to this installation procedure is that the LSL.COM file on your system must be at level 2.11 or higher.

- 1** Start the install program from the NetWare 3.12 or 4.x WSDOS\_1 diskette or the 4.x CD-ROM.
- 2** At the NetWare Client Install panel, enter input for steps 1, 2, and 3, or accept the defaults.
- 3** Perform one of the following steps appropriate for the level of NetWare that you are using:
  - For a NetWare 3.12 DOS client
    - a** At step 4 in the window, press **Enter**.
    - b** When prompted, insert the PCI Ethernet Adapter Option Diskette in drive A.
    - c** Press **Enter**.
  - For a NetWare 4.0 DOS client
    - a** At step 4 in the window, press **Enter**.
    - b** When prompted, insert the PCI Ethernet Adapter Option Diskette in drive A.
    - c** Press **Esc** and then press **Enter**. The NetWare Client Install program will read the adapter driver modules from the DOS subdirectory on the diskette.
  - For a NetWare 4.0x and 4.1 DOS client
    - a** At step 4 for 4.0x or step 5 for 4.1 in the window, press **Enter** to display a list of adapter drivers.



---

## Installing the OS/2 ODI Client Driver Using NetWare

---

**NetWare Client**                      Directory: OS2  
**with OS/2**

---

**Note:** This installation procedure is provided as an alternative to LANAIID described in Chapter 3.

- 1** Start the install program from the NetWare 3.12 or 4.x WSOS2\_1 diskette or the 4.x CD-ROM.
- 2** Select **Installation** from the menu bar.
- 3** Select **Requester on workstation** from the pull-down menu.
- 4** At the Set Target Directory panel, specify the target directory, that is the directory to which the NetWare Requester for OS/2 and the OS/2 ODI driver (IBMEANWC.OS2) will be copied. The default target directory is \NETWARE on the drive from which the computer is started.  
  
Specify the source directory (the directory from which the Requester and ODI software will be copied) as A:\OS2.
- 5** From the Requester Installation panel, select **Edit CONFIG.SYS** and **Copy All Files**.
- 6** The panel titled Step 1 - Choose the ODI LAN Driver is displayed. Click on the scroll bar for the driver name list box.
- 7** When the Installation Message prompts you to insert a third-party diskette driver diskette, insert the PCI Ethernet Adapter Option Diskette.  
  
Select **IBMEANWC.OS2** from the list of driver names. Follow the instructions in the window to load the driver.
- 8** The panel titled Step 2 - Choose NetWare Support for DOS and Windows Applications is displayed. Select the type of support you need. Then, select **Continue**.



- 9** The panel titled Step 3 - Choose Optional Protocols is displayed. Select the optional products you need. Then, select **Save**.
- 10** The Copy Requester Files panel is displayed. Select **Copy** to continue with the installation.
- 11** The Copy ODI LAN Driver panel is displayed. Select the default driver (IBMEANWC.OS2) and then select **OK**. Follow the prompts to insert the NetWare diskettes.
- 12** Follow the prompts to install the Requester files.
- 13** After the files have been copied from the diskettes, a configuration notice is displayed. Follow the instructions on that panel to edit the NET.CFG file and make any other configuration changes that apply to your configuration.

See "NetWare Server LAN Driver Parameters" on page D-1 for an explanation of the OS/2 ODI driver parameters that can be included in the LINK DRIVER section of the NET.CFG file. See "Sample OS/2 NET.CFG Files" on page E-7 for a sample NET.CFG file.

- 14** Restart the computer to load the NetWare modules and the OS/2 ODI driver.

If OS/2 ODI driver error messages are displayed or if you later have problems in using the adapter, go to "Start of Troubleshooting Procedures" on page B-2.

---

## Installing the LAN Driver for NetWare 4.x

---

**NetWare Server 4.x**    Directory: NETWARE

---

**Note:** A prerequisite to these installation procedures is that the ETHERTSM.NLM and MSM.NLM modules on the server are at Version 2.5 or higher. If they are not, replace them with the Version 2.5 modules provided on the PCI Ethernet Adapter Option Diskette

Due to some significant differences in the installation steps for NetWare 4.1 and earlier 4.0x levels, two separate sets of steps are provided. To install for NetWare 4.1, go to "Installing for NetWare 4.1" on page 4-22. Otherwise, continue below.

### Installing for NetWare 4.0x

- 1** Is NetWare 4.0x installed on this server?
  - If NetWare is installed, go to step 3.
  - If NetWare is not installed, continue with step 2.
- 2** To install NetWare 4.0X and the LAN driver, perform the following steps:
  - a** For your convenience, certain NetWare modules are included with the LAN driver files (IBMEANWS.LAN and IBMEANWS.LDI) in the NETWARE subdirectory of the PCI Ethernet Adapter Option Diskette. Copy all of the files from the NETWARE subdirectory on the diskette to the directory on the server where the NetWare SERVER.EXE file will be installed (for example, C:\NETWARE or C:\NOVELL).
  - b** Follow the instructions in the section on file server installation in the NetWare installation manual. For a version 4.0 installation, when you are prompted to enter the path to the LAN driver files, enter **A:\NETWARE**.

When instructed, enter commands to load the NetWare modules, and the LAN driver, and bind a protocol to the LAN driver. You can specify configuration parameters on the LAN driver LOAD statement. See "NetWare Server

LAN Driver Parameters” on page D-1 for an explanation of the parameters.

An example of the LOAD and BIND statements is:

```
LOAD C:\NETWARE\MSM.NLM
LOAD C:\NETWARE\ETHERTSM.NLM
LOAD C:\NETWARE\IBMEANWS.LAN
BIND IPX TO IBMEANWS NET=1
```

The LOAD and BIND statements you enter are automatically added to the AUTOEXEC.NCF file.

- c** If you want to review or edit the file, go to step 9. Otherwise, the installation is complete.
- 3** Copy all of the files from the NETWARE subdirectory of the PCI Ethernet Adapter Option Diskette to the directory that contains the NetWare SERVER.EXE file (for example, C:\NETWARE or C:\NOVELL).
- 4** From the directory containing the SERVER.EXE file, type **server** and then press **Enter** to start the server, if it has not already been started.
- 5** Verify that the ETHERTSM.NLM and the MSM.NLM modules on the server are Version 2.5 or higher. If they are not, use the Version 2.5 modules that you copied from the Option Diskette.
- 6** Go to the NetWare System Console view. Type **load install** and then press **Enter**.
- 7** From the Select Install Option panel, select **Maintenance/Selective Install**.
- 8** From the Install Options panel, select **Load LAN Drivers**. Follow the instructions in the window to load the LAN driver from the PCI Ethernet Adapter Option Diskette. For a NetWare 4.0 installation, when you are prompted to enter the LAN driver path, enter **A:\NETWARE**.
- 9** To view or change the LAN driver parameters, perform steps 10 through 18.

- 10 Load the installation program, if it has not already been loaded.
- 11 From the Select Install Option panel, select **Maintenance/Selective Install**.
- 12 From the Install Options panel, select **NCF Files Options**.
- 13 From the Available NCF Files Options, select **Edit AUTOEXEC.NCF File**.
- 14 The LAN driver supports parameters for controlling certain adapter functions. You can add or change parameters on the LAN driver (IBMEANWS.LAN) load statement. See "NetWare Server LAN Driver Parameters" on page D-1 for an explanation of the parameters. See "Sample AUTOEXEC.NCF Files" on page D-5 for sample files.
- 15 If more than one PCI Ethernet Adapter is installed in the server, add a statement for each additional adapter. Specify a unique BOARD number and NAME for each adapter. An example of the load statements for two adapters is:  

```
LOAD C:\NETWARE\IBMEANWS.LAN BOARD=1 NAME=B1  
LOAD C:\NETWARE\IBMEANWS.LAN BOARD=2 NAME=B2  
BIND IPX TO B1 NET=1  
BIND IPX TO B2 NET=2
```
- 16 Save the AUTOEXEC.NCF file and exit the install program.
- 17 Issue the DOWN and EXIT commands.
- 18 Restart the server program to load the NetWare modules and the LAN driver.

If LAN driver error messages are displayed or if you later have problems in using the adapter, go to "Start of Troubleshooting Procedures" on page B-2.

## Installing for NetWare 4.1

### 1 Is NetWare 4.1 installed on this server?

- If NetWare is installed, go to step 3.
- If NetWare is not installed, continue with step 2.

### 2 To install NetWare 4.1 and the LAN driver, perform the following steps:

- a For your convenience, certain NetWare modules are included with the LAN driver files (IBMEANWS.LAN and IBMEANWS.LDI) in the NETWARE subdirectory of the PCI Ethernet Adapter Option Diskette. Copy all of the files from the NETWARE subdirectory on the diskette to the directory on the server where the NetWare SERVER.EXE file will be installed (for example, C:\NETWARE or C:\NOVELL).
- b Follow the instructions in the section on file server installation in the NetWare installation manual. When you are prompted to enter the path to the LAN driver files, press **Enter**.

When instructed, enter commands to load the NetWare modules, and the LAN driver, and bind a protocol to the LAN driver. You can specify configuration parameters on the LAN driver LOAD statement. See "NetWare Server LAN Driver Parameters" on page D-1 for an explanation of the parameters.

An example of the LOAD and BIND statements is:

```
LOAD C:\NETWARE\MSM.NLM
LOAD C:\NETWARE\ETHERTSM.NLM
LOAD C:\NETWARE\IBMEANWS.LAN
BIND IPX TO IBMEANWS NET=1
```

The LOAD and BIND statements you enter are automatically added to the AUTOEXEC.NCF file.

- c If you want to review or edit the file, go to step 12 on page 4-23. Otherwise, the installation is complete.

- 3** Copy all of the files from the NETWARE subdirectory of the PCI Ethernet Adapter Option Diskette to the directory that contains the NetWare SERVER.EXE file (for example, C:\NETWARE or C:\NOVELL).
- 4** From the directory containing the SERVER.EXE file, type **server** and then press **Enter** to start the server, if it has not already been started.
- 5** Verify that the ETHERTSM.NLM and the MSM.NLM modules on the server are Version 2.5 or higher. If they are not, use the Version 2.5 modules that you copied from the Option Diskette.
- 6** Go to the NetWare System Console view. Type **load install** and then press **Enter**.
- 7** Select **Driver Options**.
- 8** Select **Configure network drivers**.
- 9** Select **Select a Driver**, and then press the **Insert** key to specify other drivers.
- 10** Press **F3** to specify a path.
- 11** Press **Enter** and then follow the remaining instructions.
- 12** To view or change the LAN driver parameters, perform steps 13 through 20.
- 13** Load the installation program, if it has not already been loaded.
- 14** From the Install Options panel, select **NCF Files Options**.
- 15** From the Available NCF Files Options, select **Edit AUTOEXEC.NCF File**.
- 16** The LAN driver supports parameters for controlling certain adapter functions. You can add or change parameters on the LAN driver (IBMEANWS.LAN) load statement. See "NetWare Server LAN Driver Parameters" on page D-1 for an explanation of the parameters. See "Sample AUTOEXEC.NCF Files" on page D-5 for sample files.

- 17** If more than one PCI Ethernet Adapter is installed in the server, add a statement for each additional adapter. Specify a unique BOARD number and NAME for each adapter. An example of the load statements for two adapters is:

```
LOAD C:\NETWARE\IBMEANWS.LAN BOARD=1 NAME=B1
LOAD C:\NETWARE\IBMEANWS.LAN BOARD=2 NAME=B2
BIND IPX TO B1 NET=1
BIND IPX TO B2 NET=2
```

See "Sample AUTOEXEC.NCF Files" on page D-5 for other examples.

- 18** Save the AUTOEXEC.NCF file and exit the install program.
- 19** Issue the DOWN and EXIT commands.
- 20** Restart the server program to load the NetWare modules and the LAN driver.

If LAN driver error messages are displayed or if you later have problems in using the adapter, go to "Start of Troubleshooting Procedures" on page B-2.

---

## Installing the NDIS 2.01 Driver for LSP

---

### LAN Support Program

Directory: DOS

---

- 1** LSP Version 1.33 or higher is required.
  - If LSP is installed, go to step 4.
  - If LSP is not installed, continue with step 2.
  
- 2** You can install LSP to a hard disk or a diskette. That drive or diskette will be used to start the computer and load the LSP protocol drivers and the NDIS adapter driver.
  - If you want to install LSP to a hard disk, verify that DOS Version 3.3 or higher is installed on the drive.
  - If you want to install LSP to a diskette, format a system diskette using the DOS command `FORMAT /S`.
  
- 3** Make a backup copy of the LSP installation diskette.
  - To copy the LSP diskette to another diskette, use the DOS `DISKCOPY` command. Maintain the directory structure that is found on the diskette.
  - To copy the diskette to the hard disk, use the DOS command `XCOPY /S` to copy the subdirectories.
  
- 4** Set the current drive and directory to the location of the LSP Installation Aid, `DXMAID.EXE`.
  
- 5** To start the LSP Installation Aid, type **DXMAID** and press **Enter**.
  
- 6** Follow the instructions on the first panels to respond to the installation questions concerning your setup and copy the NDIS adapter driver from the PCI Ethernet Adapter Option Diskette. When prompted, insert the diskette in drive A and press **Enter** to accept the default search path (`A:\DOS`).



If you need more information about an Installation Aid panel, press **F1** for Help. To obtain additional help, press **F1** from the Help panel.

- 7** On the panel for Primary Adapter and Alternate Adapter configuration, review the Primary Adapter section of the panel to:
  - a** Verify that IBM PCI Ethernet Adapter driver (IBMEANDI.DOS) is listed as the **Adapter Driver**.

If you want to change any of the adapter driver parameters, select the driver and then press **F5**. Use the Help function to obtain explanations of the parameters. "NDIS Adapter Drivers Parameters" on page F-1 also explains the parameters.
  - b** Review the **Protocol Drivers**. The protocol drivers listed will be installed unless you change the list. You must install one of the NDIS protocol drivers.

If you want to change the protocol drivers, select a protocol driver in the list and press **F6** to display the list of choices.
- 8** If you need to install drivers for a second PCI Ethernet Adapter installed in the computer, perform the following steps:
  - a** Move the cursor to **Adapter Driver** in the Alternate Adapter section of the panel. Then, press **F6**.
  - b** Select **IBM PCI Ethernet Adapter driver (IBMEANDI.DOS)** from the list of adapter drivers.
  - c** Move the cursor to **Protocol Drivers**. Then, press **F6** and then select a protocol driver from the list. You must install one of the NDIS protocol drivers.
- 9** Press **F4** to begin the installation. The Installation Aid will copy the NDIS driver and protocol driver to the appropriate directory and edit the CONFIG.SYS, AUTOEXEC.BAT, and PROTOCOL.INI files. See "Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files" on page F-5 for sample files.

The PCI Ethernet Adapter Option Diskette also contains a sample file, DOS\PROTOCOL.SMP, which explains the adapter parameters and illustrates the driver section of the PROTOCOL.INI file. You cannot use the DOS\PROTOCOL.SMP file as your PROTOCOL.INI file, because the file is not complete.

- 10** After the installation is completed, restart the computer to load the NDIS adapter driver and the LSP protocol driver.

If NDIS 2.01 driver error messages are displayed or if you later have problems in using the adapter, go to “Start of Troubleshooting Procedures” on page B-2.

---

## Installing the NDIS 2.01 Driver for LANManager 2.x

---

<b>LANManager</b>	Directory for DOS: MSLANMAN.DOS\DRIVERS\ETHERNET\IBMPCI
	Directory for OS/2: MSLANMAN.OS2\DRIVERS\ETHERNET\IBMPCI

---

- 1** Install Microsoft LANManager 2.x if it has not already been installed. Refer to the *Microsoft LAN Manager Installation and Configuration Guide* for instructions.
- 2** Start the LANManager Setup program and select **Configuration**.
- 3** Select **Network Drivers**.
- 4** If Microsoft LANManager has been configured to support other LAN adapters in the computer, the Workstation Configuration window will be displayed. Select **Add New Config** on that window.  
  
**Note:** The Add New Config option will not be available if another network driver has been installed by using the LANManager Basic installation. Because Basic supports only one network driver, you must remove the other driver before installing the PCI Ethernet Adapter driver, or you can use the LANManager Advanced installation to install both drivers.
- 5** On the Network Adapter Drivers window, select **Other Driver**.
- 6** When prompted, insert the PCI Ethernet Adapter Option Diskette in the diskette drive and press **Enter**. Do not enter a path name on the prompt window. The diskette is already set to enable the Setup utility to find the files.

A message will be displayed to indicate when the adapter driver (IBMEANDI.DOS or IBMEANDI.OS2) has been copied. Press **Enter** to continue.

- 7** On the Network Protocols window, select a protocol. Microsoft LANManager requires the NetBEUI driver for NetBIOS support.
- 8** Follow the instructions in the window to complete the configuration.

The LANManager Setup program will edit the CONFIG.SYS, AUTOEXEC.BAT, and PROTOCOL.INI files. See “Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files” on page F-5 for sample files.
- 9** If you want to add or change the adapter driver parameter values, use a text editor to edit the PROTOCOL.INI file. See “NDIS Adapter Drivers Parameters” on page F-1 for an explanation of the parameters.
- 10** After the configuration is completed, return to step 4 on page 4-28 if you need to configure LANManager for a second PCI Ethernet Adapter installed in the computer.
- 11** Restart the computer to load the NDIS adapter driver.

If NDIS 2.01 driver error messages are displayed or if you later have problems in using the adapter, go to “Start of Troubleshooting Procedures” on page B-2.

---

## Installing the NDIS 2.01 Driver for Windows for Workgroups 3.1

---

**Windows for Workgroups**      Directory: DOS

---

- 1** In the Main window in Windows, select the **Control Panel** icon.
- 2** In the Network Settings dialog box, select **Adapters**. The Network Adapters dialog box is displayed.
- 3** In the Network Adapters dialog box, select **Add**.
- 4** In the list of network adapters, select **Unlisted or Updated Network Adapter**
- 5** Insert the PCI Ethernet Adapter Option Diskette in drive A and enter the driver path **A:\DOS**.
- 6** Select the PCI Ethernet Adapter driver (IBMEANDI.DOS) and select **OK**.
- 7** If the adapter driver requires configuration, a **Setup** dialog box will be displayed. Follow the instructions in the window to change a configuration parameter. See "NDIS Adapter Drivers Parameters" on page F-1 for additional information about the parameters.

When you have finished, select **Close** to close the Network Adapters dialog box.

- 8** In the Network Settings dialog box, select **OK**.
- 9** Follow the instructions in the window to complete the installation.
- 10** Restart the computer to load the NDIS adapter driver.

If NDIS 2.01 driver error messages are displayed or if you later have problems in using the adapter, go to "Start of Troubleshooting Procedures" on page B-2.

---

## Installing an NDIS Driver for Windows for Workgroups 3.11

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<b>Windows for Workgroups</b>	Directory for NDIS 2.01: DOS
	Directory for NDIS 3.0: WFW

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- 1** The PCI Ethernet Adapter Option Diskette supports the Windows for Workgroups automated driver installation. The diskette is set up for cases where drive C is the boot drive (the drive from which computer is started) and the Windows for Workgroups drive.

If the Windows for Workgroups and the boot drive are drive C, go to step 2.

If the Windows for Workgroups drive is D and the boot drive is C, perform the following steps:

- a** Obtain a formatted, blank diskette.
- b** Copy the file IBMEAWFW.386 from the WFW directory of the Option Diskette to the root directory of the formatted, blank diskette.
- c** Copy the file IBMEANDI.DOS from the DOS directory of the Option Diskette to the root directory of the formatted diskette.
- d** Copy the file OEMSETUP.INF from the root directory of the Option Diskette to the root directory of the formatted diskette.
- e** Copy the file DISK1 from the root directory of the Option Diskette to the root directory of the formatted diskette.

- f** Use a text editor to edit the OEMSETUP.INF file in root directory of the diskette. Locate the following line in the file:

```
[disks]
  1=\WFW,"IBM PCI Ethernet Adapter Driver Disk", disk1
```

- g** Change **1=\WFW** to **1=\.** on that line.

- h** Continue with step 2 on page 4-32.

- 2** In the Program Manager window for Windows for Workgroups, select the **Windows Setup** icon.
- 3** From the Options Menu, select **Change Network Settings**.
- 4** From the Network Setup dialog box, select **Drivers**.  
If the Drivers button is unavailable, select **Networks** and then install the network.
- 5** In the Network Drivers dialog box, select **Add Adapter**.
- 6** In the Add Network Adapter dialog box, select **Unlisted or Updated Network Adapter** and then select **OK**.
- 7** The **Install Driver** dialog box is displayed with the A:\ prompt. Insert the PCI Ethernet Adapter Option Diskette or the diskette created in step 1 in drive A and then select **OK**.
- 8** Select either the NDIS 2.01 (IBMEANDI.DOS) or 3.0 (IBMEAWFW.386) adapter driver from the list and then select **OK**.
- 9** To display the parameters for the adapter drivers, select **Setup** in the Network Drivers dialog box. Follow the instructions in the window to change a parameter. See "NDIS Adapter Drivers Parameters" on page F-1 for additional information about the parameters.  
  
When you have finished, select **Close** to close the Network Drivers dialog box.
- 10** In the Network Setup dialog box, select **OK**.

- 11** In the Microsoft-specific dialog boxes, select **Skip** if the Windows for Workgroups software is already installed.

**Note:** If you install Windows for Workgroups, after the software is installed, you might be prompted on the Install Driver dialog box to enter the path to the NDIS 2.01 driver (IBMEANDI.DOS) on the PCI Ethernet Adapter Option Diskette. If you are prompted, type **IBDOS** in the path field and press **Enter**.

- 12** Exit Windows for Workgroups and follow the prompt to restart the computer to load the NDIS adapter driver.

If NDIS driver error messages are displayed or if you later have problems in using the adapter, go to “Start of Troubleshooting Procedures” on page B-2.



---

## Installing the NDIS 3.0 Driver for Windows 95

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**Windows 95**      Directory: none

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Drivers for the IBM PCI Ethernet Adapter are provided with the Microsoft Windows 95 package and can be installed by Windows 95 using the following procedure:

- 1** After the IBM PCI Ethernet adapter card has been installed in the machine, switch on the power and initialize Windows 95.
- 2** As Windows 95 is initializing, it will automatically detect the presence of the new adapter. A window will be displayed with the title "New Hardware Found." Because Windows 95 can determine what type of adapter is installed, it will automatically begin to install the appropriate driver software. If necessary, the installation process will display requests for insertion of the required Windows 95 media (diskettes or CD-ROM) in a drive.
- 3** After the driver installation is complete, a dialog box titled "System Settings Change" will be displayed asking if the machine should be restarted to allow the changes to take effect. Select the **Yes** button.
- 4** After the machine has restarted and Windows 95 is initialized, the adapter can be used with the default configuration. If using the default configuration is acceptable, installation is complete and you can exit this procedure. If, however, other settings are needed, select the **Start** button. A list of system applications will be displayed from which you should select **Settings**. Another list will be displayed from which you should select **Control Panel**.
- 5** When the Control Panel window is displayed, select the **Network** icon. A set of tab folders will be displayed. Select the **Configuration** tab.
- 6** A window containing a list of the installed network components (adapters, drivers, protocols, and so on) will be displayed. Select the AMD\*\* adapter, and then select **Properties**.

- 7** A window containing additional tab folders will be displayed. Each folder contains a group of adapter configuration keywords. Make any desired configuration changes; then, exit the process and return to the Windows 95 desktop.

**Note:** The keywords LED3 and TP are not supported by the IBM PCI Ethernet adapter. Do not change the default settings for these keywords.

- 8** Installation and setup of the IBM PCI Ethernet adapter for Windows 95 is now complete.

---

## Installing the NDIS 2.01 Driver for Artisoft LANtastic

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**LANtastic**                      Directory: LANTASTI

---

- 1** If Artisoft LANtastic is not already installed on the computer, use the DOS MD command to create a subdirectory called LANTASTI on the drive where LANtastic is to be installed.
- 2** Insert the LANtastic 6.0 installation diskette in drive A. At the DOS prompt, type **a:\install** and press **Enter**.
- 3** Follow the instructions on the installation panels. Refer to the LANtastic manual for help in answering prompts. In addition to that information, you will need the following information during the installation:
  - The default name for the directory where LANtastic is to be installed is LANTASTI.
  - On the panel for selecting LANtastic features, do not select any of the options titled "Client to Novell Server." The NDIS driver cannot be installed if you select one of those options.
  - On the Select Network Adapter panel, select **NDIS Support for Network Adapters**.
  - When prompted to insert the manufacturer's driver diskette, insert the PCI Ethernet Adapter Option Diskette.
  - Select **OK** to perform the installation.
  - Insert the LANtastic diskettes when prompted.
- 4** After the installation has been completed, restart the computer to load the NDIS driver (IBMEANDI.DOS) and the protocol driver (PROTOCOL.INI).

If NDIS 2.01 driver error messages are displayed or if you later have problems in using the adapter, go to "Start of Troubleshooting Procedures" on page B-2.

---

## Installing the NDIS 2.01 Driver for OS/2 with LAN Transports

---

**OS/2 with  
IBM LAN  
Transports**                      Directory: (root)

---

The adapter requires the OS/2 NDIS 2.01 driver to run in an IBM LAN Transports environment, such as an IBM OS/2 LAN Server or the Multiple Protocol Transport Service (MPTS) environment for IBM LAN Server 4.0. You can use the LAN Adapter and Protocol Support program (LAPS.EXE) or MPTS to install the OS/2 NDIS driver.

- 1** After IBM LAN Transports has been installed on the computer's hard disk, start the program.
  - Start LAPS by selecting its icon from the System Setup folder, or by entering the LAPS command from the directory \IBMCOM.
  - Start MPTS by selecting its icon from the desktop.
- 2** Select **Install** from the main menu of the IBM LAN Transports program to add the PCI Ethernet Adapter to the list of adapters recognized by IBM LAN Transports.
- 3** When the Install Additional Network Drivers panel appears, insert the PCI Ethernet Adapter Option Diskette in drive A and select **OK**.
- 4** After the message appears stating that the PCI Ethernet Adapter has been installed, select **OK**.
- 5** Select the **Configure** option from the main menu to continue with the adapter driver (IBMEANDI.OS2) installation. At this point a configuration window is displayed. The contents of the window varies depending upon whether you are installing from LAPS or from MPTS:

- For LAPS, the window contains the button Configure LAN Transport. This button is the default selection. Ensure that it is selected and then select the **Continue** button.
- For MPTS, the window contains the button LAN Adapters and Protocols. This button is the default selection. Ensure that it is selected and then select the **Configure** button.

**6** In the next window:

- a** Select **IBM PCI Ethernet Adapter (IBMEANDI.OS2)** in the Network Adapters list. If you want to specify values for adapter parameters, select **Edit**. Press **F1** to obtain explanations of the parameters. "NDIS Adapter Drivers Parameters" on page F-1 also explains the parameters.
- b** In the Protocols list, select the protocol driver that your network environment requires. Refer to the documentation for the LAN Transports program for information about the protocol drivers.
- c** If you need to install drivers for a second PCI Ethernet Adapter in the computer, select and configure the adapter driver and protocol driver for that adapter.

**7** Follow the instructions in the window to save the configuration and exit the installation program. The installation program will install the drivers and edit the system files. See "Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files" on page F-5 for sample system files.

**8** Restart the computer to load the NDIS adapter driver and the protocol driver.

If NDIS 2.01 driver error messages are displayed or if you later have problems in using the adapter, go to "Start of Troubleshooting Procedures" on page B-2.

---

## Installing the NDIS 3.0 Driver for Windows NT

---

<b>Windows NT</b>	Directory for Windows NT 3.1 and 3.5: (root) Directory for Windows NT 3.51: NT351
-------------------	--

---

**Note:** Refer to the *Microsoft Windows NT System Guide* for the general procedure for installing network drivers for Windows NT 3.1, 3.5, or 3.51.

- 1 Log on to Windows NT 3.1, 3.5, or 3.51.
- 2 Select the **Windows NT Main** icon.
- 3 Select the **Control Panel** icon. In the Control Panel window, select the **Network** icon.  
**Note:** If the Control Panel icon is not displayed, select **MS-DOS Command Prompt** to display the command-line prompt, type **Control** on the command line, and then press **Enter**.
- 4 In the Network Settings dialog box, select **Add Adapter**.
- 5 In the Add Network Adapter dialog box, scroll down the list and select **<Other> Requires disk from manufacturer**. Then, select **Continue**.
- 6 When prompted, insert the PCI Ethernet Adapter Option Diskette in drive A. If you are installing for Windows NT 3.1 or 3.5, select **OK** to accept the default path, A:\. If you are installing for Windows NT 3.51, set the path to A:\NT351.
- 7 In the Select OEM Option dialog box, select **IBM PCI Ethernet Adapter software**.  
Several work-in-progress windows are displayed, indicating that the driver (IBMEAWNT.SYS for 3.1 and 3.5, or IBMEA351.SYS for 3.51) is being copied to your computer's hard disk.
- 8 In the IBM PCI Ethernet Adapter dialog box, change the default values of the driver parameters as required. See "NDIS

Adapter Drivers Parameters” on page F-1 for additional information about the parameters.

When you have finished, select **OK**.

- 9** The Network Setting panel is displayed again. This time, there should be an entry for the IBM PCI Ethernet Adapter in the Installed Adapter Cards list box.
- 10** Select **OK** at the top right to complete the installation. You are prompted to turn OFF and then turn ON the computer. To allow the program to do this for you, respond **YES** to the prompt. Windows NT will automatically restart your computer to load the NDIS adapter driver.

If NDIS 3.0 driver error messages are displayed or if you later have problems in using the adapter, go to “Start of Troubleshooting Procedures” on page B-2.

- 11** If you want to configure a locally administered address for the adapter, perform the following steps:
  - a** Start Windows NT, if it has not already been started.
  - b** Select the command prompt. At the prompt, enter the command **regedt32**. The Registry Editor panel and the HKEY\_LOCAL\_MACHINE folder will be displayed.
  - c** From the HKEY\_LOCAL\_MACHINE folder, select the **System** folder.
  - d** Select the following options in sequence: **CurrentControlSet**, **Services**, **IBMEAWNT<sub>x</sub>** (where *x* is the instance number), and **Parameters**.
  - e** On the list of Keywords, select **NetworkAddress**.
  - f** Type in the locally administered address in canonical format. That is a 12-digit hexadecimal address of the form **x2xxxxxxxxxx**, **x6xxxxxxxxxx**, **xAxxxxxxxxxx**, or **xExxxxxxxxxx**, such as 060011112222.
  - g** Press **OK** and then restart the system.

---

## Manually Installing the Packet Driver

---

**Network Application with DOS or Windows**                      Directory: PACKET

---

- 1 The PCI Ethernet Adapter Option Diskette contains the following code and files:
  - The packet driver and related information files (in the subdirectory PACKET)
  - The packet driver source code (in PACKET\SOURCE)
  - The packet driver utilities (in PACKET\UTILS)

Be sure to read the PACKET\COPYING.DOC file, which contains the general public license for the packet driver software.

- 2 Verify that DOS 3.3 or higher, or Microsoft Windows 3.1 or higher is installed.

If you are using Windows, exit the program before installing the packet driver.
- 3 Verify that NetWare, TCP/IP, or PC-NFS is installed.
- 4 The syntax of the packet driver command is:

```
IBMEAPKT [-w] INT=0xHH  
[BUSTYPE=type] [LED0=0xHHH] [LED1=0xHHH]  
[LED2=0xHHH] [FDUP=type]
```

where INT is a required parameter and the other parameters are optional. Specify as many options as needed. See Table 4-2 on page 4-43 for an explanation of the parameters.

- 5 To load the driver from the AUTOEXEC.BAT file,
  - a Use a text editor to add the packet driver command to the file.



**Note:** If you start Microsoft Windows from the AUTOEXEC.BAT file, insert the packet driver statement before the Windows load statement.

- b** Restart the computer to load the packet driver.

If you specified the Windows support parameter, ensure that you start Windows.

- 6** To load the driver from the command line, enter the packet driver command at the DOS prompt.

If you specified the Windows support parameter, ensure that you start Windows.

- 7** If packet driver error messages are displayed or if you have problems using the adapter, go to "Start of Troubleshooting Procedures" on page B-2.

---

*Table 4-2 (Page 1 of 3). Parameters for the Packet Driver*

---

**Parameter and Explanation**

---

**-w**

Enables support for Microsoft Windows environments. This function detects when Windows has swapped the network application out of memory and drops packets. Stop Windows before you load the packet driver with this parameter specified, load the packet driver, and then restart Windows.

If you are using Windows 3 Enhanced Mode, use the WINPKT utility instead of this parameter. See "Packet Driver Utilities" on page G-1 for a description of the WINPKT utility.

---

**INT=0xHH**

Specifies the software interrupt number that the network application will use to communicate with the packet driver. The value is a hexadecimal address and must be specified using the notation 0xHH, where HH is the software interrupt number.

This parameter is required for all packet driver installations.

Valid values: 0x60 to 0x80 (0x60 recommended)

**Note:** Some interrupts in the valid range are used for other purposes. If the interrupt you specify does not work, try another value. For a listing of addresses in the valid range that are used by other applications, refer to the Appendix of the PACKET\INSTALL.TXT document on the PCI Ethernet Adapter Option Diskette.

---

**BUSTYPE=type**

Specifies the mechanism the packet driver uses to search for the IBM PCI Ethernet Adapter. The driver might be unable to locate the adapter if the parameter is set incorrectly. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.

Valid values:

PCI1 (scan mechanism 1)

PCI2 (scan mechanism 2)

**Note:** PCI2 is the recommended value.

---

---

*Table 4-2 (Page 2 of 3). Parameters for the Packet Driver*

---

**Parameter and Explanation**

---

**LED0=0xHHH**

Programs the LED0 register to have the meaning specified by *HHH*, a 3-digit, hexadecimal value. The LED0 register controls the lower green (nearest the AUI connector) adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED0, you must specify a value for LED1 and LED2.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 0C0 (link status OK)

---

**LED1=0xHHH**

Programs the LED1 register to have the meaning specified by *HHH*, a 3-digit, hexadecimal value. The LED1 register controls the amber adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED1, you must specify a value for LED0 and LED2.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 0B0 (adapter is transmitting or receiving)

---

---

*Table 4-2 (Page 3 of 3). Parameters for the Packet Driver*

---

**Parameter and Explanation**

---

**LED2=0xHHH**

Programs the LED2 register to have the meaning specified by *HHH*, a 3-digit, hexadecimal value. The LED2 register controls the upper green (nearest the RJ-45 connector) adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED2, you must specify a value for LED0 and LED1.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 180 (full-duplex mode)

---

**FDUP=*type***

Specifies whether the adapter is to operate in full-duplex mode for either the 10BASE-T port or the AUI port, or is not to operate in full-duplex mode for either port. When LED2 (described above) is on, the adapter is operating in full-duplex mode.

Valid values:

- OFF (neither port will operate in full-duplex mode)
- UTP (the 10BASE-T port will operate in full-duplex mode)
- AUI (the AUI port will operate in full-duplex mode)

Default value: OFF (neither port will operate in full-duplex mode)

---

---

## Installing an NDIS 2.01 Driver Using Other Installation Programs

---

<b>Other DOS environments</b>	Directory: DOS
<b>Other OS/2 environments</b>	Directory: (root)

---

- 1** If your network operating system or network application provides an installation program that can be used to install an NDIS adapter driver and an NDIS-compliant protocol driver, refer to that product's documentation for instructions on the use of the program to install one of the NDIS 2.01 drivers (IBMEANDI.DOS or IBMEANDI.OS2) and the protocol driver.
- 2** Restart the computer to load the NDIS adapter driver.  
If NDIS driver error messages are displayed or if you later have problems in using the adapter, go to "Start of Troubleshooting Procedures" on page B-2.

---

## Manually Installing an NDIS 2.01 Driver

---

**Other DOS environments**            Directory: DOS

**Other OS/2 environments**            Directory: (root)

---

- 1** Install the NDIS-compliant network operating system or network application, if it has not already been installed.
- 2** Copy the driver and related files from the PCI Ethernet Adapter Option diskette to the directory that contains the NDIS-compliant network protocol software.
  - For DOS, copy the following files from the DOS directory on the Option Diskette:
    - IBMEANDI.DOS
    - IBMEANDI.NIF
  - For OS/2, copy the following files from the root directory on the Option Diskette:
    - IBMEANDI.OS2
    - IBMEANDI.NIF

**3** Edit the CONFIG.SYS file in the root directory of the drive or the diskette from which the computer is started.

- a** Add a device statement to load the NDIS adapter driver. Place that statement after the DEVICE statement for the Protocol Manager (PROTMAN.DOS or PROTMAN.OS2). For DOS, the format of the statement is:

```
DEVICE=C:\path\IBMEANDI.DOS
```

For OS/2, the format of the statement is:

```
DEVICE=C:\path\IBMEANDI.OS2
```

**Note:** If there is a second PCI Ethernet Adapter in the computer, see “Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files” on page F-5 for sample CONFIG.SYS files.

- b** Verify that the CONFIG.SYS file does not contain the following statement:

```
STACKS=0,0
```

Use the computer's default STACKS allocation as a minimum.

**4** Locate the system PROTOCOL.INI file. The file is in the path specified after the */i:* parameter in the Protocol Manager (PROTMAN.DOS or PROTMAN.OS2) statement of the CONFIG.SYS file. If there is no */i:* parameter in the Protocol Manager statement, check the LANMAN directory for the PROTOCOL.INI file.

## 5 Edit the system PROTOCOL.INI file:

- a Add a section for the NDIS adapter driver. Note that the parameters in the PROTOCOL.INI file must be entered in upper case. An example of such a section is:

```
[IBMEAN_NIF]
DRIVERNAME = IBMEAN$
BUSTYPE = PCI2
NETADDRESS = "020011112222"
LED0 = 0xC0
LED1 = 0xB0
LED2 = 0x180
FDUP = OFF
RXBUFFERS = 4
TXBUFFERS = 4
```

**Note:** If there is a second PCI Ethernet Adapter in the computer, add a second driver section. See “Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files” on page F-5 for sample files. The PCI Ethernet Adapter Option Diskette also contains a sample file, DOS\PROTOCOL.SMP, which explains the adapter parameters and illustrates the driver section of the PROTOCOL.INI file. You cannot use the DOS\PROTOCOL.SMP file as your PROTOCOL.INI file, because the file is not complete.

- b Edit the section for the protocol driver that will use the PCI Ethernet Adapter. Add a BINDINGS statement to the protocol section:

```
[A_PROTOCOL_DRIVER]
BINDINGS = IBMEAN_NIF
```

**Note:** The name in the BINDINGS statement must match the name of an adapter section in the file.

- c If you do not want to use the default value for a PROTOCOL.INI driver parameter, change the value of the parameter. See “NDIS Adapter Drivers Parameters” on page F-1 for explanations of the parameters.

## 6 Restart the computer to load the NDIS adapter driver.





If NDIS driver error messages are displayed or if you later have problems in using the adapter, go to “Start of Troubleshooting Procedures” on page B-2.



---

## Appendix A. Product Warranty and Notices

This appendix contains the product warranty, notices, and trademarks.

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### Product Warranty



International Business Machines Corporation Armonk, NY 10504

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#### Statement of Limited Warranty

*The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you originally purchase for your use, and not for resale, from IBM or an IBM authorized reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. Machines are subject to these terms only if purchased in the United States or Puerto Rico, or Canada, and located in the country of purchase. If you have any questions, contact IBM or your reseller.*

**Machine** IBM PCI Ethernet Adapter

**Warranty Period\*** Lifetime

*\*Elements and accessories are warranted for three months. Contact your place of purchase for warranty service information.*

## Production Status

Each Machine is manufactured from new parts, or new and serviceable used parts (which perform like new parts). In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's warranty terms apply.

## The IBM Warranty

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. IBM calculates the expiration of the warranty period from the Machine's Date of Installation. The date on your receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period, IBM or your reseller will provide warranty service under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine. IBM or your reseller will specify the type of service.

For a feature, conversion, or upgrade, IBM or your reseller may require that the Machine on which it is installed be 1) the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Some of these transactions (called "Net-Priced" transactions) may include additional parts and associated replacement parts that are provided on an exchange basis. All removed parts become the property of IBM and must be returned to IBM.

Replacement parts assume the remaining warranty of the parts they replace.

If a Machine does not function as warranted during the warranty period, IBM in its sole discretion will repair, replace it (with a Machine that is at least functionally equivalent), or refund the purchase price. To obtain coverage under the warranty you may be required to present proof of purchase.

This warranty is non-transferable by the end-user customer.

## Warranty Service

To obtain warranty service for the Machine, you should contact your reseller or call IBM. In the United States, call IBM at **1-800-426-7299**. In Canada, call IBM at **1-800-565-3344**. You may be required to present proof of purchase.

Depending on the Machine, the service may be 1) a "Repair" service at your location (called "On-site") or at one of IBM's or a reseller's service locations (called "Carry-in") or 2) an "Exchange" service, either On-site or Carry-in.

When a type of service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced.

It is your responsibility to:

1. obtain authorization from the owner (for example, your lessor) to have IBM or your reseller service a Machine that you do not own;
2. where applicable, before service is provided —
  - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provide,
  - b. secure all programs, data, and funds contained in a Machine,
  - c. inform IBM or your reseller of changes in a Machine's location, and
  - d. for a Machine with exchange service, remove all features, parts, options, alterations, and attachments not under warranty service. Also, the Machine must be free of any legal obligations or restrictions that prevent its exchange; and
3. be responsible for loss of, or damage to, a Machine in transit when you are responsible for the transportation charges.



## **Extent of Warranty**

IBM does not warrant uninterrupted or error-free operation of a Machine.

Misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible may void the warranties.

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In Canada, warranties include both warranties and conditions.

Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.



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Circumstances may arise where, because of a default on IBM's part (including fundamental breach) or other liability (including negligence and misrepresentation), you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages, IBM is liable only for:

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2. the amount of any other actual loss or damage, up to the greater of \$100,000 or the charge for the Machine that is the subject of the claim.

Under no circumstances is IBM liable for any of the following:

1. third-party claims against you for losses or damages (other than those under the first item listed above);
2. loss of, or damage to, your records or data; or
3. economic consequential damages (including lost profits or savings) or incidental damages, even if IBM is informed of their possibility.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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## **Telecommunications Safety Requirements in the United Kingdom**

This IBM product is made to high safety standards. It complies inherently with telecommunications safety standard BS 6301. It is not designed to provide protection from excessive voltages appearing externally at its interfaces. Therefore, when this product is connected to a public telecommunications network via any other equipment, and you connect to this product items not supplied by IBM United Kingdom Ltd., you must comply with mandatory telecommunications safety requirements.

## **Statement of Compliance with the United Kingdom Telecommunications Act 1984**

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connections to the public telecommunications systems in the United Kingdom.

---

## **Electronic Emission Notices**

### **Federal Communications Commission (FCC) Statement**

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the

equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### **Industry Canada Class B Emission Compliance Statement**

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

### **Avis de conformité aux normes d'Industrie Canada**

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

### **European Union (EU) Mark of Conformity Statement**

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection





requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu führen. Der Außsteller der Konformitätserklärung ist die IBM UK Ltd., PO Box 30, Spango Valley, Greenock, Scotland PA16 0AH.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

### **Japanese Voluntary Control Council for Interference (VCCI) Statement**

This equipment is in the 2nd Class category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment aimed at preventing radio interference in such residential areas.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read the instructions for correct handling.

### **情報処理装置等電波障害自主規制協議会 (VCCI) 表示**

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## Appendix B. Obtaining Service and Troubleshooting

This chapter contains instructions for obtaining service and software updates and troubleshooting problems with the adapter. It also contains instructions for testing the adapter.

---

### Obtaining Service and Software Updates

Refer to the *Adapter Support Information* card that is included in the adapter kit for telephone numbers and Internet addresses for warranty service, technical support, and software updates.

If the card is missing or otherwise not available, the numbers and addresses are as follows:

#### IBM Product Support

Options by IBM HelpCenter	(800) 426-7299
IBM Support Services	(800) 237-5111
IBM Help Center	(800) 772-2227
HelpPC (Canada)	(800) 565-3344

#### IBM BBS

For new or updated versions of the installation or driver code call:

United States	(919) 517-0001 (directory 32)
Vancouver	(604) 664-6464
Toronto	(416) 956-7877
Montreal	(514) 938-3022
Winnipeg	(204) 934-2735
Markham	(905) 316-4255
Halifax	(902) 420-0300

You can download the code from the BBS or the Internet. If you are outside the United States or Canada, contact your IBM marketing representative.

## World Wide Web

Anonymous ftp to lansupport.raleigh.ibm.com

On a web browser: <http://www.raleigh.ibm.com/>

Select *Resources*,  
then *Network Environment Support FTP Server*,  
then *directories/pub/products/lanprods*.

---

## Start of Troubleshooting Procedures

Use the following troubleshooting procedure when you have problems installing the adapter device drivers or using the adapter for communication:

- 1** If the adapter driver is loaded, an attempt to restart using Ctrl + Alt + Del will not be successful in some computers. Similarly, if you are running Windows NT, an attempt to shut down the system will fail if the adapter driver is loaded. In either case the PCI bus is not reset. To solve the problem, restart the computer by pressing the Reset button on the computer, or switch the computer power OFF and then back ON.
- 2** Ensure that all the connections associated with the adapter or cables are good.
- 3** Verify that the correct type of cable is being used and that it is connected to the correct adapter port (see Appendix C).
- 4** If you are using the 10BASE-T port and the default setting for LED0 has not been changed, determine if the lower green LED (LED0 - nearest the AUI connector) (Link OK) is off (see "Understanding the Adapter LEDs" on page 2-5). If it is off, go to "Testing the Adapter" on page B-5
- 5** If there is a problem with loading the drivers go to "Solving Driver Installation Problems" on page B-3
- 6** If performing these actions does not solve the problem, contact your service representative. See "Obtaining Service and

Software Updates” on page B-1 for information on obtaining IBM service.

---

## Solving Driver Installation Problems

Use this procedure if you are having problems starting the PCI Ethernet Adapter drivers.

- 1 Ensure that the PCI Ethernet Adapter and network operating system drivers have been installed correctly. See Chapter 3 or Chapter 4 for installation instructions.
- 2 In Table B-1, locate the row that describes the network operating system or network application on the workstation and perform the recommended actions.

*Table B-1 (Page 1 of 3). Driver Installation Messages*

Environment	Message Type and Action
NetWare server	<ul style="list-style-type: none"> <li>• Message prefix IBMEANWS: see “NetWare Server LAN Driver Messages” on page D-7 for messages relating to this adapter. Refer to the on-line manual <i>NetWare System Messages</i> for explanations and recommended actions for any messages not listed.</li> <li>• NetWare messages: refer to the on-line manual <i>NetWare System Messages</i> to determine the appropriate action.</li> </ul>
NetWare client with DOS	<p>Message prefix IBMEANWC-DOS: see “NetWare DOS ODI Client Driver Messages” on page E-8 for messages relating to this adapter. Refer to the on-line manual <i>NetWare System Messages</i> for explanations and recommended actions for any messages not listed.</p>
NetWare client with OS/2	<p>Message prefix IBMEANWC-OS2: see “NetWare OS/2 ODI Client Driver Messages” on page E-10 for messages relating to this adapter. Refer to the on-line manual <i>NetWare System Messages</i> for explanations and recommended actions for any messages not listed.</p>

Table B-1 (Page 2 of 3). Driver Installation Messages

Environment	Message Type and Action
LAN Support Program Version 1.33 or higher	<ul style="list-style-type: none"> <li>• If the LAN Support Program copyright statement was not displayed, install the program. Refer to the LAN Support Program documentation for instructions.</li> <li>• Message prefix IBMEANDI: go to “NDIS 2.01 Driver Messages” on page F-16.</li> </ul>
LANManager with DOS or OS/2	<ul style="list-style-type: none"> <li>• Check the Microsoft LANManager log, LANMAN\LOGS\NET.ERR, for error messages. Use the LANManager <i>net error</i> command to obtain explanations.</li> <li>• Verify that the PCI Ethernet Adapter has not been configured for both LANManager and the LAN Support Program or the LAN Adapter Protocol and Support Program (LAPS.EXE). One indication of this condition would be two device statements for the Protocol Manager (PROTMAN) in the CONFIG.SYS file.  If the adapter has been configured for the LAN Support Program or IBM LAN Transports, remove the CONFIG.SYS file statements that load the NDIS adapter driver and the protocol drivers for that program.</li> </ul>
Windows for Workgroups	<ul style="list-style-type: none"> <li>• Message prefix IBMEANDI: go to “NDIS 2.01 Driver Messages” on page F-16.</li> <li>• Message prefix IBMEAWNT: go to “NDIS 3.0 Driver Messages” on page F-19.</li> </ul>
LANtastic	Message prefix IBMEANDI: go to “NDIS 2.01 Driver Messages” on page F-16.
IBM LAN Transports	<p>Check LANTRAN.LOG and LAPSHIST.LOG in the subdirectory \IBMCOM for messages.</p> <ul style="list-style-type: none"> <li>– Message prefix IBMEANDI: go to “NDIS 2.01 Driver Messages” on page F-16.</li> <li>– IBM LAN Transports messages: type <b>help xxx</b>, where xxx is the message number.</li> </ul>

*Table B-1 (Page 3 of 3). Driver Installation Messages*

<b>Environment</b>	<b>Message Type and Action</b>
Windows NT	Select <b>Administrative Tools</b> and then select <b>Event View</b> icons. Review the Events listing for Error Events and view the Error Event details.
Windows 95	Refer to Windows 95 documentation.
Packet driver	Message prefix IBMEAPKT: go to "Packet Driver Messages" on page G-7.
Other DOS environments	Refer to the documentation provided with the network operating system or network application that you used to install the adapter and protocol driver.
Other OS/2 environments	
LANAID	Refer to the LNCLIENT.TXT text file provided with the LANAID software.

## Testing the Adapter

Tests for the adapter hardware are provided by both the LANAID program and the PCI Ethernet Adapter Option Diskette. Testing using LANAID is the recommended method (see Chapter 3 for details on how to install and run LANAID). Otherwise, the diagnostic utility provided on the PCI Ethernet Adapter Option Diskette can be used.

**Note:** Run the diagnostic utility from the bootable diskette before the adapter driver is loaded (this applies to both LANAID and the PCI Ethernet Adapter Option Diskette). **Do not start the diagnostic from the command line.** If the adapter driver is loaded when the diagnostic is run, the test results might contain errors.



## Testing with the PCI Ethernet Adapter Option Diskette Diagnostic.

To run the diagnostic utility, perform the following steps:

- 1** Stop all applications and switch the computer OFF.
- 2** Insert the PCI Ethernet Adapter Option Diskette in drive A.
- 3** Switch the computer ON.

If the diagnostic utility will not run, verify that:

- a. A PCI Ethernet Adapter is installed in the computer.
- b. The PCI slot in which the adapter is installed is enabled.
- c. Bus mastering is enabled for the PCI system bus and for the PCI slot.
- d. An interrupt has been assigned and enabled for the adapter.

Refer to the documentation that came with the computer for instructions on how to use the computer's configuration utility or set the configuration switches, if present.

- 4** The diagnostic utility will offer you an opportunity to run an optional network test after the standard tests are completed. Follow the prompts on the screen to run the optional test.
- 5** If the diagnostic utility indicates that a test failed, contact your service representative. See "Obtaining Service and Software Updates" on page B-1 for information on how to contact IBM service.

## Appendix C. Adapter Cable Specifications

This appendix contains the specifications for the UTP and AUI cables that can be used to connect the adapter to an IEEE Standard 802.3 network. Use these specifications to obtain the cables.

### 10BASE-T Cables

To connect to the adapter's 10BASE-T port to a 10BASE-T port on a repeater, use an unshielded twisted-pair (UTP) cable with RJ-45 connectors at both ends. If the port on the repeater is a crossover port (MDI-X), use a UTP cable that is wired as a straight-through cable. If the port on the repeater is not a crossover port (MDI), use a UTP cable that is wired as a crossover cable.

Table C-1 describes the specifications for UTP cable used in 10BASE-T link segments and Figure C-1 on page C-2 illustrates the RJ-45 connector. Figure C-2 on page C-2 and Figure C-3 on page C-3 illustrate the wiring in straight-through and crossover cables. Use this information to obtain the type of cables you need.

*Table C-1. Cabling Specifications for 10BASE-T Link Segments*

Characteristic	Specification <sup>1</sup>
Cable type	UTP cable with 2 twisted pairs of 22, 24, or 26 AWG <sup>2</sup>
Nominal impedance	100 ohms
Velocity of propagation	0.585 c <sup>3</sup>
Maximum attenuation	8 to 10 dB per 100 m at 10 MHz

<sup>1</sup> Cables that have been certified as EIA/TIA-568 Category 3, 4, and 5 are among the cable types that meet all of the 10BASE-T specifications.

<sup>2</sup> The cable can contain two to four twisted pairs, but only two of the pairs will be used by the 10BASE-T network.

<sup>3</sup> The c represents the velocity of light traveling in a vacuum, which is 300 000 km/sec (186 400 mi/sec).



Do not use telephone extension cables to connect the adapter to a 10BASE-T repeater. The wire pairs in those cables are not twisted and the cable does not meet other requirements for use in a 10BASE-T network. You can identify telephone extension cables by their flat and thin appearance. UTP cables are rounder and thicker than telephone extension cables.

The cables used in a 10BASE-T link segment do not require grounding. However, all of the devices connected to the cables must be grounded.

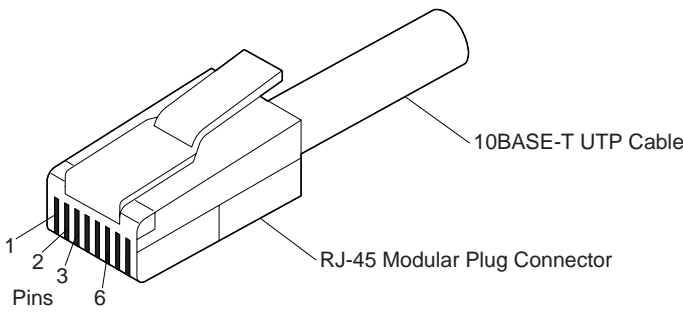
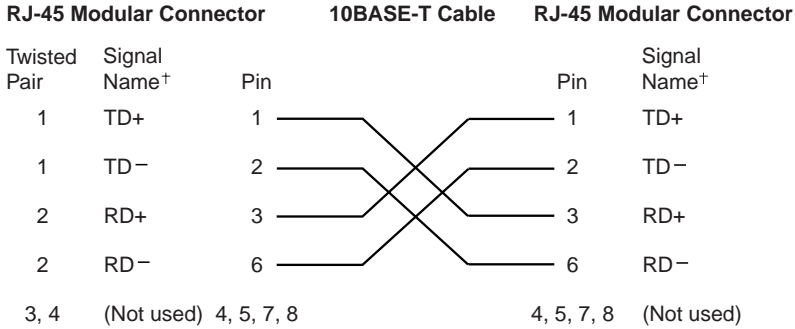


Figure C-1. RJ-45 Connector

RJ-45 Modular Connector		10BASE-T Cable	RJ-45 Modular Connector	
Twisted Pair	Signal Name <sup>†</sup>	Pin	Pin	Signal Name <sup>†</sup>
1	TD+	1	1	TD+
1	TD-	2	2	TD-
2	RD+	3	3	RD+
2	RD-	6	6	RD-
3, 4	(Not used)	4, 5, 7, 8	4, 5, 7, 8	(Not used)

<sup>†</sup> Relative to the device connected to the Adapter

Figure C-2. Straight-Through Cable Wiring



<sup>†</sup>Relative to the device connected to the Adapter

Figure C-3. Crossover Cable Wiring

## AUI Cable

To connect the adapter's AUI port to a 10BASE5 segment, use an AUI cable to connect the adapter to the 10BASE5 transceiver. An AUI cable can also be used to connect the adapter's AUI port to a 10BASE2 or 10BASE-F transceiver. Figure C-4 and Table C-2 on page C-4 describe the pin assignments for the adapter AUI port. Use this information to obtain an AUI cable.

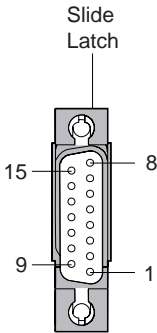


Figure C-4. Adapter AUI Port

Table C-2. Pin Assignments for AUI Port

Pin Number	Description
3	Data out +
10	Data out -
11	Digital ground
5	Data in +
12	Data in -
4	Digital ground
7	no connection
15	no connection
8	Digital ground
2	Collision in +
9	Collision in -
1	Digital ground
6	Digital ground
13	+ 12 volts
14	Digital ground
Shell	Frame ground



---

## Appendix D. NetWare Server LAN Driver Parameters and Messages

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### NetWare Server LAN Driver Parameters

---

Table D-1 describes the parameters that can be specified on the LOAD statement for the NetWare server LAN driver (IBMEANWS.LAN) in the AUTOEXEC.NCF file. See "Sample AUTOEXEC.NCF Files" on page D-5 for sample AUTOEXEC.NCF files.

---

*Table D-1 (Page 1 of 5). Parameters for the NetWare Server LAN Driver*

---

---

#### Parameter and Explanation

---

BUSTYPE=*type*

Specifies the mechanism the driver uses to search for the IBM PCI Ethernet Adapter. The driver may be unable to locate the adapter if this parameter is set incorrectly. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.

Valid values:

- PCI1 (scan mechanism 1)
- PCI2 (scan mechanism 2)

Default value: PCI2

---

---

*Table D-1 (Page 2 of 5). Parameters for the NetWare Server LAN Driver*

---

**Parameter and Explanation**

---

**LED0=xxx**

Programs the LED0 register to have the meaning specified by the 3-digit hexadecimal value. The LED0 register controls the lower (nearest the AUI connector) green adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED0, you must specify a value for LED1 and LED2.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 0C0 (link status OK)

---

**LED1=xxx**

Programs the LED1 register to have the meaning specified by the 3-digit hexadecimal value. The LED1 register controls the amber adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED1, you must specify a value for LED0 and LED2.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 0B0 (adapter is transmitting or receiving)

---

---

*Table D-1 (Page 3 of 5). Parameters for the NetWare Server LAN Driver*

---

**Parameter and Explanation**

---

**LED2=xxx**

Programs the LED2 register to have the meaning specified by the 3-digit hexadecimal value. The LED2 register controls the upper (nearest the RJ-45 connector) green adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED2, you must specify a value for LED0 and LED1.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 180 (full-duplex mode)

---

**FDUP=type**

Specifies whether the adapter is to operate in full-duplex mode for either the 10BASE-T port or the AUI port, or is not to operate in full-duplex mode for either port. When LED2 (described above) is on, the adapter is operating in full-duplex mode.

Valid values:

- OFF (ports will operate in half-duplex mode)
- UTP (the 10BASE-T port will operate in full-duplex mode)
- AUI (the AUI port will operate in full-duplex mode)

Default value: OFF (ports will operate in half-duplex mode)

---





---

*Table D-1 (Page 4 of 5). Parameters for the NetWare Server LAN Driver*

---

**Parameter and Explanation**

---

**FRAME=type**

Specifies the frame type used by the LAN driver.

Valid values:

Ethernet\_802.3  
Ethernet\_802.2  
Ethernet\_SNAP  
Ethernet\_II

Default value:

Ethernet\_802.2 (NetWare 3.12 and 4.x)  
Ethernet\_802.3 (NetWare 3.11)

---

**BOARD=number**

Assigns a number to an adapter. Use this parameter when multiple frame types are to be assigned to one adapter in a server. If this parameter is not specified, then each LOAD statement is associated with a separate adapter.

An example of statements that loads two frame types to one adapter and binds the protocol to the adapters is:

```
LOAD C:\NETWARE\IBMEANWS FRAME=ETHERNET_802.2 BOARD=1 NAME=B1_802.2
LOAD C:\NETWARE\IBMEANWS FRAME=ETHERNET_802.3 BOARD=1 NAME=B1_802.3
BIND IPX TO B1_802.2 NET=3
BIND IPX TO B1_802.3 NET=1
```

Valid values: 0-254

---

**NAME=name**

Assigns a logical name to the adapter.

To load the LAN driver for two adapters in the same server, specify a unique NAME for each adapter and bind each to the protocol. An example of statements that loads the LAN driver for two adapters and binds the protocol is:

```
LOAD C:\NETWARE\IBMEANWS.LAN NAME=ACCTGNET
LOAD C:\NETWARE\IBMEANWS.LAN NAME=SALESNET
BIND IPX TO ACCTGNET NET=1
BIND IPX TO SALESNET NET=2
```

Valid values: Any ASCII characters (maximum length of 17 characters)

---

---

*Table D-1 (Page 5 of 5). Parameters for the NetWare Server LAN Driver*

---

**Parameter and Explanation**

---

`NODE=xxxxxxxxxxx`

Specifies a locally administered address for the adapter. The 12-digit hexadecimal address must be unique among all the adapter addresses on the network. If you do not specify a locally administered address, the adapter uses the universally administered address that was encoded in the adapter at the factory.

Specify the address in LSB format (canonical format).

Valid values:

A 12-digit hexadecimal address of the form `x2xxxxxxxxxx`,  
`x6xxxxxxxxxx`, `xAxxxxxxxxxx`, or `xExxxxxxxxxx`, such as `A69876543210`.

---

---

**Sample AUTOEXEC.NCF Files**

Figure D-1 on page D-6 contains sample AUTOEXEC.NCF files. These samples illustrate how the LOAD and BIND statements are used for the NetWare modules and the LAN driver. Refer to the NetWare documentation for information about other commands that can be included in the AUTOEXEC.NCF file.

**Single PCI Ethernet Adapter in a NetWare 3.11 Server**

```
LOAD C:\NETWARE\PATCHMAN.NLM
LOAD C:\NETWARE\LSLENH.NLM
LOAD C:\NETWARE\MSM31X.NLM
LOAD C:\NETWARE\ETHERTSM.NLM
LOAD C:\NETWARE\IBMEANWS.LAN BUSTYPE=PCI2 NODE=020033334444
BIND IPX TO IBMEANWS NET=1
```

**Two PCI Ethernet Adapters in a NetWare 4.x Server**

```
LOAD C:\NETWARE\MSM.NLM
LOAD C:\NETWARE\ETHERTSM.NLM
LOAD C:\NETWARE\IBMEANWS.LAN NAME=ACCTGNET
LOAD C:\NETWARE\IBMEANWS.LAN NAME=SALESNET
BIND IPX TO ACCTGNET NET=1
BIND IPX TO SALESNET NET=2
```

**Using the FRAME, BOARD, and NAME Parameters to Load Two Frame Types to the First Adapter and One Type to the Second Adapter**

```
LOAD C:\NETWARE\MSM.NLM
LOAD C:\NETWARE\ETHERTSM.NLM
LOAD C:\NETWARE\IBMEANWS.LAN FRAME=Ethernet_802.3 BOARD=1
NAME=B1_F3
LOAD C:\NETWARE\IBMEANWS.LAN FRAME=Ethernet_802.2 BOARD=1
NAME=B1_F2
LOAD C:\NETWARE\IBMEANWS.LAN FRAME=Ethernet_802.2 BOARD=2
NAME=B2_F2
BIND IPX TO B1_F3 NET=3
BIND IPX TO B1_F2 NET=1
BIND IPX TO B2_F2 NET=2
```

**Using the BUSTYPE, LED, and FDUP Parameters**

```
LOAD C:\NETWARE\PATCHMAN.NLM
LOAD C:\NETWARE\LSLENH.NLM
LOAD C:\NETWARE\MSM31X.NLM
LOAD C:\NETWARE\ETHERTSM.NLM
LOAD C:\NETWARE\IBMEANWS.LAN BUSTYPE=PCI1 LED0=C0 LED1=B0
LED2=180 FDUP=AUI
BIND IPX TO IBMEANWS NET=3
```

*Figure D-1. Sample AUTOEXEC.NCF Files for the Server LAN Driver*

---

## NetWare Server LAN Driver Messages

This section contains the error messages for the NetWare server LAN driver (IBMEANWS.LAN). The explanation and recommended action are included with each message.

---

### **IBMEANWS-054 The IBM PCI Ethernet Adapter did not respond to the initialization command.**

**Explanation:** The adapter did not respond when the IBMEANWS driver tried to initialize it.

**Action:** Verify that a PCI Ethernet Adapter is installed correctly in the computer. See "Installing the Hardware" on page 2-1 for instructions.

---

### **IBMEANWS-66 The cable might be disconnected from the adapter.**

**Explanation:** The adapter cable might be disconnected from the adapter port.

**Action:** Verify that a cable is connected to the AUI port or the 10BASE-T port.

---

### **IBMEANWS-150 ETHERTSM.NLM Assembly Interface Level is x. This HSM needs Level 220 or above.**

**Explanation:** The Hardware Support Module (HSM) requires that the ETHERTSM.NLM module be Level 2.20 or higher. The PCI Ethernet Adapter Option Diskette contains a Level 2.50 ETHERTSM.NLM module.

**Action:** Replace the installed ETHERTSM.NLM module with the Level 2.50 module on the PCI Ethernet Adapter Option Diskette.

---

### **IBMEANWS-164 The IBM PCI Ethernet Adapter was not found.**

**Explanation:** The IBMEANWS driver cannot find an IBM PCI Ethernet Adapter in the computer.

**Action:** Perform the following steps:

1. Verify that a PCI Ethernet Adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Use the NetWare install program to edit the AUTOEXEC.NCF file to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.

## IBMEANWS-167 • IBMEANWS-180

---

### **IBMEANWS-167 An IBM PCI Ethernet Adapter cannot be found on a PCI bus.**

**Explanation:** The IBMEANWS driver cannot locate the IBM PCI Ethernet Adapter on the PCI bus.

**Action:** Perform the following steps:

1. Verify that the adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Use the NetWare install program to edit the AUTOEXEC.NCF file to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.
3. If the problem persists, go to "Testing the Adapter" on page B-5 to run the diagnostic utility.

---

### **IBMEANWS-180 The DMA parameter should not be specified for the IBMEANWS driver.**

**Explanation:** The IBMEANWS driver LOAD statement specified the DMA parameter. This parameter is not a valid LAN driver parameter. The PCI system BIOS automatically sets the DMA channel number.

**Action:** If the LOAD statement is in the AUTOEXEC.NCF file, use the NetWare install program to edit the AUTOEXEC.NCF file to delete the DMA parameter from the LAN driver LOAD statement.

---

## Appendix E. NetWare ODI Client Driver Parameters and Messages

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---

### NetWare ODI Client Driver Parameters

---

Table E-1 describes the parameters that can be specified for the NetWare DOS ODI (IBMEANWC.DOS) and OS/2 ODI (IBMEANWC.OS2) client drivers in the LINK DRIVER section of the NET.CFG file. See "Sample DOS AUTOEXEC.BAT and NET.CFG Files" on page E-5 and "Sample OS/2 NET.CFG Files" on page E-7 for sample files.

In addition to the LINK DRIVER section, the NET.CFG file can also include a LINK SUPPORT and PROTOCOL sections. Refer to the NetWare documentation for additional information about those sections and related parameters.

---

*Table E-1 (Page 1 of 4). NetWare ODI Client Driver Parameters*

---

---

#### Parameter and Explanation

---

BUSTYPE *type*

Specifies the mechanism the driver uses to search for the IBM PCI Ethernet Adapter. The driver might be unable to locate the adapter if this parameter is set incorrectly. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.

Valid values:

- PCI1 (scan mechanism 1)
- PCI2 (scan mechanism 2)

Default value: PCI2

---

---

*Table E-1 (Page 2 of 4). NetWare ODI Client Driver Parameters*

---

**Parameter and Explanation**

---

**LED0 xxx**

Programs the LED0 register to have the meaning specified by the 3-digit hexadecimal value. The LED0 register controls the lower (nearest the AUI connector) green adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED0, you must specify a value for LED1 and LED2.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 0C0 (link status OK)

---

**LED1 xxx**

Programs the LED1 register to have the meaning specified by the 3-digit hexadecimal value. The LED1 register controls the amber adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED1, you must specify a value for LED0 and LED2.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 0B0 (adapter is transmitting or receiving)

---

---

*Table E-1 (Page 3 of 4). NetWare ODI Client Driver Parameters*

---

**Parameter and Explanation**

---

**LED2 xxx**

Programs the LED2 register to have the meaning specified by the 3-digit hexadecimal value. The LED2 register controls the upper (nearest the RJ-45 connector) green adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED2, you must specify a value for LED0 and LED1.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 180 (full-duplex mode)

---

**FDUP *type***

Specifies whether the adapter is to operate in full-duplex mode for either the 10BASE-T port or the AUI port, or is not to operate in full-duplex mode for either port. When LED2 (described above) is on, the adapter is operating in full-duplex mode.

Valid values:

- OFF (ports will operate in half-duplex mode)
- UTP (the 10BASE-T port will operate in full-duplex mode)
- AUI (the AUI port will operate in full-duplex mode)

Default value: OFF (ports will operate in half-duplex mode)

---



---

*Table E-1 (Page 4 of 4). NetWare ODI Client Driver Parameters*

---

**Parameter and Explanation**

---

**FRAME** *type*

Specifies the frame type used by the ODI driver.

Valid values:

Ethernet\_802.3  
 Ethernet\_802.2  
 Ethernet\_SNAP  
 Ethernet\_II

Default value:

Ethernet\_802.2 (NetWare 3.12 and 4.x)  
 Ethernet\_802.3 (NetWare 3.11)

---

**NODE ADDRESS** *address*

Specifies a locally administered address for the adapter. The 12-digit hexadecimal address must be unique among all the adapter addresses on the network. If you do not specify a locally administered address, the adapter uses the universally administered address that was encoded in the adapter at the factory.

Specify the address in LSB format (canonical format).

Valid values:

A 12-digit hexadecimal address of the form x2xxxxxxxxx,  
 x6xxxxxxxxx, xAxxxxxxxxx, or xExxxxxxxxx, such as A69876543210.

---

**PROTOCOL** *protocol\_name protocol\_ID frame\_type*

Specifies a second protocol (such as TCP/IP) that the ODI driver will handle. This parameter differs from the PROTOCOL section command, which is the first specification of a protocol to be handled. If the PROTOCOL section is not specified in the NET.CFG file, the default protocol is IPX\*\*.

Valid values (protocol name): IPX, TCPIP, DEC, XNA, and others

Valid values (protocol ID and frame type):

0 Ethernet\_802.3  
 E0 Ethernet\_802.2  
 8137 Ethernet\_SNAP  
 8137 Ethernet\_II

---

---

## Sample DOS AUTOEXEC.BAT and NET.CFG Files

Figure E-1 on page E-6 contains sample AUTOEXEC.BAT and NET.CFG files for DOS ODI clients. These samples illustrate how the NetWare modules and the DOS ODI client are loaded and how the LINK DRIVER section of the NET.CFG file is specified.

Refer to the DOS documentation for information about other commands that can be included in the AUTOEXEC.BAT and CONFIG.SYS files. Refer to the NetWare documentation for information about specifying the LINK SUPPORT and PROTOCOL sections of the NET.CFG file.

**Sample AUTOEXEC.BAT File for a NetWare 3.11 Client Boot Diskette**

```
LSL
IBMEANWC
IPXODI
NETX
```

**Sample AUTOEXEC.BAT File for a NetWare 4.x Client**

```
C:\NWCLIENT\LSL
C:\NWCLIENT\IBMEANWC
C:\NWCLIENT\IPXODI
C:\NWCLIENT\VLM
```

**Sample NET.CFG File with NODE ADDRESS, FRAME, and PROTOCOL Parameters**

```
LINK DRIVER IBMEANWC
;Set locally administered address
NODE ADDRESS A69876543210
;Change the frame type
FRAME Ethernet_802.3
;Specify a second protocol for the DOS ODI driver
PROTOCOL TCPIP 8137 ETHERNET_SNAP
```

```
NetWare DOS Requester
FIRST NETWORK DRIVE=F
```

**Sample NET.CFG File with the BUSTYPE, LED, and FDUP Parameters**

```
LINK DRIVER IBMEANWC
;Specify the bus scan mechanism
BUSTYPE PCI2
;Change the meaning of LED1 from the default setting
LED0 C0
LED1 84
LED2 180
;Select full-duplex mode
FDUP AUJ
```

Figure E-1. Sample AUTOEXEC.BAT and NET.CFG Files for a DOS Client

---

## Sample OS/2 NET.CFG Files

Figure E-2 contains sample NET.CFG files for OS/2 ODI clients. These samples illustrate how the LINK DRIVER section of the NET.CFG file is specified. Refer to the NetWare documentation for information about specifying the LINK SUPPORT and PROTOCOL sections of the NET.CFG file.

### Sample NET.CFG File with NODE ADDRESS, FRAME, and PROTOCOL Parameters

```
LINK DRIVER IBMEANWC
;Specify the bus scan mechanism
BUSTYPE PCI2
;Set locally administered address
NODE ADDRESS A69876543210
;Change the frame type
FRAME Ethernet_802.3
;Specify a second protocol for the OS/2 ODI driver
PROTOCOL DEC 8137 ETHERNET_II
```

### Sample NET.CFG File with the LED Parameter

```
LINK DRIVER IBMEANWC
;Specify the bus scan mechanism
BUSTYPE PCI2
LED0 C0
LED1 B0
LED2 180
```

*Figure E-2. Sample NET.CFG Files for an OS/2 Client*

## IBMEANWC-DOS-27 • IBMEANWC-DOS-59

---

### NetWare DOS ODI Client Driver Messages

This section contains the error messages for the NetWare DOS ODI client driver (IBMEANWC.COM). The explanation and recommended action are included with each message.

---

#### **IBMEANWC-DOS-27 This driver requires LSL version 2.11 or higher.**

**Explanation:** The Link Support Layer module (LSL.COM) version is too old.

**Action:** Replace the existing module with a version 2.11 or higher module.

---

#### **IBMEANWC-DOS-50 The IBM PCI Ethernet Adapter was not found.**

**Explanation:** The IBMEANWC driver cannot find an IBM PCI Ethernet Adapter in the computer.

**Action:** Perform the following steps:

1. Verify that a PCI Ethernet Adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Edit the NET.CFG file to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.
3. If the problem persists, go to "Testing the Adapter" on page B-5 to run the diagnostic utility.

---

#### **IBMEANWC-DOS-54 The IBM PCI Ethernet Adapter did not respond to the initialization command.**

**Explanation:** The adapter did not respond when the IBMEANWC driver tried to initialize it.

**Action:** Verify that a PCI Ethernet Adapter is installed correctly in the computer. See "Installing the Hardware" on page 2-1 for instructions.

---

#### **IBMEANWC-DOS-59 Buffers could not be locked.**

**Explanation:** The attempt to lock buffers for direct memory access was not successful.

**Action:** Check the memory manager documentation to verify that the memory manager supports Virtual DMA Server (VDS). If you cannot verify that there is VDS support, do not use the memory manager, or use another memory manager.

## IBMEANWC-DOS-64 • IBMEANWC-DOS-80

---

### IBMEANWC-DOS-64 The IBM PCI Ethernet Adapter was not found.

**Explanation:** The IBMEANWC driver cannot find an IBM PCI Ethernet Adapter in the computer.

**Action:** Perform the following steps:

1. Verify that a PCI Ethernet Adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Edit the NET.CFG file to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.

---

### IBMEANWC-DOS-67 An IBM PCI Ethernet Adapter cannot be found on a PCI bus.

**Explanation:** The IBMEANWC driver cannot locate the IBM PCI Ethernet Adapter on the PCI bus.

**Action:** Perform the following steps:

1. Verify that the adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Edit the NET.CFG file to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your computer uses, run the diagnostic utility.
3. If the problem persists, go to "Testing the Adapter" on page B-5 to run the diagnostic utility.

---

### IBMEANWC-DOS-80 The DMA parameter should not be specified for the IBMEANWC driver.

**Explanation:** The LINK DRIVER IBMEANWC section of the NET.CFG file contains a DMA parameter. This parameter is not a valid IBMEANWC driver parameter. The PCI system BIOS automatically sets the DMA channel number.

**Action:** Edit the NET.CFG file to delete the DMA parameter from the LINK DRIVER IBMEANWC section.

## IBMEANWC-OS2-1 • IBMEANWC-OS2-50

---

### NetWare OS/2 ODI Client Driver Messages

This section contains the error messages for the NetWare OS/2 ODI client driver (IBMEANWC.OS2). The explanation and recommended action is included with each message.

---

#### **IBMEANWC-OS2-1 The LSL is not loaded.**

**Explanation:** The Link Support Layer module (LSL.SYS) is not loaded.

**Action:** Edit the CONFIG.SYS file to add a statement for LSL.SYS before the statement for the IBMEANWC driver. See Figure E-2 on page E-7 for sample CONFIG.SYS files.

---

#### **IBMEANWC-OS2-21 The IBMEANWC driver could not register the specified protocol ID.**

**Explanation:** The Protocol parameter was specified in the LINK DRIVER IBMEANWC section of the NET.CFG file. The protocol ID specified on the Protocol line is not valid for the IBMEANWC driver.

**Action:** Edit the NET.CFG file and correct the Protocol line in the LINK DRIVER IBMEANWC section.

For NetWare 3.12 and 4.x environments, do not use a text editor to edit the NET.CFG file. Instead, use the NetWare installation program on the WSOS2\_1 disk to change the parameter.

See the Protocol entry in Table E-1 on page E-1 for a list of the protocol IDs that the IBMEANWC driver supports.

---

#### **IBMEANWC-OS2-22 Could not allocate memory. The virtual adapter did not load.**

**Explanation:** The IBMEANWC driver could not allocate memory for the PCI Ethernet Adapter.

**Action:** Remove any unnecessary terminate and stay resident (TSR) programs and device drivers to make memory available for the NDIS adapter driver. Then, try loading the ODI Client driver again.

---

#### **IBMEANWC-OS2-50 The IBM PCI Ethernet Adapter was not found.**

**Explanation:** The IBMEANWC driver cannot find an IBM PCI Ethernet Adapter in the computer.

**Action:** Verify that a PCI Ethernet Adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.

**IBMEANWC-OS2-54 • IBMEANWC-OS2-67**

---

**IBMEANWC-OS2-54 The IBM PCI Ethernet Adapter did not respond to the initialization command.**

**Explanation:** The adapter did not respond when the IBMEANWC driver tried to initialize it.

**Action:** Verify that a PCI Ethernet Adapter is installed correctly in the computer. See "Installing the Hardware" on page 2-1 for instructions.

---

**IBMEANWC-OS2-64 The IBM PCI Ethernet Adapter was not found.**

**Explanation:** The IBMEANWC driver cannot find an IBM PCI Ethernet Adapter in the computer.

**Action:** Perform the following steps:

1. Verify that a PCI Ethernet Adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Edit the NET.CFG file to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.  
  
For NetWare 3.12 and 4.x environments, do not use a text editor to edit the NET.CFG file. Instead, use the NetWare install program on the WSOS2\_1 disk to change the parameter.
3. If the problem persists and your computer uses a version of OS/2 that is lower than Version 3.0 (OS/2 Warp), verify that the OS/2 fix for PCI bus support has been installed. See "Installing the IBM OS/2 Fix for PCI Support" on page 2-7 for instructions.

---

**IBMEANWC-OS2-67 An IBM PCI Ethernet Adapter cannot be found on a PCI bus.**

**Explanation:** The IBMEANWC driver cannot locate the IBM PCI Ethernet Adapter on the PCI bus.

**Action:** Perform the following steps:

1. Verify that the adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Edit the NET.CFG file to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.  
  
For NetWare 3.12 and 4.x environments, do not use a text editor to edit the NET.CFG file. Instead, use the NetWare install program on the WSOS2\_1 disk to change the parameter.
3. If the problem persists, go to "Testing the Adapter" on page B-5 to run the diagnostic utility.



## IBMEANWC-OS2-80 • IBMEANWC-OS2-80

---

### **IBMEANWC-OS2-80 The DMA parameter should not be specified for the IBMEANWC driver.**

**Explanation:** The LINK DRIVER IBMEANWC section of the NET.CFG file contains a DMA parameter. This parameter is not a valid IBMEANWC driver parameter. The PCI system BIOS automatically sets the DMA channel number.

**Action:** Edit the NET.CFG file to delete the DMA parameter from the LINK DRIVER IBMEANWC section.

For NetWare 3.12 and 4.x environments, do not use a text editor to edit the NET.CFG file. Instead, use the NetWare installation program on the WSOS2\_1 disk to change the parameter.

---

## Appendix F. NDIS Adapter Drivers Parameters and Messages

---

### NDIS Adapter Drivers Parameters

Table F-1 describes the parameters that can be specified for the NDIS 2.01 (IBMEANDI.DOS and IBMEANDI.OS2) and 3.0 (IBMEAWFW.386, IBMEAWNT.SYS, and IBMEA351.SYS) adapter drivers. Except for Windows NT systems, these parameters are written to the PROTOCOL.INI file by using the network operating system's automated installation program or a text editor. See "Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files" on page F-5 for sample PROTOCOL.INI files.

As indicated in the table, some of the parameters are supported by one of the drivers but not by the other.

---

*Table F-1 (Page 1 of 4). NDIS 2.01 and 3.0 Adapter Driver Parameters*

---

#### Parameter, Driver, and Explanation

---

BUSTYPE=*type*

NDIS 2.01 (IBMEANDI.DOS and IBMEANDI.OS2)

BUS\_TO\_SCAN=*type*

NDIS 3.0 (IBMEAWFW.386 and IBMEAWNT.SYS)

(not applicable to Windows NT 3.51)

Specifies the mechanism the driver uses to search for the IBM PCI Ethernet Adapter. The driver might be unable to locate the adapter if this parameter is set incorrectly. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.

Valid values:

PCI1 (scan mechanism 1)

PCI2 (scan mechanism 2)

Default value: PCI2

---

---

*Table F-1 (Page 2 of 4). NDIS 2.01 and 3.0 Adapter Driver Parameters*

---

**Parameter, Driver, and Explanation**

---

**LED0=0xHHH**

NDIS 2.01 and NDIS 3.0

Programs the LED0 register to have the meaning specified by the 3-digit, hexadecimal value. The LED0 register controls the lower green (nearest the AUI connector) adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED0, you must specify a value for LED1 and LED2.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 0C0 (link status OK)

---

**LED1=0xHHH**

NDIS 2.01 and NDIS 3.0

Programs the LED1 register to have the meaning specified by the 3-digit, hexadecimal value. The LED1 register controls the amber adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED1, you must specify a value for LED0 and LED2.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 0B0 (activity on the network)

---

---

*Table F-1 (Page 3 of 4). NDIS 2.01 and 3.0 Adapter Driver Parameters*

---

**Parameter, Driver, and Explanation**

---

LED2=0xHHH

NDIS 2.01 and NDIS 3.0

Programs the LED2 register to have the meaning specified by the 3-digit, hexadecimal value. The LED2 register controls the upper green (nearest the RJ-45 connector) adapter LED. When the LED is on, the condition associated with the value exists. If you specify a value for LED2, you must specify a value for LED0 and LED1.

Valid values (hexadecimal):

- 081 (a collision on the network)
- 082 (adapter is jabbering)
- 084 (activity on the network)
- 088 (receive polarity has been reversed on the 10BASE-T port)
- 090 (adapter is transmitting)
- 0A0 (adapter is receiving)
- 0B0 (adapter is transmitting or receiving)
- 0C0 (link status OK)
- 180 (full-duplex mode)

Default value: 180 (full-duplex mode)

---

**FDUP type**

Specifies whether the adapter is to operate in full-duplex mode for either the 10BASE-T port or the AUI port, or is to operate in half-duplex mode for both ports. When LED2 (described above) is on, the adapter is operating in full-duplex mode.

Valid values:

- OFF (ports will operate in half-duplex mode)
- UTP (the 10BASE-T port will operate in full-duplex mode)
- AUI (the AUI port will operate in full-duplex mode)

Default value: OFF (ports will operate in half-duplex mode)

---

---

*Table F-1 (Page 4 of 4). NDIS 2.01 and 3.0 Adapter Driver Parameters*

---

**Parameter, Driver, and Explanation**

---

NETADDRESS="xxxxxxxxxxx"

NDIS 2.01 (IBMEANDI.DOS and IBMEANDI.OS2)

NetworkAddress="xxxxxxxxxxx"

NDIS 3.0 (IBMEAWFW.386, IBMEAWNT.SYS, and IBMEA351.SYS)

Specifies a locally administered address for the adapter. The 12-digit hexadecimal address must be unique among all the adapter addresses on the network. If you do not specify a locally administered address, the adapter uses the universally administered address that was encoded in the adapter at the factory.

Specify the address in canonical (least significant bit) format.

Valid values:

A 12-digit hexadecimal address of the form x2xxxxxxxxx, x6xxxxxxxxxxx, xAxxxxxxxxxxx, or xExxxxxxxxxxx, such as 060011112222.

---

TXBUFFERS=x

NDIS 2.01 (IBMEANDI.DOS and IBMEANDI.OS2)

Specifies the number of transmit buffers to be configured in adapter memory.

Valid values: 1, 4, 8

Default value: 4

---

RXBUFFERS=x

NDIS 2.01 (IBMEANDI.DOS and IBMEANDI.OS2)

Specifies the minimum number of receive buffers to be configured in adapter memory. Any memory remaining after other storage requirements have been satisfied will be configured as additional receive buffers.

Valid values: 1, 4, 8

Default value: 4

---

---

## Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files

This section contains sample system files for NDIS adapter driver installations. Refer to the sample for your environment.

**Note:** This section does not contain sample files for Windows NT or Windows 95. The system files for those environments are created by the network operating system and cannot be manually edited by the user.

**Note:** All parameters coded in these files must be in upper case.

Environment	Figure
LAN Support Program (LSP)	Figure F-1 on page F-6
Windows for Workgroups	Figure F-2 on page F-8 and Figure F-3 on page F-9
LANManager	Figure F-4 on page F-11
LANtastic	Figure F-5 on page F-13
OS/2 LAN Transports	Figure F-6 on page F-14

**Sample AUTOEXEC.BAT File**

```
\LSP\NETBIND
```

**Sample CONFIG.SYS File for a Single PCI Ethernet Adapter**

```
DEVICE=\LSP\PROTMAN.DOS /I:C:\LSP
DEVICE=\LSP\IBMEANDI.DOS
DEVICE=\LSP\DXMA0MOD.SYS
DEVICE=\LSP\DXME0MOD.SYS
```

**Sample CONFIG.SYS File for Two PCI Ethernet Adapters**

```
DEVICE=\LSP\PROTMAN.DOS /I:C:\LSP
DEVICE=\LSP\IBMEANDI.DOS
DEVICE=\LSP\IBMEANDI.DOS
DEVICE=\LSP\DXMA0MOD.SYS
DEVICE=\LSP\DXME0MOD.SYS
```

*Figure F-1 (Part 1 of 3). Sample Files for LAN Support Program (LSP)*

**Sample PROTOCOL.INI File for a Single PCI Ethernet Adapter**

```
;Protocol Manager Section
[PROT_MAN]
    Drivername = PROTMAN$

;Protocol Driver Section
[DXME0MOD_MOD]
    Drivername = DXME0$
    Bindings = IBMEAN_MOD

;NDIS Adapter Driver Section with LAA Specified
[IBMEAN_MOD]
    Drivername = IBMEAN$
    NETADDRESS = "020011112222"
    TXBUFFERS = 4
    RXBUFFERS = 4
    LED0 = 0xC0
    LED1 = 0xB0
    LED2 = 0x180
    FDUP = OFF
    BUSTYPE = PCI2
```

*Figure F-1 (Part 2 of 3). Sample Files for LAN Support Program (LSP)*

**Sample PROTOCOL.INI File for Two PCI Ethernet Adapters**

```
;Protocol Manager Section
[PROT_MAN]
    Drivername = PROTMAN$

;Protocol Driver Section
[DXME0MOD_MOD]
    Drivername = DXME0$
    Bindings = IBMEAN_MOD, IBMEAN_MOD2

;Section for the Primary Adapter (the First Adapter
;in the Bindings= Statement)
[IBMEAN_MOD]
    Drivername = IBMEAN$
    TXBUFFERS = 4
    RXBUFFERS = 4
    LED0 = 0xC0
    LED1 = 0xB0
    LED2 = 0x180
    FDUP = OFF
    BUSTYPE = PCI2

;Section for the Alternate Adapter (the Second Adapter
;in the Bindings= Statement)
[IBMEAN_MOD2]
    Drivername = IBMEAN2$
    TXBUFFERS = 4
    RXBUFFERS = 4
    LED0 = 0xC0
    LED1 = 0xB0
    LED2 = 0x180
    FDUP = OFF
    BUSTYPE = PCI2
```

*Figure F-1 (Part 3 of 3). Sample Files for LAN Support Program (LSP)*



**Sample AUTOEXEC.BAT File**

C:\WINDOWS\NET START

**Sample CONFIG.SYS File**

DEVICE=C:\WINDOWS\PROTMAN.DOS /I:C:\WINDOWS

DEVICE=C:\WINDOWS\WORKGRP.SYS

DEVICE=C:\WINDOWS\IBMEANDI.DOS

**Sample PROTOCOL.INI File**

[NETWORK.SETUP]

;Protocol Manager Section

[PROT\_MAN]

  Drivername = PROTMAN\$

  Priority = MS\$NETBEUI

;Protocol Driver Section

[MS\$NETBEUI]

  Drivername = NETBEUI\$

  Bindings = IBM\$EANDI

;NDIS Adapter Driver Section with LAA Specified

[IBM\$EANDI]

  Drivername = IBMEAN\$

  NETADDRESS = "020011112222"

  TXBUFFERS = 4

  RXBUFFERS = 4

  LED0 = 0xC0

  LED1 = 0xB0

  LED2 = 0x180

  FDUP = OFF

  BUSTYPE = PCI2

*Figure F-2. Sample Files for Windows for Workgroups 3.1*

**Sample AUTOEXEC.BAT File**

```
NET START
```

**Sample CONFIG.SYS File**

```
LASTDRIVE=Z
```

**Sample PROTOCOL.INI File**

```
[network.setup]
version=0x3110
netcard=ibm$eandi,1, IBM$EANDI,1
transport=ms$nwlinknb, NWLINK
transport=ms$ndishlp, MS$NDISHLP
transport=ms$netbeui, NETBEUI
lana0=ibm$eandi,1, ms$netbeui
lana1=ibm$eandi,1, ms$nwlinknb
lana2=ibm$eandi,1, ms$ndishlp
```

```
;Protocol Manager Section
```

```
[PROTMAN]
```

```
DRIVERNAME = PROTMAN$
PRIORITY = MS$NDISHLP
```

```
;NDIS Adapter Driver Section
```

```
[IBM$EANDI]
```

```
Drivername = IBMEAN$
TXBUFFERS = 4
RXBUFFERS = 4
LED0 = 0xC0
LED1 = 0xB0
LED2 = 0x180
FDUP = OFF
BUSTYPE = PCI2
```

*Figure F-3 (Part 1 of 2). Sample Files for Windows for Workgroups 3.11*

```
[NWLINK]
  Bindings = IBM$EANDI

;Protocol Driver Section
[NETBEUI]
  Drivername = netbeui$
  Sessions = 10
  NCBS = 12
  Bindings = IBM$EANDI
  LANABASE = 0
```

*Figure F-3 (Part 2 of 2). Sample Files for Windows for Workgroups 3.11*

**Sample AUTOEXEC.BAT File**

```
SET PATH=C:\MSLANMAN.DOS\BASIC;%PATH%
LOAD MSDLC
LOAD NETBEUI
NETBIND
NET START WORKSTATION SMITH
```

**Sample CONFIG.SYS File**

```
FILES=50
BUFFERS=20
DEVICE=C:\MSLANMAN.DOS\DRIVERS\PROTMAN\PROTMAN.DOS /I:C:
\MSLANMAN.DOS
DEVICE=C:\MSLANMAN.DOS\DRIVERS\ETHERNET\IBMPCI\IBMEANDI.DOS
LASTDRIVE=Z
```

**Sample PROTOCOL.INI File for a Single PCI Ethernet Adapter**

```
;Protocol Manager Section
[PROT_MAN]
    Drivername = PROTMAN$

;Protocol Driver Section
[NETBEUI_XIF]
    Drivername = NETBEUI$
    Bindings = IBMEAN_NIF

;NDIS Adapter Driver Section with LAA Specified
[IBMEAN_NIF]
    Drivername = IBMEAN$
    NETADDRESS = "020011112222"
    TXBUFFERS = 4
    RXBUFFERS = 4
    LED0 = 0xC0
    LED1 = 0xB0
    LED2 = 0x180
    FDUP = OFF
    BUSTYPE = PCI2
```

Figure F-4 (Part 1 of 2). Sample Files for LANManager

**Sample PROTOCOL.INI File for Two PCI Ethernet Adapters  
Installed by Using the LANManager Advanced Installation**

```
;Protocol Manager Section
[PROT_MAN]
    Drivername = PROTMAN$
[NETBEUI_XIF]
    Drivername = NETBEUI$
    Bindings = IBMEAN_NIF, IBMEAN_NIF2

;NDIS Adapter Driver for the First Adapter
;in the Bindings=Statement)
[IBMEAN_NIF]
    Drivername = IBMEAN$
    NETADDRESS = "020011112222"
    TXBUFFERS = 4
    RXBUFFERS = 4
    LED0 = 0xC0
    LED1 = 0xB0
    LED2 = 0x180
    FDUP = OFF
    BUSTYPE = PCI2

;NDIS Adapter Driver for the Second Adapter
;in the Bindings=Statement)
[IBMEAN_NIF2]
    Drivername = IBMEAN2$
    NETADDRESS = "020033334444"
    TXBUFFERS = 4
    RXBUFFERS = 4
    LED0 = 0xC0
    LED1 = 0xB0
    LED2 = 0x180
    FDUP = OFF
    BUSTYPE = PCI2
```

*Figure F-4 (Part 2 of 2). Sample Files for LANManager*

**Sample AUTOEXEC.BAT File**

```
call c:\LANTASTI\STARTNET.BAT
```

**Sample PROTOCOL.INI File**

```
;Protocol Manager Section
[PROTMAN]
  PRIORITY = NETBEUI
  DRIVENAME = PROTMAN$
  DYNAMIC=YES

;Protocol Driver Section
[NETBEUI_XIF]
  Drivename = netbeui$
  Bindings = IBMEANDI_NIF

;NDIS Adapter Driver Section
[IBMEANDI_NIF]
  Drivename = IBMEAN$
  RXBUFFERS = 4
  TXBUFFERS = 4
  LED0 = 0xC0
  LED1 = 0xB0
  LED2 = 0x180
  FDUP = OFF
  BUSTYPE = PCI2
```

*Figure F-5. Sample Files for LANtastic*

**Sample CONFIG.SYS File for a Single PCI Ethernet Adapter**

```
DEVICE=C:\IBMCOM\PROTMAN.OS2 /I:C:\IBMCOM
RUN=C:\IBMCOM\PROTOCOL\NETBIND.EXE
RUN=C:\IBMCOM\LANMSGEX.EXE
DEVICE=C:\IBMCOM\PROTOCOL\LANDD.OS2
DEVICE=C:\IBMCOM\PROTOCOL\LANDLLDD.OS2
DEVICE=C:\IBMCOM\MACS\IBMEANDI.OS2
RUN=C:\IBMCOM\PROTOCOL\LANDLL.EXE
DEVICE=C:\IBMCOM\PROTOCOL\NETBEUI.OS2
```

**Sample PROTOCOL.INI File for a Single PCI Ethernet Adapter**

```
;Protocol Manager Section
[PROT_MAN]
    Drivername = PROTMAN$
[IBMLXCFG]
    IBMEAN_NIF = IBMEAN.NIF
    LANDD_NIF = LANDD.NIF
    NETBEUI_NIF = NETBEUI.NIF
[LANDD_NIF]
    Drivername = LANDD$
    Bindings = IBMEAN_NIF
[NETBEUI_NIF]
    Drivername = NETBEUI$
    Bindings = IBMEAN_NIF
;NDIS Adapter Driver Section with LAA Specified
[IBMEAN_NIF]
    Drivername = IBMEAN$
    NETADDRESS = "020011112222"
    TXBUFFERS = 4
    RXBUFFERS = 4
    LED0 = 0xC0
    LED1 = 0xB0
    LED2 = 0x180
    FDUP = OFF
    BUSTYPE = PCI2
```

*Figure F-6 (Part 1 of 2). Sample Files for OS/2 with LAN Transports*

**Sample PROTOCOL.INI File for Two PCI Ethernet Adapters**

```
;Protocol Manager Section
[PROT_MAN]
    Drivername = PROTMAN$
[IBMLXCFG]
    IBMEAN_NIF = IBMEAN.NIF
    LANDD_NIF = LANDD.NIF
    NETBEUI_NIF = NETBEUI.NIF
[LANDD_NIF]
    Drivername = LANDD$
    Bindings = IBMEAN_NIF, IBMEAN_NIF2
[NETBEUI_NIF]
    Drivername = NETBEUI$
    Bindings = IBMEAN_NIF, IBMEAN_NIF2
;Section for the Primary Adapter (the First Adapter
;in the Bindings= Statement)
[IBMEAN_NIF]
    Drivername = IBMEAN$
    TXBUFFERS = 4
    RXBUFFERS = 4
    LED0 = 0xC0
    LED1 = 0xB0
    LED2 = 0x180
    FDUP = OFF
    BUSTYPE = PCI2
;Section for the Alternate Adapter (the Second Adapter
;in the Bindings= Statement)
[IBMEAN_NIF2]
    Drivername = IBMEAN2$
    TXBUFFERS = 4
    RXBUFFERS = 4
    LED0 = 0xC0
    LED1 = 0xB0
    LED2 = 0x180
    FDUP = OFF
    BUSTYPE = PCI2
```

Figure F-6 (Part 2 of 2). Sample Files for OS/2 with LAN Transports



## IBMEANDI-1 • IBMEANDI-8

---

### NDIS 2.01 Driver Messages

This section contains the error messages for the NDIS 2.01 drivers (IBMEANDI.DOS and IBMEANDI.OS2). The explanation and recommended action are included with each message.

---

#### IBMEANDI-1 The Protocol Manager could not be opened.

**Explanation:** An unexpected error occurred when the program attempted to open the Protocol Manager. The IBMEANDI driver has been removed.

**Action:** Search the hard disk for the Protocol Manager (PROTMAN.DOS or PROTMAN.OS2). Note the path where the module was found. Edit the CONFIG.SYS file and change the Device statement for the Protocol Manager to specify the path where the module was found.

---

#### IBMEANDI-6 The attempt to allocate buffers failed.

**Explanation:** The IBMEANDI driver could not allocate the requested buffers, because there is not enough memory.

**Action:** Edit the PROTOCOL.INI file to reduce the number of Tx buffers and Rx buffers specified for the IBMEANDI driver.

---

#### IBMEANDI-7 Protocol Manager device error.

**Explanation:** The IBMEANDI driver is not configured correctly in the PROTOCOL.INI file.

**Action:** Edit the PROTOCOL.INI to check the IBMEANDI driver section. See Table F-1 on page F-1 for explanations of the IBMEANDI driver parameters. See "Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files" on page F-5 for sample PROTOCOL.INI files.

---

#### IBMEANDI-8 Bad status for Protocol Manager.

**Explanation:** The IBMEANDI driver is not configured correctly in the PROTOCOL.INI file.

**Action:** Edit the PROTOCOL.INI to check the IBMEANDI driver section. See Table F-1 on page F-1 for explanations of the IBMEANDI driver parameters. See "Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files" on page F-5 for sample PROTOCOL.INI files.

**IBMEANDI-9 • IBMEANDI-15**

---

**IBMEANDI-9 The IBMEANDI driver cannot find its section in the PROTOCOL.INI file.**

**Explanation:** The IBMEANDI driver could not find its section in the PROTOCOL.INI file. That section should contain the driver parameter specifications.

**Action:** Edit the PROTOCOL.INI to add a IBMEANDI driver section. See Table F-1 on page F-1 for explanations of the IBMEANDI driver parameters. See "Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files" on page F-5 for sample PROTOCOL.INI files.

---

**IBMEANDI-10 The Protocol Manager IOCtl failed.**

**Explanation:** The IBMEANDI driver is not configured correctly in the PROTOCOL.INI file.

**Action:** Edit the PROTOCOL.INI to check the IBMEANDI driver section. See Table F-1 on page F-1 for explanations of the IBMEANDI driver parameters. See "Sample AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI Files" on page F-5 for sample PROTOCOL.INI files.

---

**IBMEANDI-11 Protocol Manager registration failed.**

**Explanation:** The IBMEANDI driver was unable to register with the Protocol Manager (PROTMAN.DOS or PROTMAN.OS2).

**Action:** Re-install the Protocol Manager and try the operation again. If the error persists, contact your service representative.

---

**IBMEANDI-15 The IBM PCI Ethernet Adapter was not found.**

**Explanation:** The IBMEANDI driver cannot find an IBM PCI Ethernet Adapter in the computer.

**Action:** Perform the following steps:

1. Verify that a PCI Ethernet Adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Edit the PROTOCOL.INI file to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.
3. If the problem persists and your computer uses a version of OS/2 that is lower than Version 3.0 (OS/2 Warp), verify that the OS/2 fix for PCI bus support has been installed. See "Installing the IBM OS/2 Fix for PCI Support" on page 2-7 for instructions.
4. If the problem persists, go to "Testing the Adapter" on page B-5 to run the diagnostic utility.

## IBMEANDI-16 • IBMEANDI-25

---

### IBMEANDI-16 An IBM PCI Ethernet Adapter cannot be found on a PCI bus.

**Explanation:** The IBMEANDI driver cannot locate the IBM PCI Ethernet Adapter on the PCI bus.

**Action:** Perform the following steps:

1. Verify that the adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Edit the PROTOCOL.INI file to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your computer uses, run the diagnostic utility to display the scan mechanism.
3. If the problem persists, go to "Testing the Adapter" on page B-5 to run the diagnostic utility.

---

### IBMEANDI-21 The checksum test of the IBM PCI Ethernet Adapter failed.

**Explanation:** The IBMEANDI driver cannot find an IBM PCI Ethernet Adapter in the computer.

**Action:** Verify that a PCI Ethernet Adapter is installed correctly in the computer. See "Installing the Hardware" on page 2-1 for instructions.

---

### IBMEANDI-25 A PCI bus was not found in the computer.

**Explanation:** The Bustype parameter in the IBMEANDI driver section of the PROTOCOL.INI file specifies a PCI bus. The IBMEANDI driver cannot find a PCI bus to scan for the IBM PCI Ethernet Adapter.

**Action:** Verify that the computer has a PCI bus and that the adapter is correctly installed in the bus. See "Installing the Hardware" on page 2-1 for instructions.

---

## NDIS 3.0 Driver Messages

This section contains the error messages for the NDIS 3.0 driver for Windows NT (IBMEAWNT.SYS and IBMEA351.SYS) and Windows for Workgroups 3.11 (IBMEAWFW.386). The explanation and recommended action are included with each message.

---

### IBMEAWNT-17 A PCI bus was not found in the computer.

**Explanation:** The Bustype parameter for the IBMEAWNT or the IBMEAWFW driver specifies a PCI bus. The driver cannot find a PCI bus to scan for the IBM PCI Ethernet Adapter.

**Action:** Verify that the computer has a PCI bus and that the adapter is correctly installed in the bus. See "Installing the Hardware" on page 2-1 for instructions.

---

### IBMEAWNT-18 An IBM PCI Ethernet Adapter cannot be found on a PCI bus.

**Explanation:** The IBMEAWNT or the IBMEAWFW driver cannot locate the IBM PCI Ethernet Adapter on the PCI bus.

**Action:** Perform the following steps:

1. Verify that the adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Reconfigure the adapter driver to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your computer uses, run the diagnostic utility.
3. If the problem persists, go to "Testing the Adapter" on page B-5 to run the diagnostic utility.

---

### IBMEAWNT-19 Open Adapter failed.

**Explanation:** The configuration is set up incorrectly.

**Action:** Rerun the setup program.

---

### IBMEAWNT-21 The IBM PCI Ethernet Adapter was not found.

**Explanation:** The IBMEAWNT or the IBMEAWFW driver cannot find an IBM PCI Ethernet Adapter in the computer.

**Action:** Perform the following steps:

1. Verify that a PCI Ethernet Adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Reconfigure the adapter driver to change the Bustype parameter to PCI1 or PCI2. If you do not know which scan mechanism your



computer uses, run the diagnostic utility to display the scan mechanism.



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## Appendix G. Packet Driver Utilities and Messages

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### Packet Driver Utilities

---

The packet driver utilities can be used after the packet driver (IBMEAPKT) is loaded. The utilities are in the PACKETUTILS sub-directory of the PCI Ethernet Adapter Option Diskette. Table G-1 describes the utilities. Enter the utility commands at the command line.

---

*Table G-1 (Page 1 of 6). Packet Driver Utilities*

---

#### Utility Syntax and Explanation

---

`pktaddr 0xHH [ethernet_addr]`

Sets the Ethernet address for the specified packet driver.

Use the optional `ethernet_addr` parameter to specify the address of the PCI Ethernet Adapter that the packet driver is to support. If you enter the command without the `ethernet_addr` parameter, the utility returns the current address assigned to the packet driver.

Parameters:

`0xHH` The software interrupt number for the packet driver (IBMEAPKT). That number was specified when the driver was loaded.

`ethernet_addr` Specifies the universally administered address or the locally administered address of the PCI Ethernet Adapter. Specify a 12-digit hexadecimal address in canonical format (`x2xxxxxxxxx`, `x6xxxxxxxxx`, `xAxxxxxxxxx`, or `xExxxxxxxxxx`). Enter the address in 2-digit clusters with a blank space or colon between the clusters, such as `06 00 11 11 22 22` or `06:00:11:11:22:22`.

If the `pktaddr` utility runs successfully, the Ethernet address is displayed along with other information about the packet driver.

---



---

*Table G-1 (Page 2 of 6). Packet Driver Utilities*

---

### **Utility Syntax and Explanation**

---

#### **pktall 0xHH**

Causes all packets to be received and discarded by the specified packet driver. This utility is most useful when used in conjunction with the pktmode and trace utilities.

#### Parameters:

**0xHH** The software interrupt number that was specified when the packet driver (IBMEAPKT) was loaded.

---

#### **pktchk 0xHH [0xXX]**

Checks the system for a packet driver at software interrupt 0xHH. If the optional parameter 0xXX is specified, all software interrupts in the range 0xHH through 0xXX are checked.

#### Parameters:

**0xHH** The software interrupt number that was specified when the packet driver (IBMEAPKT) was loaded.

**0xXX** The software interrupt number for the upper limit of the search range.

---

#### **pktmode 0xHH [receive\_mode]**

Sets the receive mode for the packet driver at software interrupt 0xHH. If the utility runs successfully, a list of all the receive modes is displayed. The current mode is labeled *current*. Available modes are labeled *yes*. Modes that are not available are labeled *no*.

#### Parameters:

**0xHH** The software interrupt number that was specified when the packet driver (IBMEAPKT) was loaded.

**receive\_mode** Valid values:

- 1 (turn off receiver)
  - 2 (receive only packets sent to this adapter address)
  - 3 (mode 2 plus receive broadcast packets)
  - 4 (mode 3 plus receive limited multicast packets)
  - 5 (mode 3 plus receive all multicast packets)
  - 6 (receive all packets)
- 



---

*Table G-1 (Page 3 of 6). Packet Driver Utilities*

---

### **Utility Syntax and Explanation**

---

`pktmulti 0xHH [-f filename] [address ...]`

Specifies one or more multicast addresses to be allowed. The addresses can be entered on the command line or listed in a file.

Parameters:

**0xHH** The software interrupt number that was specified when the packet driver (IBMEAPKT) was loaded.

**-f filename**

Specifies the file option and the name of a file that contains the list of multicast addresses. Do not use this option if you specify the address option.

**address ...**

One or more multicast addresses entered on the command line. Do not use this option if you specify the -f option.

---

`pktring [-m] 0xHH 0xXX`

Tests communication between two packet drivers loaded on the same PCI Ethernet Adapter. Packets of every possible length are sent from the packet driver loaded at 0xHH to the packet driver at 0xXX.

Parameters:

**-m** Enables the option that tests the receiving packet driver in each of the receive modes. See the explanation of the `receive_mode` utility for a listing of the receive modes.

**0xHH** The software interrupt number for the packet driver from which the test frames will be sent. 0xHH must be in the range 0x60 through 0x80.

**0xXX** The software interrupt number for the packet driver to which the test frames will be sent. 0xXX must be in the range 0x60 through 0x80.

---





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*Table G-1 (Page 4 of 6). Packet Driver Utilities*

---

**Utility Syntax and Explanation**

---

**pktstat** [0xHH] [0xXX]

Displays statistics for all packet drivers or for packet drivers at software interrupts between 0xHH through 0xXX.

Parameters:

0xHH The software interrupt number for a packet driver. 0xHH must be in the range 0x60 through 0x80.

0xXX The software interrupt number for the upper limit of the search range. 0xXX must be in the range 0x60 through 0x80.

The statistics are:

pkt_in	The number of packets received by the packet driver
pkt_out	The number of packets transmitted by the packet driver
byt_in	The number of bytes received by the packet driver
byt_out	The number of bytes transmitted by the packet driver
pk_drop	The number of packets the packet driver discarded because there was no handler for that Ethernet packet type
err_in	The number of errors on incoming packets
err_out	The number of errors on outgoing packets

---

**pktsend** 0xHH [-r] [-f filename] [packet]

Sends the specified packet to the packet driver.

Parameters:

0xHH The software interrupt number for a packet driver. 0xHH must be in the range 0x60 through 0x80.

-r Repeats sending the packet as fast as possible.

-f filename

Specifies the file option and the name of a file that contains the packet. The file contains only numbers separated by one or more blanks. Blank lines are not allowed. The numbers can be specified as hexadecimal (expressed as 0x0B), octal (expressed as 013), or decimal (expressed as 11). Do not use this parameter if you specify the packet on the command line.

packet

Specifies the packet contents.

---



---

*Table G-1 (Page 5 of 6). Packet Driver Utilities*

---

### **Utility Syntax and Explanation**

---

#### **pkttraf 0xHH**

Displays an illustration of the packet traffic on an enhanced graphics adapter (EGA) or a video graphics adapter (VGA) screen. The first twenty Ethernet addresses encountered are assigned a node number on the display. Traffic between the nodes is displayed as a line of varying intensity. When any line reaches maximum intensity, the intensities of all lines are halved.

To display the Ethernet address for a node, use the spacebar and the Backspace key to move the cursor to the node. The address will be displayed in the lower right corner.

Parameters:

0xHH The software interrupt number for a packet driver. 0xHH must be in the range 0x60 through 0x80.

---

#### **termin [-s] 0xHH**

Terminates the packet driver at the specified software interrupt and recovers its memory allocation.

Parameters:

-s Used to prepare for stopping the packet driver. The in-use flag for all handles are cleared. This prevents upcalls to handlers that are to be removed and makes it possible to later stop the packet driver although the handles are not released.

0xHH The software interrupt number that was specified when the packet driver (IBMEAPKT) was loaded.

---



---

*Table G-1 (Page 6 of 6). Packet Driver Utilities*

---

**Utility Syntax and Explanation**

---

trace 0xHH [buffer\_size]

Traces all transactions between a network application and the packet driver at the specified software interrupt. The transactions are stored in the buffer.

The trace utility will start COMMAND.COM. Run the network application, quit the network application after the transactions are completed, then enter **Exit** to return to trace. Then the transactions will be written to the TRACE.OUT file. Use the dump utility to interpret the trace.

Parameters:

0xHH The software interrupt number that was specified when the packet driver (IBMEAPKT) was loaded.

buffer\_size

The number of bytes to be allocated for the trace buffer. The maximum value is 10000.

---

dump

Interprets the contents of the TRACE.OUT file.

---

winpkt 0xXX 0xHH

Provides a packet driver interface between Microsoft Windows 3 Enhanced mode applications and the specified packet driver. This solves the problem of Windows moving applications in memory. The winpkt utility can be used instead of specifying the -w option with the packet driver command (IBMEAPKT).

Be sure to use the following sequence for the installation:

1. Install the packet driver.
2. Install the winpkt utility.
3. Start Windows.

Parameters:

0xXX The software interrupt number for the winpkt driver. 0xXX must be in the range 0x60 through 0x80.

0xHH The software interrupt number that was specified when the packet driver (IBMEAPKT) was loaded.

---



---

## Packet Driver Messages

This section contains the error messages for the packet driver (IBMEAPKT.COM). The explanation and recommended action are included with each message.

---

### **IBMEAPKT-1 The command syntax is IBMEAPKT [-w] INT=0xHH [BUSTYPE=type] [LED0=0xHHH] [LED1=0xHHH] [LED2=0xHHH] [FDUP=type]**

**Explanation:** The packet driver command was not entered correctly. See "Manually Installing the Packet Driver" on page 4-41 for an explanation of the command parameters and values.

**Action:** If you entered the command from the command line, enter the command with the correct syntax. If the command is in the AUTOEXEC.BAT file, edit the file to correct the syntax.

---

### **IBMEAPKT-2 Unable to reset the IBM PCI Ethernet Adapter**

**Explanation:** The packet driver could not initialize the adapter.

**Action:** Verify that a PCI Ethernet Adapter is correctly installed in the computer. See "Installing the Hardware" on page 2-1 for instructions.

---

### **IBMEAPKT-3 Unable to initialize the IBM PCI Ethernet Adapter**

**Explanation:** The packet driver could not initialize the adapter.

**Action:** Perform the following steps:

1. Verify that the I/O address and the interrupt level are set for the adapter. If the parameters are not set, refer to the computer's documentation for instructions on setting the parameters.
2. Verify that the PCI bus is enabled and bus mastering is enabled for the PCI slot in which the adapter is installed.
3. If the problem persists, go to "Testing the Adapter" on page B-5 to run the diagnostic utility.

---

### **IBMEAPKT-4 Virtual DMA Server (VDS) memory allocation failed.**

**Explanation:** The packet driver could not allocate memory for the PCI Ethernet Adapter.

**Action:** Remove any unnecessary terminate and stay resident (TSR) programs and device drivers to make memory available for the packet driver. Then, try loading the packet driver again.

## IBMEAPKT-5 • IBMEAPKT-18

---

### IBMEAPKT-5 There is already a packet driver at xxxx.

**Explanation:** The packet driver is already loaded at this memory location. It cannot be loaded a second time at the same location.

**Action:** If you want to load the packet driver at a different memory location, issue the packet driver command and specify another software interrupt address on the INT parameter.

---

### IBMEAPKT-7 Packet driver failed to initialize the IBM PCI Ethernet Adapter.

**Explanation:** The PCI Ethernet Adapter initialization failed.

**Action:** Go to "Testing the Adapter" on page B-5 to run the diagnostic utility.

---

### IBMEAPKT-8 INT=0xHH should be in the range 0x60 to 0x80.

**Explanation:** The specified software interrupt number is out of the allowable range.

**Action:** Restart the packet driver and specify a valid value for the INT parameter.

---

### IBMEAPKT-15 The IBM PCI Ethernet Adapter was not found.

**Explanation:** The packet driver cannot find an IBM PCI Ethernet Adapter in the computer.

**Action:** Perform the following steps:

1. Verify that a PCI Ethernet Adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Restart the packet driver and specify PCI1 or PCI2 for the Bustype parameter. If you do not know which scan mechanism your computer uses, run the diagnostic utility on the PCI Ethernet Adapter Option Diskette to display the scan mechanism.
3. If the problem persists, go to "Testing the Adapter" on page B-5 to run the diagnostic utility.

---

### IBMEAPKT-18 An IBM PCI Ethernet Adapter cannot be found on a PCI bus.

**Explanation:** The packet driver cannot locate the IBM PCI Ethernet Adapter on the PCI bus.

**Action:** Perform the following steps:

1. Verify that the adapter is installed correctly. See "Installing the Hardware" on page 2-1 for instructions.
2. Restart the packet driver and specify PCI1 or PCI2 for the Bustype parameter. If you do not know which scan mechanism your computer uses, run the diagnostic utility on the PCI Ethernet Adapter Option Diskette to display the scan mechanism.

3. If the problem persists, go to "Testing the Adapter" on page B-5 to run the diagnostic utility.

---

**Packet driver is at memory address xxxx.**

**Explanation:** The memory address where packet driver is loaded is xxxx.

**Action:** None.

---

**Packet interrupt number xxxx.**

**Explanation:** The interrupt number used by the packet driver is xxxx.

**Action:** None.

---

**Ethernet address xxxxxxxxxxxx.**

**Explanation:** The Ethernet address for the IBM PCI Ethernet Adapter is xxxxxxxxxxxx.

**Action:** None.



---

## Appendix H. RIPL Messages

This appendix contains the messages for the RIPL feature. The explanation and recommended action are included with each message.

---

### RPL-ROM-ADR: xxxx xxxx xxxx

**Explanation:** The 12-digit hexadecimal node address of the installed adapter. This address may be required for your RIPL server to respond to your adapter.

**Action:** You may need to supply this address to your server.

---

### RPL-ROM-ERR: BADA; RPL Halted

**Explanation:** The RIPL server sent a File Data Response frame with an invalid Locate or Transfer address.

**Action:** Check your server configuration and retry. On a network server, set the ACK bind time parameter for this requester. Refer to your NetWare documentation for information on setting the ACK parameter.

---

### RPL-ROM-ERR: DExx; RPL Halted

**Explanation:** An internal error has occurred in the RIPL function.

**Action:** Retry the operation. If you still experience problems see "Obtaining Service and Software Updates" on page B-1 for information on obtaining service for your adapter.

---

### RPL-ROM-FFC: nnnn

**Explanation:** A decimal field indicating the number of Find frames sent by the RIPL function.

If the number of Find frames is excessive, the RIPL server is not present, not configured to respond to your adapter's address, or is congested.

**Action:** Verify that your server is connected to the same network as your RIPL requester and that the server has been configured to respond to your adapter's RIPL request.



## RPL-ROM-HSM: • RPL-ROM-SFC:

---

### RPL-ROM-HSM: nn

**Explanation:** An error has occurred in the RIPL module's internal device driver. The error number nn identifies the specific error.

**Action:** See "NetWare DOS ODI Client Driver Messages" on page E-8 for information on error messages generated by this driver. The error messages for this driver have the prefix IBMEANWC-DOS-nn, where nn corresponds to the number following the RPL-ROM-HSM: message prefix. For example, if the message is RPL-ROM-HSM: 54, then look up message IBMEANWC-DOS-54. Take whatever action is recommended for the driver error.

---

### RPL-ROM-IRQ: nn

**Explanation:** A decimal field indicating the interrupt level being used by your adapter.

**Action:** No action required.

---

### RPL-ROM-PIO: xx

**Explanation:** A two-byte hexadecimal field containing the Programmed I/O (PIO) address being used by your adapter.

**Action:** No action required.

---

### RPL-ROM-SEQ: nnnn

**Explanation:** A decimal field containing the number specifying the last valid sequence number received from the LAN server. The sequence number is included in each frame of the image file sent by the server to the RIPL requester.

**Action:** No action required.

---

### RPL-ROM-SFC: nnnn

**Explanation:** A decimal field indicating the number of Send File Request frames sent by the your adapter to the RIPL server. An excessive number of Send File Request frames indicates that the RIPL server is not responding after it has been found.

**Action:** Check your RIPL server configuration.

## Glossary

This glossary includes terms and definitions from the *IBM Dictionary of Computing* (New York; McGraw-Hill, Inc., 1994).

- The symbol (A) identifies definitions from the *American National Standard Dictionary for Information Systems*, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies can be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018.
- The symbol (E) identifies definitions from the ANSI/EIA Standard-440-A, *Fiber Optic Terminology*.
- The symbol (I) identifies definitions from published parts of the *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC1/SC1).

- The symbol (T) identifies definitions from draft international standards, committee drafts, and working papers being developed by ISO/IEC JTC1/SC1.

The following cross-references are used in this glossary:

**Contrast with:** This refers to a term that has an opposed or substantively different meaning.

**Synonym for:** This indicates that the term has the same meaning as a preferred term, which was defined in its correct place in the glossary.

**Synonymous with:** This is a backward reference from a defined term to all other terms that have the same meaning.

**See:** This refers the reader to multiple-word terms that have the same last word.

**See also:** This refers the reader to related terms that have a related, but not synonymous, meaning.

## A

**ac.** Alternating current.

**adapter.** In a communicating device, a circuit card that, with its associated software and/or microcode, enables the device to communicate over the network.

**address.** (1) A character or group of characters that identifies a register, a particular part of storage, or some other data source or destination. (A) (2) In data communication, the unique code assigned to each device or workstation connected to a network.

**APAR.** Authorized program analysis report

**API.** Application program interface

**application.** A collection of software components used to perform specific types of user-oriented work on a computer.

**attachment unit interface (AUI).** In a local area network, the interface between the medium attachment unit and the data terminal equipment within a data station. (I) (A)

**ASCII.** American National Standard Code for Information Interchange.

**attenuation.** A decrease in magnitude of current, voltage, or power of a signal in transmission between points.

**AUI cable.** The cable used to connect the AUI port on the PCI Ethernet Adapter to a transceiver on a 10BASE5, 10BASE2, or 10BASE-FI segment.

**AUI port.** A connector on the PCI Ethernet Adapter that conforms to the AUI port specifications in IEEE Standard 802.3.

**AWG.** American Wire Gauge.

## B

**BBS.** Bulletin board system

**BIOS.** Basic Input/Output System.

**bit.** Either of the digits 0 or 1 when used in the binary numeration system. Synonymous with *binary digit*. (T) See also *byte*.

**bits per second (bps).** The rate at which bits are transmitted per second. Contrast with *baud*.

**bps.** Bits per second.

**bus.** A facility for transferring data between several devices located between two end points, only one device being able to transmit at a given moment. (T)

**Bus Master.** A device on the Micro Channel bus that has its own built-in DMA controller instead of using the system-provided DMA controller. This allows the device to set up the DMA transfer itself instead of relying on the system software to set up the system DMA controller, giving the

device greater flexibility in function and, in general, better system performance than a DMA subordinate device.

**byte.** A string that consists of a number of bits, treated as a unit, and representing a character. (T)

## C

**c.** The velocity of light traveling in a vacuum, which is 300 000 km/sec (186 400 mi/sec).

**cable segment.** A section of cable between components or devices on a network. A segment may consist of a single patch cable, multiple patch cables connected together, or a combination of building cable and patch cables connected together. See *LAN segment, ring segment*.

**carrier sense multiple access with collision detection (CSMA/CD).** A network protocol in which the transmitting workstation detects data collisions and waits a random length of time before retrying the transmission.

**CD-ROM.** High-capacity read-only memory in the form of an optically read compact disc.

**channel.** The portion of a storage medium that is accessible to a given reading or writing station; for example, track, band. (A)

**coaxial (coax) cable.** A cable consisting of one conductor, usually a small copper tube or wire, within

and insulated from another conductor of a larger diameter, usually copper tubing or copper braid.

**collision.** An unwanted condition that results from concurrent transmissions on a channel. (T)

**collision detection.** In carrier sense multiple access with collision detection (CSMA/CD), a signal indicating that two or more stations are transmitting simultaneously.

**crossover cable.** A type of 10BASE-T cable in which the transmit and receive data pairs are wired so that the transmit pair is terminated at the pin positions used by the receive pair at the opposite end of the cable. A crossover cable is used to connect the 10BASE-T port on a PCI Ethernet Adapter to a 10BASE-T port (on a repeater) that does not perform the crossover function.

**CSD.** Corrective service diskette.

**CSMA/CD.** See *carrier sense multiple access with collision detection*.

## D

**dB.** Decibel.

**direct memory access (DMA).** The transfer of data between memory and input/output units without processor intervention.

**DLC.** Data link control.

**DMA.** Direct memory access.

**DOS.** Disk Operating System.

**duplex.** Pertaining to communication in which data can be sent and received at the same time. Synonymous with *full-duplex (FDX)*. Contrast with *half-duplex (HDX)*.

## E

**ECB.** Event Control Block

**EGA.** Enhanced graphics adapter.

**EIA.** Electronics Industries Association.

## F

**FDX.** Full-duplex. Synonymous with *duplex*. Contrast with *HDX*.

**frame.** (1) A data structure that consists of fields, predetermined by a protocol, for the transmission of user data and control data. The composition of a frame, especially the number and types of fields, may vary according to the type of protocol. Synonymous with *transmission frame*. (T) (2) A packet that is transmitted over a serial line or LANs. See also *packet*.

**FTP.** File transfer protocol. FTP is an application protocol used for transferring files to and from host computers.

## G

**GUI.** Graphical user interface. The user interface that is visual, not textual. Users can perform tasks through this object-oriented, windowed interface. Contrast with command-line interface.

## H

**half-duplex.** In data communication, pertaining to transmission in only one direction at a time. Contrast with *duplex*.

**HDX.** Half-duplex.

**hexadecimal.** Pertaining to a system of numbers to the base 16; hexadecimal digits range from 0 through 9 and A through F, where A represents 10 and F represents 15.

**HSM.** Hardware Support Module.

## I

**ID.** Identification, identifier.

**IEEE.** Institute of Electrical and Electronics Engineers.

**IEEE Standard 802.3.** A series of standards that define a type of LAN that uses an access method called *carrier sense multiple access with collision detection (CSMA/CD)* over cabling of various types. The cabling types defined by the standard are thick coaxial (10BASE5), thin coaxial (10BASE2),

unshielded twisted pair (10BASE-T), and optical fiber (10BASE-F).

**impedance.** The combined effect of resistance, inductance, and capacitance on a signal at a particular frequency.

**Internet Packet Exchange (IPX).**

The routing protocol used to connect Novell's servers or any workstation or router that implements IPX with other workstations. Although similar to TCP/IP, it uses different packet formats and terminology. See also *TCP/IP* and *Xerox Network Systems\*\* (XNS\*\*)*.

**Internet Protocol (IP).** A protocol used to route data from its source to its destination in an Internet environment.

**interrupt level.** The means of identifying the source of an interrupt, the function requested by an interrupt, or the code or feature that provides a function or service.

**I/O.** Input/output.

**IP.** Internet Protocol.

**IPL.** Initial program load

**IPX.** Internet Packet Exchange.

**IRQ.** Interrupt request.

**ISA.** Industry Standard Architecture.

## J

**jabber.** Transmission by a data station beyond the time interval allowed by the protocol. (T)

**jumper.** A connector between two pins on a network adapter that enables or disables an adapter option, feature, or parameter value.

## K

**kB.** For disk storage capacity and data transmission rates, 1000 bytes. For processor memory size, 1024 bytes.

**Kbps.** Kilobits per second (1 kilobit equals 1000 bits).

**km.** Kilometer.

## L

**LAA.** Locally administered address.

**LAPS.** LAN Adapter Protocol Support. Replaced by MPTS.

**LAN.** Local area network.

**LAN segment.** Any portion of a LAN (for example, a single bus or ring) that can operate independently but is connected to other parts of the establishment network via bridges.

**LED.** Light-emitting diode.

**link segment.** In simple terms, a single cable or interconnected cables that connect a device to a

10BASE-T repeater. The cables in a link segment are unshielded twisted-pair cables that conform to the cabling specifications in IEEE Standard 802.3 10BASE-T.

**locally administered address.** In a local area network, an adapter address that the user can assign to override the universally administered address. Contrast with *universally administered address*.

**LSB.** Least significant bit.

**LSL.** Link Support Layer.

**LSP.** LAN Support Program.

## M

**m.** meter.

**MAC.** Medium access control.

**MAU.** Medium attachment unit.

**MB.** For disk storage capacity and data transmission rates, 1 000 000 bytes. For processor memory size, 1 048 576 bytes.

**Mb.** Megabit. For disk storage capacity and data transmission rates, 1 000 000 bits. For processor memory size, 1 048 576 bits.

**Mbps.** Megabits per second.

**MDI.** Medium Dependent Interface

**MDI port.** The port that acts as the electrical and mechanical interface

between the twisted-pair link segment and the medium attachment unit.

**MDI-X.** A port on a 10BASE-T repeater that performs the crossover function.

**MHz.** Megahertz.

**mi.** Mile.

**mm.** Millimeter, millimeters.

**MPTS.** Multiple Protocol Transport Services. LAPS replacement.

**MSB.** Most significant bit.

**MS-DOS\*\*.** Microsoft DOS.

## N

**NDIS.** Network Driver Interface Specification.

**NetBEUI.** NetBIOS extended user interface.

**NetBIOS.** Network BIOS. An operating system interface for application programs used on IBM personal computers that are attached to the IBM Token-Ring Network. See also *BIOS*.

**NIF.** Network information form.

**NIOS.** NetWare I/O subsystem

**NLM.** NetWare loadable module

**node address.** The address of an adapter on a LAN.

**non-canonical.** In this form, the most significant bit of an octet is transmitted first.

## O

**OBI.** Options by IBM.

**ODI.** Open-Data Link Interface.

**ohm.** A unit of measure of electrical resistance.

## P

**packet.** In data communication, a sequence of binary digits, including data and control signals, that is transmitted and switched as a composite whole. The data, control signals, and possibly error control information are arranged in a specific format. (I)

**parameter.** A variable that is given a constant value for a specified application and that may denote the application. (I) (A)

**PCI.** Peripheral component interconnect.

**PC-NFS.** Personal Computer-Network File System.

**port.** A connector on a device to which cables for other devices such as display stations and printers are attached.

**POST.** Power-on self-test.

**power-on self-test (POST).** A series of diagnostic tests that are

run automatically by a device when the power is switched on.

**protocol.** A set of semantic and syntactic rules that determines the behavior of functional units in achieving communication. (I)

## R

**RIPL.** Remote IPL.

**read-only memory (ROM).** Memory in which stored data cannot be modified by the user except under special conditions.

**repeater.** A device used to amplify or reshape signals.

**ROM.** Read-only memory. (A)

## S

**sec.** Second.

**segment.** A section of cable between components or devices. A segment may consist of a single patch cable, several patch cables that are connected, or a combination of building cable and patch cables that are connected.

**SNAP.** Subnetwork Access Protocol.

**straight-through cable.** A type of 10BASE-T cable in which the transmit and receive data pairs are wired so that each signal wire is terminated at the same pin position at each end of the cable. A straight-through cable is used to





connect the 10BASE-T port on a PCI Ethernet Adapter to a 10BASE-T port (on a repeater) that performs the crossover function.

**Subnetwork Access Protocol (SNAP).** A 5-byte protocol discriminator that identifies the non-IEEE standard protocol family to which it belongs.

## T

**TCP.** Transmission Control Protocol.

**TCP/IP.** Transmission Control Protocol/Internet Protocol.

**telephone twisted pair.** One or more twisted pairs of copper wire in the unshielded voice-grade cable commonly used to connect a telephone to its wall jack. Also referred to as *unshielded twisted pair* (UTP).

**TIA.** Telecommunications Industries Association. A part of EIA.

**TSR.** Terminate and stay resident.

**transceiver.** A physical device that connects a host interface to a local area network, such as Ethernet. Ethernet transceivers contain electronics that apply signals to the cable and sense collisions.

**Transmission Control Protocol (TCP).** A communications protocol used in Internet and in any network that follows the U.S. Department of

Defense standards for inter-network protocol. TCP provides a reliable host-to-host protocol between hosts in packet-switched communications networks and in interconnected systems of such networks. It assumes that the Internet protocol is the underlying protocol.

**Transmission Control Protocol/Internet Protocol (TCP/IP).** A set of protocols that allow cooperating computers to share resources across a heterogeneous network.

**transmit.** To send information from one place for reception elsewhere. (A)

**twisted pair.** A transmission medium that consists of two insulated electrical conductors twisted together to reduce noise. (T)

## U

**universally administered address.** In a local area network, the address permanently encoded in an adapter at the time of manufacture. All universally administered addresses are unique. Contrast with *locally administered address*.

**URL.** Universal resource locator. Internet information locating facility.

**unshielded twisted pair (UTP).** See *telephone twisted pair*.

## V

**VDS.** Virtual DMA Server.

**VGA.** Video graphics adapter.

## W

**web browser.** A client program that allows a user to navigate the Internet Worldwide Web via hypertext links. These links, called uniform resource locators (URLs), specify the protocol, location, and file name of each document. The documents can be text, graphics, video, or audio. The links can also use other protocols such as file transfer protocol (FTP) or gophers.

**WFW.** Windows for Workgroups. A variation of the Microsoft Windows program that supports multiple users in a LAN environment.

## X

**Xerox Network Systems (XNS).** A Xerox Network Services protocol. This term collectively describes the suite of internet protocols developed by the Xerox Corporation. Although similar to TCP/IP protocols, XNS uses different packet formats and terminology. See also *IPX*.

**XNS.** Xerox Network Systems.

## Numerics

**10BASE-F segment.** An optical fiber cable that interconnects devices in an IEEE 802.3 network.

**10BASE-T segment.** An unshielded twisted-pair cable that interconnects devices in an IEEE 802.3 network.

**10BASE2 segment.** A thin coaxial cable that interconnects devices in an IEEE 802.3 network.

**10BASE5 segment.** A thick coaxial cable that interconnects devices in an IEEE 802.3 network.



# Index

## A

- adapter cables
  - connecting 2-2
  - specifications C-1
- adapter kit 1-3
- addresses
  - locally administered 2-4
  - universally administered 2-4
- AUI cable 1-6, C-3
- autosense function 1-1

## C

- checklist for installation 1-2
- configuring LAN servers for RIPL 2-9
- configuring the adapter with LANAID 3-1
- crossover cable 1-6, C-2

## D

- diagnostic utility B-5

## E

- electronic emissions notices A-6

## F

- features 1-1

## I

- installing
  - adapter driver 4-1
  - adapter hardware 2-1
  - aids 1-7

## installing (*continued*)

- checklist 1-2
- index to driver installation 4-2
- LANAID 3-3
- RIPL feature 2-8

## L

- labels 2-4
- LAN Client 3-1
- LAN Support Program
  - environment 1-5
  - installing NDIS driver 4-25
  - sample files F-6
- LAN Transports
  - environment 1-5
  - installing NDIS driver 4-37
  - sample files F-14
- LANAID
  - configuring with 3-1
  - installing 3-3
  - running 3-3
- LANManager
  - environment 1-5
  - installing NDIS driver 4-28
  - sample files F-11
- LANtastic
  - environment 1-5
  - installing NDIS driver 4-36
  - sample files F-13
- LEDs 2-5
- locally administered address 2-4
  - configuring for NDIS 3.0 driver 4-40



## M

### MAC

See medium access control (MAC)

MDI port 1-6

MDI-X port 1-6

medium access control (MAC)

MAC address 3-4

MAC address label on adapter 2-4

messages

NDIS 2.01 driver F-16

NDIS 3.0 driver F-19

NetWare DOS client driver E-8

NetWare LAN driver D-7

NetWare OS/2 client driver E-10

Packet driver G-7

RIPL messages H-1

## N

NDIS 2.01 driver

installing for LAN

Transports 4-37

installing for LANManager 4-28

installing for LANtastic 4-36

installing for LSP 4-25

installing for WFW 3.1 4-30

installing for WFW 3.11 4-31

installing manually 4-47

messages F-16

parameters F-1

sample files F-5

using other installation

programs 4-46

NDIS 3.0 driver

installing for WFW 3.11 4-31

installing for Windows 95 4-34

installing for Windows NT 4-39

messages F-19

NDIS 3.0 driver (*continued*)

parameters F-1

sample files F-10

NetWare DOS ODI client driver

environment 1-4

installing 4-15

installing manually 4-8

messages E-8

parameters E-1

sample files E-5

NetWare LAN driver

environment 1-4

installing for 3.11 4-4

installing for 3.12 4-12

installing for 4.x 4-19

messages D-7

parameters D-1

sample files D-5

NetWare OS/2 ODI client driver

environment 1-5

installing 4-17

installing manually 4-10

messages E-10

parameters E-1

sample files E-7

notices

electronic emission A-6

IBM general A-5

trademarks A-9

## O

OBI registration card 1-3

OS/2 software fix 2-7

## P

packet driver

COPYING.DOC 4-41

environment 1-5

INSTALL.TXT 4-43

packet driver (*continued*)

- installing 4-41
- messages G-7
- parameters 4-43
- utilities G-1

PCI slot 2-1

PCISSETUP.EXE 2-6

## R

Remote IPL 1-1, 2-8

- messages H-1

requirements

- PCI slot 2-1

- software 1-4

RJ45 connector C-2

running

- LANAID 3-3

## S

safety booklet 1-3

sample files

- NDIS 2.0 driver F-5

- NetWare DOS ODI client  
driver E-5

- NetWare LAN server driver D-5

- NetWare OS/2 ODI client  
driver E-7

service and support B-1

software

- installation 4-1

- updates B-1

straight-through cable 1-6, C-2

## T

testing the adapter B-5

trademarks A-9

troubleshooting

- service numbers B-1

troubleshooting (*continued*)

- start procedure B-2

- testing the adapter B-5

## U

universally administered

- address 2-4

## W

warranty A-1

WFW 3.1

- environment 1-5

- installing NDIS driver 4-30

- sample files F-8

WFW 3.11

- environment 1-5

- installing NDIS driver 4-31

- sample files F-9

Windows 95

- environment 1-5

- installing NDIS driver 4-34

Windows NT

- environment 1-5

- installing NDIS driver 4-39



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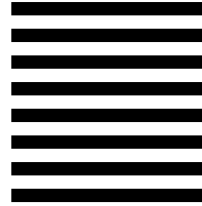


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