

Netfinity 10/100 Ethernet Security Adapter



Installation Guide

Note

Before using this information and the product it supports, be sure to read "Safety Information" on page 43 and "Appendix J. Notices" on page 41.

First Edition (January 2000)

This edition applies to the IBM Netfinity 10/100 Ethernet Security Adapter.

You can submit comments concerning this documentation online at
<http://www.ibm.com/networking/support/feedback.nsf/docsoverall>

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About this manual

This manual contains the information you need to install and use your adapter.

Also on this CD-ROM are the installation aids and device drivers for the adapter.

Who should read this manual

This manual is intended for use by network administrators and other end-users of the IBM Netfinity 10/100 Ethernet Security Adapter.

This adapter supports adapter teaming, adapter hot plug, Wake on LAN[®], and IP Security. For more information regarding the IP security feature of this adapter, see “Using IP Packet Protect” on page 5.

How this manual is organized

“Chapter 1. Installing the adapter hardware” on page 1 describes the procedure for installing the adapter into your computer.

“Chapter 2. Configuring your adapter” on page 7 describes the procedure for software installation for a number of network operating environments.

“Appendix A. IBMSet: an overview” on page 15 describes the IBMSet configuration utility.

“Appendix B. Duplex mode (optional)” on page 17 describes the duplexing performance option.

“Appendix C. Virtual LANs” on page 19 describes using a Virtual LAN.

“Appendix D. Teaming options” on page 21 describes choosing and setting up teaming options.

“Appendix E. Hot plug support” on page 27 describes the function of hot plugging Ethernet adapters.

“Appendix F. Troubleshooting and testing the adapter” on page 29 describes troubleshooting procedures and how to contact IBM product support.

“Appendix G. Priority Packet: an overview” on page 33 describes this traffic-prioritization utility.

“Appendix H. PCI installation tips” on page 35 lists common situations in which manual installation of PCI is warranted.

“Appendix I. Adapter specifications” on page 39 lists the specifications of the adapter.

“Appendix J. Notices” on page 41 lists the legal notices that are required for the IBM Netfinity 10/100 Ethernet Security Adapter.

Related information

For additional information such as software updates, troubleshooting tips, and installation notes, refer to the Web at:

<http://www.ibm.com/networking>

Refer the readme files on the CD-ROM for more information. Use one of the following methods:

- Automatic online help from the CD-ROM autorun program
- Go to the \info directory and open the files with any text editor

- From a DOS prompt, enter **setup /readme**

Year 2000

This product is Year 2000 ready. When used in accordance with its associated documentation, it is capable of correctly processing, providing and/or receiving date data within and between the 20th and 21st centuries, provided all other products (for example, software, hardware and firmware) used with the product properly exchange accurate date data with it.

Chapter 1. Installing the adapter hardware

This chapter contains information to assist you in installing the IBM Netfinity® 10/100 Ethernet Adapter. Topics include:

- “Installing the adapter”
- “Using the correct adapter cable” on page 2
- “Wake on LAN connection” on page 3
- “Using Wake On LAN” on page 5
- “Using IP Packet Protect” on page 5

Installing the adapter

1. In the manual provided with your computer, locate the instructions for installing an adapter. Be sure to follow any safety instructions in that manual.
2. Switch OFF the computer and all connected devices.

Note: In the U.K., by law, the telephone line cable (if connected) must be disconnected before the power cord.

3. Remove the power cord from the outlet.
4. Remove all cables from your computer to the connected devices.

Note: Make sure that you label the cables for correct reconnection later.

5. Follow the instructions provided in your computer manual for removing the cover or otherwise accessing the adapter slots.
6. Remove the screw and cover for the appropriate PCI Busmaster-capable expansion slot. (Refer to your computer manual.) Keep the cover to use again if you remove the adapter.

If you plan to use the adapter for Wake on LAN®, go to “Wake on LAN connection” on page 3.

If you do not plan to use Wake on LAN, continue here with the following step.

7. Place the adapter in the slot.

Note: Most PCI slots in computers are Busmaster-enabled, but some are not. If you have configuration problems, refer to your computer manual.

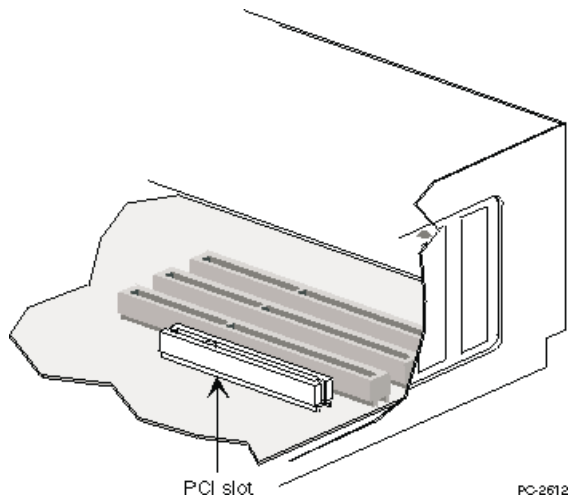


Figure 1. PCI Slot Illustration

8. Push the adapter into the slot until the adapter is seated firmly. Secure the adapter bracket with a screw.
9. If you are installing more than one adapter, repeat steps 6, 7, and 8 for each adapter you want to install.
Otherwise, continue with step 10.

Note: In the U.K., by law, the power cord must be connected before the telephone line cable.

10. Replace the cover on the computer, connect the cables to the connected devices, connect the signal cables to the receptacles, and then connect the power cord to the outlet.
11. Connect a twisted-pair Ethernet Category 5 cable to the adapter and to your Ethernet outlet. See “Using the correct adapter cable” for more information.
12. Switch ON the connected devices and the computer.

If you want to run the adapter diagnostics at this point, see “Testing the adapter using the diagnostics” on page 31 for details.

Using the correct adapter cable

To operate your network reliably at 100 Mbps, you must use Category 5 data grade cables with this adapter. Although Category 3 or 4 might appear to work, you might experience intermittent loss of data. For more information, refer to the Hardware Specifications and Cabling topic on the IBM Installation and Drivers CD-ROM or diskette. For 10 Mbps, you can use Category 3, 4, or 5 cabling.

Residential Use: If you are using this adapter in a residential environment, you **must** use Category 5 data-grade cables for either 10 Mbps or 100 Mbps (see emission notices in “Appendix J. Notices” on page 41).

Note: The adapter Ethernet address is printed on a sticker on the edge of the adapter as shown in Figure 2 on page 3.

The Ethernet address is sometimes called the *Node address* or the *MAC address*. This unique, 12-digit hexadecimal address was stored in the adapter memory at the factory.

You can use this address to match the adapter to the slot number when configuring multiple adapters.

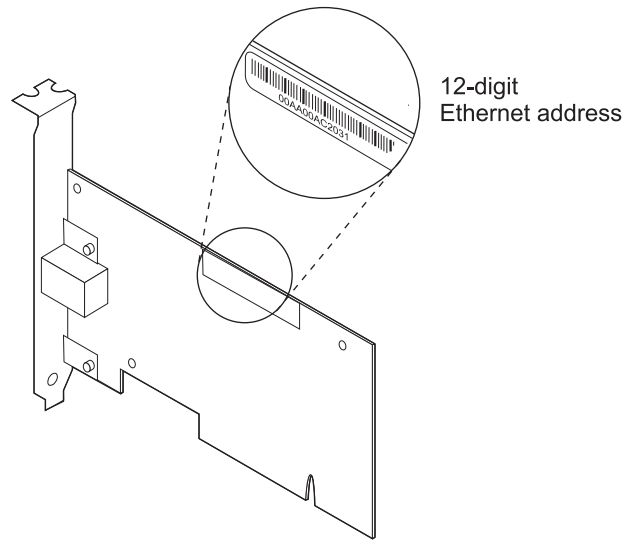


Figure 2. Ethernet Address Location

Wake on LAN connection

For the Wake On LAN feature to work correctly, the adapter must be connected to a continuous power source. This allows the IBM Netfinity 10/100 Ethernet Security Adapter to monitor the network even when the computer is switched off.

The IBM Netfinity 10/100 Ethernet Security Adapter is a PCI 2.2 Adapter that can support Wake on LAN on both PCI 2.2 and PCI 2.1 PC desktop and server systems that are Wake on LAN capable.

With PCI 2.2 PC systems, all Wake on LAN power and signal connections are through the PCI Bus Connector, so no Wake on LAN cable is required.

With PCI 2.1 PC systems, a Wake on LAN cable is required. Because this adapter is intended primarily for new PCI 2.2 PC systems, the Wake on LAN cable is not shipped with the adapter. Contact IBM Help or your sales representative to acquire a 2-way Wake on LAN cable for your PCI 2.1 Wake on LAN system.

Connecting the 2-way Wake on LAN cable

Attention: Switch off and unplug power to the computer before installing the WOL cable. Failure to do so could damage the adapter or computer. The WOL connector on your motherboard is live when the computer is plugged in to a power outlet. Likewise, always unplug the computer prior to removing an adapter from the computer.

1. Make sure that your computer is unplugged from the power outlet.
2. Locate the Wake On LAN 3-pin connector on the adapter. Attach one end of the cable to the adapter as shown in Figure 3 on page 4. Note that the connector is notched so as to prevent incorrect attachment. Also note that you can use either end of the cable, because the two ends are identical.

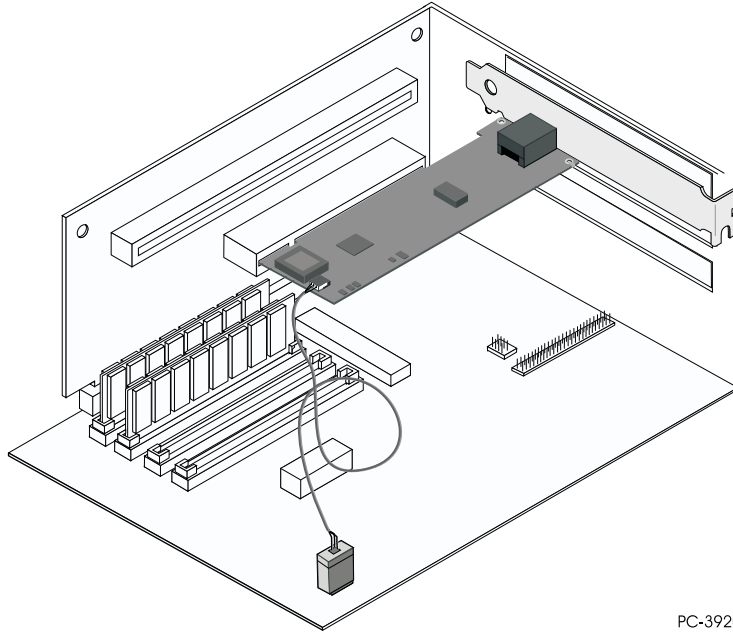


Figure 3. Connecting the 2-Way Wake On LAN Cable

3. Place the adapter in the slot.

Note: Most PCI slots in computers are Busmaster-enabled, but some are not. If you have configuration problems, refer to your computer manual.

4. Push the adapter into the slot until the adapter is seated firmly. Secure the adapter bracket with a screw.
5. Locate the Wake On LAN connector on your system board. The location varies, depending on the vendor and model. The connector is usually located near other power connectors, such as the LED connectors.
6. Connect the other end of the cable to the connector on the system board as shown in Figure 3.
7. Some computers might require you to change a setting in the BIOS or setup program to enable the Wake On LAN feature. Check your computer manual or contact your dealer for more information.
8. If you are installing more than one adapter, repeat steps 6, 7, and 8 on page 2 for each adapter that you want to install. Otherwise, continue with step 9.

Note: In the U.K., by law, the power cord must be connected before the telephone line cable.

9. Replace the cover on the computer, connect the cables to the connected devices, connect the signal cables to the receptacles, and then connect the power cord to the outlet.
10. Connect a twisted-pair Ethernet Category 5 cable to the adapter and to your Ethernet outlet. See "Using the correct adapter cable" on page 2 for more information.
11. Switch ON the connected devices and the computer.

Using Wake On LAN

The Wake on LAN feature can be disabled or enabled using your system configuration utility. Refer to your computer documentation for details.

Power for the IBM Netfinity 10/100 Ethernet Security Adapter is always ON when the computer is connected to ac power, regardless of the computer ON/OFF switch. When the computer power is OFF, this adapter constantly monitors the LAN for the wake-up frame that requests power to be applied to the computer.

The wake-up frame can be a broadcast or an individually-addressed frame. The following data is required and can occur anywhere in the data portion of the wake-up frame.

- 6 bytes of X'FF', followed by
- 48-bit universally administered address (UAA or MAC address) of the adapter to be woken up, repeated eight or more times. Eight repetitions are required; more than eight are acceptable.

See "Appendix F. Troubleshooting and testing the adapter" on page 29 for general troubleshooting and a listing of common problems and solutions for Wake On LAN operability.

Using IP Packet Protect

The Packet Protect feature is included with your adapter. It is designed to help protect Internet Protocol (IP) packets traveling on your LAN from unauthorized users or intruders. You can protect your company's confidential information from outsiders who might break into your network, as well as from unauthorized insiders.

For example, your company might keep confidential information on a central server. Using readily available tools, an intruder can discover and view all this data. Intruders can include both company insiders, and outsiders who break through your firewall or visit your company. IP Packet Protect protects server traffic by verifying that only the intended computer receives the information and guarding the data while it travels on the network.

Currently, there are two separate standards for data encryption: 3DES or Triple DES for use in the U.S. and Canada, and DES or Single DES for the rest of the world.

Accordingly, there are two separate hardware versions of the IBM Netfinity 10/100 Ethernet Security Adapter: a 3DES adapter and a DES adapter. The 3DES adapter hardware and software are shipped in the U.S. and Canada. The DES adapter hardware and software are shipped to authorized countries in the rest of the world.

Overall, the shipments of both 3DES and DES adapters follow this general guideline from the U.S. government for data security:

Unlawful to export outside the U.S. or Canada except under an approved Dept. of Commerce export license or applicable license exception.

All the information in the following sections generally applies to both 3DES and DES.

Protecting network traffic

IP Packet Protect uses the following features to help protect your company's IP information as it travels on the LAN:

Identity verification

Identity verification protects the integrity and authenticity of information traveling on the LAN. Each packet is from the expected computer. This helps prevent an intruder from impersonating another computer in an attempt to receive information that was intended for that computer.

Confidentiality

Confidentiality protects the privacy of information traveling on the network. Each packet is encoded so that unwanted recipients can not interpret it. This helps prevent an intruder from intercepting and interpreting information as it travels on the LAN.

Hardware acceleration

When you implement a security solution on your network, it is common for the computer's CPU utilization and network traffic to increase, which reduces performance. The IBM Netfinity 10/100 Ethernet Security Adapter is designed to speed up the security overhead by using a special on-board processor, thereby reducing impact on CPU utilization and network traffic.

IP Packet Protect is designed to off-load memory-intensive security tasks to the IBM Netfinity 10/100 Ethernet Security Adapter. This frees up the computer's CPU utilization for other tasks, while reducing impact to the network performance.

Operating systems supported

IP Packet Protect is currently supported in Windows® 2000 only.

Note: The current IP Packet Protect software only supports IP security in a Workgroup. Workgroup IP Security includes a Workgroup Server or Workgroup Admin, and the Workgroup authorized members. 10 to 100 nodes is the expected size.

More information

For more information on how to install and run IP Packet Protect, refer to the software CD-ROM shipped with the adapter. The Packet Protect User's Guide and Packet Protect software are provided in the \PACKET PROTECT directory on the CD-ROM.

Chapter 2. Configuring your adapter

This chapter describes how to make a setup diskette, if needed, and how to configure the adapter and install the drivers in many different LAN environments.

Making a setup diskette

If you need to use a diskette to install the adapter drivers in NetWare, Windows, or OS/2[®], use the MAKEDISK.BAT utility located in the \MAKEDISK directory of the software CD-ROM. The format is:

```
MAKEDISK [operating system] [destination]
```

where [*operating system*] is the operating system for which you are creating the diskette and [*destination*] is the diskette drive letter, for example A:

The possible operating system options are:

NT	Microsoft Windows NT
W9X	Microsoft Windows 95 and Windows 98
NW	Novell NetWare servers and clients
DOS	MS-DOS [®] , Windows 3.1, and IBM OS/2

Make sure you have a 1.44 MB formatted, non-bootable diskette in the diskette drive of your computer when using this utility.

Note: This utility must be run from the \MAKEDISK directory.

Configuring the adapter and installing the drivers

Novell NetWare 5.0

Note: For Novell NetWare 4.1x, see "Novell NetWare 4.1x" on page 8. For versions 3.11 and 3.12, refer to the readme files on this CD-ROM. For DOS ODI, see "DOS and Windows 3.1 setup for Novell NetWare DOS ODI clients" on page 12.

1. From the NetWare console, type **load nwconfig** and press **Enter**.
2. From the Configuration Options screen, select **Driver options** and press **Enter**.
3. Select **Configure network drivers** and press **Enter**. If any drivers are already loaded, a list of them appears.
4. Choose **Select an additional driver** and press **Enter**. A list of drivers appears.
5. Insert the IBM Installation and Drivers CD-ROM or diskette and press **Insert** to install an unlisted driver.
6. Specify the correct path to your media if necessary by pressing **F3**. Press **Enter** to search the diskette or CD-ROM. To install from the CD, type CD volume name :\NetWare server name. For example, **IBM100S31:\NWSERVER**.
7. Highlight the IBM Netfinity 10/100 Ethernet Security Adapter and press **Enter** to select it.

8. The next panels ask for frame and protocol types. Use the arrow keys to select specific items or choose the defaults. Select **Save parameters and load driver** to continue.
9. To install an additional adapter, press **Esc** to go back to select an adapter to install. Then, repeat steps 7 through 9 for each additional adapter that you want to install.
10. To complete the driver installation process, go back to the Installation Options panel by pressing the **Esc** key until you see it.
11. Select **Exit** to return to the console prompt.

Note: If the adapter cannot transmit or receive following the installation, you might need to modify the frame type in the AUTOEXEC.NCF file.

Novell NetWare 4.1x

For Novell NetWare 3.11 and 3.12, refer to the readme files. For DOS ODI, see “DOS and Windows 3.1 setup for Novell NetWare DOS ODI clients” on page 12.

Note: Prior to installing, either load DOS or NetWare drivers for your computer's CD-ROM drive or create a diskette from the CD-ROM on a different computer.

1. From the NetWare console, type **load install** and press **Enter**.
2. From the Installation Options panel, select **Driver options** and press **Enter**.
3. Select **Configure network drivers** and press **Enter**. If any drivers are already loaded, a list of them appears.
4. Choose **Select an additional driver** and press **Enter**. A list of drivers appears.
5. Insert the IBM Installation and Drivers CD-ROM or diskette and press **Insert** to install an unlisted driver.
6. If necessary, specify the correct path to your media by pressing **F3**. Press **Enter** to search the diskette or CD-ROM.
7. The driver name is displayed:
IBM Netfinity 10/100 Ethernet Security Adapter. Press **Enter** to select it.
8. The next panels enable you to specify frame and protocol types. Use the arrow keys to select specific items or choose the defaults. Select **Save parameters and load driver** to continue.
9. To install an additional adapter, press **Esc** to go back to **Select an adapter to install**. Then, repeat steps 7 through 9 for each additional adapter that you want to install.
10. To complete the driver installation process, go back to the Installation Options panel by pressing **Esc** until you see it.
11. Select **Exit** to return to the console prompt.

Note: If the adapter cannot transmit or receive following the installation, you may need to modify the frame type in the AUTOEXEC.NCF file.

Windows 95

Windows 95 automatic configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The BIOS automatically sets the adapter IRQ level and I/O address each time you start your computer.

Start your computer to automatically configure the adapter. Resource configuration is complete when Windows 95 starts.

If your computer displays an error while booting, it might require additional configuration steps. See “Appendix H. PCI installation tips” on page 35 for more information.

Installing network drivers from diskette

Have your Windows 95 installation CD-ROM or diskettes available, because you will be prompted for them when you install the new adapter.

1. After you put the adapter in the computer and connect the cable, start Windows 95. You will see the New Hardware Found dialog box.

Note: If this box does not appear and Windows 95 starts normally, you might need to manually add the adapter. Refer to the MS.TXT readme file in the \MS directory for more information.

2. Click **Driver from disk provided by hardware manufacturer**, then click **OK**. You will see the Install From Disk dialog box.
3. Insert the IBM Installation and Drivers CD-ROM or diskette.
4. Specify D:\ (or the appropriate drive letter for the CD-ROM drive) or A:\ (for diskette) as the path and then click **OK**.
5. Follow the prompts for any Windows 95 installation diskettes and restart the computer when prompted.

Note: If you installed from the CD-ROM, the installation files are typically located at D:\Win95, where D is your CD-ROM drive.

After restarting Windows 95, connect to your network by double-clicking **Network Neighborhood** on the desktop.

Windows troubleshooting

If you cannot connect to a server or if Windows 95 or Windows 98 reports an error after you double-click **Network Neighborhood**, try the suggestions here first and then see “Appendix F. Troubleshooting and testing the adapter” on page 29 if necessary.

- Make sure that you are using the drivers that are on the CD-ROM that ships with this adapter.
- Make sure that the driver is loaded and that the protocols are bound. Check the Device Properties list for trouble indicators (an X or ! symbol).
- Test the adapter with the IBMSet advanced configuration utility that was installed on your system when you installed the IBM Netfinity 10/100 Ethernet Security Adapter. To start IBMSet, double-click **IBMSet** in the Windows control panel. To run diagnostics, select the adapter and click **Diagnostics**, then click **Run Tests**. For additional information, click **Help** in the IBMSet window.
- Check with your LAN administrator. You might need to install additional networking software.

Windows 98

Windows 98 automatic configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The BIOS automatically sets the adapter IRQ level and I/O address each time you start your computer.

Start your computer to automatically configure the adapter. Resource configuration is complete when Windows 98 starts.

If your computer displays an error while booting, it might require additional steps to configure. See “Appendix H. PCI installation tips” on page 35 for more information.

Install Network Drivers from Diskette

1. After you put the adapter in the computer and connect the cable, start Windows 98. You will see the New Hardware Found dialog box.

Note: If this box does not appear and Windows 98 starts normally, you might need to manually add the adapter. See “Manually installing the network drivers”.

2. When prompted, insert the IBM Installation and Drivers CD-ROM or diskette.
3. Specify D:\ (or the appropriate drive letter for the CD-ROM drive) or A:\ (for diskette drive) as the path, then click **OK**.
4. Restart the system when prompted.

Manually installing the network drivers

1. After you put the adapter in the computer and connect the cable, start Windows 98.
2. Double-click **System** in the Control Panel.
3. Click **Device Manager**.
4. Double-click **Network Adapters** in the list area.
5. Double-click the IBM Netfinity 10/100 Ethernet Security Adapter. The Update Device Driver Wizard appears.
6. Select **Search for a better driver than the one your device is using now**. Make sure that the IBM Installation and Drivers CD-ROM or diskette is in the drive, and click **Next**.
7. Select the drive that contains the IBM Configuration and Drivers disk and click **Next**.
8. Select **Choose the updated driver (Recommended)** and continue to click **Next** at each dialog box until the driver files are copied.
9. When Windows has finished copying drivers, click **Close** and restart your computer.

Note: For troubleshooting information, see “Windows troubleshooting” on page 9.

Windows 2000

Note: These instructions are based on the Beta version of Windows 2000.

Installing network drivers from diskette

After you put the adapter in the computer, connect the cable, plug in the power cord and start Windows, Windows automatically installs a driver for the adapter from its own library of drivers.

To use the IP Packet Protect feature of the IBM Netfinity 10/100 Ethernet Security Adapter, you need to update this driver with the driver included on the EtherJet Secure Adapter Configuration and Drivers CD-ROM. To update the driver, perform the following procedure:

1. Insert the IBM Netfinity 10/100 Ethernet Security Adapter Configuration and Drivers CD-ROM in the CD-ROM drive.
2. From the Control Panel, double-click the **System** icon, select the **Hardware** tab, and click the **Device Manager** button.
3. Select **Network Adapters** and right-click **IBM Netfinity 10/100 Ethernet Security Adapter** to display its menu.
4. Click the **Properties** menu option.
5. From the Properties dialog box, click the **Driver** tab and click the **Update Driver** button.
The Update Device Driver Wizard appears.
6. Click **Next**.
7. At the "What do you want the wizard to do" prompt, select the **Search for a suitable driver for my device** radio button, and click **Next**.
8. Select the **CD-ROM drives** check box and click **Next**.
9. Select the **Install one of the other drivers** check box and click **Next**.
10. Restart your computer, if prompted.
11. After restarting Windows, connect to your network by double-clicking the **My Network Places** icon on the desktop.

Windows NT automatic configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The adapter IRQ level and I/O address are automatically set by the BIOS each time you start your computer.

Start your computer to automatically configure the adapter. Configuration is complete when Windows NT starts or when the DOS prompt appears.

If your computer displays an error while booting, it might require additional steps to configure. See "Appendix H. PCI installation tips" on page 35 for more information.

Adding an adapter when installing Windows NT

The IBM driver that ships with Windows NT 4.0 is an older driver which does not support IBM Netfinity 10/100 Ethernet Security Adapter. Therefore, if you want to install the IBM Netfinity 10/100 Ethernet Security Adapter software while installing Windows NT, you need to either install the adapter after the Windows NT installation is complete or install the adapter software from a installation diskette created from the IBM Installation and Drivers CD (using the MAKEDISK.BAT file in the MAKEDISK directory of the CD-ROM. See "Making a setup diskette" on page 7).

Windows NT Version 4.0

After you have put the adapter in the computer, connected the cables, and started Windows NT, install the correct drivers by performing the following steps.

1. Double-click **Network** in the Control Panel.
2. Click **Adapters**.
3. Click **Add**. You will see a list of adapters.

4. Do not select an adapter from this list. Instead, insert the IBM Installation and Drivers CD-ROM or diskette into the appropriate drive and click **Have Disk**.
5. Specify the appropriate drive in the dialog box and click **OK**. Then follow the prompts to complete installation. When the adapter is added you will see a new adapter listed in the Network adapter list.
6. Click **Close** to finish.
7. Restart Windows NT when prompted.

Windows NT Version 3.51

After you have put the adapter in the computer, connected the cables, and started Windows NT, install the correct drivers.

1. Double-click **Network** in the Control Panel.
2. Click **Add Adapter**.
3. When the list of adapters appears, scroll to the end of the list and select **<Other> Requires disk from manufacturer** and then click **Continue**.
4. Insert the IBM Installation and Drivers CD-ROM or diskette in the appropriate drive, specify that drive, and click **OK**.
5. Select **IBM Netfinity 10/100 Ethernet Security Adapter** and click **OK**. Drivers and utilities are then installed.
6. The TCP/IP Configuration dialog box appears. Enter the appropriate information and click **OK**. Remove the installation disk.
7. When prompted, restart Windows NT.

Note: For troubleshooting information, see “Windows NT troubleshooting”.

Windows NT troubleshooting

If Windows NT reports an error or you cannot connect to the network, try the suggestions here first, then see “Appendix F. Troubleshooting and testing the adapter” on page 29 if necessary.

- Make sure that you use the drivers for this adapter. Drivers are located on the IBM Installation and Drivers CD-ROM or diskette.
- Make sure that the driver is loaded and that the protocols are bound. Check the settings in the Control Panel Network/Bindings dialog box.
- Check the Windows NT Event Viewer for error messages.
- If you are attaching to a NetWare network, check your frame type and verify that NetWare client or server software has been installed.
- Test the adapter with the IBMSet advanced configuration utility that was installed on your system when you installed the IBM Netfinity 10/100 Ethernet Security Adapter. To start IBMSet, double-click **IBMSet** in the Windows control panel. To run diagnostics, select the adapter and click the **Diagnostics** tab, then click **Run Tests**. For additional information, click **Help** in the IBMSet window.
- Check with your LAN administrator - you might need to install supplemental networking software.

DOS and Windows 3.1 setup for Novell NetWare DOS ODI clients

Note: If you are using Windows 95 and Windows 98, see the previous sections on Windows 95 and Windows 98. If you are using NetWare Client 32, refer to the NetWare readme files in the \NETWARE directory.

DOS and Windows 3.1 automatic configuration

PCI computers automatically detect and configure PCI-compliant adapters while booting. The BIOS sets the adapter IRQ level and I/O memory address automatically each time you start your computer.

Start your computer in order to automatically configure the adapter. Resource configuration is complete when the DOS prompt appears. You can now continue with the following procedure.

If your computer displays an error while booting, it might require additional steps to configure a PCI adapter. See “Appendix H. PCI installation tips” on page 35 for more information.

Run setup to install network drivers

Setup can automatically install NetWare DOS ODI client drivers or display a readme file with installation instructions for other network operating system drivers.

1. If your computer already has network drivers installed, restart the computer without loading them. If the drivers are loaded from the AUTOEXEC.BAT or CONFIG.SYS file, type REM in front of each line that loads a network driver. Or, with DOS 6.x or later, press **F5** as DOS starts, to bypass the drivers.
2. Insert the IBM Installation and Drivers CD-ROM or diskette in a drive, switch to that drive, and at the DOS prompt, type **setup** and press **Enter**.
3. Select the adapter from the menu.
4. Select **Automatic Setup** from the Main menu. Then follow the instructions on the panel. If you want to test the adapter with a responder on the network, see “Responder testing on the network (optional)”.

Setup displays the adapter configuration and then runs a series of diagnostic tests that make sure that the adapter and network are functioning correctly. If Setup finds a problem, it displays the results and some possible solutions.

5. When Setup finishes the tests, you will see the Install Network Drivers panel.
6. Select the driver that you want to install. Setup can install a NetWare client driver for you. If you want to install other drivers, Setup displays a readme file with installation instructions.

To set duplexing options, see “Appendix B. Duplex mode (optional)” on page 17.

Troubleshooting

If you cannot connect to a server, first try the suggestions here and then see “Appendix F. Troubleshooting and testing the adapter” on page 29.

- Make sure that you are using the drivers for this adapter (for example, IBMFEODI.COM).
- If you are replacing an existing adapter, make sure that the LINK statement in your NET.CFG is correct for the new adapter. For example, the LINK statement for a NetWare client is LINK DRIVER IBMFEODI.
- Verify that the frame type in your NET.CFG file matches your network.
- Test the adapter by running diagnostics in Setup. Additional testing is available by using a responder. See “Responder testing on the network (optional)”.
- Check the readme files.

Responder testing on the network (optional)

Setup can test the adapter more thoroughly if there is a responder on the network while you run the tests.

1. Go to a computer on the network with a comparable PCI adapter installed.

2. Run the appropriate configuration program for the installed adapter and set it up as a responder.
3. Return to the computer that has the new adapter. Run Setup and test the adapter by running diagnostics.

NetWare 3.11, 3.12, Client 32, UNIX, Banyan VINES, and other operating systems

Refer to the online documents. On a DOS computer, view the appropriate readme file for information on installing your network driver.

To view the readme files, insert the IBM Installation and Drivers CD-ROM or diskette into a drive, switch to that drive, and enter **setup /readme**

Appendix A. IBMSet: an overview

When you install the IBM Netfinity 10/100 Ethernet Security Adapter Windows drivers, an advanced configuration utility called IBMSet is also installed. If you are running Windows NT, Windows 95, or Windows 98, you can easily test hardware and set standard and advanced adapter features with IBMSet.

IBMSet runs when you highlight an adapter and click **Properties** in the Network control panel.

To start IBMSet:

- In Windows NT, go to Adapters in Network from the Control Panel, highlight the adapter, and click **Properties**.
- In Windows 95 and Windows 98, click **IBMSet** in the Control Panel.

From the IBMSet panel as shown in Figure 4, you can view the following information:

- View adapter parameters such as MAC Address and IP Address
- View Network Link status such as speed, duplex mode, and activity
- Check the device driver level used for the adapter
- Obtain IBM Web support information

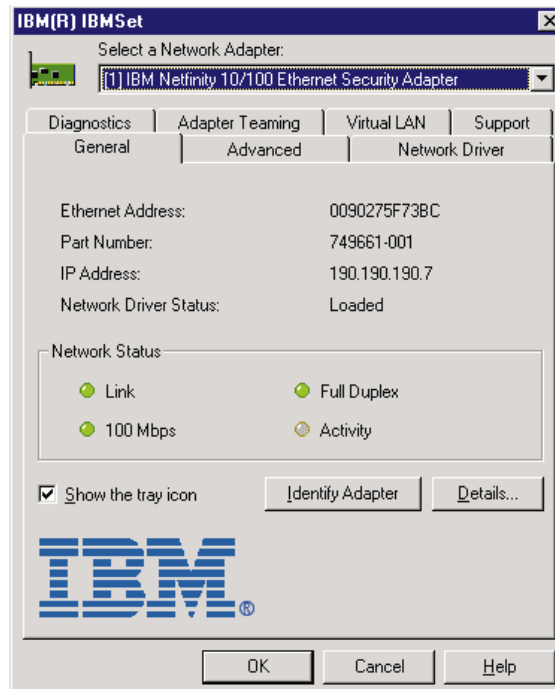


Figure 4. IBMSet panel

Note about adapter DOS diagnostics

Besides the adapter hardware test feature available with IBMSet, you can also run adapter diagnostics from DOS with SETUP.EXE. With the CD-ROM or driver diskette in the drive, from a DOS prompt enter **setup**.

Appendix B. Duplex mode (optional)

Duplexing is a performance option that lets you choose how the adapter sends and receives data packets over the network. The adapter can operate at full duplex only when connected to a full-duplex 10BASE-T or 100BASE-TX switch, or to another full-duplex adapter.

The possible settings for duplexing are:

- Auto (requires a full-duplex adapter or switch with auto-negotiation capability). The adapter negotiates with the switch to send and receive packets at the highest rate. This is the default setting. If the switch does not provide auto-negotiation, the adapter runs at half duplex.
- Full duplex (requires a full-duplex switch or adapter). The adapter can send and receive packets at the same time. This mode can increase adapter performance capability. If the full-duplex switch provides autonegotiation, the adapter runs at full duplex. If the full-duplex switch does not provide auto-negotiation, you need to set the adapter duplex mode manually (see the following sections), because it defaults to half duplex.
- Half duplex. The adapter performs one operation at a time; it either sends or receives.

Note: If an adapter is running at 100 Mbps and half duplex, your potential bandwidth is higher than if you run it at 10 Mbps and full duplex.

Manually configuring for full duplex

If your switch supports auto-negotiation with the N-way standard, duplex configuration is automatic and no action is required on your part. However, many currently-installed switches do not support auto-negotiation. Check with your network system administrator to verify whether your switch supports this feature. Most installations will require manual configuration to change to full duplex.

Configuration is specific to the driver that you are loading for your network operating system.

To set up the duplex mode, see the section that corresponds to your operating system.

Attention: Adapter performance may suffer or your adapter may not operate if your switch does not support full duplex and you configure the adapter to full duplex. The switch settings must always agree with the adapter.

Also, make sure that you always set the speed when you configure duplex.

Setting full duplex in DOS, ODI, NDIS 2.01 clients

For each adapter, edit the NET.CFG or PROTOCOL.INI file. If you edit the NET.CFG file, add the following keywords to the Link Driver section. For the PROTOCOL.INI file, add the keywords anywhere:

```
FORCEDUPLEX 2  
SPEED 100 (or 10 if 10BASE-T)
```

Setting full duplex in NetWare servers

For each adapter in AUTOEXEC.NCF, edit the LOAD command and add the following options (you must include the equal sign for servers):

```
FORCEDUPLEX=2  
SPEED=100 (or 10 if 10BASE-T)
```

For more information, refer to the readme file for NetWare computers.

Setting full duplex in Windows 95 and Windows 98

While running Windows 95 or Windows 98:

1. Double-click **IBMSet** from the Control Panel.
2. Click **Settings**.
3. In the Network Speed list box, click **10** or **100**, according to the speed of your network.
4. In the Duplex Mode list box, click **Full**.
5. Click **OK**.
6. Restart Windows.

Setting full duplex in other operating systems

Refer to the OTHER.TXT readme file in the \OTHER directory on the IBM Installation and Drivers CD-ROM or diskette. Open the file with any text editor.

Appendix C. Virtual LANs

The appendix describes how to set up a virtual LAN (VLAN).

Creating a virtual LAN

A virtual LAN (VLAN) is a logical grouping of network devices put together as a LAN regardless of their physical grouping or collision domains. VLANs lets a user see and access only specified network segments. This increases network performance and improves network security.

VLANs offer the ability to group users and devices together into logical workgroups. This can simplify network administration when connecting clients to servers that are geographically dispersed across the building, campus, or enterprise network.

Typically, VLANs consist of co-workers within the same department but in different locations, groups of users running the same protocol, or a cross-functional team working on a joint project.

Normally, VLANs are configured at the switch and any computer can be a member of one VLAN per installed network adapter. The IBM Netfinity 10/100 Ethernet Security Adapter supersedes this by communicating directly with the switch, allowing multiple VLANs on a single network adapter (up to 64 VLANs).

To set up VLAN membership, your adapter must be attached to a switch that has VLAN capability. You also need to use Windows NT 4.0 or later, or Novell NetWare 4.1x or later.

For more information about VLANs, refer to the switch documentation or the VLAN readme files on the IBM Installation and Drivers CD.

General configuration notes

- Windows NT versions prior to 4.0 do not support VLANs.
- VLANs require NT 4.0 with Service Pack 3.0 and the NDIS driver hotfix from Microsoft.
- In Windows NT, VLANs cannot be implemented on adapters that have been configured for teaming options. NetWare can support teaming options and VLANs on the same adapters.

Joining a VLAN from Windows NT 4.0

1. Create a VLAN on the switch. Use the parameters you assign there to join the VLAN from the server. Refer to your switch documentation for more information.
2. Double-click the Network icon in Control Panel window.
3. On the Adapters tab, select the adapter you want to be on the VLAN and select **Properties**.
4. In IBMSet, select **Join VLAN**. Note that VLANs cannot be assigned to adapters that are already defined to have an adapter teaming option.
5. Enter the VLAN ID and VLAN name. The VLAN ID must match the VLAN ID of the switch. The ID range is from 1 to 1000. The VLAN name is for information only and does not need to match the name on the switch.
6. Select Join VLAN. Repeat steps 3 through 5 for each VLAN you want the server to join. The VLANs you add are listed on the Adapters tab.

7. Select **Close** and restart the computer.

Joining a VLAN from NetWare 4.1x or 5.0

This adapter supports VLAN for NetWare. For information on how to set up VLAN with NetWare, refer to the EXAMPLES.TXT file in the \INFO\NETWARE directory of the CD-ROM.

Appendix D. Teaming options

The IBM Netfinity 10/100 Ethernet Security Adapter provides the following options, called *teaming options*, which increase throughput and fault tolerance when running with Windows NT 4.0 or NetWare 4.1x or later:

adapter fault tolerance (AFT)

Provides automatic redundancy for your adapter. If the primary adapter fails, the secondary adapter takes over. Adapter fault tolerance supports from 2 to 4 adapters per team.

adaptive load balancing (ALB)

Allows balancing the transmission data flow among two to four adapters. ALB also includes the AFT option. ALB can be used with any 100BASE-TX switch.

Cisco Fast EtherChannel (FEC)

Creates a team of two or four adapters to increase transmission and reception throughput. FEC also includes the AFT option. FEC can only be used with a switch that has FEC capability.

General configuration notes

- Windows NT versions prior to 4.0 do not support adapter teaming options.
- Adapter teaming options require Windows NT 4.0 with Service Pack 5.
- In Windows NT, teaming options cannot be implemented on adapters that have been configured for VLANs. NetWare can support teaming options and VLANs on the same adapters.

Setting up adapter fault tolerance

Note: Use the procedure in this section if you are setting up adapter fault tolerance (AFT) only. If you are setting ALB or FEC, use the procedures in those sections. The AFT option runs automatically when you run ALB or FEC.

AFT provides the safety of an additional backup link between the server and buffered repeater or switch. If you have a buffered repeater, switch port, cable, or adapter failure, you can maintain uninterrupted network performance through an adapter team.

AFT is implemented with a *primary* adapter and one or more backup, or *secondary* adapters. During normal operation, the secondary adapters have their transmit function disabled. If the link to the primary adapter fails, the link to the secondary takes over automatically.

To use AFT, you must have at least two IBM Netfinity 10/100 Ethernet Security Adapters or one IBM Netfinity 10/100 Ethernet Security Adapter and one IBM Netfinity Gigabit adapter installed in your server and linked to the same network. When teaming a Netfinity Gigabit adapter with a Netfinity 10/100 adapter, ensure that the 10/100 adapter is in AFT mode.

Setting adapter fault tolerance in Windows NT 4.0

For software requirements, see "General configuration notes".

1. Double-click the **Network** icon on the Control Panel.

2. On the Adapters tab, select a IBM Netfinity 10/100 Ethernet Security Adapter that will be in the team and select **Properties**.
3. In the IBMSet window, select the **Adapter Teaming** tab.
4. Select **Add Adapter to a Team**.
5. The Teaming Wizard starts. Follow the wizard steps for assigning adapters to a team. AFT supports up to four Netfinity 10/100 or Netfinity Gigabit adapters per team, in any combination. Note that you can specify a Preferred Primary adapter, which in most cases should be your highest bandwidth adapter. Refer to the IBMSet Help for more information.
6. Select **OK**, and then select **Close** to finish. When prompted, restart your computer.

Configuring properties

The default AFT properties are suitable for most applications. To change them, use the following procedure:

1. Run IBMSet
2. On the adapter list, select the desired AFT team.
3. Select the **Advanced Settings** tab.
4. Adjust parameters as required. Select **Help** for more information.

Deleting a team

Note: The frame type for each adapter in the team reverts to Auto when a team is deleted.

1. Double-Click the **Network** icon on the Control Panel.
2. On the Adapters tab, select the AFT team to be deleted.
3. Select **Remove**. A confirmation box is displayed. Select **Yes** to confirm deletion.
4. Select **Close**. Restart Windows NT when prompted.

Setting adapter fault tolerance in NetWare

When you install CIBMFE.LAN with CIBMFE.LDI, the BANS.LAN driver is also copied into the NetWare system directory. Both CIBMFE.LAN and BANS.LAN files need to be in the system directory before you proceed with AFT setup. CIBMFE.LAN is the main driver and BANS.LAN is the intermediate driver for adapter teaming and VLAN.

1. Using the following example, modify the lines in the AUTOEXEC.NCF to match your server settings.


```
- Load LAN driver on both adapters for Ethernet 802.2
load cibmfe slot=a frame=ethernet_802.2 name=cibmfe_1_e82
load cibmfe slot=b frame=ethernet_802.2 name=cibmfe_2_e82

; - Load LAN driver on both adapters for Ethernet II
load cibmfe slot=a frame=ethernet_II name=cibmfe_1_eII
load cibmfe slot=b frame=ethernet_II name=cibmfe_2_eII

; - Load BANS driver
load bans frame=ethernet_802.2 name=bans_e82
load bans frame=ethernet_II name=bans_eII

; - Bind BANS and CIBMFE and select primary adapter
bind bans cibmfe_1_e82 primary
bind bans cibmfe_2_e82
bind bans cibmfe_1_eII
```

```
bind bans cibmfe_2_eII

; - Load Teaming mode
load bans commit mode=aft

; - Bind protocols to Teaming
bind ipx bans_e82 net=111
bind ip bans_eII addr=10.100.0.206 mask=ff.ff.ff.0
```

2. Save the AUTOEXEC.NCF file and restart your server.

For more details, refer to EXAMPLES.TXT in \INFO\NETWARE.

Deleting a team

To delete a team, comment out the preceding lines in AUTOEXEC.NCF and restart the server.

Setting adaptive load balancing

Adaptive load balancing (ALB) is a simple and effective way to balance the transmission load of your server among two to four IBM Netfinity 10/100 Ethernet Security Adapters. Using ALB you can group your IBM Netfinity 10/100 Ethernet Security Adapters into teams. The ALB software continuously analyzes transmit loading on each adapter and balances the rate across the adapters as needed. Adapter teams configured for ALB also provide the benefits of AFT. Received data is not load balanced.

Note: For maximum benefit, ALB should not be used under NetBEUI and some IPX environments. For a list of supported IPX environments, see "Teaming options supported by operating system and protocol" on page 26.

To use ALB, your adapters must be configured to your server as a team and be linked to the same network.

Setting adaptive load balancing in Windows NT 4.0

1. Double-click the **Network** icon on the Control Panel.
2. On the Adapters tab, select a IBM Netfinity 10/100 Ethernet Security Adapter that will be in the team and select **Properties**.
3. In the IBMSet window, select the **Adapter Teaming** tab.
4. Select **Add Adapter to a Team**.
5. The Teaming Wizard starts. Follow the wizard steps for assigning adapters to a team. Note that you can specify a Preferred Primary adapter, which in most cases should be your adapter with the greatest bandwidth. Refer to the IBMSet Help for more information.
6. Select **OK**, and then select **Close** to finish. When prompted, restart your computer.

Deleting a team

Note: The frame type for each adapter in the team reverts to Auto when a team is deleted.

1. Double-Click the **Network** icon on the Control Panel.
2. On the Adapters tab, select the ALB team to be deleted.
3. Select **Remove**. A confirmation box is displayed. Select **Yes** to confirm deletion.

4. Select **Close**. Restart Windows NT when prompted.

Setting adaptive load balancing in NetWare

When you install CIBMFE.LAN with CIBMFE.LDI, the BANS.LAN driver is also copied into the NetWare system directory. Both CIBMFE.LAN and BANS.LAN files need to be in the system directory before you proceed with ALB setup.

CIBMFE.LAN is the main driver and BANS.LAN is the intermediate driver for adapter teaming and VLAN.

1. Using the following example, modify the lines in the AUTOEXEC.NCF file to match your server settings.

```
; - Load LAN driver on both adapters for Ethernet 802.2
load cibmfe slot=a frame=ethernet_802.2 name=cibmfe_1_e82
load cibmfe slot=b frame=ethernet_802.2 name=cibmfe_2_e82

; - Load LAN driver on both adapters for Ethernet II
load cibmfe slot=a frame=ethernet_II name=cibmfe_1_eII
load cibmfe slot=b frame=ethernet_II name=cibmfe_2_eII

; - Load BANS driver
load bans frame=ethernet_802.2 name=bans_e82
load bans frame=ethernet_II name=bans_eII

; - Bind BANS and CIBMFE and select primary adapter
bind bans cibmfe_1_e82 primary
bind bans cibmfe_2_e82
bind bans cibmfe_1_eII primary
bind bans cibmfe_2_eII

; - Load Teaming mode
load bans commit mode=alb

; - Bind protocols to Teaming
bind ipx bans_e82 net=111
bind ip bans_eII addr=10.100.0.206 mask=ff.ff.ff.0
```

2. Save the AUTOEXEC.NCF file and restart your server.

For more details, refer to EXAMPLES.TXT in \INFO\NETWARE.

Deleting a team

To delete a team, comment out the preceding lines in AUTOEXEC.NCF and restart the server.

Setting Cisco Fast EtherChannel

Fast EtherChannel (FEC) is a performance technology developed by Cisco Systems, Inc. to increase throughput between switches. FEC increases your servers throughput. Unlike ALB, FEC can be configured to increase both transmission and reception channels between your server and switch. FEC works only with FEC-enabled Cisco switches such as the Catalyst 5000 series. With FEC, as you add adapters to your server, you can group them in teams to provide up to 800 Mbps at full duplex, with a maximum of four IBM Netfinity 10/100 Ethernet Security Adapters. The FEC software continuously analyzes loading on each adapter and balances network traffic across adapters as needed. Adapter teams configured for FEC also provide the benefits of AFT.

To use FEC, you must have two or four IBM Netfinity 10/100 Ethernet Security Adapters configured to your server as an FEC team and be linked to the same FEC-enabled Cisco switch.

Setting Fast EtherChannel in Windows NT 4.0

1. Double-click the **Network** icon on the Control Panel.
2. On the Adapters tab, select a IBM Netfinity 10/100 Ethernet Security Adapter that will be in the team and select **Properties**. (Do not select an adapter that is on a VLAN.)
3. In the IBMSet window, select the **Adapter Teaming** tab.
4. Select **Add Adapter to a Team**.
5. The Teaming Wizard starts. Follow the wizard steps for assigning adapters to a team. Note that you can specify a Preferred Primary adapter, which in most cases should be your adapter with the greatest bandwidth. Refer to the IBMSet Help for more information.
6. Select **OK**, and then select **Close** to finish. When prompted, restart your computer.

Deleting a team

1. Double-Click the **Network** icon on the Control Panel.
2. On the Adapters tab, select the FEC team to be deleted.
3. Select **Remove**. A confirmation box is displayed. Select **Yes** to confirm deletion.
4. Select **Close**. Restart Windows NT when prompted.

Setting Fast EtherChannel in NetWare

When you install CIBMFE.LAN with CIBMFE.LDI, the BANS.LAN driver is also copied into the NetWare system directory. Both CIBMFE.LAN and BANS.LAN files need to be in the system directory before you proceed with FEC setup. CIBMFE.LAN is the main driver and BANS.LAN is the intermediate driver for adapter teaming and VLAN.

1. Using the following example, modify the lines in the AUTOEXEC.NCF file to match your server settings.

```
; - Load LAN driver on both adapters for Ethernet 802.2
load cibmfe slot=a frame=ethernet_802.2 name=cibmfe_1_e82
load cibmfe slot=b frame=ethernet_802.2 name=cibmfe_2_e82

; - Load LAN driver on both adapters for Ethernet II
load cibmfe slot=a frame=ethernet_II name=cibmfe_1_eII
load cibmfe slot=b frame=ethernet_II name=cibmfe_2_eII

; - Load BANS driver
load bans frame=ethernet_802.2 name=bans_e82
load bans frame=ethernet_II name=bans_eII

; - Bind BANS and CIBMFE and select primary adapter
bind bans cibmfe_1_e82
bind bans cibmfe_2_e82
bind bans cibmfe_1_eII
bind bans cibmfe_2_eII

; - Load Teaming mode
load bans commit mode=fec

; - Bind protocols to Teaming
bind ipx bans_e82 net=111
bind ip bans_eII addr=10.100.0.206 mask=ff.ff.ff.0
```

2. Save the AUTOEXEC.NCF file and restart your server.

For more details, refer to EXAMPLES.TXT in \INFO\NETWARE.

Deleting a team

To delete a team, comment out the preceding lines in AUTOEXEC.NCF and restart the server.

Gigabit and 10/100 teaming and VLAN

The IBM Netfinity Gigabit Ethernet Adapter can be teamed with IBM Netfinity 10/100 Ethernet Adapter. For this 1000 to 10/100 teaming, install the Gigabit adapter first and then the 10/100 adapter. The Gigabit adapter should always be selected as the primary adapter for optimal performance benefits. Mixed 1000/100/10 teaming is only supported for AFT. VLAN can co-exist with 1000 to 10/100 teaming with NetWare. For more teaming and VLAN details, please read EXAMPLES.TXT in the \INFO\NETWARE\ directory of the CD-ROM.

Teaming options supported by operating system and protocol

Option	Windows NT 4.0	NetWare 4.11, 5.0
AFT	IP, NetBEUI, IPX(NCP), IPX(NetBIOS)	IP, IPX(NCP), AppleTalk
ALB	IP, IPX(NCP)	IP, IPX(NCP)
FEC	IP, NetBEUI, IPX(NCP), IPX(NetBIOS)	IP, IPX(NCP)

Note: Only NCP (NetWare Core Protocol) IPX packets are load-balanced. Under FEC, all protocols can be load-balanced.

Appendix E. Hot plug support

The IBM Netfinity 10/100 Ethernet Security Adapters are enabled for use in selected servers equipped with hot plug capability, including IBM Netfinity Hot Plug capable-servers, running Windows NT 4.0 and NetWare 5.0, 4.2, or 4.1x.

For NetWare Hot Plug, make sure you have the latest NetWare support pack before setting up hot plug. Refer to your server's documentation for more information on setting up and using NetWare Hot Plug.

For Windows NT 4.0 Hot Plug with IBM Netfinity Hot Plug capable-servers, the IBM Netfinity 10/100 Ethernet Security Adapters, at this time, support the **Hot Add** and **Hot Swap** functions.

Hot add

With the server running, an adapter can be installed to an open hot plug PCI slot without having to shutdown and reboot the server. Multiple adapters can be hot added to multiple open hot plug PCI slots.

Hot swap

With the server running and with an adapter fault tolerant team in place(also known as a fail-over team), if one of the adapters in the team fails, you can swap the failing adapter with a new adapter without having to shut down or reboot the server.

For details on how to set up and run IBM Hot Plug, follow the Readme and instructions in the Hotplug directory of the Installation and Drivers CD shipped with the adapter

You can also visit the IBM Support web site at:

<http://www.ibm.com/networking/support>

Notes:

1. If you replace an adapter in a hot plug slot, do not place the removed adapter back into the same network until the server has rebooted. The two adapters may have the same Ethernet address and create a resource conflict.
2. Hot Swap is only for replacing a failing adapter in an existing adapter team in your server. If you form a new adapter team, the server will have to be rebooted for Hot Swap to work with the new adapter team.

Appendix F. Troubleshooting and testing the adapter

The appendix describes corrective actions for a number of common problems. It also describes how to test the adapter using the diagnostics.

Problem symptoms and corrective actions

The adapter cannot connect to the network

1. **Make sure that the cable is installed correctly.**

The network cable must be securely attached at both RJ-45 connections (adapter and hub). The maximum allowable distance from adapter to the hub is 100 m (328 ft). If the cable is attached and the distance is within acceptable limits but the problem persists, try a different cable.

If you are directly connecting two computers without a hub or switch, use a crossover cable.

2. **Check the LED lights on the adapter.**

The adapter has two diagnostic LEDs, one on each side of the cable connector. These lights help you to determine whether there is a problem with the connector, cable, switch, or hub.

LED	Indication	Meaning
ACT/LNK	On	<ul style="list-style-type: none">The adapter and switch are receiving power.The cable connection between the switch and adapter is good.
	Off	This can be due to one of the following causes: <ul style="list-style-type: none">The adapter is not sending or receiving network data.The adapter and switch are not receiving power.The cable connection between the switch and adapter is faulty.You have a driver configuration problem.
	Flashing	The adapter is sending or receiving network data. The frequency of the flashes varies with the amount of network traffic.
100	On	The adapter is operating at 100 Mbps.
	Off	The adapter is operating at 10 Mbps.

3. **Make sure that you are using the correct drivers.**

Make sure that you are using the drivers that come with this adapter (for example, IBMFEODI.DOS). Drivers that support previous versions of this adapter do not support this version of the adapter.

4. **Make sure that the switch port and the adapter have the same duplex setting.**

If you configured the adapter for full duplex, make sure that the switch port is also configured for full duplex. Setting the wrong duplex mode can degrade performance, cause data loss, or result in lost connections.

SETUP.EXE reports the adapter is “Not enabled by BIOS”

The PCI BIOS is not configuring the adapter correctly. See “Appendix H. PCI installation tips” on page 35.

The computer hangs when the drivers are loaded

1. Change the PCI BIOS interrupt settings. See “Appendix H. PCI installation tips” on page 35 for more information.
2. If you are using EMM386, make sure that it is Version 4.49 or higher (this version ships with MS-DOS 6.22 or higher).

Diagnostics pass, but the connection fails or errors occur

1. For 100 Mbps:
 - a. Use Category 5 cabling and make sure that the network cable is securely attached.
 - b. Connect to a 100BASE-TX hub/switch (not 100BASE-T4).
2. For NetWare, make sure you specify the correct frame type in your NET.CFG file.
3. Make sure the duplex mode setting on the adapter matches the setting on the switch.

The LNK LED does not light

1. Make sure that you loaded the network drivers.
2. Check all connections at the adapter and the switch.
3. Try another port on the switch.
4. Make sure that the duplex mode setting on the adapter matches the setting on the switch.
5. Make sure that you have the correct type of cable between the adapter and the hub. 100BASE-TX requires two pairs. Some hubs require a crossover cable while others require a straight-through cable.

The ACT LED does not light

1. Make sure that you loaded the correct network drivers.
2. The network may be idle. Try accessing a server.
3. The adapter is not transmitting or receiving data. Try another adapter.
4. Make sure that you are using two-pair cable for TX wiring.

The adapter stops working without apparent cause

1. Run the diagnostics.
2. Try reseating the adapter in its slot, or try a different slot if necessary.
3. The network driver files may be corrupt or missing. Remove the drivers and then reinstall them.

The Wake on LAN feature is not working

1. Make sure that the WOL cable is attached and that power is being applied to the computer.
2. Check the BIOS for its WOL setting. Some computers may need to be configured for WOL. For IBM WOL PC systems, make sure that the WOL option in the BIOS is set to ENABLED.
3. Make sure the network cable is fully attached to the adapter.

The LNK LED does not light when you connect the power

1. Make sure that the WOL cable is attached and power is applied to the computer.
2. Make sure that the network cable is attached at both ends.

Testing the adapter using the diagnostics

Test the adapter by running diagnostics.

- For DOS or Windows 3.1, run Setup on the IBM Installation and Drivers CD-ROM or diskette.
- For Windows NT, Windows 95, or Windows 98, run IBMSet by double-clicking **IBMSet** in the Windows control panel.

To run diagnostics, select the adapter, click **Diagnostics**, and then click **Run Tests**. For additional information, click **Help** in the IBMSet window.

IBM product support

The following IBM product support is available:

- Internet Service
You can use the Internet to download software updates, troubleshooting tips, installation notes, and more. Contact the IBM Networking Web site at:
<http://www.ibm.com/networking/support>
- IBM Product Support
 - 1 800 772-2227 for IBM HelpCenter®
 - 1 800 237-5511 for IBM Support Services
 - 1 800 565-3344 for HelpPC (Canada)

Web sites for software updates

You can download the necessary Microsoft and Novell software updates from the following sites:

- **Microsoft Service Pack 5:**
<ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/ussp5/>
- **Microsoft Service Pack 4:**
<ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/ussp4/>
- **Microsoft Service Pack 3:**
<ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/ussp3/>
- **Microsoft NDIS Driver Hotfix:**
<ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/hotfixes-postsp3/ndis-fix/>
- **Novell Support Pack 6 for NetWare 4.11 or Support Pack 1 for NetWare 5.0:**
<http://support.novell.com/misc/pat1st.htm>

Appendix G. Priority Packet: an overview

Priority Packet is a traffic-prioritization utility that enables you to set up filters to process high-priority traffic before normal traffic. Using Priority Packet, you can set up filters to give priority to critical applications or users.

Priority Packet is available on the IBM Networking Web site at:
<http://www.ibm.com/networking/support>

Prioritizing network traffic

Priority Packet lets you set up priority filters to send information from critical nodes or applications with an indicated priority. By prioritizing traffic at the host or entry point of the network, network devices can base forwarding decisions on priority information defined in the packet.

Priority Packet prioritizes traffic based on priority filters. These are parameters you assign to outgoing (transmit) packets. Using the Priority Filter Wizard, you can set up predefined or custom priority filters based on a node (MAC) address, Ethernet type, or by various properties of the protocol and port. Priority Packet provides two different methods for prioritizing traffic: IEEE 802.1p tagging and High Priority Queue.

IEEE 802.1p tagging

IEEE 802.1p is a new IEEE standard for tagging, or adding additional bytes of information to, packets with different priority levels. Packets are tagged with 4 additional bytes, which increase the packet size and indicate a priority level. When these packets are sent out on the network, the higher priority packets are transferred first. Priority packet tagging (also known as Traffic Class Expediting) allows the adapter to work with other elements of the network (such as switches and routers) to deliver priority packets first. 802.1p tagging enables you to assign specific priority levels from 0 (low) to 7 (high).

Using the IEEE 802.1p standard for packet tagging, you can assign values to packets based on their priority. This method requires a network infrastructure that supports packet tagging. The routing devices receiving and transferring these packets on your network must support 802.1p for tagging to be effective.

After you set up the priority filter in Priority Packet, you must launch IBMSet and select **802.1p/802.1Q Tagging** on the Advanced tab.

Attention: IEEE 802.1p tagging increases the size of the packets it tags. Some hubs and switches will not recognize the larger packets and will drop them. Check your hub or switch documentation to see if they support 802.1p. (You can configure the switch to strip the tags from the packets and send it on to the next destination as normal traffic.) If these devices do not support 802.1p or if you are not sure, use High Priority Queue (HPQ) to prioritize network traffic.

The requirements for effectively using IEEE 802.1p tagging are:

- The other devices receiving and routing 802.1p tagged packets must support 802.1p.

- The adapters on these devices must support 802.1p (adapters using the Intel® 82558 or higher Ethernet controller). All IBM Netfinity 10/100 Ethernet Security Adapters support 802.1p.
- The adapter cannot be assigned to an adapter team.
- If you are setting up VLANs and packet tagging on the same adapter, 802.1p/802.1Q Tagging must be Enabled on the IBMSet Advanced tab.

High priority queue

If your network infrastructure devices do not support IEEE 802.1p or you are not sure, you can still define filters and send packets as high priority. While High Priority Queue (HPQ) does not provide the precise priority levels of 802.1p tagging, it does assign traffic as either high or low priority and sends high priority packets first. Therefore, if there are multiple applications on a system sending packets, the packets from the application with a filter are sent out first. HPQ does not change network routing, nor does it add any information to the packets.

To assign HPQ, you can specify it using Priority Packet when you create or assign a filter.

To effectively use HPQ tagging, the adapter cannot be assigned to an adapter team.

For more information on Priority Packet, refer to the related white papers on IBM's Networking Web site at

<http://www.ibm.com/networking/support>

Appendix H. PCI installation tips

PCI computers are designed to configure add-in cards automatically each time the computer starts. Your PCI computer sets the I/O address and IRQ level for your network adapter when the computer starts. These values cannot be changed by IBM adapter software. If you experience a problem when the computer starts, you might need to follow additional configuration steps.

On some computers, manual configuration is possible through the computer's PCI BIOS setup utility. Refer to your computer documentation. You might need to verify or change some BIOS settings.

Some common PCI solutions are listed here.

- Busmaster-enabled slots. On some computers, not all slots are busmaster enabled by default. Check your BIOS PCI bus setting. It will be set to either Busmaster or Non-busmastered. Select **Busmaster**.
- Reserve interrupts (IRQs) and/or memory addresses for ISA adapters. This prevents PCI cards from trying to use the same settings that ISA cards are using. Check your PCI BIOS setup program. There might be IRQ options such as Enable for ISA, Reserve for ISA, or Disable for PCI. This option is sometimes in the Plug and Play area of the BIOS setup.
- Enable the PCI slot. In some PCI computers, you must use the PCI BIOS setup program to enable the PCI slot. This is especially common in PCI computers with the PhoenixBIOS.
- Update your PCI BIOS. An updated PCI system BIOS can correct some PCI configuration problems. Contact your computer manufacturer to see if an updated BIOS version is available for your computer.
- Configure the slot for level-triggered interrupts. The slot that the adapter is using must be configured for level-triggered interrupts rather than edge-triggered interrupts. Check your PCI BIOS Setup program.

Here are some examples of PCI BIOS setup program parameters:

PCI slot #:

Slot where the adapter is installed

Master:

ENABLED

Slave: ENABLED

Latency timer:

40

Interrupt:

Choose an IRQ from the list

Edge-level:

Level

The exact wording of these parameters varies with different computers.

Removing an existing adapter in Windows 95

If you are replacing an existing adapter with a IBM Netfinity 10/100 Ethernet Security Adapter, follow these steps before physically removing the adapter:

1. Double-click **My Computer**.
2. Double-click **Control Panel**.
3. Double-click **System**.
4. Click **Device Manager**.
5. Double-click **Network Adapters**.
6. Select the adapter driver listed below the Network Adapters group and click **Remove**.
7. Click **OK**.
8. Follow the instructions in "Chapter 1. Installing the adapter hardware" on page 1.

Push installation for Windows 95

If you are a LAN administrator setting up server-based push installation of Windows 95 as defined in Microsoft Windows 95 Resource Kit, you will need to follow additional steps for this adapter. Refer to the Push Installation for Windows 95 readme file on the IBM Support Web site.

Fast Ethernet wiring

The 100BASE-TX specification supports 100-Mbps transmission over two pairs of Category 5 twisted-pair Ethernet wiring. One pair is for transmit operations and the other for receive operations. Segment lengths are limited to 100 meters with 100BASE-TX for signal timing reasons. This complies with the EIA 568 wiring standard.

Boot Agent

The Boot Agent is a utility program that is stored in a flash memory chip on the adapter, allowing the adapter to remotely boot the system from the network using either of two methods.

- The default method is PXE, a remote boot procedure defined by the Wired for Management specifications and used by powerful network management programs, such as IBM LAN Client Control Manager or Intel LANDesk[®] Management suite.
- The alternate method is RPL, an established industry standard historically utilized for remote booting of diskless workstations from network operating systems such as NetWare and Windows NT Server.

Computers do not need to be Wake on LAN enabled to use this feature, and the feature will work with or without the 3-pin auxiliary power connector attached.

Configuration

When the computer is first powered-on, the Boot Agent will execute and display the following message:

```
Initializing Boot Agent Version 2.0  
Press Ctrl+S to enter the Setup Program
```

By default, this message will display for 2 seconds, after which the agent will attempt to boot from a local drive. If the attempt to boot from a local drive fails, the agent will attempt to boot remotely.

To change the configuration of the Boot Agent, press **Ctrl+S** during the time that this message is displayed. This will bring up the Boot Agent configuration panel.

There are five configurable parameters. Follow the on-screen instructions to select, change and save the different parameters. The different parameters are explained below, with the default parameter listed first.

Boot protocol

Selections are PXE and RPL. Select PXE for use with Wired for Management-compliant network management programs, such as IBM LAN Client Control Manager or Intel LANDesk Management Suite. Select RPL for legacy-style remote booting.

PnP/BEV boot

Selections are Disable and Enable. Select **Disable** for normal remote boot operation. Select **Enable** if you want to use the computer BIOS boot sequence instead of the Boot Agent.

Default boot

Selections are Local and Network. If you select Local, the Boot Agent will attempt to boot from a local drive first, then attempt to boot from the network if local boot fails. If you select Network, the Boot Agent will attempt to boot from the network first.

Local boot

Selections are Enable and Disable. If you select Enable, the system will be able to boot from a local drive (diskette drive or hard drive). If you select Disable, the system will not be able to boot from a local drive. This will be true regardless of the Default Boot setting.

Prompt time

Selections are 2, 3, 5, and 8. The number represents the amount of time in seconds during which the following message is displayed every time the system is booted:

Initializing Boot Agent Version 2.0 - Press Setup Program

Troubleshooting Boot Agent

If you do not see the message Initializing Boot Agent Version 2.0, check the following:

In the computer setup, check for the boot device sequence. If **Boot Agent** or **Network** is listed, move it ahead of the hard drive in the boot sequence.

Some computers require manual intervention to execute the Boot Agent. Look for an informational note on the computer monitor after power-on that instructs you about executing a network boot.

Appendix I. Adapter specifications

Compatibility	PCI v2.2 systems
Media (cable) Connectors and Wiring	<ul style="list-style-type: none">• RJ-45• Use Category 5 cabling at 100 Mbps• Supports 100BASE-TX Fast Ethernet
Data Rate Mode	10 or 100 Mbps
Interrupt Levels	PCI: INTA
SRAM Transsmmit/Receive Buffer	6 KB
Power Requirements	1.06 Watts at 5.0 V dc
Isolation Voltage	200 V rms
Operating Temperature	0 to 55 degrees C
Humidity	10% to 90% non-condensing
Diagnostic LEDs	Activity/Link, 100 Mbps
Diagnostic Software	<ul style="list-style-type: none">• On-board• IBMSet, Setup• Responder
Compliance & Certification	<ul style="list-style-type: none">• Safety - UL• FCC Class B• CE & Immunity• C-tick (Australian)

Appendix J. Notices

This information was developed for products and services offered in the U.S.A.

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This information is for planning purposes only. The information herein is subject to change before the products described become available.

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.



خطر: قبل عملية بدء تركيب هذا المنتج، قم بقراءة معلومات الحماية الموجودة في التحذير: معلومات الحماية - Read This First، SD21-0030. يقوم هذا الكتيب بوصف إجراءات الأمان لتوصيل الأدوات الكهربائية بالكابلات والمقبس الكهربائي.



Gevaar: Voordat u begint met de installatie van dit produkt, 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.



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 elétricos.



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。



Opasnost: Prije nego što počnete sa instalacijom produkta, pročitajte naputak o pravilima o sigurnom rukovanju u Opozorenje: Pravila o sigurnom rukovanju - Prvo pročitaj ovo, SD21-0030. Ovaj prvitak opisuje sigurnosne postupke za priključivanje kabela i priključivanje na električno napajanje.



Upozornění: než zahájíte instalaci tohoto produktu, přečtěte si nejprve bezpečnostní informace v pokynech „Bezpečnostní informace“ č. 21-0030. Tato brožurka popisuje bezpečnostní opatření pro kabeláž a zapojení elektrického zařízení.



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



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.



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.



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.



Κίνδυνος: Πριν ξεκινήσετε την εγκατάσταση αυτού του προϊόντος, διαβάστε τις πληροφορίες ασφάλειας στο φυλλάδιο *Caution: Safety Information-Read this first*, SD21-0030. Στο φυλλάδιο αυτό περιγράφονται οι ασφαλείς διαδικασίες για την καλωδίωση των ηλεκτρικών συσκευών και τη σύνδεσή τους στην πρίζα.



Κίνδυνος: Πριν ξεκινήσετε την εγκατάσταση αυτού του προϊόντος, διαβάστε τις πληροφορίες ασφάλειας στο φυλλάδιο *Caution: Safety Information-Read this first*, SD21-0030. Στο φυλλάδιο αυτό περιγράφονται οι ασφαλείς διαδικασίες για την καλωδίωση των ηλεκτρικών συσκευών και τη σύνδεσή τους στην πρίζα.



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.



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.



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。



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



ОПАСНОСТ

Пред да почнете да го инсталирате овој продукт, прочитајте ја информацијата за безбедност:

"Предупредување: Информација за безбедност: Прочитајте го прво ова", SD21-0030.

Оваа брошура опишува безбедносни процедури за каблирање и вклучување на електрична опрема.



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.



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



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.



ОСТОРОЖНО: Прежде чем устанавливать этот продукт, прочтите Инструкцию по технике безопасности в документе "Внимание: Инструкция по технике безопасности -- Прочсть в первую очередь", SD21-0030. В этой брошюре описаны безопасные способы кабирования и подключения электрического оборудования.



Nebezpečenstvo: Pred inštaláciou výrobku si prečítajte bezpečnostné predpisy v
Výstraha: Bezpečnostné predpisy - Prečítaj ako prvý,
SD21-0030. V tejto brožúrke sú opísané bezpečnostné postupy pre pripojenie elektrických zariadení.



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



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.



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.



危險：

開始安裝此產品之前，請先閱讀安全資訊。

注意：

請先閱讀 - 安全資訊 SD21-0030

此冊子說明插接電器設備之電纜線的安全程序。

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 for Category 5 Data Grade Cables

IBM Netfinity 10/100 Ethernet Security Adapter — P/N 34L4601

IBM Netfinity 10/100 Ethernet Security Adapter — P/N 34L4701

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

instruction manual, 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 the 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 complies with Canadian ICES-003.

Avis de conformité aux normes d'Industrie Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

European Norm (EN) Statement

This product is in conformity with the protection requirements of EC 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.

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. IBM cannot accept responsibility for any interference caused by using other than recommended cables and connectors.

Hinweis zur Elektromagnetischen Verträglichkeit (EMVG)

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9. Nov. 92 das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die

IBM Deutschland Informationssysteme GmbH
70548 Stuttgart

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

Japanese Voluntary Control Council for Interference (VCCI) Statement

This product is a Class B Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Technology Equipment (VCCI). This product is aimed to be used in a domestic environment. When used near a radio or TV receiver, it may become the cause of radio interference. Read the instructions for correct handling.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

Korean Class B Communication Statement

Please note that this device has been certified for residential use and may be used in any environment.

Electronic Emission Notices for Category 3 and 4 Data Grade Cables

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. 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 A Emission Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité aux normes d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

European Norm (EN) Statement

This product is in conformity with the protection requirements of EC 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 A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

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.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richtlinie 89/336).

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist die IBM Deutschland Informationssysteme GmbH, 70548 Stuttgart.

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2) 2:

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden: "Warnung: dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen."

EN 50082-1 Hinweis: "Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082-2 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem Fall ist der Abstand bzw. die Abschirmung zu der industriellen Störquelle zu vergrößern."

Anmerkung: Um die Einhaltung des EMVG sicherzustellen, sind die Geräte, wie in den IBM Handbüchern angegeben, zu installieren und zu betreiben.

Japanese Voluntary Control Council for Interference (VCCI) Statement

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Technology

Equipment (VCCI). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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Korean Class A Communications Statement

Please note that this device has been certified for business use with regard to electromagnetic interference. If you find this is not suitable for your use, you may exchange it for one of residential use.

Taiwanese Class A Warning Statement

警告使用者：
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

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Machine IBM Netfinity 10/100 Ethernet Security Adapter

Warranty Period* Lifetime

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

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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.

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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.

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To obtain warranty service for the Machine, you should contact your reseller or call IBM. In the United States, call IBM at **1-800-772-2227**. In Canada, call IBM at **1-800-565-3344**. You may be required to present proof of purchase.

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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.

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