High-performance, feature-packed adapters

IBM Ethernet LAN Adapter Family

• **Gigabit performance**

• **Plug and Play capability**

• **10/100 operation for smooth migration to Fast Ethernet**

• **Full-duplex capability for shared or switched LANs**

• **Support for ACPI power management**

• **IEEE 802.3 hardware auto-negotiation support**

• **Revolutionary Wake on LAN™ function**

• **Operating system device drivers included**

• **Limited lifetime warranty and IBM HelpCenter support**

10/100 EtherJet PCI Adapter with Wake on LAN

10/100 EtherJet CardBus Adapter with 56K Modem

Netfinity Gigabit Ethernet SX Adapter

IBM is on the leading edge of Ethernet technology with its high-performance, feature-packed LAN adapter family. Whether you're part of a small business, a department, a workgroup or a large enterprise, you can't afford to compromise on the performance, quality, reliability and manageability of your Ethernet network. To meet all your networking needs, IBM adapters provide exceptional performance, a rich set of features and functions, and outstanding value in a variety of adapter offerings for desktop systems, servers and portable PCs.
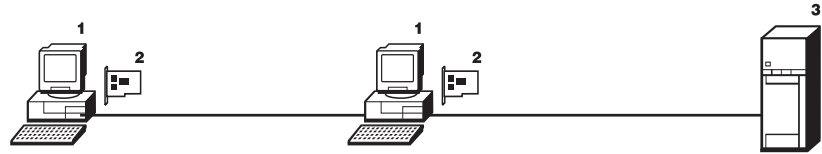
Positioning and Benefits

Problem: Need for a fully managed Wake on LAN Network.

Environment: A-300 node PC multi-building network with constant application updates. Users are utilizing the system 12 to 14 hours a day, and the only time for updates is at night.

1. *IBM Desktop system (Wake on LAN enabled - out of the box)*

2. *IBM 10/100 Ethernet PCI Adapter with Wake on LAN*

3. *IBM Netfinity® Server with Windows NT® 4.0 and LAN Client Control Manager (LCCM) 4.0*

Solutions: Create the network with Wake on LAN enabled desktop systems, a 10/100 Etherjet PCI Adapter and the LAN Client Control Manager application. These components allow the system administrator to "wake up" the LAN at non-peak hours and "push" the applications. Then the applications update down the LAN to the desktop server.

Benefits
- Cost reduction and time savings in application updates.
- Allows maximum uses of the LAN (LAN not down for updates during critical business hours) to complete critical tasks.
- Ensures better control of desktop systems.

Product Overview

Ease of installation

Installing the IBM EtherJet™ and Netfinity adapters is simple, thanks to their Plug and Play support in Windows®-based systems and easy-to-use installation utility in other environments. The PC97-compliant adapters ship with device drivers for all leading operating systems.

Support for all leading network operating systems

An IBM Ethernet adapter will connect your desktop running any major operating system to the Ethernet LAN. Device drivers are included with most adapters that will allow you to use them in Windows® 95, Windows 98, in OS/2® or DOS workstations or in servers using OS/2 LAN Server, Novell NetWare and Windows NT operating environments. With IBM's certified device drivers, your network connection is reliable and worry-free.

Protect your investments— current and future

All IBM Ethernet adapters feature a diagnostic capability to minimize service and maintenance costs and provide for high availability and user productivity. All IBM Ethernet adapters meet IBM's rigorous quality and reliability standards. EtherJet adapters are backed by a lifetime, limited warranty for as long as you own them; the Netfinity adapters have a 3-year warranty. And support assistance from the IBM HelpCenter (1 800 772-2227) is available 24 hours a day, 7 days a week (24x7) at no additional charge during the warranty period.

Compliant with industry specifications

The adapters support all the Ethernet wiring environments and protocols conforming to IEEE 802.3 Ethernet and PCI 2.1 bus specifications. All EtherJet and Netfinity adapters comply with FCC Class B, CISPR B and VCCI Class B for electronic emissions.

They also support the ACPI specification, which defines a standard way to integrate power management features throughout a PC system, including hardware, operating system and application software. This enables the PC to automatically switch on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers.

Portable PC users can count on IBM for the latest industry power management specifications including CardBus Power Management, PC97 and PC98.

Support for half-duplex and full-duplex operation

The EtherJet 10/100 adapters support half-duplex and full-duplex operation at 10 Mbps and 100 Mbps. When plugged into the network, they auto-negotiate to set the speed and duplex mode, enabling an easy connection to shared or switched Ethernet running at either speed. This enables you to get the most out of your upgrade to a switched Ethernet environment.

A key advantage of IBM full-duplex-enabled adapters is that they allow simultaneous transmission and reception, doubling the potential bandwidth. This allows the transmission of up to 20 Mbps for 10-Mbps adapters or 200 Mbps for the 10/100 adapters. What's more, no hardware changes are required to connect your IBM or non-IBM computer to a full-duplex switch such as the IBM 8271 Nways® Ethernet LAN Switch. In full-duplex mode, a server with a full-duplex-enabled adapter can receive a spreadsheet from one workstation while it downloads an application to another.
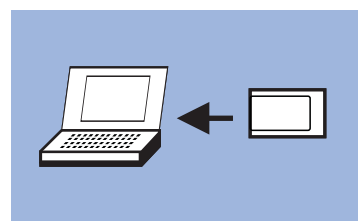
Mobile Adapters

Ethernet adapters for Mobile Servers
- IBM 10/100 EtherJet CardBus Adapter

- IBM 10/100 EtherJet CardBus Adapter with 56K Modem

- IBM EtherJet PC Card (10BASE-T)

- IBM EtherJet PC Card Combo (10BASE-T and 10BASE2)

Fast Ethernet high-performance LAN and modem capabilities
Both the 10/100 EtherJet CardBus Adapter and 10/100 EtherJet CardBus Adapter with 56K Modem are ideal for connecting today's powerful mobile computers to a 10-Mbps or 100-Mbps Ethernet network. These adapters offer 10BASE-T and 100BASE-TX Ethernet connectivity through their PCI-based CardBus interface. The 32-bit bus master architecture of CardBus enables full use of the bandwidth of Fast Ethernet networks by providing greater system bus access and higher data-transfer speeds than the 16-bit PCMCIA bus found on lower-performance laptops. The adapter is designed to run with minimal utilization of the PC's processor, freeing up the processor to perform other functions.

Mobile Adapters are supported by IBM ThinkPad® and non-IBM systems

10/100 EtherJet CardBus Adapter with 56K Modem

Now portable PC users who require high-speed connectivity both in the office and on the road can get Fast Ethernet network performance and 56-Kbps[1] modem speeds all in a single, convenient adapter. The 10/100 EtherJet CardBus Adapter with 56K Modem is the first in the industry to combine Fast Ethernet and 56-Kbps modem capabilities with a CardBus interface in a single card. The EtherJet adapter's simultaneous operation of 10BASE-T or 100BASE-TX LAN and modem functions make it possible to dial out with your modem while logged on to your network. With this one-card solution it has never been easier to handle bandwidth-intensive applications while receiving the benefits of faster downloads and throughput provided by 56-Kbps modem technology.

The EtherJet modem can achieve speeds up to 56 Kbps and delivers easy and reliable worldwide connec-tions. The modem is flash-upgradable to the V.90 56K standard. It also supports analog cellular attachment for the Motorola StarTac Phone, Global Systems for Mobile Communications (GSM) and Personal Communications Systems (PCS) 1900 wireless attach-ment, with optional kits.

Low power consumption

The 10/100 EtherJet CardBus Adapter and 10/100 EtherJet CardBus Adapter with 56K Modem are designed for very low power consumption, minimizing the computer's battery drain. These adapters do not consume power while inserted in the computer with the LAN and modem cables disconnected.
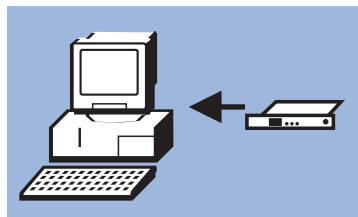
PC Card Adapters

The IBM EtherJet PC Card delivers high performance and advanced functions for 10-Mbps Ethernet connectivity in a PC Card for laptop computers with a PCMCIA bus. It features device drivers for the latest operating environments, including Windows 95, Windows NT and Novell NetWare. It offers a combo media-access module for connection to 10BASE-T and 10BASE2 networks in a single compact package. It's easy to install and is full-duplex capable. In short, it offers everything you need in an EtherJet PC Card Adapter.

Desktop Adapters

Ethernet adapters for desktop PC systems

- 10/100 EtherJet PCI Adapter

- 10/100 EtherJet PCI Adapter with Wake On LAN

New Ethernet performance

The new IBM 10/100 EtherJet PCI Adapter is ideal for Fast Ethernet customers who need high perfor-mance and the latest features. This adapter offers enhanced VLSI technol-ogy and device drivers that support adapter fault tolerance for use in mission-critical applications. The IBM 10/100 EtherJet PCI Adapter maintains device driver consistency with all IBM 10/100 PCI adapters and PC-embedded 10/100 Ethernet solutions.

Innovative Wake on LAN capability

The new IBM 10/100 EtherJet PCI Adapter with Wake on LAN provides the same leading performance and function as the standard adapter. It also adds the innovative Wake on LAN capability pioneered by IBM and an on-board remote boot flash EPROM, enabling the highest level of PC manageability available for IBM's new Wake on LAN capable PCs. Coupled with IBM's Netfinity or LAN Client Control Manager software, it enables you to download the latest software or project data onto PCs during non-use hours or perform other maintenance tasks with higher efficiency and lower user-interruption than ever before.

IBM EtherJet PC Card Combo (10BASE-T and 10BASE2)

Desktop Adapters are supported by IBM Commercial Desktop and non-IBM systems

10/100 EtherJet PCI Adapter with Wake on LAN

[1]K56Flex modems are designed to receive data at up to 56 Kbps from a K56Flex-comparabile service provider and transmit data at up to 33.6 Kbps. Public networks currently limit maximum download speeds to about 53 Kbps. Actual speeds depend on many factors and are often less than the maximum possible.

Improved PC manageability and simplified network administration
IBM's new LAN Client Control Manager (LCCM) V2.0 is a Windows NT 4.0-based application that works with Wake on LAN enabled PCs and adapters to cost-effectively configure and manage PC installations. The LCCM management software works with the 10/100 EtherJet PCI Adapter with Wake on LAN to enable the PC to be awakened from a powered-off state and booted up from a remote server over the LAN. This enables a network administrator to set up and configure PCs remotely using a "push" approach from a central location. LCCM V2.0 uses the industry-defined pre-boot execution environment (PXE) extension of DHCP to carry out low-level maintenance tasks like formatting a hard drive, installing or reinstalling an operating system and updating the BIOS. Because LCCM 2.0 is a routable protocol, it is more powerful and flexible than its predecessor, LCCM 1.0, which was based on the non-routable RPL protocol. The combination of LCCM software, Wake on LAN enabled PCs, and EtherJet Wake on LAN adapters creates a solution providing significant manageability and cost-of-ownership advantages.

Server Adapters

Ethernet adapters for PC servers
• Netfinity Gigabit Ethernet SX Adapter
• Netfinity 10/100 Ethernet Adapter
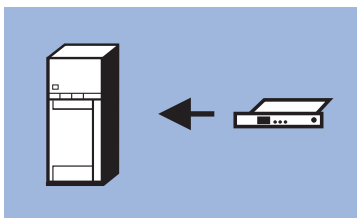• Netfinity 10/100 Fault Tolerant Adapter

Netfinity Gigabit Ethernet SX Adapter

Robust performance and reliability for critical applications
The new Netfinity Gigabit Ethernet SX Adapter and Netfinity 10/100 Ethernet Adapter join the Netfinity 10/100 Fault Tolerant Adapter in IBM's LAN adapter family with features geared specifically for PC servers. Designed for high speed and reliability, these feature-rich adapters ensure that your mission-critical office, intranet and multimedia applications will continue to run under the strain of a growing network. The 32-bit PCI architecture performs in demanding high-traffic server environments without placing intense demand on the CPU's processor, and operates in both uniprocessor and symmetrical multiprocessor (SMP) machines.

High-performing Gigabit Ethernet
The Netfinity Gigabit Ethernet SX Adapter provides breakthrough Gigabit Ethernet performance that can dramatically improve server bottle-necks in high-traffic environments. Its 1000-Mbps data rate and 32- or 64-bit PCI bus mastering architecture enable the highest Ethernet bandwidth available in an adapter. This adapter provides 1000BASE-SX connectivity over a 50- or 62.5-micron multimode fiber-optic link. It is fully compliant with the IEEE 802.3z Gigabit Ethernet standard, ensuring an easy integration with existing Ethernet and Fast Ethernet networks.

Server Adapters are supported by IBM Netfinity and non-IBM servers

Adapter fault tolerance
All three of the Netfinity server adapters support adapter fault tolerance (AFT), allowing two adapters to be paired inside a PC in a primary-backup mode. If there is a failure of the cable, connector or primary adapter, then the backup adapter is automatically brought online to handle the traffic. This failover typically occurs in a fraction of a second, minimizing lost data and virtually eliminating downtime due to adapter or cable failures. This fault tolerance feature also works between a Netfinity adapter and the 10/100 Ethernet technology on the planar of many models of IBM PCs and servers. Netfinity adapters are ideal if you cannot afford your network to be down.

Hot Pluggability
All Netfinity adapters offer unparalleled reliability and maintainability in mission-critical situations on IBM Netfinity and PC servers supporting PCI HotPlug. The hot pluggability feature in the Netfinity 5500 and 7000 MT10 servers allows you to swap adapters while the server is in operation and perform necessary repairs without down time for critical applications in Novell NetWare 4.11/5.0 and Windows NT 4.0 environments.

Load Balancing
The Netfinity 10/100 Ethernet Adapter supports adapter load balancing, enabling the server to add scalable bandwidth as traffic demands grow. This feature balances outgoing server traffic across up to four like adapters, enabling server bandwidth to scale up to 400 Mbps in a shared hub environment or up to 800 Mbps in a full-duplex switched environment.

Features	Benefits
Wake on LAN	Enables PC manageability and lower cost of ownership
RPL or PXE	Enables the workstation to boot remotely over the LAN
Adapter fault tolerance	Protects mission-critical applications against cable, connector or adapter failure
Adapter load balancing	Balances outgoing traffic across multiple adapters
Hot pluggability	Allows adapters to be swapped while the server is powered on
Full-duplex capability	Maximizes throughput benefits of switched Ethernet environments
Plug and Play	Fast and easy automatic configuration
Device drivers	Support leading operating and network operating systems
Status LEDs	Quick and easy troubleshooting without disrupting network operation
Lifetime limited warranty	High reliability, worry-free operation

Ethernet Adapters for Mobile Systems Specifications

	EtherJet PC Card (10BASE-T)	EtherJet Combo PC Card (10BASE-T and 10BASE2)	10/100 EtherJet CardBus Adapter	10/100 EtherJet CardBus Adapter with 56K Modem
Part numbers				
Single	72H4533	72H4534	08L3147	08L3167
5-pack	62H4550	72H4551	08L3162	08L3637
Significant features				
Bus architecture	PCMCIA	PCMCIA	CardBus	CardBus
Data and address width	16-bit	16-bit	32-bit	32-bit
Network topology	10BASE-T	10BASE-T, 10BASE 2	10BASE-T, 100BASE-TX	10BASE-T, 100BASE-TX
Full-duplex capable	yes	yes	yes	yes
Auto-Negotiation	no	no	yes	yes
Plug and Play support	yes	yes	yes	yes
Interrupt levels	3–7, 9–12, 14, 15	3–7, 9–12, 14, 15	3–15	3–15
Maximum number per machine	2	2	2	2
Software support				
Microsoft Windows 95, 98	yes	yes	yes	yes
Microsoft Windows NT 3.51, 4.0	yes	yes	yes	yes
Novell NetWare 3.12, 4.1x, 5.0	3.12, 4.1x	3.12, 4.1x	yes	yes
OS/2 2.11 or later	yes	yes	yes	yes
Physical specifications				
Height	5 mm (0.2 in.)	5 mm (0.2 in.)	5 mm (0.2 in.)	5 mm (0.2 in.)
Width	54 mm (2.1 in.)	54 mm (2.1 in.)	54 mm (2.1 in.)	54 mm (2.1 in.)
Depth	85.6 mm (3.4 in.)	85.6 mm (3.4 in.)	85.6 mm (3.4 in.)	85.6 mm (3.4 in.)
Weight	0.05 kg (0.1 lb.)	0.05 kg (0.1 lb.)	0.024 kg (0.05 lb.)	0.042 kg (0.09 lb.)
Operating environment				
Temperature	0° to 55°C (32° to 131°F)	0° to 55°C (32° to 131°F)	0° to 65°C (32° to 149°F)	0° to 65°C (32° to 149°F)
Relative humidity	5% to 95%	5% to 95%	10% to 95%	10% to 95%
Maximum wet-bulb temperature	23°C (73°F)	23°C (73°F)	27°C (80.6°F)	27°C (80.6°F)
Maximum electrical power	1.2 W	1.2 W	0.43 W	1.3 W

IBM Ethernet Adapters for Mobile Systems continued

Ports and connectors	• RJ-45 (male)	• RJ-45, BNC	• RJ-45	• RJ-45 for LAN, RJ-11 for modem
Certification	• IEEE 802.3 • FCC Class B, CISPR B and VCCI Class B for radiated emissions	• IEEE 802.3 • FCC Class B, CISPR B and VCCI Class B for radiated emissions	• IEEE 802.3 • FCC Class B, CISPR B and VCCI Class B for radiated emissions	• IEEE 802.3 • FCC Class B, CISPR B and VCCI Class B for radiated emissions
Warranty	Limited lifetime	Limited lifetime	Limited lifetime	Limited lifetime
Country of origin	U.S.A	U.S.A	U.S.A	U.S.A

IBM Ethernet Adapters for Desktop Systems Specifications

	10/100 EtherJet PCI Adapter	10/100 EtherJet PCI Adapter with Wake on LAN
Part number		
Single	34L0801	34L0201
Card pack	34L0810	34L0210
Significant features		
Bus architecture	PCI	PCI
Data and address width	32-bit	32-bit
Network topology	10BASE-T, 100BASE-TX	10BASE-T, 100BASE-TX
Full-duplex capable	yes	yes
Auto-Negotiation	yes	yes
Plug and Play support	yes	yes
Wake on LAN	no	yes
Remote boot with PXE/DHCP or RPL	optional	standard
ACPI support	yes	yes
DMI 2.0, SNMP-manageable	yes	yes
Interrupt levels supported	3–5, 9–10, 11,15	3–5, 9–10, 11,15
Maximum configuration	4	4
Software support		
Microsoft Windows 95, 98	yes	yes
Microsoft Windows NT 3.51, 4.0	yes	yes
Novell NetWare 3.12, 4.1x, 5.0	yes	yes
OS/2 2.11 or later	yes	yes
SCO UnixWare 2.1	yes	yes
Physical specifications		
Height	87 mm (3.4 in.)	87 mm (3.4 in.)
Width	120 mm (4.7 in.)	120 mm (4.7 in.)
Depth	20 mm (0.8 in.)	20 mm (0.8 in.)
Weight	0.07 kg (0.15 lb.)	0.07 kg (0.15 lb.)
Operating environment		
Temperature	0° to 55°C (32° to 131°F)	0° to 55°C (32° to 131°F)
Relative humidity	8% to 80%	8% to 80%
Maximum wet-bulb temperature	27°C (80.6°F)	27°C (80.6°F)
Electrical requirements	5 V dc	5 V dc

IBM Ethernet Adapters for Desktop Systems continued

Ports and connectors	• RJ-45	• RJ-45

Certification	• IEEE 802.3
	• FCC Class B and CISPR
	  B for radiated emissions
		• IEEE 802.3
		• FCC Class B and CISPR
		  B for radiated emissions

Warranty	Limited lifetime	Limited lifetime
Country of origin	U.S.A	U.S.A

IBM Ethernet Adapters for PC Servers Specifications

	Netfinity 10/100 Fault Tolerant Adapter	Netfinity 10/100 Ethernet Adapter	Netfinity Gigabit Ethernet SX Adapter
Part number			
Single	08L3341	34L0901	34L0301
Card pack	N/A	34L0910	34L0310
Significant features			
Bus architecture	PCI	PCI	PCI
Data and address width	32-bit	32-bit	32/64-bit
Network topology	10BASE-T, 100BASE-TX	10BASE-T, 100BASE-TX	1000BASE-SX
Full-duplex capable	yes	yes	yes
Auto-Negotiation	yes	yes	yes
Plug and Play support	yes	yes	yes
Adapter fault tolerance	yes	yes	yes
PCI HotPlug	yes	yes	yes
Adaptive load balancing	no	yes	no
DMI 2.0, SNMP-manageable	yes	yes	yes
Interrupt levels supported	3–5, 9–10, 11, 15	3–5, 9–10, 11, 15	3–5, 9–10, 11, 15
Maximum configuration	4	4	4
Software support			
Microsoft Windows NT 3.51, 4.0	yes	yes	4.0
Novell NetWare 3.12, 4.1x, 5.0	yes	yes	yes
OS/2 server 2.11 or later	yes	yes	no
SCO UnixWare 2..1	yes	yes	yes
Physical specifications			
Height	87 mm (3.4 in.)	87 mm (3.4 in.)	83 mm (3.25 in.)
Width	120 mm (4.7 in.)	120 mm (4.7 in.)	164 mm (6.4 in.)
Depth	20 mm (0.8 in.)	20 mm (0.8 in.)	20 mm (0.8 in.)
Weight	0.07 kg (0.15 lb.)	0.07 kg (0.15 lb.)	0.09 kg (0.15 lb)
Operating environment			
Temperature	0° to 55°C (32° to 131°F)	0° to 55°C (32° to 131°F)	0° to 55°C (32° to 131°F)
Relative humidity	8% to 80%	8% to 80%	8% to 80%
Maximum wet-bulb temperature	27°C (80.6°F)	27°C (80.6°F)	27°C (80.6°F)
Electrical requirements	5 V dc	5 V dc	5 V dc

IBM Ethernet Adapters for PC Servers continued

Ports and connectors	RJ-45	RJ-45	Duplex SC connector
Certification	IEEE 802.3 FCC Class B and CISPR B for radiated emissions	IEEE 802.3 FCC Class B and CISPR B for radiated emissions	IEEE 802.3 FCC Class B and CISPR B for radiated emissions
Warranty	3 years	Limited lifetime	Limited lifetime
Country of origin	U.S.A	U.S.A	U.S.A

Installation information

Hardware requirements

Mobile	Any PCMCIA or CardBus slot-equipped, Intel processor 80486 or higher, IBM or non-IBM PC
Desktop/Servers	Any PCI-slot-equipped, Intel® processor 80486 or higher, IBM or non-IBM PC

Software and operating systems

Microsoft® Windows 95 and Windows 98

Microsoft Windows NT 3.51 or higher

Microsoft LAN Manager

Microsoft Windows for Workgroups Version 3.11

Novell Netware 3.12 or higher

OS/2 Warp, OS/2 Warp Connect,

OS/2 Version 2.11 or higher

OS/2 SMP Version 2.11 or higher

SCO 5.0, SCO 3.0

Unixware 2.x or higher

Refer to product literature for operating system support on individual products.

Cables and connectors

A network adapter cable is not included with these adapters. The appropriate cable must be ordered to connect the adapter to an Ethernet network:

• UTP-3, -4 or -5 cable with RJ-45 connectors for 10BASE-T networks

• RG-58 standard coaxial cable (10BASE2) with BNC terminators and the BNC T-type connector shipped with the adapter for use with thin coaxial cable in a 10BASE2 network

• UTP-5 cable for 100BASE-TX networks

• 50- or 62.5-micron multimode fiber optic cable for 1000BASE-SX networks

Wake on LAN power cables are included with appropriate adapters.

Key Customer Benefits

- Gigabit performance
- 10/100 operation for smooth migration to Fast Ethernet
- Auto-negotiation support
- Wake on LAN capability
- Plug and Play support
- Support for all leading network operating systems
- Full-duplex capability for shared or switched LANs
- Supports adapter fault tolerance for use in mission-critical applications

Supplementary Information

The following sales tools are available for the IBM Ethernet LAN Adapter Family:

- Specification sheet:
  IBM Ethernet LAN Adapter Family, G221-4074-08

- Information on the IBM Ethernet LAN Adapter Family is available at:
  www.networking.ibm.com.