IBM Ethernet Quad PeerMaster Server Adapters

IBM Ethernet Quad PeerMaster™ Server Adapters provide a cost-effective way to improve server, network, and client communications performance. With Quad PeerMaster adapters, you can segment your Ethernet networks and effectively multiply LAN bandwidth without placing an additional processing burden on your server.

The Quad PeerMaster solution is particularly appropriate when you need to:

- Switch or bridge traffic among multiple Ethernet segments
- Attach more than eight Ethernet 10Base-T segments to the server
- Attach more than four 10Base2 segments to the server
- Provide switching between 10Base-T and 10Base2 Ethernet segments
- Conserve server slots

The Ethernet Quad PeerMaster server adapters, Ethernet Quad-BT and Quad-B2, are high-performance Intel i960 RISC processor-controlled, 4-port LAN adapters. Both adapters feature integrated Ethernet switching function and are designed to operate with Micro Channel® (MC)-based servers.

PeerMaster adapters are 32-bit address, 64-bit data busmaster adapters that support the MC capability of burst-mode communication at 80MB/sec. The adapters are particularly well suited for servers with multiple Ethernet segment connections in installations with multiple servers. Network performance is increased by support of up to 24 Ethernet LAN segments in a PC Server 500 with six PeerMaster adapters. Server performance is enhanced by off-loading all Ethernet bridging function to the adapters, including peer-to-peer switching between adapters. Each Ethernet segment supports the full 10Mbps Ethernet bandwidth for a total system bandwidth potential of 240Mbps.

The Quad-BT PeerMaster adapter supports connection to 10Base-T unshielded twisted pair (UTP) networks. A typical configuration is multiple clients connected to shared segments using standard Ethernet concentrators such as the IBM 8222 6-Port 10Base-T Workgroup Hub. The Quad-B2 PeerMaster adapter supports connection to 10Base2 thin coax networks. Protocols conform to IEEE 802.3 and Ethernet Version 2 standards.

Device driver support is provided for both Novell** NetWare** and OS/2® LAN Server. Multiple configuration options are supported, including single or multiple virtual networks.

IN BRIEF . . .

- Offers high-bandwidth PC Server Ethernet communications server solutions
- Features Intel i960 RISC processor-based intelligent server subsystem
- Provides four Ethernet ports per adapter; up to 24 ports per server
- Supports 32-bit address and 64-bit data transfers
- Provides integrated Ethernet switch function (port-to-port, adapter-to-adapter)
- Improves server and network performance
- Supports both 10Base-T and 10Base2 networks
- Provides server LAN subsystem management via NetFinity
- Includes device drivers for Novell NetWare and OS/2 LAN server

Description	Planned Availability	Single Unit Price
Quad-BT PeerMaster		$2,399
Novell NetWare support	10/17/94	
OS/2 LAN server support	12/16/94	
Quad-B2 PeerMaster		2,669
Novell NetWare support	12/16/94	
OS/2 LAN Server support	12/16/94	

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Description

High Performance

IBM Ethernet Quad PeerMaster Server adapters are 32-bit address, 64-bit data busmaster streaming data adapters that support card-to-card data transfers at a burst rate of 80MB/sec. When attaching to current PC Servers that support MC streaming data architecture, the supported adapter-to-processor data transfer rate is 40MB/sec. With one adapter (four LAN segments), the total Ethernet subsystem data bandwidth is 40Mbps. With six adapters (24 LAN segments), the total Ethernet subsystem data bandwidth is 240Mbps.

Increased Server Capacity

With the ability to support up to 24 LAN segments, total server Ethernet attachment capacity is three times greater than other available alternatives. In addition, significant network-related server processing work is off-loaded to the adapters in many server configurations. Using the adapter's integrated switching function, the task of bridging from segment to segment is entirely off-loaded to the adapter processors, freeing the server processor to support other functions.

Business Solutions

Due to increasing LAN bandwidth demands and the need to provide improved server and client communications performance, many customers are segmenting their Ethernet networks. By segmenting into several 10Mbps LANs, customers can effectively multiply LAN bandwidth. The least expensive way of integrating multisegment LANs is to bridge them through the Novell NetWare IPX or multiprototol router function; but this approach is limited to routing IPX packets, and the function places an additional processing burden on the server. There is no similar function available for OS/2 LAN Server customers. Another, better-performing approach is to integrate the multiple segments with an Ethernet switch, but purchase of an external switch adds cost to the installation and bandwidth from the switch to the server is limited, especially for OS/2 servers where support for multiple segment server connections is not offered. Through integration of the server Ethernet adapter and Ethernet switch functions, Quad PeerMaster adapters provide an attractive, high-performance, affordable cost alternative solution that is equally applicable to Novell NetWare and OS/2 LAN Server installations and bridges any packet type, such as IP packets, not only IPX packets.

Connectivity Solutions

Quad-BT PeerMaster adapters provide four RJ-45 connectors/ports for connection to four independent 10Base-T network segments, using Category 3, or higher, UTP cabling. Multiple clients can be attached to each port, limited only by the number of ports in the chosen concentrator/hub configuration. The Quad-B2 PeerMaster provides four BNC connectors/ports for connection to four independent 10Base2 network segments, using thin coax cabling. A server with a combination of Quad-BT and Quad-B2 PeerMaster adapters can provide adapter-based switching function between 10Base-T and 10Base2 Ethernet networks.

Investment Protection

Quad PeerMaster adapters are designed to accommodate future growth. The firmware for Intel i960-based adapters is downloaded from the server device drivers and can be updated, as needed, over time. In addition, the DRAM uses an industry standard SIMM socket that allows the total DRAM capacity to be expanded up to 16MB to provide for future function enhancements.

Device Drivers Provided with Adapters

Device drivers for support of Novell NetWare and OS/2 LAN Servers are included. Multiple configuration options are provided, ranging from the traditional adapter mode (adapter appears to the Network Operating System (NOS) as four separate Ethernet adapters) to virtual network (VNET) mode (multiple Ethernet segments are registered with the NOS as a single network). Multiple PeerMaster adapters can be configured as one large VNET, multiple independent VNETs, traditional single segment LANs, or any combination.

Server LAN Subsystem Management

An add-on to NetFinity provides an advanced Ethernet subsystem management tool. Parameters such as packets/second or total throughput can be monitored for each port, traffic within an adapter, or traffic between adapters. Through use of NetFinity, you can graphically view the data, monitor for predefined thresholds, and optionally generate simple network management protocol (SNMP) alerts. NetFinity allows SNMP-compliant network management applications to collect information on the Quad PeerMaster server subsystem.

User Productivity

Using NetFinity management tools, you can identify traffic patterns among various Ethernet segments and easily optimize performance by reconfiguring segment port assignments. Heavily used segment-to-segment paths can be configured on the same adapters to keep heavy traffic isolated within a single adapter. With the switching firmware's "learning" algorithm, the new location of clients is quickly learned and put into the adapter routing tables, which enables routing of the packet to the current destination address only. Server administrators can easily optimize Ethernet subsystem performance and end users can benefit from quick resolution of LAN traffic bottlenecks.

Advanced Adapter Technology

Most server LAN adapters employ a "shallow" design, which means that a lot of LAN-related processing is done on the server processor. Quad PeerMaster Ethernet adapters employ a "deep" design (each adapter has its own processor), enabling the adapters to off-load selected LAN functions from the server processor. In addition, the PeerMaster adapters attach to the MC with the "Miami" module developed by IBM, which supports 80MB/sec data-streaming mode and peer-to-peer data transfers across the MC. The advanced channel interface enables 64-bit wide data transfers direct from adapter to adapter, with a performance improvement up to four times that of currently available Ethernet adapter alternatives.

Growth Enablement

Quad PeerMaster adapters provide a granular approach to implementation of Ethernet switch functionality. You can implement a 4-port switch using only the single MC slot necessary for any Ethernet server connection, even for a single-segment network. Additional switch ports can be added four ports at a time (up to 24 total ports in a PC Server 500). In addition, the ability to configure four Ethernet ports in a single slot may free up slots for other server adapters. Through the highly efficient packet switching capability of Quad PeerMaster adapters, growth to multiple server configurations is also enhanced.

Open Enterprise:

- Institute of Electrical and Electronics Engineers (IEEE) 802.3

- Ethernet Version 2

Product Positioning

Use Quad PeerMaster Server Adapters where:

- Multiple Ethernet segments are needed in the network and integration of the network at the server is desirable

- Maximum Ethernet subsystem performance is desired

- Integration or bridging with the server processor is:

  - Not acceptable due to CPU loading/performance impacts (Novell NetWare)

  - Not available (OS/2 LAN Server)

Where bridging with the NetWare IPX or MPR routing function is acceptable, no more than eight total Ethernet segments are needed, and a sufficient number of server slots are available, the IBM EtherStreamer™ MC 32 or IBM Dual EtherStreamer MC 32 adapters may provide an acceptable, lower-cost solution.

Where it is preferred to implement the Ethernet switching function in a wiring closet physically distant from the server, the use of an external Ethernet switch, such as the IBM 8271 EtherStreamer Switch, may be a more appropriate solution.

Publications

The *IBM Quad-BT and -B2 PeerMaster Server Adapter Installation Instructions* (19H1082) is shipped with the product. Additional copies are not available

Technical Information

Specified Operating Environment

Physical Specifications:

- Length: 332.74 mm (13.1 inches)
- Height: 122.55 mm (4.825 inches)

Operating Environment: These products meet FCC Class A criteria.

- Dry Bulb Temperature: 10°C to 35°C
- Relative Humidity: 8% to 80% noncondensing
- Wet Bulb: 27°C
- Altitude: 0 to 7,000 feet

Hardware Requirements: The IBM Ethernet Quad PeerMaster adapters are supported on the following IBM MC server systems:

- PS/2® Server 95 Array 566
- PS/2 Server 95 Array 560
- PS/2 Server 95 Array 466
- PS/2 Server 95 566
- PS/2 Server 95 560
- PS/2 Server 95 466
- PS/2 Server 85 466
- PS/2 Server 85 433
- PC Server 500

Software Requirements: Ethernet Quad PeerMaster adapters are designed to operate with the following network operating systems:

- IBM Operating System/2® LAN Server 3.X and 4.0
- Novell NetWare Version 3.1X and 4.0X
- NetWare from IBM 3.1X and 4.0X

Limitations: A maximum of two Quad PeerMaster adapters may be installed in PS/2 Server Models 85 or 95, using slots 2 and/or 3 (type-5 adapter slots with space available for the PeerMaster adapters).

Refer to your Network Operating System specifications for any limitations in the total number of supported Ethernet segments or virtual networks.

Planning Information

Cable Orders: A customer-supplied attachment cable is required to connect the Quad-BT adapter to a 10Base-T network. The cable must have an RJ-45 connector on the adapter end of the cable, and the other end of the cable must have the appropriate connector for attachment to the wall outlet or concentrator/hub.

A customer-supplied attachment cable is required to connect the Quad-B2 adapter to a 10Base2 network. The cable must have a BNC connector on the adapter end of the cable, and the other end of the cable must have the appropriate connector for attachment to the wall outlet or adjacent system/Ethernet adapter.

Packaging:

Product	Shipment Group	Number of Boxes
06H5184 Quad-BT PeerMaster	MCA Type-5 Card Assembly, Diskette, Install Instructions	1
06H6041 Quad-B2 PeerMaster	MCA Type-5 Card Assembly, Diskette, Install Instructions	1

Security, Auditability, and Control

Customers are responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

Terms and Conditions

MES Discount Applicable: No

Field-Installable Feature: Yes

Warranty Period: Three years

Customer Setup: Yes

All other terms and conditions are the same as those applicable to the machine type the feature is installed in.

Charges

Description	Number	Single Unit Price
Quad-BT PeerMaster	3940	$2,399
Quad-B2 PeerMaster	3941	2,669

* The single unit price reflects the purchase price for a single unit acquired from IBM, and is subject to change without notice. This price is for information purposes only, and shall not limit in any way the remarketers' ability to set their own prices for IBM products.

Sale or delivery of IBM Ethernet Quad PeerMaster Adapters is subject to approval of the Federal Communications Commission (FCC). IBM will not accept customer orders for this device until FCC approval has been obtained.