

LAN Hub Sales Guide

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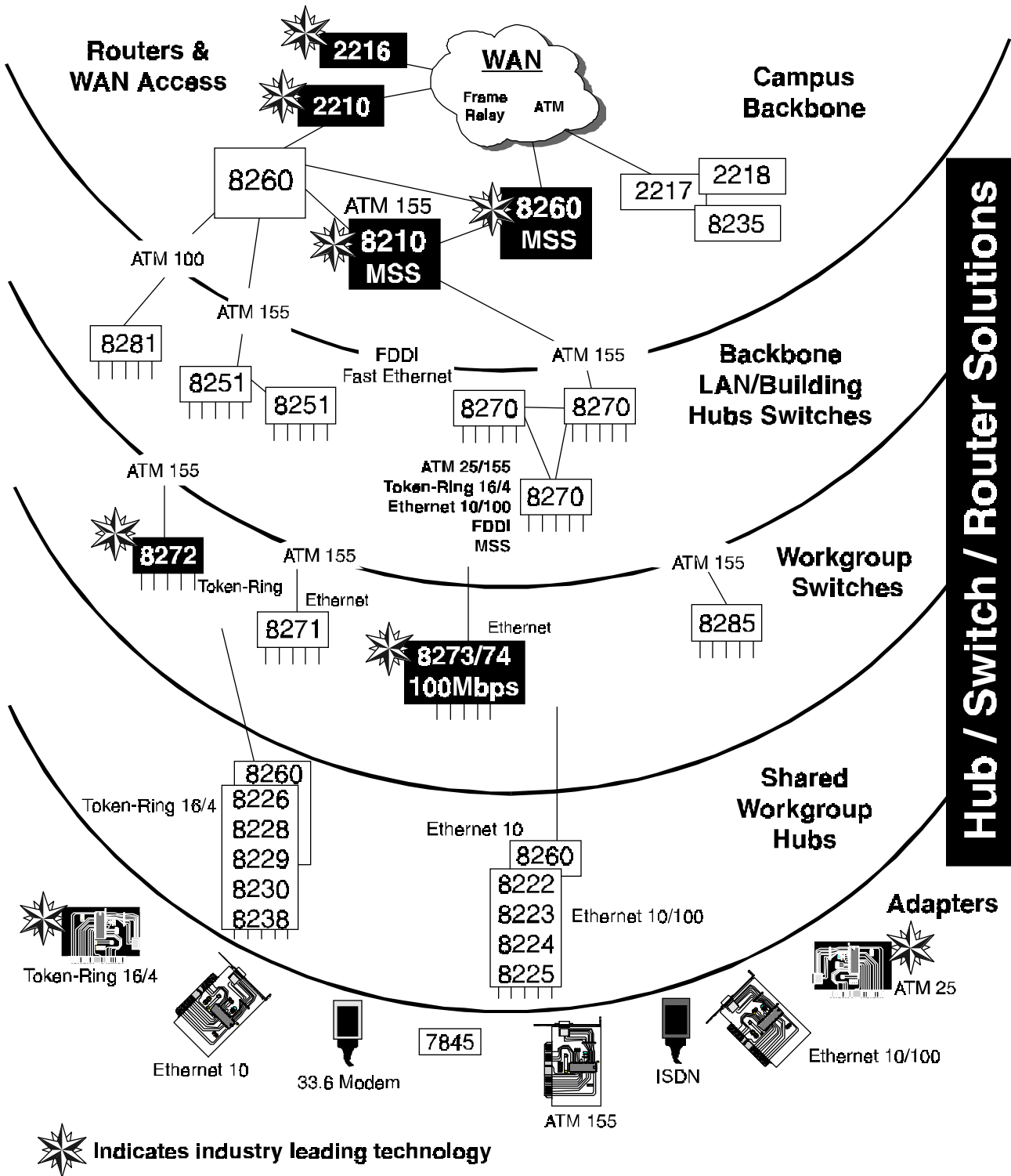
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IBM Networking Portfolio Highlights



PLUS: End-to-end integrated Network Management, extensive education, service and support

Background

Definition

LAN hubs are physical layer devices that create the network infrastructure. LAN hubs can be classified into three primary categories:

- low-end, single-protocol **stackable workgroup concentrators** connect 2 to 60 devices on a single, shared LAN segment.
- **mid-range hubs** are usually multiprotocol and intelligent, connecting larger numbers of devices on multiple, shared LAN segments.
- **super hubs** are multiprotocol, intelligent and fault-tolerant. They employ a higher amount of available bandwidth through the use of ATM (Asynchronous Transfer Mode) technology.

Stackable Hub Market

The market for **low-end hubs** is experiencing significant growth. IBM projects the shared LAN stackable hub market will increase from 47 million ports shipped in 1996 to 61 million ports in 1998. There are several reasons that demand for workgroup hubs is increasing dramatically.

- **Price.** For low-end hubs, the price per port can range from \$26 to \$67 for Ethernet and \$50 to \$150 for Token-Ring, depending on the level of management functionality.
- **Flexibility.** Low-end hubs come in many varieties to meet customers' needs. They range from small, unmanaged workgroup hubs to larger, intelligent, managed hubs.
- **Scalability.** Stackable hubs offer customers an easy growth path instead of "forklift upgrades" often associated with high-end hubs.

Mid-Range Hub Market

The market for these modular chassis-based shared LAN concentrators has matured. The shared LAN port content of this segment is shifting into the stackable hub market. The requirements for switching functions in this market segment continues to grow rapidly but is moving into the super hub arena. The remaining market is predominantly incremental growth of the existing installed base.

Super Hub Market

This is a new and emerging segment of the hub market. It is driven by the need to move to high-speed, high-bandwidth switched technologies such as ATM. Super hubs also offer extended fault-tolerant features for network reliability and availability.

IBM Hubs IBM offers the following **low-end, workgroup hubs** for Ethernet, Token-Ring and FDDI networks:

- | | |
|------------|--|
| Ethernet | IBM 8222 Ethernet Workgroup (8 & 16 port) Hubs
IBM 8223 Fast Ethernet Workgroup (8 Port) Hub
IBM 8224 Ethernet Stackable Hub
IBM 8225 Fast Ethernet Stackable Hub |
| Token-Ring | IBM 8226 Token-Ring RJ-45 Connection
IBM 8228 Token-Ring Network MAU
IBM 8230 Token-Ring Network CAU
IBM 8238 Token-Ring Stackable Hub |
| FDDI | IBM 8244 FDDI Workgroup Concentrator |

In the **mid-range hub market**, IBM offers several models of the IBM 8250, a multiprotocol intelligent hub that provides connectivity for Ethernet, Token-Ring and FDDI networks.

IBM's **super hub** offering is the IBM 8260 an enterprise, intelligent switching hub that supports ATM networking as well as Token-Ring, Ethernet and FDDI.

Positioning IBM's low-end hubs can be positioned based upon the degree of function they provide using this general concept of hub market segments:

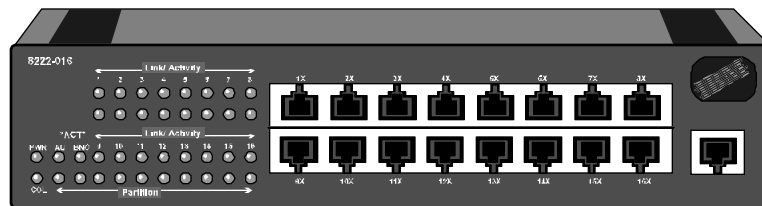
Unmanaged	Intelligent/Managed
------------------	----------------------------

Homogeneous	Heterogeneous
--------------------	----------------------

Workgroup Hub	Stackable Hub	Mid-Range Hub	Super Hub
Single Segment Single LAN Type No Management 6-16 Ports <u>FDDI</u> 8244 <u>Token-Ring</u> 8226 8228 <u>Ethernet</u> 8222 8223	Single/Multiple Segments Single LAN Type Optional Management 16 to 128 Ports (average) Stackable <u>Token-Ring</u> 8230 8238 <u>Ethernet</u> 8224 8225	Multiple Segments Ethernet, Token-Ring, FDDI Strong Management 100-200 Ports <u>Multiprotocol</u> 8250	Multiple Segments Ethernet, Token-Ring & FDDI Strong Management 200+ Ports High Integration Switched Support ATM, etc. <u>Multiprotocol</u> 8260

IBM 8222

Product Description The IBM 8222 Ethernet Workgroup Hubs are a family of standalone Ethernet workgroup hubs comprised of two models: 8222-008 contains eight 10BASE-T ports; and, 8222-016 contains sixteen 10BASE-T ports. These hubs fully comply with the IEEE 802.3 CSMA/CD specification. The primary function of the 8222 is to provide a means for workstations and other devices to be connected over low cost unshielded twisted pair cabling (UTP and FTP) and communicate with one another over an Ethernet local area network. These hubs can be joined via cascading over a variety of media 10BASE-T (UTP and FTP), 10BASE2 coax, 10BASE5 coax or fiber) to allow additional devices to connect to an Ethernet network segment.



IBM 8222 Ethernet Workgroup Hub

Positioning

The IBM 8222 is an unmanaged workgroup hub for environments with relatively few Ethernet devices to interconnect. It does offer scalability because it can grow with a customer's network through cascading without the requirement of a cross-over cable.

8222-008

The 8222 model 008 features:

- Eight MDI-X 10BASE-T network ports.
- One MDI 10BASE-T port which is an alternate to Port 8 (does not have receive/transmit pair reversal). It is useful for cascading without the need for cross-over cables.
- One AUI port.
- One 10BASE2 (BNC) Port. (Note: the AUI and BNC ports cannot be used concurrently.)
- One AUI/BNC switch which determines which port is active.

8222-016

The 8222 model 016 features:

- Sixteen MDI-X 10BASE-T network ports.
- One MDI 10BASE-T port which is an alternate to Port 16 (does not have receive/transmit pair reversal). It is useful for cascading without the need for cross-over cables.
- One AUI port.
- One 10BASE2 (BNC) port. Both the AUI and BNC ports can be used at the same time.

Features/Functions The IBM 8222 offers the following features:

Feature	Function
Automatic Partitioning	Disables any of its ports connected to a device that generates repeated collisions, re-enables that port when the condition clears.
Automatic Polarity Reversal	Detection and correction on cables connected to its 10BASE-T ports.
Cascading	Connect individual hubs for large networks through AUI, BNC or 10BASE-T ports.
Jabber Protection	Automatically disables transmission when a node transmits continuously for set period and enables transmission later.
Status LEDs	<ul style="list-style-type: none"> • Power and collision (hub) • Link, activity and auto-partitioned (per 10BASE-T port) • Activity and auto-partitioned (AUI port) • Activity and auto-partitioned (BNC port)
Internal Auto-Ranging	Suitable for operation on the worldwide range of voltages and
Power Supply	frequencies (100 - 250v).
Space-saving	Fits on shelf or wall-mountable.
Warranty	One year warranty.

8222 Products and Options

Model
Ethernet Workgroup Hub Model 008
Ethernet Workgroup Hub Model 016

Target Market

The IBM 8222 is an unmanaged workgroup hub for environments with relatively few Ethernet devices to interconnect. It is targeted at workgroups as well as small networks in locations such as schools, stores or doctor's/lawyer's offices.

Q's and A's

- Q) *How can I obtain racks to rack-mount the IBM 8222?*
- A) IBM offers several installation options for workgroup hubs including a customized shelf/rack for the IBM 8222. For more information, contact Newton Instruments Co., Butner, N.C., (919) 575-6426.

Sales Tools

The following marketing aid is available on MKTTOOLS:

8222DOCS PACKAGE --

Documents describe the IBM 8222 8-port and 16-port hubs. Includes product description document, installation and planning guide and preliminary spec sheet.

The following sales tools are available for the IBM 8222:

8222 Nways Ethernet Workgroup Hubs

Models 008 & 016 (spec sheet)

G224-4428-00

Information about the IBM 8222 is available via the IBM fax-back systems.

- IBM PCC FAX (800-IBM-3395, product spec sheet document # 10167)

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Competition

The IBM 8222 compares very favorably with its leading competitors.

	IBM	D-Link	Hewlett-Packard	Bay Networks
Model	8222	DE-809 TP	Advance Stack - 8U, 16U	800, System 2000
Uplink Port	Yes	Yes	Yes (modular)	Yes
Management	Unmanaged	Unmanaged	Unmanaged	Unmanaged
Ports	8 or 16 UTP 1 BNC, 1 AUI	9 UTP	8 or 16 UTP 1 AUI or BNC or Fiber	8 UTP, 1 AUI, or 16 UTP, 1 AUI

Key Selling Points

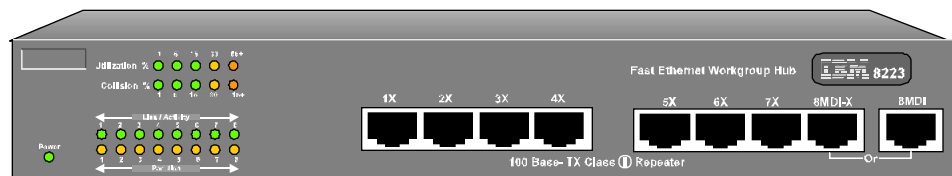
When selling the IBM 8222, the following points should be emphasized:

- The 8222's growth options
- The 8222 is compatible with all current IBM Ethernet products and non-IBM Ethernet products based on IEEE 802.3 standards
- The 8222's internal auto-ranging power supply (no clumsy "brick" external power transformer as some competitors have)
- RJ-45 connectors and status LEDs are conveniently located on the same side of the hub
- BNC port offers low cost cascading via 10BASE2 coax
- Investment protection offered by the IBM 8222
- IBM's customer support
- IBM's technology leadership and breadth of products

IBM 8223

Product Description The IBM 8223 Fast Ethernet Workgroup Hub is a low-cost, 100BASE-TX Fast Ethernet hub. The 8223 contains eight, 100BASE-TX ports that fully comply with the IEEE 802.3u Class II hub specifications. The primary function of the 8223 is to provide a means for workstations and other devices to be connected over low-cost unshielded twisted pair cabling (category 5 UTP wire is supported) and communicate with one another over a 100BASE-TX Ethernet network.

The IBM 8223 Model 008 has eight MDI-X 100BASE-TX network ports as well as one MDI 100BASE-TX port (which is an alternate to port 8). The MDI 100BASE-TX port does not have receive/transmit pair reversal. This port is useful for cascading without the need for cross-over cables.



IBM 8223 Fast Ethernet Workgroup Hub

Positioning

The IBM 8223 is an unmanaged workgroup hub for environments with relatively few 100BASE-TX devices to interconnect. It does offer scalability because it can grow with a customer's network through cascading without the requirement of a cross-over cable.

Features/Functions The IBM 8223 offers the following features:

Feature	Function
Fast Ethernet	Enables transmission at the rate of 100 Mbps over low-cost twisted pair cabling. 100BASE-TX is a version of Fast Ethernet (100BASE-T).
Automatic Partitioning	Disables any of its ports connected to a device that generates more than 60 consecutive collisions, re-enables that port when the condition clears.
Cascading	Connecting up to two 8223s or other IEEE 802.3u Class II hubs for larger networks through any 100BASE-TX port. Port 8 includes an MDI connector (without internal crossover) to enable easy cascading to the MDI-X port on another hub without requiring a cross-over cable.
Jabber Protection	Automatically disables transmission when a node transmits continuously for a set period and enables transmission later.
Status LEDs	<ul style="list-style-type: none"> •Power (to hub) •Link, activity, auto-partitioned •"EtherWatch" Collision LED bar quickly indicates whether collisions are occurring on the network •"EtherWatch" Utilization LED bar indicates the percentage of valid data over the whole network bandwidth
Internal Auto-Ranging Power Supply	Suitable for operation on the worldwide range of voltages (100 -240 volts AC). Eliminates the need for a bulky, external power transformer.
Space-Saving	Fits on a tabletop, shelf or wall-mountable.
Warranty	One year warranty.

8223 Products and Options

Model
Fast Ethernet Workgroup Hub Model 008

Target Market

The IBM 8223 is an unmanaged workgroup hub for environments with relatively few 100BASE-TX Ethernet devices to interconnect. It is targeted at workgroups as well as small networks in locations such as schools, stores or doctor's/lawyer's offices.

Q's and A's

Q) How many kinds of 100BASE networks are available?

- A) Currently, there are three versions of 100BASE networks available:
- **100BASE-TX.** This Ethernet network transmits at 100 Mbps over 2-pairs of 100-ohm category 5 unshielded twisted pair cable.
 - **100BASE-T4.** This type of Ethernet network transmits at 100 Mbps over 4-pairs of 100-ohm category 3 unshielded twisted pair cable.
 - **100BASE-FX.** This Ethernet transmission method transmits at 100 Mbps over 2-conductor, 62.5/125 micrometer multimode fiber cable.

All of IBM's Fast Ethernet products support 100BASE-TX cabling.

Q) What kind of network adapters do I have to use with the IBM 8223?

- A) IBM offers two 100BASE-TX adapters that could be used with the IBM 8223 hub. These are the:
- 100/10 ISA Ethernet Adapter
 - 100/10 PCI Ethernet Adapter

Q) How can I obtain racks to rack-mount the IBM 8223?

- A) IBM offers several installation options for workgroup hubs including a customized shelf/rack for the IBM 8223. For more information, contact Newton Instruments Co., Butner, N.C., (919) 575-6426. Their part number is 21365800XX.

Q) What kind of cabling can be used with the 8223?

- A) Your 100BASE-TX network will operate correctly on category 5, 100-ohm UTP or STP cable and connecting hardware as specified in the ANSI/TIA/EIA 568-A or CSA T529 standards. Your 100BASE-TX network will also operate on 150-ohm STP-A cable and components as specified in these standards. In addition, your network will operate on IBM Cabling System types 1, 6, and 9, 150-ohm STP or STP-A cable. If you are using 150-ohm cabling systems, impedance-matching devices must be used in conjunction with the cable.

Your 100BASE-TX network will also operate correctly on category 5, 100- and 120-ohm balanced, shielded or unshielded cables and components as specified in the ISO/IEC 11801 standard. It will also operate on 150-ohm balanced, shielded cables and components as specified in the ISO/IEC standard. In addition, your network will operate on any link that meets the specifications of a Class D link as specified in the standard; this includes IBM Cabling System type 9 STP cabling. If you are using 120- or 150-ohm cabling systems, impedance-matching devices must be used in conjunction with the cable.

For further information, please see the *8223 Fast Ethernet Workgroup Hub Installation and Planning Guide* (GA27-4142-00).

Sales Tools

The following marketing aid is available on MKTTOOLS:

8223DOCS PACKAGE Documents describing the IBM 8223 including product description document, user's guide and spec sheet.

The following sales tools are available for the IBM 8223:

8223 Fast Ethernet Workgroup Hub (spec sheet) G224-4481-00

Information about the IBM 8223 is available via the IBM faxback system

- IBM PCC FAX (800-IBM-3395, product spec sheet document #10179)
- IBM FAX (800-IBM-4FAX, product spec sheet document #4288)

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Competition

The IBM 8223 is positioned against unmanaged Fast Ethernet hubs from several leading vendors.

	IBM	3Com	Bay Networks	Cisco	Cisco
Model	8223	Super Stack II Hub 100	Bay Stack Fast Ethernet Hub	Fast Hub 100	Fast Hub 100+
Form Factor	Stand-alone	Stackable	Stackable	Stand-alone	Stackable
Ports (single/stack)	8/na	12/96 (stack of 8 hubs)	12, 24/132 (stack of 6 hubs)	4, 8/na	16/254 (2 stacks of 8 hubs)
Media	100BASE-TX	100BASE-TX or 100BASE-T4	100BASE-TX	100BASE-TX	100BASE-TX
Management	Unmanaged	SNMP, RMON	SNMP, RMON	Unmanaged	SNMP, RMON

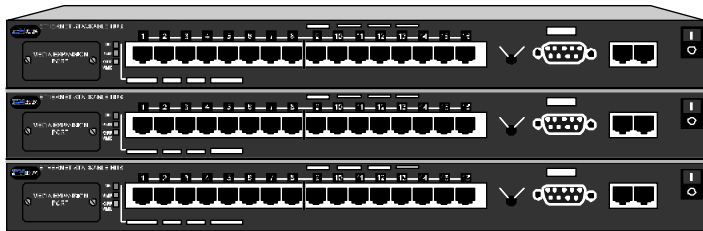
Key Selling Points

When selling the IBM 8223, the following points should be emphasized:

- The Fast Ethernet 100Mbps transmission bandwidth offered by the IBM 8223
- The 8223 is compatible with all current IBM 100BASE-TX Ethernet products and non-IBM 100BASE-TX Ethernet products based on the IEEE 802.3u standards
- The 8223's growth options
- The 8223's internal auto-ranging power supply (no clumsy external power transformer as some competitors have)
- RJ-45 connectors and status LEDs are conveniently located on the same side of the hub
- "EtherWatch" Collision and Utilization LEDs
- IBM's customer support
- IBM's technology leadership and breadth of products

Product Description The IBM 8224 Ethernet Stackable Hub is a family of rackable, stackable, managed or unmanaged 16-port 10BASE-T Ethernet workgroup hubs. In addition to the sixteen 10BASE-T ports, each hub has a media expansion port for optional connection to 10BASE2, 10BASE5 or fiber (FOIRL or 10BASE-FL) networks. Each hub also has a communications port for configuration and out-of-band management. Up to ten 8224s can be connected into a stack. Two models of the IBM 8224 are available:

- Model 001 is the basic connectivity unit and it can be managed by Model 002. Used by itself, it is a flexible, scalable, but unmanaged Ethernet repeater.
- Model 002 is an SNMP management unit that can manage up to nine Model 001s (or 002s) in a stack. It has the same connectivity features as the Model 001.



IBM 8224 Ethernet Stackable Hub

Positioning Because it provides for either unmanaged or SNMP-managed stacks, and from 16 to 170 ports in a stack, the IBM 8224 is a reliable, expandable solution for small to medium-sized networks. It is an ideal branch office (or branch store) solution.

Features/Functions The IBM 8224 offers the following features:

Feature	Function
Stackability	Gives customers an easy and cost-effective way for their network to grow. Customers can start with an unmanaged Model 001 and then add more hubs as needed. For management capabilities, a Model 002 is added. Investment in existing hubs is protected with these growth options.
Location Flexibility	Hubs can be separated up to 250 feet (76 meters) from the first unit to the last. The maximum distance from a 10BASE-T workstation to a hub is 330 feet (100 meters). This flexibility saves customers time and expense associated with wiring.
Space-Saving	Fits on shelf, stackable and rack-mountable.

Feature	Function
Connectivity Options	<ul style="list-style-type: none"> ·8224s can be added to the stack using the 6-inch twisted pair (UTP) supplied cable (or standard category 3 UTP cable) to connect through the hub expansion ports. ·Cascade through the optional media expansion port using 10BASE2, 10BASE5 or fiber (10BASE-FL or FOIRL) cabling. ·Cascade through a 10BASE-T port to connect one 8224 to another. An uplink switch is provided on the 16th port which can be set for cascading or a cross-over cable can be used to cascade through the other 10BASE-T ports.
Segmentation	Each hub in the stack can be in a separate segment, allowing as many as 10 segments in a stack. Customers have the option of putting several hubs in the same segment in order to allocate bandwidth optimally. The IBM 8224 still retains its management capability even with segmentation as long as the segments are connected via bridges, routers or switches.
SNMP Support over IP	Management in a TCP/IP network for both in-band and out-of-band management (via SLIP).
SNMP Support over IPX	Support for a Novell NetWare Management Station. It supports Novell HUBNVLE.MIB and IPX Autodiscovery.
SNMP Management	Agent in the 8224 supports four Management Information Bases (MIBs): SNMP MIB II (RFC 1213), the Ethernet Repeater MIB (RFC 1516), the Novell Repeater MIB and IBM 8224 MIB. These MIBs can be managed by most DOS and AIX [®] network management applications.
Automatic Partitioning	Disables any of its ports connected to a device that generates repeated collisions, re-enables that port when the condition clears.
Jabber Protection	Automatically disables transmission when a node transmits continuously for set period and enables transmission later.
Autopolarity Reversal	Autopolarity reversal is an RJ-45 port level programmable feature that can automatically invert and correct the polarity of a port due to a wiring error.
Port Intrusion Security	Port intrusion provides a method of preventing unauthorized stations from accessing the network.
20 Status LEDs	<ul style="list-style-type: none"> ·Power, management agent present and collision (hub) ·Link, activity, auto-partitioned and management disabled (per 10BASE-T port) ·Link, activity, auto-partitioned and management disabled (Media Expansion port)
Flash EPROM	Fast and easy field upgrades.
Backup Ports	Can be designated for high-priority resources.
One EIA 232 Port	Provides for local or remote data terminal attachment used for network administration and service.

Feature	Function
Multiple Managing 002s	Multiple 8224 Model 002s can be placed in the stack. If the managing unit fails, the other takes over with full knowledge of the status and configuration of the stack.
Durable Configuration Information	Configuration and machine status information is retained in non-volatile RAM so that it is automatically restored after power disruptions.
Hot Pluggability Internal Auto-Ranging Power Supply	Enables hubs to be added without shutting down the stack. Suitable for operation on the worldwide range of voltages and frequencies (100 - 250v).
Warranty	One year warranty

Management Software

IBM offers several management products for use with the IBM 8224. Each of the management products offers the following features:

- GUI-based
- Network maps defined with geographic maps and icons of elements
- Point-and-click access to statistical displays
- Monitors events real time
- Includes security options

The five options provided by IBM are:\

Environment	Management Product
Standalone 8224	StackWatch for Windows
Multiple SNMP Devices in a NetWare Network	StackWatch for NetWare Management System
NetView for Windows for Multiple IBM Networking Devices	Nways Manager for Windows V2.0 (see page 81)
NetView for AIX Management Platform	Nways Campus Manager LAN for AIX V3.0 (see page 85)
HP Open View Platform	Nways Campus Manager LAN for HP-UX V1.1 (see page 87)

StackWatch for Windows is a standalone low-cost Windows network management application for the 8224. It is the ideal solution for customers with only 8224 Ethernet hubs in the network or for those customers that desire the most inexpensive 8224 network management application. It runs on the Microsoft Windows operating system and can be used on any personal computer or laptop attached to or in a stack with an 8224 Model 002.

StackWatch for NetWare Management System is an application that runs on top of Novell's NetWare Management System (NMS). StackWatch for NMS is used with multiple SNMP managed devices (bridges, routers, hubs) in a network using Novell's NetWare Management System V2.0 platform. StackWatch has not been updated to include the ability to manage any of the features introduced in microcode V1.31.

All 8224 network management applications allow the customer to manage and monitor the 8224 hubs. They provide a graphical representation of how the networks are interconnected and enable you to view real-time statistics of the 8224 hubs and ports. The applications communicate with the 8224s via Simple Network Management Protocol (SNMP) over an Ethernet network. The applications allow the customer to point-and-click on various managed graphical elements for immediate statistical displays.

8224 Products and Options

Description
8224-001
8224-002
Optional Media Expansion Port Module <ul style="list-style-type: none"> • AUI • 10BASE2 • Fiber
StackWatch for Windows (5871-AAA)
StackWatch for NMS (5871-AAA)
Nways Manager for HP-UX V1.1 (4mm tape) (5801-AAR)
Nways Campus Manager LAN for AIX V3.0 (8 mm tape) (5697-BO7) (1/4 inch tape) (5697-BO7) (4 mm tape) (CD-ROM)
Nways Manager for Windows V2.0 (5801-AAR)
Nways Campus Manager Suite for AIX V3.0 (5697-B06) (8 mm tape) (1/4 inch tape) (4 mm tape) (CD-ROM)

Target Market Because the IBM 8224 is positioned as a reliable, expandable solution for small- to medium-sized networks, it is an ideal branch office (or branch store) solution.

Handling Sales

Objections

The IBM 8224 does not provide RMON support.

The IBM 8224 offers a choice of SNMP-based management products but does not offer RMON support. IBM is looking into the possibility of offering this in the future.

Sales Tools

The following sales tools are available for the IBM 8224:

8224 Ethernet Stackable Hub (spec sheet) G221-4130-00

Information about the IBM 8224 is available via the IBM fax-back systems.

- IBM FAX (800-IBM-4FAX, product spec sheet document # 2954)

The following marketing aid is available on MKTTOOLS:

LAN8224 PACKAGE

This package contains a technical description (presentation) for the IBM 8224 Ethernet Stackable Hub. It shows configuration schematics and is suitable for technical marketing.

The following marketing aid is available on LANCSO:

8224MIBS PACKAGE

8224 MIBs information.

The following technical aid is available at the IBMWeb site:

8224V131.EXE

8224-001, 8224-002 Microcode version 1.31 update containing a self-extracting packed file with the microcode image file and a configuration file that can be used to load the code into the 8224.

This package is also available from the Networking Web site at <http://www.raleigh.ibm.com/nes/neshub.htm>, using the same file name.

This package is available to non-IBM people from the IBM PC Company BBS (919) 517-001 under the name 8224V131.EXE.

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Competition

The IBM 8224 competes against stackable hubs from such major vendors as Cabletron, Bay Networks, Hewlett-Packard and 3Com. The following table summarizes the strengths and weaknesses of the IBM 8224's primary competitors and how to sell against them.

	Features	Weaknesses	Selling Against
IBM 8224	<ul style="list-style-type: none"> 16 ports plus media expansion port max 10 hub stack/170 nodes up to 10 segments SNMP mgt. integrated in Model 2 distributed in stack <ul style="list-style-type: none"> — 330' device to hub 250' first to last hub 	<ul style="list-style-type: none"> no RMON support 	
3Com Super Stack II Hub 10 (formerly LinkBuilder FMS II)	<ul style="list-style-type: none"> 12, 24 port + 2 downlinks downlink ports could be UTP, STP, coax, fiber, AUI 24 port Telco or 6 port fiber modules AUI connector standard optional SNMP mgt. w/RMON (all 9 groups) or RMON 2 optional redundant power and fans 	<ul style="list-style-type: none"> no segmentation no distributed stack capability no redundant mgt. capability in a stack proprietary interconnect cable used 	<ul style="list-style-type: none"> stress segmentation capabilities stress distributed stack stress redundant mgt. capability
Bay Networks 2800 Series	<ul style="list-style-type: none"> 16 ports max 5 cascaded hubs/80 nodes optional SNMP and RMON mgt. 	<ul style="list-style-type: none"> no segmentation no redundant mgt. in stack must upgrade to 'SA' model to gain RMON no backup port capability 	<ul style="list-style-type: none"> 8224 has greater port density and segmentation capability stress distributed stack stress redundant mgt. capability

Competition (continued)

	Features	Weaknesses	Selling Against
Bay Networks BayStack Hub 101/102	<ul style="list-style-type: none"> 12, 14 ports + 2 media adapter slots media adapters could be UTP, coax, fiber, AUI max 10 hub stack/260 nodes up to 10 segments redundant power, clocks optional SNMP and RMON mgt. 	<ul style="list-style-type: none"> must add mgt. module for SNMP, RMON support mgt. cabling needed in addition to cascade cabling 	<ul style="list-style-type: none"> SNMP mgt. integrated in Model 2 8224 expansion units managed through cascade cable
Cabletron HubSTACK SEH, SEHi, MicroMMAC	<ul style="list-style-type: none"> 12, 24 port plus 1,2 EPIM slots max 5 hub stack/130 ports unmanaged (SEH) or SNMP managed (SEHi) or advanced mgt. (MicroMMAC) LANVIEWSECURE provides intruder prevention and eavesdrop protection 	<ul style="list-style-type: none"> no segmentation no distributed stack capability no redundant mgt. in stack 	<ul style="list-style-type: none"> 8224 has greater port density stress segmentation capabilities stress distributed stack stress redundant mgt. capability

	Features	Weaknesses	Selling Against
HP AdvanceStack Hub-12R, 24R, 24T (2 nd generation)	<ul style="list-style-type: none"> 12, 24 ports max 8 hubs in stack/200 nodes max 4 segments per hub/ max 32 segments in stack redundant power supply optional mgt. module for SNMP and RMON (4 groups) advanced features (available with optional mgt. pack) include <ul style="list-style-type: none"> -- SNMP, RMON mgt. -- backup port capability -- redundant mgt. with second mgt. module -- security features include intruder protection, eavesdrop protection, auto port disability, password protection 	<ul style="list-style-type: none"> no distributed stack capabilities 	<ul style="list-style-type: none"> stress distributed stack

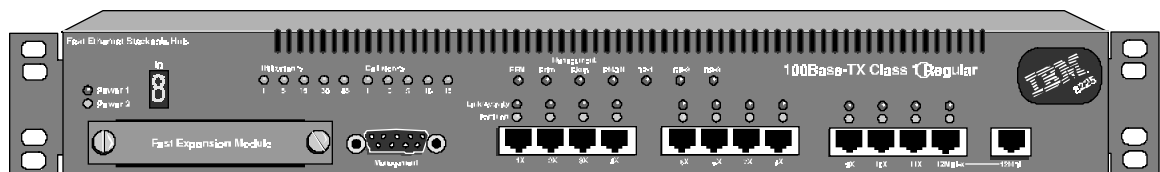
Key Selling Points When selling the IBM 8224, the following points should be emphasized:

- The 8224's growth options, especially the ability to stack 10 hubs (up to 170 ports)
- The 8224's segmentation capability (while retaining manageability)
- The 8224's location flexibility with a maximum of 250 feet allowed between the first and last hubs
- The IBM management software available for the 8224
- Redundant management capability in the 8224 stack
- Backup port capability
- Port intrusion security
- Investment protection offered by the IBM 8224
- The 8224 is compatible with all current IBM Ethernet products and non-IBM Ethernet products based on IEEE 802.3
- IBM's customer support
- IBM's technology leadership and breadth of products

IBM 8225

Product Description The 8225 Fast Ethernet Stackable Hub is a family of rackable, stackable, managed or unmanaged 12-port 100BASE-TX Ethernet workgroup hubs. In addition to its twelve 100BASE-TX ports, each hub has a Fast Expansion Module for optional connection to 10BASE-T/100BASE-TX, or 100BASE-FX. Each hub also has a communications port for configuration and out-of-band management. Up to six 8225s can be connected into a stack. Three models of the IBM 8225 are available:

- Model 001 is the basic connectivity unit. Used by itself, Model 001 is a stackable, multiport, Fast Ethernet repeater that conforms to the IEEE 802.3u Ethernet standard for Class I repeaters. It can also be managed by Model 002 or 003. Model 001 is field upgradable to either a Model 002 or a Model 003.
- Model 002 is a basic SNMP management unit that can manage up to five additional Model 001s (or 002s) in a stack. Model 002 is field upgradable to Model 003. Model 002 has the same connectivity features as Model 001.
- Model 003 is an advanced SNMP management unit that can manage up to five additional Model 001s (or 002s or 003s) in a stack. Model 003 has the same connectivity features (and SNMP management support) as Model 002, with the addition of full RMON support.



IBM 8225 Fast Ethernet Stackable Hub

Positioning

Since the 8225 provides for either unmanaged or SNMP/RMON managed stacks, and from 12 to 72 ports in a stack, the 8225 is designed to serve the broad market range between the 8223 and the 8250/8260. The 8225 is an expandable solution for small to medium-sized networks. It is an ideal branch office (or branch store) solution.

Features/Functions The IBM 8225 offers the following features:

Feature	Function
Stackability	Gives customers an easy, cost-effective way for their networks to grow. Customers can start with an unmanaged Model 001 and then add more hubs as needed. For management capabilities, a Model 002 or 003 can be added. Investment in existing hubs is protected with these growth options.
Connectivity Options	Connect to another device such as a hub or switch through the optional Fast Expansion Module (FEM) using 10BASE-T, 100BASE-TX, or 100BASE-FX cabling. Each FEM provides a switched interface that forms a separate collision domain, thus increasing bandwidth and greatly increasing the flexibility of interconnecting 8225 stacks with additional 8225 stacks or with other parts of the network.
Segmentation	Each 8225 Stack contains three 100Mbps backplanes. Customers have the option of isolating any or all of the hubs or allocating them to any of the three segments to optimize bandwidth utilization. The 8225 still retains its management capability even with segmentation.
SNMP Support Over IP	Management in a TCP/IP network for both in-band and out-of-band management (via SLIP).
SNMP Support Over IPX	Support for a Novell NetWare Management Station. The 8225 supports the Novell HMI (Hub Management Interface) specifications.
SNMP Management	The 8225 supports five Management Information Bases (MIBs): SNMP II (RFC 1213), the Ethernet Repeater MIB (RFC 1516), the Ethernet MIB (RFC 1643), the Novell Repeater MIB, and the IBM 8225 MIB. These MIBs can be managed by most DOS, OS/2, and AIX network management applications. Model 003 also supports the RMON MIB (RFC 1757).
Automatic Partitioning	Disables any of its ports connected to a device that generates repeated collisions, and re-enables that port when the condition clears.
Jabber Lockup Protection	Automatically disables transmission when a node transmits continuously for a set period and enables transmission later.

Feature	Function
Autopolarity Reversal	A port-level programmable feature that can automatically invert and correct the polarity of a port due to a wiring error.
Port Intrusion Security	Provides a method of preventing unauthorized stations from accessing the network.
Status LEDs	<ul style="list-style-type: none"> • Utilization bar graph, collision bar graph, power supply 1, power supply 2, segment number, and hub ID. • Link, activity, and auto-partitioned (per 100BASE-TX port) • Management agent present, acting as primary or backup
Backup Ports	Can be designated for high-priority resources.
Backup SNMP Agents	Multiple Model 002s and 003s can be placed in the stack. If the managing unit fails, the "slave" unit takes over with full knowledge of the status and configuration of the stack.
Flash EPROM	Fast and easy field upgrades.
Durable Configuration Information	Configuration and hub status information is retained in non-volatile RAM so that it is automatically restored after power disruptions.
Hot Pluggability	Enables hubs to be added and removed without shutting down the stack.
Redundant Power Supplies	An optional, hot-swappable, second power supply to provide high availability.
Internal Auto-Ranging Power Supply	Suitable for operation on a worldwide range of voltages and frequencies (100-250v).
Space Saving	Fits on a shelf, is stackable or rack mountable.
Warranty	One year warranty.

Management Software

Customers have several management options, including out-of-band management from an ASCII terminal and/or SNMP management. For SNMP management with a graphical user interface, IBM offers management solutions depending upon the platform the customer chooses for management applications:

Platform	Management Solution
Windows	Nways Manager for Windows V2.0 (see page 81) Nways LAN Remote Monitor for Windows V1.0 (see page 88)
AIX	Nways Campus Manager LAN for AIX V3.0 (see page 85) Nways Campus Manager Suite for AIX V3.0 (see page 92) Nways Campus Manager LAN Remote Monitor for AIX V2.0 (see page 88)
HP-UX	Nways Campus Manager LAN for HP-UX V1.1 (see page 87) Nways LAN Remote Monitor for HP-UX V1.0 (see page 88)

More information is provided regarding these management products later in this guide. See the pages referenced in the table.

8225 Products and Options

Description
8225-001 8225-002 8225-003
Optional Fast Expansion Modules: 10BASE-T/100BASE-TX 100BASE-FX
Management Upgrades Upgrade to SNMP Basic: Model 001 to 002 Upgrade to SNMP Advanced: Model 001 to 003 Model 002 to 003
Redundant Power Supply Hub Interconnect Cable Assembly Kit

Target Market Since the IBM 8225 is positioned as a reliable, expandable solution for small to medium-sized networks, it is an ideal branch office (or branch store) solution.

Sales Tools The following sales tools are available for the IBM 8225:
 8225 Managed Ethernet Hub (spec sheet) G224-4487-00

- Information about the IBM 8225 is available via the IBM fax-back systems:
- IBM FAX (800-IBM-4FAX, product spec sheet document #5696)
 - IBM PCC FAX (800-IBM-3395, product spec sheet document #10187)

The following marketing aid is available on MKTTOOLS:
 8225DOCS PACKAGE A freelance product description presentation

Information about IBM networking products is available on the Internet WWW server via: <http://www.raleigh.ibm.com/nethome.html>

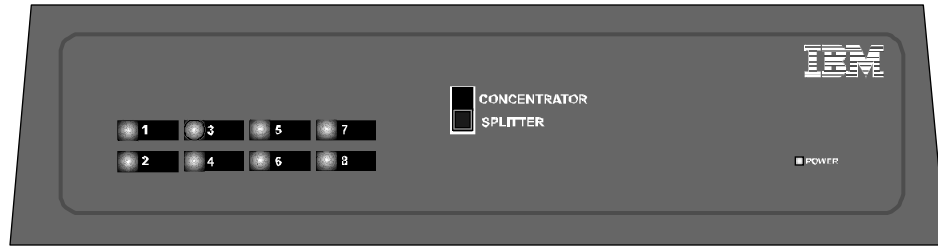
Competition

	IBM	3Com	Bay Networks	Cisco
Model	8225	Super Stack II Hub 100	Bay Stack Fast Ethernet Hub	Fast Hub 100+
Form Factor	Stackable	Stackable	Stackable	Stackable
Ports (single/stack)	12/72 (stack of 6 hubs)	12/96	12, 24/132 (stack of 6 hubs)	16/254 (2 stacks of 8 hubs)
Media	100BASE-TX	100BASE-TX or 100BASE-T4	100BASE-TX	100BASE-TX
Management	SNMP, RMON (Mod 003)	SNMP, RMON	SNMP, RMON	SNMP, RMON

- Key Selling Points** When selling the IBM 8225, the following points should be emphasized:
- The 8225's growth options, especially its ability to stack 6 hubs (up to 78 ports) in one stack
 - The 8225's segmentation capability, while retaining manageability
 - Redundant SNMP management capability in the 8225 stack
 - Optional redundant power supplies
 - Optional full RMON capability
 - Backup port capability
 - Port intrusion security
 - The 8225's three, 100 Mbps backplanes
 - The Fast Expansion Modules, providing a switched expansion option
 - Investment protection offered by the IBM 8225
 - The 8225 is compatible with all current IBM 100BASE-TX products and non-IBM 100BASE-TX products
 - IBM's renowned customer support
 - IBM's technology leadership and breadth of products

IBM 8226

Product Description The IBM 8226 Token-Ring RJ-45 Connection Model 001 is a flexible, inexpensive Token-Ring Multistation Access Unit (MAU) used to build workgroup networks using twisted pair wiring and RJ-45 connectors. The 8226 provides up to 8 port attachments to either a 4 Mbps or 16 Mbps Token-Ring LAN. Up to ten 8226s can be joined together via their Ring-In and Ring-Out ports.



IBM 8226 Token-Ring RJ-45 Connection Model 001

Positioning The IBM 8226 is a simple, unmanaged Token-Ring hub targeted at small workgroup LANs that use twisted pair wiring and RJ-45 connectors.

Features/Functions The IBM 8226 offers the following features:

Feature	Function
Splitter	Features a “splitter” function that uses a single hub port to connect up to eight devices, instead of requiring a separate hub port for each device. The 8226 is attached to an existing hub port, the switch on the front panel is set to “Splitter” and then up to eight additional devices can be connected to the 8226.
Connectivity	There are three ways to connect IBM 8226s: <ul style="list-style-type: none"> •for a single ring of up to eight attached workstations •cable up to ten IBM 8226s together via the Ring-In/Ring-Out ports to connect up to 80 workstations •use the splitter function to connect to a port of another hub so that up to 8 workstations can use that hub
Ease of Use	No installation procedures to be run—simply connect equipment using twisted pair cabling to create a LAN.
Powered	Resets port relays automatically and is less expensive to operate.
Media Support	Supports UTP, STP and FTP for connections to devices as well as for connections between Token-Ring segments.
LEDs	Port activity LED and power on LED.
Space-Saving	Fits on shelf or wall-mountable.
Warranty	One year warranty.

8226 Products and Options

Model
Token-Ring RJ-45 Connection Model 001

Target Market

The IBM 8226 is a simple, unmanaged workgroup hub for Token-Ring LANs. It is an ideal solution for first time users in a small office because of its ease of use. Classrooms, stores, doctor/lawyer's offices, insurance agencies and branch banks are target markets for the IBM 8226. In addition, it can also be a departmental solution.

Sales Tools

The following sales tools are available for the 8226:

8226 Token-Ring RJ-45 Connection Model 001 (spec sheet) G224-4415-00
8226 Token-Ring RJ-45 Connection Model 001
Installation and Planning Guide GA27-4981-00

Information about the IBM 8226 is available via the IBM fax-back systems.

- IBM FAX (800-IBM-4FAX, product spec sheet document #s 3492, 4674)
- IBM PCC FAX (800-IBM-3395, product spec sheet document # 10171)

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Q's and A's

Q) How can I obtain racks to rack-mount the IBM 8226?

A) IBM offers several installation options for workgroup hubs including a customized shelf/rack for the IBM 8226. For more information, contact Newton Instruments Co., Butner, N.C., (919) 575-6426.

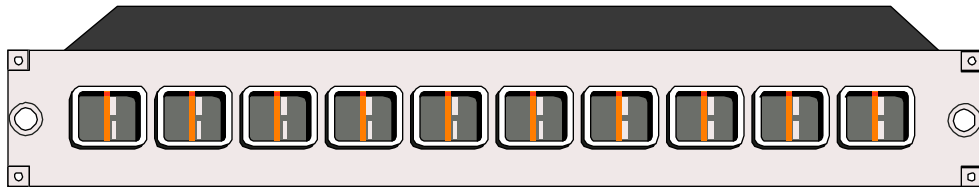
Key Selling Points

When selling the IBM 8226, the following points should be emphasized:

- The 8226's growth options
- The 8226's splitter function
- The 8226's ease of use
- The 8226 is compatible with all current IBM Token-Ring products and non-IBM Token-Ring products based on IEEE 802.5
- IBM's leadership in the Token-Ring market
- IBM's customer support
- IBM's technology leadership and breadth of products

IBM 8228

Product Description The IBM 8228 is an unintelligent, unpowered Token-Ring Multistation Access Unit. It can attach up to eight devices in a 4 Mbps or 16 Mbps Token-Ring network. Using IBM Cabling System Connectors (ICS), cables from the workstations or devices are simply plugged into the unit. The IBM 8228 supports STP cabling as well as UTP cabling when used with appropriate connectors/filters.



IBM 8228 Multi-Station Access Unit

Positioning The IBM 8228 is a simple, unintelligent, unpowered Token-Ring hub targeted at small workgroup LANs that use IBM Cabling System Connectors.

Features/Functions The IBM 8228 offers the following features:

Feature	Function
Growth Options	Up to thirty-two 8228s can be joined together using the Ring-In/Ring-Out ports.
Ease of Use	Devices are simply plugged in to form network. The 8228 will detect the presence of a signal for each of the eight connections and will configure the ring.
Location Flexibility	Allows up to 1,263 feet of maximum length with IBM Cabling System (330 feet with UTP). Easily fits in standard wiring closet.
Space-Saving	Fits in a 19 inch rack, shelf or wall-mountable.
Warranty	One year warranty.

8228 Products and Options

Description
8228 MAU
MAU Plastic Housing

Target Market The IBM 8228 is a simple, unmanaged and unpowered workgroup hub for Token-Ring customers using IBM Cabling System Connectors.

Sales Tools The following sales tools are available for the 8228:

IBM Token-Ring Hub (spec sheet) G221-4075-00

Information about the IBM 8228 is available via the IBM fax-back system

- IBM FAX (800-IBM-4FAX, product spec sheet document # 2919)

Information about IBM networking products is available on the Internet WWW Server via:

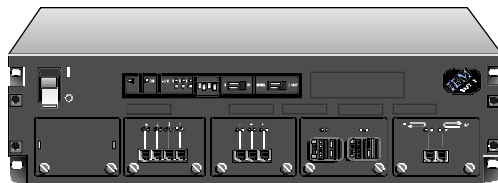
- URL: <http://www.raleigh.ibm.com/nethome.html>

Key Selling Points When selling the IBM 8228, the following points should be emphasized:

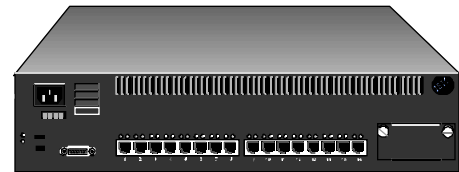
- The 8228's growth options
- The 8228's ease of use
- The 8228 fits easily into a wiring closet, allowing a maximum length of 1,263 feet with ICS cable and connectors
- IBM's leadership in the Token-Ring market
- IBM's customer support
- IBM's technology leadership and breadth of products

Product Description The IBM 8230 is a family of managed, intelligent access concentrators. These hubs can connect from 2 to 92 devices to a Token-Ring LAN (4 Mbps or 16 Mbps) by plugging them into either Lobe Insertion Units (LIUs) or Lobe Attachment Modules (LAMs). A variety of cable types are supported, offering a broad range of attachment options. There are currently five models of the IBM 8230 available:

- **Model 3.** The Model 3 consists of a base unit and a selection of LIUs and LAMs to connect as many as 92 devices in 2-, 3- or 4- port increments. Optional are features such as Dual-Ring Redundancy and Ring-In/Ring-Out. It is positioned as a standalone concentrator or ring-attached hub.
- **Model 13.** This model is the same as the Model 3 except that Dual-Ring Redundancy is a standard feature (which is required for RI/RO).
- **Model 213** is designed for customers who use unshielded cabling and require at least 100 meters distance between the concentrator and the attaching devices. It offers the same basic function and features as Model 13 plus a larger power supply for active UTP LAMs. It supports up to 3 UTP LAMs in addition to front-loading Lobe Insertion Units (LIUs).
- **Model 4A** (active) and **Model 4P** (passive) are new fixed function models with 16 RJ-45 ports. The Model 4A is an active model in which the Token-Ring signal is retimed and amplified. Model 4P is for a passive configuration in which re-timing is not a requirement.



Model 3/13/213



Model 4

Positioning

The IBM 8230 is a family of intelligent and managed Token-Ring hubs that are positioned for small- and medium-sized networks where robust management/reliability is needed. The 8230 is a good solution for sites requiring multiple cable types in a single small hub or those requiring migration from CMOL to SNMP management.

Features/Functions The IBM 8230 offers the following features:

Feature	Function
Cabling Options	Using various LIUs, any combination of the following can be supported by Models 3/13/213: STP, category 3, 4, or 5 UTP via a 3-port active LIU or category 4 or 5 UTP via a 4-port passive LIU.
Growth Options	With all models of the 8230 (except 4A and 4P), growth is modular by adding LIUs or LAMs. Models 4A and 4P offer an optional Ring-In/Ring-Out feature for growth from a single LAN segment to multiple LANs.
Location Flexibility	Models 3, 13 and 213 can attach an active or passive 16-port Remote LAM (RLAM) up to 100 meters from the base unit.
Flexible Device Attachment	Models 3, 13 and 213 offer options for device attachment including mixing and matching active and passive UTP and ICS connections within a single 8230.
Ring-In/Ring-Out	This feature allows an 8230 to connect to a main ring using ICS, RJ-45 STP or optical fiber media RI/RO LIUs. It requires the Dual-Ring Redundancy feature on Models 3, 13, 213. The 8230 Models 4A and 4P connect to the main ring using RJ-45 STP or optical fiber media.
DRR	Dual-Ring Redundancy is standard on Model 13 and 213 and optional on Model 3. It provides alternate paths for all connected nodes to reduce network downtime.
Management	Models 3, 13, 213, 4P and 4A support SNMP and CMOL management.
RMON Support	Models 4A/4P and 3/13/213 support 4 RMON groups described in RFC 1271 and RFC 1513.
RS-232 Com Port	Models 3, 13, 213, 4A and 4P provide out-of-band management.
Flash Memory	Enables microcode updates via software download.
Auto Error Recovery	In all models, error detection is provided in LIUs (or LAMs) and ring segments adjacent to the 8230. The fault is automatically removed from the network, reducing downtime.
Automatic Speed Detect	A feature of models 3, 13, 213, 4A and 4P that reduces error and simplifies management by avoiding network interruptions.
LEDs	All models offer LEDs and four character hexadecimal error code display for power status, wrap state, 8230 status and insertion state of each LAM or lobe.
Warranty	One year warranty.

Management Software

Customers have several management options for the IBM 8230 Models 3, 13, 4A, 4P and 213. These options include out-of-band management from an ASCII terminal, SNMP management or CMOL management. IBM offers the following management solutions depending upon the platform the customer chooses for management applications.

Platform	Management Solution
Windows	Nways Manager for Windows V2.0 (see page 81) Nways LAN Remote Monitor for Windows V1.0 (see page 88)
OS/2	LNM for OS/2 V2.0 (see page 93)
AIX	Nways Campus Manager LAN for AIX V3.0 (see page 85) Nways Campus Manager Suite for AIX V3.0 (see page 92) Nways LAN Remote Monitor for AIX V2.0 (see page 88)
HP-UX	Nways Campus Manager LAN for HP-UX V1.1 (see page 87) Nways LAN Remote Monitor for HP-UX V1.0 (see page 88)

CMOL

CMOL is Common Management Information Protocol Over Logical Link Control. This is an implementation of the CMIP management protocol over the second layer of the OSI protocol stack. Management of these models in CMOL mode is supported by Version 2.0 of the IBM LAN Network Manager (LNM) for OS/2. Local support (on the LNM for OS/2 workstation) is offered in PTF for LNM V2.0 #UR45856. Please see page 89 for more information on LNM V2.0.

- Models 3, 13, 213, 4A, 4P are CMOL-enabled and can be managed by LNM V2.0 with the PTF# UR45856 and the current 8230 CMOL code. The current code can be found at the IBM networking home page listed at the end of this section.

These models ship with a program called Concentrator/Configuration Management Facility (CCMF) which provides local box management information via the EIA 232 port and an ASCII emulator such as ProComm.

SNMP

SNMP management for Models 3, 13, 213, 4A and 4P is provided on both the NetView for Windows, the NetView for AIX, and HP OpenView platforms.

- AIX/UNIX Platforms. These models of the 8230 can be managed by IBM LAN Network Manager for AIX running on the NetView for AIX platform in addition to the **Nways Campus Manager LAN for AIX** and the **Nways Campus Manager LAN for HP-UX**.
- Windows Platform. These models of the 8230 can be managed by IBM's **Nways Manager for Windows V2.0** which is an integrated suite of network management applications (packaged with NetView for Windows Version 2.1) that works seamlessly with the IBM NetView for Windows management platform.

8230 Products and Options

Description
Model 3 without DRR Model 13 with DRR Model 213 Model 4A with 16 Active Ports Model 4P with 16 Passive Ports Model 4 RJ-45 Ring-In/Ring-Out Module Model 4 Optical-Fiber Ring-In/Ring-Out Module
<i>For Models 3, 13 and 213:</i> ICS 2-port LIU UTP 3-port LIU UTP 4-port LIU ICS RI/RO Shielded RJ-45 RI/RO Optical Fiber RI/RO ICS/Optical Fiber RI/RO Optical Fiber/ICS RI/RO Dual-Ring Redundancy upgrade (003 only) Remote LAM LIU Passive Remote LAM Active Remote LAM 8230 LAM (for ICS) Shielded RJ-45 LAM (passive) Shielded UTP LAM (active)
<i>Management Software for AIX Platform</i> Nways Campus Manager LAN for AIX V3.0, 8 mm tape Nways Campus Manager LAN for AIX V3.0, ¼ inch tape Nways Campus Manager LAN for AIX, V3.0, 4 mm tape Nways Campus Manager for AIX V3.0, CD-ROM Nways Campus Manager Suite for AIX V3.0 (5697-B06), 8 mm tape Nways Campus Manager Suite for AIX V3.0 (5697-B06), ¼ inch tape Nways Campus Manager Suite for AIX V3.0 (5697-B06), 4 mm tape Nways Campus Manager Suite for AIX V3.0 (5697-B06), CD-ROM LAN ReMon for AIX V2.0 (5697-B17), ¼ inch tape LAN ReMon for AIX V2.0 (5697-B17), 8 mm tape LAN ReMon for AIX V2.0 (Advanced) (5697-B19), ¼ inch tape LAN ReMon for AIX V2.0 (Advanced) (5697-B17), 8 mm tape
<i>Management Software for Windows Platform</i> Nways Manager for Windows V2.0 (5801-AAR) LAN ReMon for Windows V1.0 (5801-AAR)
<i>Management Software for OS/2 Platform</i> LAN Network Manager for OS/2 V2.0 (1-2 segments) (5871-AAA)
<i>Management Software for HP-UX Platform</i> Nways Campus Manager LAN for HP-UX V1.1, 4 mm tape LAN ReMon for HP-UX V1.0 (5801-AAR), 4 mm tape LAN ReMon for HP-UX V1.0 (Advanced) (5801-AAR), 4 mm tape

Target Market

The IBM 8230 is an intelligent, managed Token-Ring hub that combines low cost and high functionality. It is an ideal solution for branch offices with workgroup concentration, with or without SNMP or CMOL management. Remote sites can connect to corporate networks for data access as well as centralized network management. The 8230 can be used to provide distributed concentration for offices spanning several floors of a building using a collapsed backbone.

- Model 4A and 4P are lower priced, entry-level branch office solutions with fixed functions. They support an optional Ring-In/Ring-Out feature for growth potential from a single LAN segment to a larger, multiple LAN configuration.
- Model 213 is designed for customers who use unshielded cabling and require at least 100 meters distance between the concentrator and the attaching devices.
- Model 3 and 13 offer more flexibility and capabilities than the other 8230 models. These are targeted at customers who need a managed hub with flexible device attachments and growth options.

Q's and A's

Q) How does the IBM announcement about its agreement with 3Com to sell their Token-Ring stackable hubs affect IBM's existing Token-Ring stackable products?

A) IBM offers a high end Token-Ring stackable product (the IBM 8238) to complement the existing IBM 8230 product family, which will be enhanced. The new combined product set will allow a broader range of functional coverage for customers.

Sales Tools

The following sales tools are available for the 8230:

8230 CAU Model 3, Model 13 and Model 213 (spec sheet)	G221-4049-01
8230 CAU Model 4A and 4P (spec sheet)	G224-4433-00

Information about the IBM 8230 is available via the IBM fax-back systems.

- IBM FAX (800-IBM-4FAX, product spec sheet document # 1439, 4678, 4679)
- IBM PCC FAX (800-IBM-3395, product spec sheet document #s 10064, 10047).

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Competition

The IBM 8230 competes against stackable hubs from such major vendors as 3Com, Cabletron and Bay Networks as well as against CAU/LAMs from Madge and Olicom. The following table summarizes the strengths and weaknesses of the IBM 8230's primary competitors and how to sell against them.

	Features	Weaknesses	Selling Against
Cabletron HubStack (STH, STHi, MicroMMAC)	<ul style="list-style-type: none"> • 12 or 24 ports • bridge Interface Module • router Interface Module • offers WAN connection • optional SNMP, RMON 	<ul style="list-style-type: none"> • no ICS • no passive option • no remote LAM capability • PLL on RI/RO ports only • active circuitry on ports amplifies only, does not re-time • no CMOL support • must upgrade to MicroMMAC hardware for RMON 	<ul style="list-style-type: none"> • position against STHi • scalable port configuration, 2-90 ports • RJ-45 and ICS can be mixed in LIUs • CMOL, SNMP, RMON (four groups) • passive and active LAMs, including active remote LAM
Bay Networks 2700 Series	<ul style="list-style-type: none"> • stackable, 16 ports • optional SNMP and RMON ('SA' models) • active expansion units 	<ul style="list-style-type: none"> • no ICS • no Telenet or SLIP • must upgrade to 2715SA hardware for RMON • no CMOL support 	<ul style="list-style-type: none"> • position against version of 2700 series with no RMON • scalable port configuration, 2-92 ports • RJ-45 and ICS can be mixed via LIUs • CMOL, SNMP, RMON (four groups) • passive and active LAMs, including active Remote LAM • Bay must move to expensive 'SA' model to gain RMON
Bay Networks BayStack Token Ring Hub	<ul style="list-style-type: none"> • 24 ports • max 156 users in a full cascade configuration • max 12 hub stack/288 users across 48 separate rings • optional media adapter supports RI/RO, UTP, STP, fiber • distributed automatic beacon resolution feature • optional redundant power • Announced 10/96, available now 	<ul style="list-style-type: none"> • no ICS (IBM cabling system) • no CMOL support 	<ul style="list-style-type: none"> • Position against BayStack TR hub with no RMON • CMOL, SNMP, RMON (4 groups)

	Features	Weaknesses	Selling Against
Madge Smart CAU/ SmartLAM	<ul style="list-style-type: none"> • 20 ports • active LAMs • managed (SNMP, RMON, LNM and out-of-band) 	<ul style="list-style-type: none"> • CAU and LAM are not integrated • RMON limited to five groups 	<ul style="list-style-type: none"> • scalable port configuration, 2-92 ports • RJ-45 and ICS can be mixed via LIUs • CMOL, SNMP, RMON (four groups) • passive and active LAMs, including active Remote LAM • additional RMON support may be required
Madge SmartRAM	<ul style="list-style-type: none"> • stackable • combines CAU and LAM function • 20 ports, max 60 ports in stack • UTP, STP or fiber expansion port for direct switch connection • SNMP, IBM LNM, some RMON support 	<ul style="list-style-type: none"> • no remote LAM equivalent • limited port configurations • no RI/RO 	<ul style="list-style-type: none"> • position against 8230-4A, 4P • choice of active or passive circuitry • CMOL, SNMP, RMON (four groups)
3Com SuperStack II Hub TR (formerly the LinkBuilder FMS TR)	<ul style="list-style-type: none"> • 12 or 24 port • 260 ports in a stack • PLL active circuitry • optional redundant power • optional RMON, advanced RMON • distributed recovery intelligence • part of SuperStack solution 	<ul style="list-style-type: none"> • no passive option • no ICS • no remote LAM equivalent 	<ul style="list-style-type: none"> • position against SS Hub TR without RMON module • scalable port configuration (2-92 ports) • RJ-45 and ICS can be mixed via LIUs • CMOL, SNMP, RMON (four groups) • passive and active LAMs, including Remote LAM
Olicom CAM/LAM	<ul style="list-style-type: none"> • 10 or 20 port, max 60 ports • managed (SNMP, RMON, IBM LNM V1.1 and V2.0, out-of-band) • first to market with combined CAU/LAM • low price leader 	<ul style="list-style-type: none"> • no active LAMs • no RI/RO 	<ul style="list-style-type: none"> • position against 8230-4A, 4P • choice of active or passive circuitry • CMOL, SNMP, RMON (four groups) • RI/RO support

Key Selling Points When selling the IBM 8230, the following points should be emphasized:

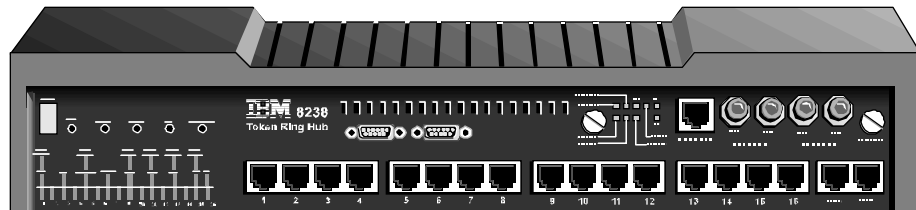
- Very scalable port configuration (2- 92 ports)
- The 8230's management options (SNMP and CMOL)
- The 8230's enhanced wiring flexibility, can be mixed in base unit
- The 8230's RMON support
- The 8230's flexible device attachment (RJ-45 and IBM data connectors)
- The 8230's network availability/recovery features
- IBM's leadership in the Token-Ring market
- IBM's customer support
- IBM's technology leadership and breadth of products

IBM 8238

Product Description The IBM 8238 Token-Ring Stackable Hub offers from 16 to 128 active or passive ports per management base. The Managed Base is the heart of the stack and provides either active or passive support for each level of management. There are three levels of SNMP management support: bronze, silver and gold. Based on these, the following types of Managed Base Models are available:

- Managed Base Models AB1 and PB1 (active bronze 1 and passive bronze 1) provide SNMP support, configuration support, status data, fault reporting on a per-port basis, ring traffic status, and support for two groups of RMON: Token-Ring statistics and ring station groups.
- Managed Base Models AS1 and PS1 (active silver 1 and passive silver 1) provide traffic monitoring on a per-port basis and support for eight groups of RMON: Token-Ring statistics, host, ring station, ring station order, ring station configuration, source routing, event, and alarm groups.
- Managed Base Models AG1 and PG1 (active gold 1 and passive gold 1) support all 13 RMON groups as well as event logging.

Expansion units are available in either active (AE1) or passive (PE1) models. Up to seven expansion units can be added to a single Managed Base.



IBM 8238 Token-Ring Stackable Hub

Positioning

The IBM 8238 is ideally suited for workgroups and remote sites where space does not permit the installation of a chassis-based hub. The manageability, fault tolerance and reliability of the 8238 provide the level of confidence required to supply critical applications from LAN to LAN across a variety of wide area networks.

Features/Functions The IBM 8238 offers the following features:

Feature	Function
Management	Three levels of SNMP management are offered with full RMON capability for superior manageability.
Optional RI/RO Modules	Does not require RI or RO modules unless the 8238 is in a main ring path with other hubs. When RI/RO modules are required, both copper and optical fiber modules are available.
Two EIA 232 Ports	Provides for simultaneous local and/or remote data terminal attachment used for network administration and service.
Instant Beacon Recovery	Provides superior fault tolerance because each hub has a chip dedicated to detecting and recovering from beaconing conditions.
Automatic Speed Detection	Reduces errors and simplifies management while helping to avoid network interruptions.
Phase Locked Loop (PLL)	Active models using PLL, re-time and repeat the signal at each port, so it is possible to support lobe lengths in excess of the maximum recommendations of wiring standards.
Lobe Cabling	Passive models support: <ul style="list-style-type: none"> • 100-ohm UTP Categories 4 or 5 up to 100 m • up to 200 m of type 1 150-ohm STP Active models support: <ul style="list-style-type: none"> • up to 100 m of Category 3 UTP • up to 225 m of Category 5 UTP or FTP • up to 400 m of type 1 150-ohm STP
Non-Volatile RAM	Vital product data such as hardware names, serial numbers and historical information can be entered into nonvolatile memory to speed problem resolution and provide asset management.
Compatibility	Compatible with the IBM 8230, 8250 and 8260 including full support for the fault-tolerant ring-wrap feature of these products.
Hot Swapping of Units	Allows physical changes to be made to the 8238 stack (add, remove, or change) without powering down the stack and without interfering with ring activity.

Management Software

Customers have several management options including out-of-band management from an ASCII terminal and/or SNMP management. For SNMP management with a graphical user interface, IBM offers management solutions depending upon the platform the customer chooses for management applications:

Platform	Management Solution
Windows	Nways Manager for Windows V2.0 (see page 81) Nways LAN Remote Monitor for Windows V1.0 (see page 88)
AIX	Nways Campus Manager LAN for AIX V3.0 (see page 85) Nways Campus Manager Suite for AIX V3.0 (see page 92) Nways Campus Manager LAN Remote Monitor for AIX V2.0 (see page 88)
HP-UX	Nways Campus Manager LAN for HP-UX V1.1 (see page 87) Nways Campus Manager LAN Remote Monitor for HP-UX V1.0 (page 88)

More information is provided regarding these management products later in this guide. See the pages referenced in the table.

8238 Products and Options

Description
8238 Passive Base - Bronze
8238 Passive Base - Silver
8238 Passive Base - Gold
8238 Active Base -Bronze
8238 Active Base -Silver
8238 Active Base -Gold
8238 Passive Expansion
8238 Active Expansion
Fiber RI/RO Module
Copper RI/RO Module
4 MB Memory Expansion
8 MB Memory Expansion
Code Download Kit
Bronze to Silver Upgrade
Bronze to Gold Upgrade
Silver to Gold Upgrade
Management Software for Windows Platform
Nways Manager for Windows V2.0 (5801-AAR)
LAN ReMon for Windows V1.0 (5801-AAR)
Management Software for AIX Platform
Nways Campus Manager LAN for AIX V3.0, 8 mm tape
Nways Campus Manager LAN for AIX V3.0, 1/4 inch tape
Nways Campus Manager LAN for AIX V3.0, 4 mm tape
Nways Campus Manager LAN for AIX V3.0, CD-ROM
Nways Campus Manager Suite for AIX V3.0, 8 mm tape
Nways Campus Manager Suite for AIX V3.0, 1/4 inch tape
Nways Campus Manager Suite for AIX V3.0, 4 mm tape
Nways Campus Manager Suite for AIX V3.0, CD-ROM
LAN ReMon for AIX V2.0 (5697-B17), 1/4 inch tape
LAN ReMon for AIX V2.0 (5697-B17), 8 mm tape
LAN ReMon for AIX V2.0 (Advanced) (5697-B19), 1/4 inch tape
LAN ReMon for AIX V2.0 (Advanced) (5697-B19), 8 mm tape
Management Software for HP-UX Platform
Nways Campus Manager LAN for HP-UX, V1.1, 4 mm tape
LAN ReMon for HP-UX, V1.0 (5801-AAR), 4 mm tape
LAN ReMon for HP-UX, V1.0 (Advanced) (5801-AAR), 4 mm tape

Target Market

The IBM 8238 is ideal for remote sites such as field offices and retail locations. It also supports new workgroups in a large facility. It is an ideal solution for customers with 16-128 users who require higher levels of management and availability.

Sales Tools

The following sales tools are available for the 8238:

8238 *Token-Ring Stackable Hub* (spec sheet) G224-4434-01

Information about the IBM 8238 is available via the IBM fax-back systems.

- IBM PCC FAX (800-IBM-3395, product spec sheet document # 10049)

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Competition

The IBM 8238 competes against stackable hubs from such major vendors as 3Com, Cabletron, Bay Networks, Madge and Olicom. The following table summarizes the strengths and weaknesses of the IBM 8238's primary competitors and how to sell against them.

	Features	Weaknesses	Selling Against
Madge Smart CAU/ SmartLAM	<ul style="list-style-type: none"> • 20 ports • active LAMs • managed (SNMP, RMON, LNM and out-of-band) 	<ul style="list-style-type: none"> • CAU and LAM are not integrated • RMON limited to five groups 	<ul style="list-style-type: none"> • scalable port configuration, 2-92 ports • RJ-45 and ICS can be mixed via LIUs • CMOL, SNMP, RMON (four groups) • passive and active LAMs, including active Remote LAM • additional RMON support may be required
Madge SmartRAM	<ul style="list-style-type: none"> • stackable • combines CAU and LAM function • 20 ports, max 60 ports in stack • UTP, STP or fiber expansion port for direct switch connection • SNMP, IBM LNM, some RMON support 	<ul style="list-style-type: none"> • no remote LAM equivalent • limited port configurations • no RI/RO 	<ul style="list-style-type: none"> • position against 8230-4A, 4P • choice of active or passive circuitry • CMOL, SNMP, RMON (four groups)
3Com SuperStack II Hub TR (formerly the LinkBuilder FMS TR)	<ul style="list-style-type: none"> • 12 or 24 ports • 260 ports in a stack • PLL active circuitry • optional redundant power • optional RMON, advanced RMON • distributed recovery intelligence • part of SuperStack solution 	<ul style="list-style-type: none"> • no passive option • no ICS • no remote LAM equivalent 	<ul style="list-style-type: none"> • position against SS Hub TR without RMON module • scalable port configuration (2-92 ports) • RJ-45 and ICS can be mixed via LIUs • CMOL, SNMP, RMON (four groups) • passive and active LAMs, including Remote LAM
Olicom CAM/LAM	<ul style="list-style-type: none"> • 10 or 20 port, max 60 ports • first to market with combined CAU/LAM • low price leader • managed (SNMP, RMON, IBM LNM V1.1 and V2.0, out-of-band) 	<ul style="list-style-type: none"> • no active LAMs • no RI/RO 	<ul style="list-style-type: none"> • position against 8230-4A, 4P • choice of active or passive circuitry • CMOL, SNMP, RMON (four groups) • RI/RO support

	Features	Weaknesses	Selling Against
Cabletron HubStack (STH, STHi, MicroMMAC)	<ul style="list-style-type: none"> 12 or 24 ports bridge Interface Module router Interface Module offers WAN connection optional SNMP, RMON 	<ul style="list-style-type: none"> no ICS no passive option no remote LAM capability PLL on RI/RO ports only active circuitry on ports amplifies only, does not re-time no CMOL support must upgrade to MicroMMAC hardware for RMON 	<ul style="list-style-type: none"> position against STHi scalable port configuration, 2-90 ports RJ-45 and ICS can be mixed in LIUs CMOL, SNMP, RMON (four groups) passive and active LAMs, including active remote LAM
Bay Networks 2700 Series	<ul style="list-style-type: none"> stackable, 16 ports optional SNMP and RMON ('SA' models) active expansion units 	<ul style="list-style-type: none"> no ICS no Telenet or SLIP must upgrade to 2715SA hardware for RMON no CMOL support 	<ul style="list-style-type: none"> position against version of 2700 series with no RMON scalable port configuration, 2-92 ports RJ-45 and ICS can be mixed via LIUs CMOL, SNMP, RMON (four groups) passive and active LAMs, including active Remote LAM Bay must move to expensive 'SA' model to gain RMON
Bay Networks BayStack Token Ring Hub	<ul style="list-style-type: none"> 24 ports max 156 users in a full cascade configuration max 12 hub stack/288 users across 48 separate rings optional media adapter supports RI/RO, UTP, STP, fiber distributed automatic beacon resolution feature optional redundant power Announced 10/96, available now 	<ul style="list-style-type: none"> no ICS (IBM cabling system) no CMOL support 	<ul style="list-style-type: none"> Position against BayStack TR hub with no RMON CMOL, SNMP, RMON (4 groups)

Key Selling Points When selling the IBM 8238, the following points should be emphasized:

- The 8238's stackable, modular design which offers flexibility and growth potential
- The 8238's SNMP and RMON management options
- The 8238's fault-tolerant features such as beacon recovery, speed detect, and hot swappable units
- The 8238's high reliability
- Compatibility with other IBM networking products such as the 8230, 8226, 8228, 8250, and 8260
- IBM's leadership in the Token-Ring market
- IBM's customer support
- IBM's technology leadership and breadth of products
- Full one-year warranty
- Free code updates for life within model level (bronze, silver, gold)

IBM EtherJet Networking Kit

Product Description The IBM EtherJet Networking Kit is a complete solution for creating an industry standard Ethernet Local Area Network. The kit is composed of an 8220-08 workgroup hub, three EtherJet 10 Mbps ISA Adapters, three 50-foot twisted pair cables, and all required documentation, including installation manuals, users guides, diskettes, and LAN AID software.

The EtherJet Kit provides a simple path to networking for a small office or organization that anticipates future growth. The EtherJet Kit will serve as the foundation for future expansion simply by adding more hubs and adapters as needs grow. All parts within the kit are also offered as standalone products.

The IBM EtherJet Networking Kit is an entry point into networking for small business owners. With everything required to create an Ethernet LAN, the kit is positioned for sale to organizations with little or no networking expertise, up to sophisticated users who seek simple, efficient LAN operations.

Features/Benefits*

Feature	Benefit*
Complete Solution	Nothing else required outside of the IBM EtherJet Networking Kit to create a Local Area Network.
Plug and Play Compatibility	No manual configuration. Hubs and Adapters auto-configure to make install and setup simple.
Expansion Capability	Add additional adapters and hubs to expand your network to meet changing needs.
Software/Operating System Support	Supports all major operating systems to provide flexibility in use of the Network Kit.

*Review features/benefits section of Sales Guides for the individual parts of the IBM EtherJet Networking Kit: 8222-008 is included in the Hub Sales Guide, EtherJet ISA Adapter is included in the Adapter Sales Guide.

Products and Options

Model
IBM EtherJet Networking Kit

Target Market

The IBM EtherJet Networking Kit is targeted for the small office and home office. The small office is defined by organizations with less than 50 people. The average small office is composed of seven people. The home office is defined as a home-based business. The EtherJet Kit can be installed by non-technical personnel, which is typical of the SOHO marketplace.

Sales Tools

The following sales tools are available:

IBM EtherJet Networking Kit(spec sheet) G224-4539-00

Information about IBM networking products is available on the Internet WWW Server via:

- IBM Networking Home Page: <http://www.raleigh.ibm.com>
- IBM PC Options Home Page: <http://www.pc.ibm.com/options>

Competition

The key competitors in the marketplace are 3Com and Hewlett Packard. Other competitors offer similar networking kits.

	IBM	3Com	HP
Model	EtherJet Networking Kit	OfficeConnect Networking Kit	Network Kit
Hub Ports	8	8	8
# of Adapters/Bus	3/ISA	3/ISA	3/PCI

*Note: Both 3Com and HP kits require an external AC power adapter. The IBM kit provides an internal, auto-ranging power supply.

Winning against 3Com:

- Stress end-to-end solutions available from IBM as a complement to the expansion capability of the IBM EtherJet Networking Kit
- Stress "clean" solution using internal power supply cord
- Stress IBM service and support

Winning against HP:

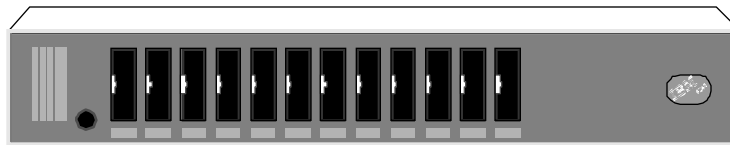
- Stress lower price of IBM solution
- Stress end-to-end solutions available from IBM as a complement to the expansion capability of the IBM EtherJet Networking Kit
- Stress "clean" solution using internal power supply cord
- Stress IBM service and support

Key Selling Points

When selling the IBM EtherJet Networking Kit, the following points should be emphasized:

- All-in-one Network Kit; nothing else required to create an Ethernet Local Area Network
- Simple, plug and play installation
- Support for all major operating systems
- Expansion capability by adding additional adapters and hubs as needs change
- IBM's customer support
- IBM's technology leadership and breadth of products

Product Description The IBM 8244 Fiber Distributed Data Interface (FDDI) Workgroup Concentrator is the primary attachment to the FDDI dual ring for attaching devices to the backbone. The 8244 allows attachment of up to 12 devices to a 100 Mbps network. The devices may be connected via multimode optical fiber or unshielded twisted pair (UTP-5) copper cable.



IBM 8244 FDDI Workgroup Concentrator

Positioning The IBM 8244 is a managed workgroup hub for environments with between 6 and 12 ports. The 8244, therefore, can be used for small, dedicated workgroups or as a backbone unit for LAN extension.

Features/Functions The IBM 8244 offers the following features:

Feature	Function
FDDI Support	Enables transmission at the rate of 100 Mbps over fiber and low-cost twisted pair cabling (UTP-5)
Plug and Play	Designed as a customer set-up hub. Allows customers to be productive quickly and easily on a high-performance 100 Mbps FDDI network.
Cabling Options	Optical fiber and copper attachments can be intermixed on the same 8244.
SMT 7.3 Support	Provides support for ISO and ANSI Station Management (SMT) 7.3 frame-based protocols.
Status LEDs	<ul style="list-style-type: none"> • 8244 status • FDDI ring status • Transmit/receive activity • Port status
Flash Memory	Enables microcode updates via software download
RS-232 Com Port	All models provide an out-of-band management capability for customization and configuration
Network Management	All models include an embedded FDDI SNMP agent for management from NetView for AIX and LNM for AIX.
Space-Saving	Fits on tabletop or rack-mountable.
Warranty	One year warranty.

8244 Products and Options

Description
8244-06F (2 fiber ring ports and 4 fiber device ports)
8244-06U (2 fiber ring ports and 4 UTP-5 device ports)
8244-12F (2 fiber ring ports and 10 fiber device ports)
8244-12U (2 fiber ring ports and 10 UTP-5 device ports)
8244-ZZZ (Fiber Expansion Kit) (2 ports)
8244-ZZZ (Copper Expansion UTP-5 Kit) (2 ports)

Management Software

Customers have several options for management of the 8244. With all models of the 8244, a V.24 terminal emulation program is provided. (Any other V.24 terminal emulation program can be used as well.) Using this terminal emulation program, one can:

- Update the microcode on the 8244
- Configure the SMT parameters
- Edit the port configurations
- Configure the IP and SNMP parameters
- Display the MAC addresses associated with the 8244

For SNMP management with a graphical user interface, IBM offers a management solution for the AIX platform. It is Nways Campus Manager LAN for AIX (see page 81).

Target Market

Since the IBM 8244 is positioned as a reliable, expandable solution for small networks, it is an ideal dedicated workgroup or backbone hub solution.

Sales Tools

The following sales tools are available for the 8244:

8244 FDDI Workgroup Concentrator (spec sheet) G221-4160-00

Information about the IBM 8244 is available via the IBM fax-back systems.

- IBM FAX (800-IBM-4FAX, product spec sheet document # 1229)
- IBM PCC FAX (800-IBM-3395, product spec sheet document # 10069)

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Key Selling Points

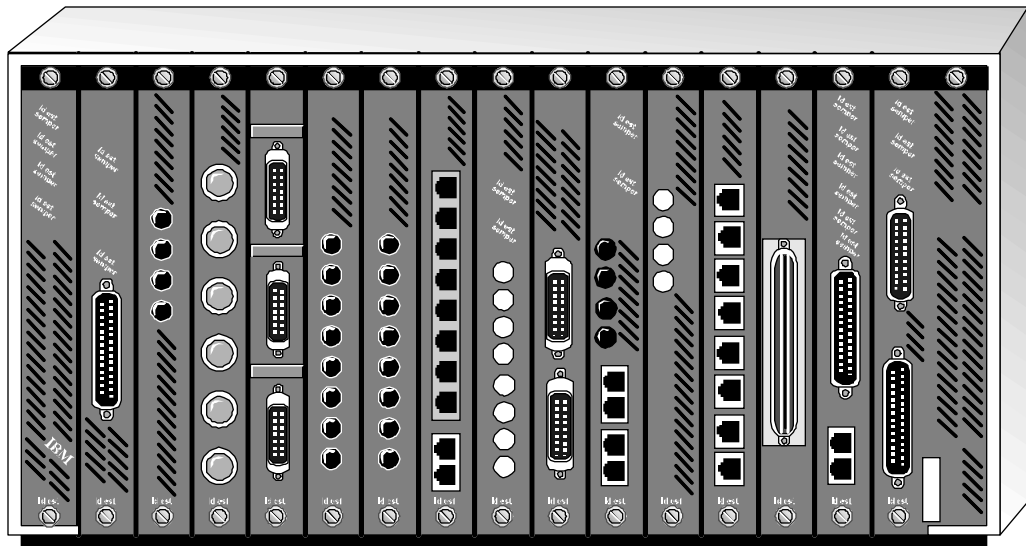
When selling the IBM 8244, the following points should be emphasized:

- The 8244's growth options with the ability to take a 6-port model and add ports as need be
- The ability to intermix cable types (fiber and UTP-5)
- The capability to manage the 8244 from NetView for AIX in conjunction with Nways Campus Manager LAN for AIX
- The 8244 is compatible with all IBM FDDI products and non-IBM FDDI products based on ANSI and ISO standards
- IBM's customer support
- IBM's technology leadership and breadth of products

IBM 8250

Product Description The IBM 8250 Intelligent Hub is a family of multiprotocol, intelligent hubs that provides connectivity for systems on Token-Ring, Ethernet and FDDI networks. In addition, the 8250 also provides routing, bridging and remote access functions as well as other specialized connectivity and management.

The IBM 8250 is a chassis hub that accepts a combination of interchangeable modules which are front-loaded into slots. These feature modules provide the functions of LAN concentration, LAN media management, hub management, bridging, routing and remote access.



IBM 8250 Intelligent Multiprotocol Hub

Two chassis sizes of the 8250 are available:

- **Model 017** is a 17-slot hub chassis in which one of the slots has to be used for the separate, fault-tolerant controller which is shipped with the chassis.
- **Model 6HC** (hidden controller), a 6-slot hub chassis, includes an integrated fault-tolerant controller, making all six slots available for plug-in feature modules. The chassis can accept a back-up power supply for fault tolerance.

Positioning

The IBM 8250 is a modular, intelligent hub designed to meet the needs of medium- to large-sized networks. Because of the flexibility of its modular architecture, customers can choose the features and capabilities they need both today and in the future.

- The **Model 017** is designed for concentration in areas with a high density of users or for linking several LANs.
- **Model 6HC** is targeted at workgroups and departments.

Support for Multiple Networks

The 8250 offers flexible support for Ethernet, Token-Ring and FDDI networks. The following table illustrates network and port density without management modules installed.

Model	017	6HC
Capacity (available slots)	16	6
Maximum ports per hub		
Token-Ring	160	60
Ethernet	384	144
FDDI	32	16
3270 Devices ¹	224	64
Maximum LANs per backplane²		
Token-Ring	7	7
Ethernet	3	3
FDDI	4	4

1. Category A devices via 8250 Token-Ring Workstation Networking Modules with 3174 features.
 2. When configuring multiple LAN types on backplane, refer to configuration table in Planning Guide

Features/Functions The IBM 8250 offers the following features:

Feature	Function
Switching	Ports or modules can be software-switched among networks. Port switching allows a customer to assign a workstation to an individual port on any network without changing wiring or reconfiguring. Module switching permits a customer to reassign a module to any network. Bank switching allows the customer to reassign clusters of users to any network.
Hot Pluggable	Modules can be installed or removed without powering down the hub or interrupting the use of the network. Modules can be installed in any position in the chassis.

Feature	Function
Fault-Tolerant Options	Prevent downtime with redundant critical components such as the controller module, management module, power supply, backup cable links.
Passive Backplane	No active components to potentially fail. Resource usage is software-defined.
Female Backplane Design	If pins are bent on the module (rather than the backplane), it is less costly to replace the module and reduces downtime for repairs.
Modular Design	Both the 6-slot and 17-slot models accept the same interchangeable feature modules, enabling customers to preserve their investment in feature modules when upgrading to the larger chassis. Modularity allows customers to customize systems and grow networks at their own pace.
Management Options	<p>Several management options are available:</p> <ul style="list-style-type: none"> •No management module installed. Run the 8250 as an unmanaged hub with segment assignments and other configuration functions controlled by DIP switches. •LAN management directly at the hub. Connect an ASCII terminal to the RS-232-C port in the management module for character-based, command-line interface. •Remote logon. Using a Telnet session to carry management traffic over the network from a TCP/IP station. •SNMP for remote management. The 8250 supports SNMP for management from a central management station. •RMON monitoring is an option for Ethernet and Token-Ring networks.
Compatibility	The 8250 is fully compatible with IBM's extensive line of network concentrators and adapters. It can be used to integrate existing LANs into larger networks by interconnecting networks currently using IBM hubs, bridges and routers.
Investment Protection	When customers decide to upgrade to the IBM 8260, they can move their 8250 feature modules unchanged into the 8260 chassis. <u>This helps protect the majority of their investment in the 8250.</u>
Automatic Update Service	(AUS) An option providing automated distribution of microcode upgrades for a three year period.
Warranty	One year warranty.

Feature Modules

IBM offers a large number of feature modules supporting a variety of LAN protocol, media, interconnection and management options. These include:

- Ethernet Modules
- Ethernet Interconnect Modules
- Ethernet Transceivers
- Token-Ring Modules
- Integrated Bridge
- FDDI Modules
- Management Modules
- Remote Access Modules

Ethernet Modules IBM offers a full range of **Ethernet Concentration Modules** to connect Ethernet segments using a variety of media and connectors.

	10BASE-T TELCO Modules	10BASE-T Modules	10BASE-FB Modules	BNC Module	10BASE-FL Modules
Port Connectors	TELCO	RJ-45	ST	BNC	ST
Ports	12 or 24	8 or 24	2 or 4	6	4
Switching Type	port, module (12-port) bank (24-port)	module (8-port) bank (24-port)	port, module	module	module
Module Media	UTP	UTP/STP (8 & 24-port) FTP/SFTP (24-port)	fiber	thin coax	fiber
Max. Distance	150 m	300 m (STP)	2 km	185 m	2 km

In addition, IBM offers two **Terminal Server Modules** for terminal connection to LAT (Local Area Transport) and TCP/IP servers. An Ethernet terminal server module provides 16 asynchronous ports which are used to attach terminals, printers, modems and other serial devices to the terminal server. The terminal server is then connected to an Ethernet network over the 8250 backplane, allowing it to provide its asynch ports with access to the services available on the Ethernet network. Also through a function called Network Protocol Translation (NPT), the terminal server can be configured to allow TCP/IP devices to access LAT services and LAT devices to access TCP/IP services. This provides LAN-based users with access to both LAT and TCP/IP resources.

Ethernet Interconnect Modules

IBM has recently introduced its new 6-port **Ethernet Interconnect Modules** for switching and bridging/routing based on the new Router Engine Module (REM).

- The 6-Port Switch is a store-and-forward switch.
- The bridge/router version is a Multiprotocol Bridge/Router for TCP/IP, IPX, SPX and DECnet Phase IV communication protocols and RIP and OSPF protocols.

The Ethernet Interconnect Modules occupy two slots in the 8250. Each module has five ports on the front panel and one port attached to the 8250 backplane. Ports are switchable among segments. Three of the front-panel ports are RJ-45 ports (two are switchable) and two (both switchable) are AUI ports.

In addition, IBM offers a **Repeater Module** that provides two AUI ports for connecting the IBM 8250 via an external transceiver to an Ethernet segment such as a thick coaxial cable of up to 500 meters. A **3-Port Transceiver Module** attaches the 8250 hub to bridges, routers, repeaters and network stations.

Ethernet Transceivers

External IBM **Ethernet Transceivers** provide Attachment Unit Interface (AUI) connectivity to the 8250 hub. They are available in fault-tolerant versions. IBM offers the following:

- 10BASE-T Transceivers (max distance 150 m on UTP)
- 10BASE-FB Transceivers (max distance 2 km)
- 10BASE-FL Transceivers (max distance 2 km)
- Fault Tolerant 10BASE-T Transceiver
- Fault Tolerant 10BASE-FB Transceiver

Token-Ring Modules

The 8250 **Token-Ring** feature modules include:

- concentration modules that handle shielded and unshielded twisted pair
- fiber and copper repeater modules for main ring connections
- interconnect or bridge modules that provide Source Routing (SR) and Source Routing Transparent (SRT) between Token-Ring segments
- the Token-Ring Workstation networking module which is functionally similar to the 32-port 3174-23R

The Token-Ring concentration modules are summarized below.

	20-Port Media Module	18-Port Active Media	Fiber Repeater	Copper Repeater
Data Rate (Mbps)	4 or 16	4 or 16	4 or 16	4 or 16
Ports/Lobe Connectors	20 Shielded RJ-45	18 Shielded RJ-45	2 2RJ-45, copper; 2RJ-45 STP RI/RO	4 Shielded RJ-45
Maximum Modules: ports (6-slot hubs) ports (17-slot hubs)	2; 40 (60 ¹) 7; 140 (160 ¹)	2; 36 (54 ¹) 7; 126 (144 ¹)	5; 10 (12 ¹) 15; 30 (32 ¹)	5; 20 (24 ¹) 15; 60 (64 ¹)
Max Lobe Cable: 4Mbps rings STP 4Mbps rings UTP 16Mbps rings STP 16Mbps rings UTP	350 m 175 m (Cat 4,5) 125 m (Cat 3) 175 m 100 m (Cat 4)	800 m 425 m (Cat 4,5) 250 m (Cat 3) 400 m 225 m (Cat 5) 210 m (Cat 4/120 ohm) 100 m (Cat 3)	275 m 100 m 130 m 100 m	375 m 100 m 175 m 100 m
LEDs port status backplane status ring status	yes yes no	yes yes no	yes yes yes	yes yes yes

1. Without Management Module installed

The **3174 Module** attaches directly to the Token-Ring on the 8250 backplane and connects 3174 Category A devices or PCs. It can be configured as a Token-Ring gateway to a remote host. This module provides operational consistency with existing 3174s and other 8250 modules while exploiting the high availability and space savings of the 8250 hub. Enhancements to this module include static routing between a LAN and a Frame Relay network for TCP/IP devices, support for TN3270 protocol, support for SNMP MIB-II, and support for printers using the Line Printer Daemon. The **Frame Relay Communications Option for the 3174 Workstation Networking Module** supports source-route remote bridging to attach remote Token-Ring and peer communication segments via a Frame Relay network.

Integrated Bridge The 8229 Integrated Bridge Module is a two-port bridge which connects a Token-Ring segment on the hub backplane to either a Token-Ring segment or an Ethernet segment. Source Routing (SR) and Source Route Transparent (SRT) bridging are supported for Token-Ring bridging. Source Route Translational Bridging (SRTB) is supported for Token-Ring-to-Ethernet bridging. This bridge occupies two slots in the 8250. For more information about the 8229's capabilities, refer to the *IBM Bridge/Router Sales Guide*.

FDDI Modules **FDDI media modules** are designed to connect single (SAS) or dual (DAS) attached workstations to a FDDI network that uses STP, UTP or fiber-optic cabling with standard ST or MIC connectors. Each module provides 8 ports and requires 2 slots in the 8250 hub. Four modules (32 ports) can be installed in a 17-slot hub and two modules (16 ports) can be installed in a 6-slot hub.

	FDDI Fiber Modules	FDDI UTP Module
Connectors	8 ST- or MIC-type	8 RJ-45
Switching	module	module
Media	62.5/125 or 50/125 multimode fiber optic	IBM Type 1, 2, 6 or 9; cat 5 (UTP)
Data Rate	125 Mbps (100 Mbps at data link)	125 Mbps (100 Mbps at data link)
Maximum Modules	32	32
Max. Distance Between Stations	2 km	100 m ¹
Max. Network Distance	200 km	200 km
Max. Attenuation	11 dB	11 dB
Backplane Interface	96-pin edge connector of 8250 Hub	96-pin edge connector of 8250 Hub
Standards Supported	ANSI X3.166: 1990 FDDI Physical Layer; Medium Dependent; ANSI X3.148: 1988 FDDI Token-Ring Physical Layer Protocol; ANSI X3.139: 1988 FDDI Token-Ring Media Access	
LEDs	port status, module status software download status, slave or redundant backup	port status, module status software download status, slave or redundant backup

1. Type 1 and Type 2=100 m; Type 6=75 m; Type 9=67 m; UTP category 5 = 100 m.

Management Modules

These are recommended to provide a host of functions for monitoring, collecting statistics and operating the networks. Each management module implements an SNMP agent with a full set of SNMP objects and options for hub and media management from a central SNMP manager. There are basic and advanced management modules which offer the following management functions:

- The **Basic Ethernet Management Module** provides: in-band and out-of-band management, dynamic network control to module/port/bank, remote configuration of modules/concentrators, automatic detection of faults/failures and continuous monitoring/reporting of key network statistics. The **Ethernet Advanced Management Module** offers fault tolerance, port security, network-wide error monitoring and support for in-band download of new software.
- The **Basic TRMM** (Token-Ring Management Module) offers the following capabilities: configurations, fault statistics monitoring, security control, in-band/out-of-band downloads, SNMP support, remote login support, topology mapping and beacon recovery capability. The **Advanced TRMM** (Token-Ring Management Module) offers the features of the basic module plus real-time performance monitoring, alarms, time-of-day security, and RMON support (10 groups).
- The **FDDI Management Module** (FMM) is a double slot module with an FDDI medium access control (MAC). Two ports are provided for uplink connections to another 8250 hub, to an IBM 8244 FDDI concentrator or to a non-IBM FDDI hub. An optical bypass switch bypasses the 8250 hub in the event of a local power failure. Other capabilities include: support for FDDI systems management team (SMT 7.3); SMT access (read-write or read-only) from remote SMT stations; and, real-time monitoring and control of one FDDI ring. Two types of FMM are available: multimode FMM and single mode FMM.

IBM also offers the **8250 Ethernet RMON Probe Module** which lets network managers get up-to-the-minute, detailed network status. This module fully supports RFC 1757 RMON standard as well as the system and interface groups of MIB-II. The Probe is an integrated network monitor that supports all three 8250 Ethernet backplane networks. It can be used as a combination network analyzer/hub monitor, eliminating the need for a separate network analyzer.

Remote Access Modules

Ethernet and Token-Ring **8235 Remote Access Modules** (functionally equivalent to the IBM 8235 Models 021/022) are available to support remote PC users who want dial-in access to the network. These modules (with the latest software Release 4.0) offer dial-in, dial-out, fax-out and LAN-to-LAN routing in complex environments. Dial-in support for the following clients is provided: DIALs for OS/2, DOS and Windows; ARA 2.0 supporting AppleTalk on Ethernet; Macintosh and UNIX/AIX-based workstations using SLIP or PPP; and Windows 95 and Windows NT 3.5. The 8235 modules support dial-out for DOS and Windows-based asynchronous dial-out applications using the 8235 Dial-out client software. These modules support LAN-to-LAN routing for IP, IPX and AppleTalk (on Ethernet) protocols with connection established from Windows-based LAN workstations using the 8235 LAN connect software. Data compression improves throughput. For more information about the 8235's capabilities, refer to the *IBM Remote Access Sales Guide*.

Management

Software

Customers have several management options including out-of-band management from an ASCII terminal, remote logon via Telnet and SNMP management. For SNMP management with a graphical user interface, IBM offers management solutions depending upon the platform the customer chooses for management applications.

Platform	Management Solution
AIX	Nways Campus Manager LAN for AIX V3.0 (see page 85) Nways Campus Manager Suite for AIX V3.0 (see page 92) Nways LAN Remote Monitor for AIX V2.0 (see page 88)
Windows	Nways Manager for Windows V2.0 (see page 81) Nways LAN Remote Monitor for Windows V1.0 (see page 88)
HP-UX	Nways Campus Manager LAN for HP-UX V1.1 (see page 87) Nways LAN Remote Monitor for HP-UX V1.0 (see page 88)

More information is provided regarding these management products later in this guide. See the pages referenced above.

8250 Products and Options

Description
8250 Hub Chassis Model 017 Model 6HC Fault Tolerant Controller Module Backup Power Supply, 6 Slot Backup Power Supply, 17-slot Universal Code Download Kit
Ethernet Modules 10BASE-T, 8-port, RJ-45 Connector, Module Switch 10BASE-T, 12-port, Telco Connector, Module Switch 10BASE-T, 12-port, Port Switching, Telco Connector 10BASE-T, 24-port, Telco Connectors (2), Bank Switch 10BASE-T, 24-port, RJ-45 Connector, Bank Switch 3-port AUI Transceiver, Port Switching 2-port AUI Repeater, Port Switching 4-port 10BASE-FB, ST Connector, Module Switching 4-Port 10BASE-FB, ST Connector, Port-Switching 2-Port 10BASE-FB, ST Connector, Port-Switching 4-port 10BASE-FL, ST Connector, Module Switching 6-port BNC Connector, Module Switching TCP/IP-LAT Terminal Server, 16-port Terminal Server TCP/IP-LAT/TN3270 AUS TCP/LAT/TN3270 Single AUS Enet Terminal Server Single 10BASE-T 12-Port Security Module, Telco Connector, Module Switching

Description
Basic Ethernet Management Module, V4.2 Advanced Ethernet Management Module, V4.2 Ethernet Management Module Basic Update to V4.2 Ethernet Management Module Advanced Update to V4.2 AUS Ethernet Management Module Basic Single AUS Ethernet Management Module Basic Site AUS Ethernet Management Module Advanced Single AUS Ethernet Management Module Advanced Site Ethernet RMON Probe Module Ethernet RMON Probe AUS
Ethernet Transceivers (external) 10BASE-T Transceiver 10BASE-T Fault-Tolerant Transceiver 10BASE-FB Transceiver, ST Connector 10BASE-FB Fault Tolerant Transceiver, ST Connector 10BASE-FL Transceiver, ST Connector
Token-Ring Modules 18-port Active Module, RJ-45 Connector 20-port MAU, RJ-45 Connector Fiber Repeater Module, RI/RO ST, RJ-45 Connector TR Copper Repeater Module Token-Ring Workstation Networking Module with 3174 Features Frame Relay Option for 3174 Workstation Net. Module Basic Token-Ring Management Module V4.0 (TRMM) Advanced TR Management Module V4.0 (TRMM), (RMON support) TRMM Update from Basic to Advanced (daughter card only) TRMM Update to V4.0 (Basic or Advanced with 2MB SIMM) TRMM Update to V4.0 (Basic or Advanced without 2 MB SIMM), (RMON support for Advanced) AUS TR Management Module Basic, Single AUS TR Management Module Basic, Site AUS TR Management Module Advanced Single AUS TR Management Module Advanced Site
8229 Integrated Bridge Module 8229 TR to Enet SRTB Module 8229 Token-Ring SR Module 8229 Token-Ring SR/SRT Module 8229 Token-Ring SR to SRT Upgrade 8229 Ethernet SRTB AUS (Single) 8229 Token-Ring SR AUS (Single) 8229 Token-Ring SR/SRT AUS (Single)
Ethernet Interconnect Modules 2-port Ethernet Bridge 6-port Switch (REM) Module 6-port B/Router Module 6-port Bridge (REM) Module AUS (single) 6-Port B/Router Module AUS (single)

Description
<p>FDDI Modules 8-port UTP Media Module 8-port ST Media Module 8-port MIC Media Module FDDI Management Module (FMM), Multi-Mode FDDI Management Module (FMM), Single Mode AUS FMM Multi-Mode (single) AUS FMM Single Mode (single)</p>
<p>Remote Access Modules Ethernet 8235 Module Release 4.0 AUS Ethernet 8235 Module, Single AUS Ethernet 8235 Module, Site TR 8235 Module Release 4.0 AUS TR 8235 Module, Single AUS TR 8235 Module, Site</p>
<p>Management Software for Windows Platform Nways Manager for Windows V2.0 (5801-AAR) LAN ReMon for Windows V1.0 (5801-AAR)</p>
<p>Management Software for AIX Platform Nways Campus Manager LAN for AIX V3.0, 8 mm tape Nways Campus Manager LAN for AIX V3.0, 1/4 inch tape Nways Campus Manager LAN for AIX V3.0, 4 mm tape Nways Campus Manager LAN for AIX V3.0, CD-Rom Nways Campus Manager Suite for AIX V3.0, 8 mm tape Nways Campus Manager Suite for AIX V3.0, 1/4 inch tape Nways Campus Manager Suite for AIX V3.0, 4 mm tape Nways Campus Manager Suite for AIX V3.0, CD-Rom LAN ReMon for AIX V2.0 (5697-B17), 1/4 inch tape LAN ReMon for AIX V2.0 (5697-B17), 8 mm tape LAN ReMon for AIX V2.0 (Advanced) (5697-B19), 1/4 inch tape LAN ReMon for AIX V2.0 (Advanced) (5697-B19), 8 mm tape</p>
<p>Management Software for HP-UX Platform Nways Campus Manager LAN for HP-UX V1.1, 4 mm tape LAN ReMon for HP-UX V1.0 (5801-AAR), 4 mm tape LAN ReMon for HP-UX V1.0 (Advanced) (5801-AAR), 4 mm tape</p>

Target Market

The 8250 is targeted at medium to large networks where the following characteristics are present:

- a heterogeneous hub is appropriate
- the network infrastructure is mixed
- multiple network segments are desired in a single chassis
- configuration/reconfiguration flexibility is important (such as module/port switching, configuration switching via software and no port/slot restrictions)
- redundancy and fault tolerance are key requirements
- value-add LAN access functions need to be integrated into a hub
- a congested wiring closet

**Handling Sales
Objections**

The IBM 8250 does not offer the extensive bridging and router capabilities that competitors do.

While it offers an adequate variety of internetworking modules including the new Ethernet Interconnect Modules, IBM maintains that large routers or bridges should not be on the 8250 modules. A hub is a local area, not a wide area product. Customers should not pay a premium for internetworking capabilities that should be part of a separate product.

Q's and A's

Q) Can 3Com modules be used with the IBM 8250?

A) Yes, because these hubs are the result of shared technology, 3Com modules (such as a router) can be used in the IBM 8250.

Sales Tools

The following sales tools are available for the IBM 8250:

8250 Multiprotocol Intelligent Hub Family G520-6945-01

8250 Intelligent Hub Products G511-1825-00

8250 Multiprotocol Intelligent Hubs (spec sheet) G221-3454-02

Information about the IBM 8250 is available via the IBM fax-back systems.

- IBM PCC FAX (800-IBM-3395, product spec sheet document #s 11404, 11403, 11401, 11042, 11041)

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Competition

The IBM 8250 competes against mid-range and enterprise hubs from such major vendors as Cabletron and Bay Networks. The following table summarizes the strengths and weaknesses of the IBM 8250's primary competitors and how to sell against

	Strengths	Weaknesses	Selling Against
Bay Networks System 3000 System 3030	<ul style="list-style-type: none"> • 4, 12 slot chassis • Optivity network mgt. industry standard. Support for <ul style="list-style-type: none"> - SunNet Mgr - OpenView and - NetView for AIX • Different backplanes provide: <ul style="list-style-type: none"> - Ethernet only - Ethernet & Token-Ring - Enet, TR & FDDI • 5 Ethernet segments 2 Token-Ring segments 3 FDDI segments • joint development of "tank circuitry" with IBM • hardware-based wrong speed detector for TR • Basic, Advanced, Advanced Analyzer (RMON) network mgt. options 	<ul style="list-style-type: none"> • redundant power requires 3 slots of 12 slot chassis • active relays for TR backplane • male pins on backplane: not recommended for "hot swap" • requires media dependent management module • no management module redundancy • slot dependencies force different management modules per segment with divider • no Ethernet per port switching • power supply summing module single point of failure (no redundancy) • configuration information stored in volatile RAM (BOOTP support only) • low TR port density • no migration path to 5000 	<ul style="list-style-type: none"> • 6, 17 slot chassis • Ethernet per port switching • RMON capabilities <ul style="list-style-type: none"> - Ethernet all 9 groups - TR 10 groups (TRMM V4.0) • chassis includes 1 power supply and controller module. Bay Networks' priced separately • Stress warranty and 24x7 service and maintenance included in price • superior 10BASE-FB/FL support • investment protection – migration path to 8260 • slot position independent • system fault tolerance (power supply, controller modules, management modules)

	Strengths	Weaknesses	Selling Against
Cabletron MMAC	<ul style="list-style-type: none"> • 3, 5, 8 slot • redundant power on 5, 8 • 6-port Ethernet switching ES/MIM • BRIM (Bridge/Routing Interface Module) provides ATM connectivity (155 Mbps) • partner with Cisco for routing technology as well as inhouse technology • partner with Fore for ATM and working on own technology • Token-Ring per port switching • Synthesis switched networking strategy (VLANs, SecureFast switching, Virtual Networking Services) • very extensive product line; number of modules and features (100+ modules) • Spectrum- 3rd in network management market share (artificial intelligence engine and alert correlation capability) • STRONG SNA and TR campaign (Token-Ring pps, BlueVision, Channel attach, SDLC to LLC2) • strong FDDI products 	<ul style="list-style-type: none"> • active relays for TR backplane • no redundant management • slot dependency • no Ethernet per port switching • performance issues EMM-E6 • requires one retiming module per Ethernet segment • often miss ship dates • limited migration path to MMAC-Plus (BRIMs only) 	<ul style="list-style-type: none"> • 6, 17 slot chassis • Ethernet per port switching • RMON capabilities <ul style="list-style-type: none"> --Ethernet all 9 groups --TR 10 groups (TRMM V4.0) • chassis includes 1 power supply and controller module; Cabletron's priced separately • stress warranty and 24x7 service and maintenance included in the price • investment protection - migration path to 8260 • slot position independent • system fault tolerance (power supply, controller modules, management modules)

Key Selling Points When selling the IBM 8250, the following points should be emphasized:

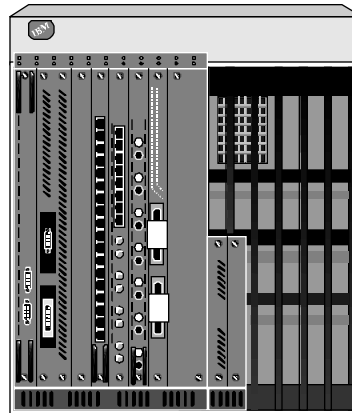
- The 8250's system fault tolerance
- The 8250's switching capability (port, bank and module switching)
- The 8250's hot pluggable and position independent modules
- The 8250's backplane design (female connectors and passive backplane)
- The 8250's RMON support (Token-Ring and Ethernet)
- The strength of management module functions
- The IBM management software available for the 8250
- Investment protection offered by the 8250 (modules can be used in 8260)
- The automatic update service of the 8250
- The warranty is on a "per hub" basis and not on a "per module" basis as with some of the 8250's competitors
- The 8250 is compatible with all current IBM networking products
- IBM's customer support and service
- IBM's technology leadership and breadth of products

**Product
Description**

The IBM 8260 Nways Multiprotocol Switching Hub is an intelligent hub that supports Ethernet, Token-Ring, FDDI and ATM networks. It comes in two chassis sizes:

- **Model 017** has 17 slots (all 17 are available for use). The Redundant Fault-Tolerant Controllers do not require a slot. They're hot-pluggable and front-loadable into special compartments outside the slot area. This model is field-upgradable to be ATM and Packet Channel ready.
- **Model 010** is a compact, 10-slot version that has the same state-of-the-art characteristics as the 17-slot model. It is also field-upgradable to be ATM and Packet Channel ready.

The IBM 8260 offers the best features of the IBM 8250 including fault-tolerance, an advanced passive backplane architecture, powerful management features, slot independence and hot-pluggability. In addition to these common features, the IBM 8260 offers new capabilities such as ATM networking, the 8260 Intelligent Power System, the 8260 Distributed Management design and additional LAN segments. The 8260 can also be equipped with the Packet Channel to accommodate the "Switching Modules Series" of Modules.

**IBM 8260 Nways Multiprotocol Switching Hub Model 010****ATM Models**

Two ATM-ready models of the 8260 are available. These are the:

- **Model A17 hub**, a 17-slot chassis with an integrated ATM backplane in addition to the 8260 and 8250 backplanes for Ethernet, Token-Ring and FDDI. For ATM operation, a combined ATM Switch/Control Point Module and at least one ATM Concentration Module must be installed. A maximum of 14 ATM Concentration Modules may be installed.
- **Model A10 hub**, a 10-slot chassis with an integrated ATM backplane in addition to the 8260 and 8250 backplanes for Ethernet, Token-Ring and FDDI. An ATM Switch/Control Point module and up to 8 ATM concentration modules can be installed.

Switching Module Series

Three Packet Channel-ready models of the 8260 are available. These are the:

- **Model P17** hub, a 17-slot chassis with an integrated Packet Channel backplane in addition to the 8260 and 8250 backplanes for Ethernet, Token-Ring and FDDI. A maximum of 204 ports of switched Ethernet may be installed in a P17.
- **Model P10** hub, a 10-slot chassis with an integrated Packet Channel backplane in addition to the 8260 and 8250 backplanes for Ethernet, Token-Ring and FDDI. A maximum of 120 ports of switched Ethernet may be installed in a P10.
- **Model G17** hub, a 17-slot chassis with an integrated ATM and Packet Channel backplane in addition to the 8260 and 8250 backplanes for Ethernet, Token-Ring and FDDI. A maximum of 144 ports of switched Ethernet may be installed in a G17.

Positioning

The IBM 8260 is positioned as the strategic platform for next-generation, high-speed enterprise networks. It is an extension of proven 8250 architecture offering high port capacity, port-switching for workgroup support and an ATM networking vehicle. These features make the IBM 8260 suitable for the high-speed, highly managed networks needed for mission-critical and client-server applications requiring nonstop operation.

Features/Functions The IBM 8260 offers the following features:

Feature	Function
Greater LAN Capacity	Model 017/A17/G17 supports up to 17 Token-Ring, 8 Ethernet or 8 FDDI networks per backplane and 1 ATM network. The maximum number of independent segments supported are 96 Ethernet and 160 Token-Ring.
Fault Tolerant Options	Redundant units can be installed for any module including the fault-tolerant controller. Redundant mode for power is also an option.
Intelligent Power System	The 8260 operates continually with the intelligent control of power and cooling. The fault-tolerant controller provides clock generation, power supply monitoring and management, and environmental control. Up to four power supplies can be added. Intelligent Power System dynamically distributes the load evenly between the power supplies. Redundant mode assures that no single point of failure can bring the system down.
Distributed Management Design	<ul style="list-style-type: none"> • Management functions that relate to the physical resources (configuration, SNMP agent for hub, power management, in-band and out-of-band management) are performed by the 8260's Distributed Management Modules (DMM). • LAN-specific management functions (RMON support, monitoring and collecting statistics) are incorporated in Media Access Control (daughter cards) plugged into a media module, not a hub slot.

Feature	Function
Advanced LAN Backplane Architecture	<ul style="list-style-type: none"> Includes passive backplane for reliability. Clocking and relays are on the individual modules, not on the hub to prevent single point of failure from bringing down the entire hub. Design enhanced with an increased number of backplane LANs and new capability for isolated LANs.
Slot Independence	Any slot can accept any type of module.
Hot-Pluggability	Modules are inserted/removed without shutting down the hub or any part of the system. Power supplies and fans are hot-pluggable. Modules are checked before power-up for power budget.
Management Options	<ul style="list-style-type: none"> Allows LAN management directly at the hub through connection of an ASCII terminal to the RS-232-C port for command line interface, locally or through a modem. Can manage from a Telnet session with a remote login. SNMP management is possible from a central station or from the RS-232 through SLIP.
RMON Support	8260 provides RMON support for Ethernet and Token-Ring remote monitoring.
ATM Migration	Provides a smooth migration path to ATM networking while preserving existing LANs. Models A17/A10 come with an ATM backplane and existing Models 017s and 010s are field upgradable.
Modular Design	Modularity allows customers to customize systems and grow networks at their own pace.
Easy Upgrades	By accessing the IBM Website, customers can receive easy microcode upgrades. Upgrades can be downloaded from the IBM networking site at http://www.raleigh.ibm.com/826/826fix.html
Investment Protection	The feature modules from the 8250 can be used unchanged in the 8260. This protects the majority of the investment in the 8250 when upgrading to an 8260.
Switched Ethernet and FDDI Support	Switching Modules that maximize network performance by reducing backbone congestion and eliminating bandwidth overload. Models P17/P10 come with the Packet Channel and existing 017/010s are field upgradable.
Warranty	One year warranty.

Feature Modules

- 8260 Token-Ring Modules
- 8260 Ethernet Modules
- 8260 Management Modules
- 8260 Interconnect Modules
- 8260 ATM Modules
- 8260 ATM WAN Modules
- 8271 and 8272 LAN Switch Modules for the 8260
- 8260 Switching Module Series
- 8260 Video Distribution Module
- Any IBM 8250 Feature Module
- FiberCom ATM Circuit Emulation Card

8260 Token-Ring Modules

The **Token-Ring modules** for the 8260 include several media modules that offer per-port switching, beacon recovery and speed-detect. These media cards can host daughter cards such as the **Jitter Attenuator Card (JAC)** and the **Token-Ring Media Access Control (TMAC)** for enhanced management and control. The JAC is designed to ensure that the amount of jitter entering the 8260's backplane is minimized. This reduction in jitter allows a customer to have longer lobe distances and a higher number of devices per ring segment. A JAC is always required on the trunks (copper or fiber) of the 8260, when the 8260 will be connected to another non-8260 hub.

The TMAC enables statistics to be gathered about the Token-Ring segment to which it is attached and transmits this information to the Distributed Management Module (DMM). The TMAC supports seven RMON groups as well as the IBM added value function, such as Configuration Report Server (CRS) and Ring Error Monitor (REM).

The **High-End Token-Ring MAC Card (HTMAC)** is a new Token-Ring daughter card that supports the full set of 13 Token-Ring RMON groups. The card has a single network interface and can be placed on any of the 8260 Token-Ring media modules using the same daughter card position at the TMAC. It can be used to monitor any Token-Ring backplane or isolated segment or, when placed on a module with the module switching feature, it is assigned to the same network as the module. It offers a superset of the same functions as the TMAC, providing for outstanding network management and monitoring.

Like the TMAC card, the IBM value added functions of CRS and REM are embedded on the card, as well as the Enterprise Communication Analysis Module (ECAM) for layer 3 protocol analysis. By adding the capability to run these advanced monitoring applications via the Dynamic Load of Applications Module (DLM), these embedded functions can be accessed without interrupting the ongoing function of the card. This simplifies troubleshooting by allowing network operators to tune the network and view intranet traffic beyond the current RMON standard

	18-Port Active Media Module	20-Port Passive Media Module	Dual Fiber Repeater Module	18-Port Per Port Switching Module
RJ-45 Connectors	1	20	10	18
RI/RO Ports	optional RI/RO copper	N/A	2 sets of RI/RO fiber	optional RI/RO copper
Port Switching	backplane or isolated	backplane or isolated	backplane or isolated	backplane or isolated
Switching Type	per-module	per-module	per-port	per-port
Segments Supported	10 possible on backplane and 1 possible isolated	10 possible on backplane and 1 possible isolated	10 possible on backplane and 11 possible isolated	10 possible on backplane and 11 possible isolated

	18-Port Active Media Module	20-Port Passive Media Module	Dual Fiber Repeater Module	18-Port Per Port Switching Module
Module Media	UTP or STP	High-grade UTP or STP	UTP or STP	UTP or STP
Ring Speeds	4 or 16 Mbps	4 or 16 Mbps	4 or 16 Mbps	4 or 16 Mbpsd
Maximum Users	288	320	250	288
Maximum Lobe Distance at 16 Mbps with UTP	100 m (category 3) 210 m (category 4) 225 m (category 5)	100 m (category 4) 100 m (category 5)	100 m (category 3) 210 m (category 4) 225 m (category 5)	100 m (category 3) 210 m (category 4) 225 m (category 5)
Optional Daughter Cards	Token-Ring MAC Token-Ring Jitter	Token-Ring MAC	Token-Ring MAC Token-Ring Jitter (up to 2 Jitter cards)	Token-Ring MAC Token-Ring Jitter
LED Indicators	port status, module status, RI/RO status, jitter attenuator status	port status and module status	port status, module status, RI/RO status, jitter attenuator status	port status, module status, RI/RO status, jitter attenuator status
Active DPLL	per-port	per-module	per-port	per-port

to full seven layer data collection.

8260 Ethernet Modules

The **IBM 8260 Ethernet media cards** offer per-port switching for creating more highly segmented networks and supporting a broad range of media and connectors. An **Ethernet security daughter card** is available that offers intrusion protection and eavesdropping protection with no performance impact. The **Ethernet Media Access Control (EMAC)** is another daughter card that can reside on the Ethernet media module or the DMM. The EMAC enables statistics to be collected about the Ethernet segment to which it is attached. The High-End Ethernet MAC Card (HEMAC) is a daughter card that can reside on an Ethernet media module or the DMM. The HEMAC provides two network interfaces allowing one to monitor up to two Ethernet networks simultaneously. The HEMAC provides full RFC 1271 RMON support in addition to going beyond the current RMON standards to provide full seven layer data collection. The EMAC supports the RFC 1271 RMON standard and provides support for seven RMON groups. The modules on the following page are for 10BASE-T.

	24-Port 10BASE-T	10-Port 10BASE-T	20-Port 10BASE-T	40-Port 10BASE-T	36-Port 10BASE-T
Port Connectors	TELCO	ST, FC or SMA	RJ-45	RJ-45	TELCO
Port Switching	backplane or isolated	backplane or isolated	backplane or isolated	backplane or isolated	backplane or isolated
Switching Type	per-port	per-port	per-port	per-port	bank switching
Segments Supported	6 concurrently from 8 possible on backplane and 8 possible isolated	10 concurrently from 8 possible on backplane and 4 possible isolated	8 concurrently on backplane and 8 isolated	8 concurrently on backplane and 8 isolated	3 concurrently from 8 backplane and 8 isolated
Module Media	UTP	Fiber	UTP, STP, FTP	UTP, STP, FTP	UTP, STP
Maximum Distance	150 m 150 m (UTP-4) 150 m (FTP-5, SFTP-5) 200 m (STP-1, 2)	2 km link 4 km network	125 m (UTP-3) 150 m (UTP-4) 150 m (FTP-5, SFTP-5) 200 m (STP-1, 2)	125 m (UTP-3) 150 m (UTP-4) 150 m (FTP-5, SFTP-5) 200 m (STP-1, 2)	100 m UTP 100 m STP
Optional Daughter Cards	Ethernet MAC Ethernet Security	Ethernet MAC Ethernet Security	Ethernet MAC Ethernet Security	Ethernet MAC Ethernet Security	Ethernet MAC Ethernet Security
LED Indicators	port status, port activity, module status	port status, port activity, module status link redundancy	port status, port activity, module status	port status, port activity, module status	port status, port activity, module status

The **Ethernet Modular Board** is a single-slot media module that allows customers maximum mix and match flexibility. This module accepts up to four of any of the following I/O cards:

- 2-port 10BASE-FB/FL with ST connectors
- 2-port 10BASE-FB/FL with FC connectors
- 2-port 10BASE-FB/FL with SMA connectors
- 4-port 10BASE-T with RJ-45 connectors
- 3-port 10BASE2 with BNC connectors
- 3-port 10BASE5 with male AUI connectors
- 3-port 10BASE5 with female AUI connectors

Each port on the **Ethernet Modular Board** is switchable under software control to any 8260 backplane segment or up to eight isolated networks. The module maintains its own inventory and power management information in nonvolatile RAM. It also supports two daughter cards.

8260 Management Modules The **Distributed Management Module (DMM)** supports all LAN types simultaneously and performs all hub and media management functions. IBM has recently announced the **Advanced DMM/Controller** module that saves a payload slot in the 8260 by integrating the DMM functionality and controller on a module that uses a controller slot. This new module includes two frontal RS-232C ports for management from a local console or remote access via Telnet. The **DMM/Controller** module comes with 8 MB of memory and is field upgradable for future DMM functions. This new DMM is compatible with the existing DMM. The **DMM/Controller Module** should be considered in situations where there are slot constraints in the 8260. Only one is required per hub. LAN-specific management tasks are performed by daughter cards called **Media Access Control**. These daughter cards fit on the media modules or up to six EMACs can fit on the DMM with Ethernet carrier. They provide in-band communication and segment management. One daughter card is suggested per managed segment.

8260 Interconnect Modules These modules provide local bridge/routing functions in the 8260 chassis, with connectivity to Ethernet and Token-Ring networks.

8260 ATM Modules These modules add ATM capability to the IBM 8260 Models A10, A17 or G17. An ATM backplane can be used to upgrade an existing IBM 8260 Model 017 or Model 010 to ATM, or a customer can purchase the ATM-ready models A17 and A10. The ATM backplane is a dedicated set of connections that provides the high-speed interface between ATM devices or concentration modules in the 8260 and the ATM Switch/Control Point.

- The **ATM backplane** supplements the existing 8260 backplane and serves all of the slots of the 8260 hub A17, A10 or G17. Thus, a customer can interconnect ATM modules on the ATM backplane while connecting other types of networks over the standard 8260 backplane. ATM is configured as a star topology with the Switch/Control Point Module as the nucleus and two stars of dedicated connections available.
- The **ATM Switch/Control Point Module** integrates the ATM cell-switching functions and network control functions. This is a two-slot module with an aggregate throughput of 8 Gbps.
- The **ATM 622 Mbps Module** is a 2-slot module with one 1-port I/O card available in single-mode and multimode fiber versions with SC connector interface. By providing speeds of 622 Mbps, it provides a solution for large ATM backbone networks where ATM switches concentrate a growing number of 155 Mbps links, requiring the connections between the switches to answer to higher traffic requirements.
- The **FiberCom ATM Circuit Emulation Card (ACE)** is a plug-in board for the 1-slot ATM carrier module that provides circuit emulation services over ATM. The ACE card is available from Litton FiberCom. Developed and tested under the IBMATMKit, the boards are available in structured or unstructured E1 or T1 versions, with 4 or 8 physical ports. The channels are segmented using AAL-1 circuit emulation methods and placed over ATM permanent virtual circuits with a constant bit rate (CBR) quality of service.

- **4-Port 100Mbps ATM Fiber Concentration Module with MIC Connector**
- **4-Port 100Mbps ATM Fiber Concentration Module with SC Connector**
- **ATM 12-Port 25.6 Mbps Concentration Module** is a single slot, 12-port, 25.6 Mbps module. This module provides an excellent way to bring ATM support to workgroups at a cost comparable to other high speed technologies.
- The **1-Port ATM 155 Mbps I/O MMF card** fits on any ATM 12-port 25 Mbps Module and allows users to attach one ATM 155 Mbps port using multimode fiber. This allows customers to add new servers or install backbone link redundancy in the desktop environment at a more competitive price than buying a 2 or 3 port ATM 155 Mbps module.
- **Nways ATM Flex 155-Mbps Media Module** is a single slot, 2 or 3 port 155-Mbps concentration module with feature I/O cards for multimode/single-mode fiber and I/O card for UTP 5 and STP copper. Two or three feature cards can be installed on one module. NOTE: All concentration modules can coexist in the same 8260 and work in conjunction with the ATM Switch/Control Point Module to connect workstations, other concentrators and other switches.
- **8281 ATM LAN Bridge Module** is an integrated version of IBM's standalone 8281 ATM LAN Bridge. This two-slot module attaches four Ethernet or four Token-Ring segments to the 8260 ATM backplane.
- **Multiprotocol Switched Services (MSS) Server Module** is an integrated, 2-slot module for an ATM network that allows existing networking hardware and software to take advantage of an ATM network. The MSS module provides ATM Forum-compliant functions such as:
 - LAN Emulation for Token-Ring and Ethernet
 - Classical IP routing
 - IPX routing
 - Transparent bridging support for Ethernets
 - Source route bridging support for Token-Rings

The MSS functions are also available in an externalized box (non-8260 module) called the 8210. Please see the *ATM Sales Guide* for more information.

For more information about ATM and the 8260's ATM capabilities, please refer to the *IBM ATM Sales Guide*. For more information on IBM's Switched Virtual Networking strategy, please see the Appendix on page 95.

8260 ATM Wide Area

Network Modules

There are two ATM WAN modules. The first is a 1-slot module that provides the capability to connect campus ATM backbones to an ATM wide area network, to interconnect campuses, or to connect a campus to a small remote site. The ATM WAN module can host up to 2 daughter I/O cards of any of the following types:

- 1-port, E3 I/O card (34 Mbps) with BNC Connector; it supports the G.832 standard
- 1-port, DS3 I/O card (44.736 Mbps) with BNC Connector
- 1-port, STM1 (155 Mbps) with SC optical connector over single mode fiber up to 20 km
- 1-port, STM1 (155 Mbps) with SC optical connector over multimode fiber up to 2 km
- 1-port, OC3 (155 Mbps) with SC optical connector over single mode fiber up to 20 km
- 1-port OC3 (155 Mbps) with SC optical connector over multimode fiber up to 2 km

These I/O cards support PVC, SVC, and point-to-multipoint connections.

The ATM WAN 2 module provides 8260 users with a lower cost option to connect campus ATM backbones to an ATM wide area network, to interconnect campuses, or to connect a campus to a small remote site. The WAN 2 module for ATM attachments is a single-slot module, with room for up to 2 I/O cards, each with 4-ports E1/T1/J1 interface. The same I/O card supports either E1 or T1/J1 interfaces and is customer settable. The I/O card supports:

- The E1 (2 Mbps) interface which can use either twisted pair cable or coaxial cable.
- The T1/J1 (1.5 Mbps) interface which uses twisted pair cable.

8271 and 8272 LAN Switch Modules for the 8260

The 8271 and 8272 LAN Switch Modules in an 8260 offer an integrated solution for interconnecting LAN segments in an easy, cost-effective manner. The switch modules incorporate all of the functions of the standalone 8271 and 8272 LAN Switches and also inherit such 8260 features as intelligent cooling, redundant power supplies, comprehensive management, and hot pluggability.

The 8271 and 8272 LAN Switch Modules are available in 2- or 3-slot formats, and share the following features:

- support for up to two UFCs for the 2-slot module and up to four UFCs for the 3-slot module
- virtual switch support, allowing subdivision of a single physical LAN switch module into two to eight virtual switches
- support for a maximum of 1700 active LAN station addresses per port and 10,000 per module
- SNMP management via either the service port on the module, local or remote Telnet, or in-band from an SNMP management station
- code upgradable

In addition, the 8271 LAN Switch Module offers:

- twelve 10BASE-T frontal ports with RJ-45 UTP/STP connectors (UTP cabling category 3, 4, and 5 is supported)
- support for up to 28 Ethernet segments

The 8272 LAN Switch Module also offers these additional features:

- eight Token-Ring frontal ports with RJ-45 UTP/STP connectors (UTP cabling category 3, 4, and 5 is supported)
- support for up to 24 Token-Ring segments

ATM connectivity can be accomplished via the ATM UFC (for non-ATM backplane capable modules) or via the 8271/8272 Modules that are equipped with the ATM interface on the module.

Switching Module Series

These modules are a set of Ethernet and FDDI switching modules that maximize network performance by reducing backbone congestion. The Switching Module Series in an 8260 positions one for future growth by making it easy for you to migrate from shared LANs to switched LANs and ATM.

A dedicated switching ASIC on each Switching Module Series module provides scalable performance for full wire-speed forwarding on all ports. With its store and forward architecture and dynamic buffering, the Switching Module Series provides full error checking and the ability to switch large bursts of data without packet loss. Switching Module Series are interconnected through the Packet Channel.

All Switching Module Series modules have a full set of capabilities that provide proactive traffic management, user access, and growth for future network requirements. These capabilities include:

- Support for 32,000 MAC addresses per module
- User-definable MAC address filters
- Support for 64 protocol filters per module
- Traffic prioritization based on protocol type
- Support for up to 256 virtual switches per hub
- "Dynamic Side Switching" which allows each module to detect when a device has moved to a different port on the hub
- Hot swappable
- Support for the 8260 hub architecture, including power and cooling management and vital product data reporting
- A full RMON agent on every module that can gather statistics to any single port
- Roving Port Analysis to mirror traffic from one port to another for analysis

The Switching Module Series modules are available in the following types:

- 10BASE-T in a single slot, using 12 RJ-45 connectors (UTP or STP) or a dual slot with 24 ports
- 10BASE-FB/FL in a single slot using 10, auto-sensing FB/FL, ST connectors or a dual slot with 20 connectors.
- FDDI in a single slot using a 2-port DAS/SAS MIC connector or a dual slot using a single port DAS/SAS MIC connector with twelve 10BASE-T ports. A dual slot using a single port DAS/SAS MIC connector with 10 auto-sensing 10BASE-FB/FL is also available.

- 100BASE-TX in a single slot, 4 port, RJ-45 connectors (UTP CAT 5) supporting both half and full duplex speeds (auto-negotiation)
- 100BASE-FX in a single slot, 4 port, ST connectors (multimode fiber) supporting both half and full duplex speeds (auto-negotiation)

The Packet Channel/ATM switching module enables the seamless integration of Ethernet, Fast Ethernet and FDDI switching modules users into a high performance ATM backbone network. The 2-slot module for models P10, P17 or G17 has room for up to two ATM 155 Mbps I/O cards. The I/O cards provide a OC3 multimode fiber interface with an SC connector. With the maximum 2 I/O cards installed, the module provides a primary OC3 port and a backup OC3 port. The module offers a Dual Homing function, providing automatic cut-over to the backup port in case the primary fails for a high-level of redundancy. The module also enables up to 512 switched virtual circuits operating concurrently and up to 64 VLANs that can span multiple hubs and can be configured simply by using software commands.

The LAN Access Switching Module is designed to allow it to interconnect with all other Switching Series Modules via the 2 gigabits Packet Channel and with shared media modules across the 8 shared Ethernet backplane. This module can be plugged into any 8260 (010, 017, A10, A17, P10, P17 or G17). Users who need a limited number of switched LAN ports can install one module in their current hub without the need to upgrade it with a Packet Channel backplane. This module requires no external crossover connections from a shared media module to a module from the Switching Series Modules. This increases overall reliability of the system. Also, by using the on-board RMON probe of the LAN Access Switching Module, users have the ability to effect full RMON monitoring without the need for a dedicated Ethernet MAC card.

A simple, graphical view of the Switching Module Series will be provided through an upgrade (PTF) to Nways Campus Manager LAN for AIX concurrent with hardware availability. Full integration of these new modules will be in the next version of Nways Campus Manager LAN for AIX (1H 1997) and HP-UX (2H 1997).

For any of the Switching Module Series modules to communicate with each other across the backplane, the Packet Channel backplane is required. Existing, installed 8260s can be field upgraded to include the packet channel or the 8260 can be ordered with the packet channel already included.

Video Distribution Module

The Video Distribution Module (VDM) is part of a cost-effective, high-quality video delivery solution. This two-slot module has eight independent ATM addressable MPEG-2 decoding ports. The VDM receives encoded MPEG-2 video streams from the ATM network and converts them to NTSC/PAL video and stereo audio for distribution to TV monitors.

IBM 8250 Modules These can be used unchanged in the IBM 8260. The 8250 modules can be adapted to work with the 8260 by using either a 4-slot, 9-slot or 16-slot adapter kit. These adapter kits enable the smaller 8250 modules to fit correctly into the larger slots of the 8260.

Management Software

Customers have several management options including out-of-band management from an ASCII terminal, remote logon via Telnet and SNMP management. For SNMP management with a graphical user interface, IBM offers management solutions depending upon the platform the customer chooses for management applications:

Platform	Management Solution
AIX	Nways Campus Manager LAN for AIX V3.0 (see page 85) Nways Campus Manager ATM for AIX V2.0 (see page 90) Nways Campus Manger Suite for AIX V3.0 (see page 92) Nways LAN Remote Monitor for AIX V2.0 (see page 88)
Windows	Nways Manager for Windows V2.0 (see page 81) Nways LAN Remote Monitor for Windows V1.0(see page 88)
HP-UX	Nways Campus Manager LAN for HP-UX V1.1 (see page 87) Nways LAN Remote Monitor for HP-UX V1.0 (see page 88)

More information is provided regarding these management products later in this guide. See the pages referenced above.

8260 Products and Options

Description
<p>IBM 8260 Chassis (does not include redundant Fault-Tolerant Controller Module and power supply - order separately)</p> <ul style="list-style-type: none"> Model 017, 17-slot Model 010, 10-slot Model A17, ATM-ready, 17-slot Model A10, ATM-ready, 10-slot Model P17, Packet Channel ready, 17-slot Model P10, Packet Channel ready, 10-slot Model G17, Packet Channel and ATM ready, 17-slot
<p>Chassis Options</p> <ul style="list-style-type: none"> Redundant Fault-Tolerant Controller Power Supply (AC 295 WATTS) Power Supply (DC 295 WATTS, -48 VOLTS) Power Supply (AC 415 WATTS) 8250 Adapter Kit - 4-slot 8250 Adapter Kit - 9-slot 8250 Adapter Kit - 16-slot Universal Code Download Kit
<p>Management Modules</p> <ul style="list-style-type: none"> Advanced DMM/Controller Module Distributed Management Module (DMM) standalone V3.0 DMM with Ethernet Carrier (EC-DMM) V3.0 MES Upgrade to DMM V 4.1 or EC-DMM to V 4.1
<p>Ethernet Modules</p> <ul style="list-style-type: none"> Ethernet 10BASE-T 24-port PPS TELCO Module Ethernet 20-port 10BASE-T PPS RJ-45 Module Ethernet 40-port 10BASE-T PPS RJ-45 Module Ethernet 36-port 10BASE-T Bank-Switching, TELCO Ethernet 10BASE-FB 10-port PPS Module (ST) Ethernet 10BASE-FB 10-port PPS Module (FC) Ethernet 10BASE-FB 10-port PPS Module (SMA) Ethernet Modular Board 2-port FB/FL (ST) Modular Media Card 2-port FB/FL (FC) Modular Media Card 2-port FB/FL (SMA) Modular Media Card 4-port RJ-45 Modular Media Card 3-port BNC Modular Media Card 3-port Male AUI Modular Media Card 3-port Female AUI Modular Media Card 50-pin, 45 degree Connector Ethernet Media Access Card (EMAC) (RMON Support) High-End EMAC (HEMAC) (RMON Support) HEMAC, 4 MB RAM Upgrade HEMAC, 8 MB RAM Upgrade Ethernet Security Card

8260 Products and Options

Description
<p>Token-Ring Modules</p> <p>TR 20-port, Passive, Media Module TR Media Access Card (TMAC) (RMON Support) High-End TMAC (HTMAC) (RMON Support) HTMAC, 8 MB RAM Upgrade HTMAC, 16 MB RAM Upgrade TR Dual Fiber Repeater TR 18-port, Per-Port Switching, Media Module TR 18-port Active, Per-Module Switching, Media Module TR Jitter Attenuator Card Token-Ring RI Crossover Cable</p>
<p>Interconnect Modules</p> <p>Ethernet Interconnect Module 1-slot Ethernet Interconnect Module 2-slot 10BASE-T I/O Card 10BASE2 I/O Card 10BASE5 I/O Card Token-Ring I/O Card</p>
<p>ATM Modules</p> <p>ATM Backplane for 17-slot model ATM Backplane for 10-slot model ATM Switch/Control Point Module (16MB RAM) MSS Server Module, 2-slot MSS Module, PCMCIA Hard Disk MSS Module Microcode Release 1 MES ATM Switch/Control Point Module Upgrade (for F/C 5000) 4-port 100 Mbps ATM Fiber Concentration Module-MIC 4-port 100 Mbps ATM Concentrator Module - SC Nways ATM 12-Port 25Mbps Concentration Module Nways ATM 1-Port 155 Mbps MMF I/O Card OC3 Nways ATM FLEX 155-Mbps Media Module, 2 port Nways ATM FLEX 155 Mbps Media Module, 3 port Nways ATM 1-port MMF I/O Card Nways ATM 1-port SMF I/O Card Nways ATM 1-Port UTP5/STP I/O Card ATM 622 Mbps Module, MMF ATM 622 Mbsp Module, SMF Nways 8281 ATM TR - Ethernet LAN Bridge Module Video Distribution Module, 2-slot FiberCom ACE Card</p>
<p>ATM WAN Modules</p> <p>ATM WAN Module for A10 and A17 1-port E3 I/O Card for A10 and A17 1-port STM1 I/O Card for A10 and A17, Single Mode Fiber 1-port STM1 I/O Card for A10 and A17, Multimode Fiber 1-port OC3 I/O Card for A10 and A17, Single Mode Fiber 1-port OC3 I/O Card for A10 and A17, Multimode Fiber ATM WAN 2 Module 4-port E1/T1/J1 I/O card</p>

8260 Products and Options

Description
<p>LAN Switch Modules 8271 LAN Switch Module 2-slot 8271 LAN Switch Module 3-slot 8271 LAN Switch Module 2-slot (with ATM backplane interface) 8271 LAN Switch Module 3-slot (with ATM backplane interface) 8272 LAN Switch Module 2-slot 8272 LAN Switch Module 3-slot 8272 LAN Switch Module 2-slot (with ATM backplane interface) 8272 LAN Switch Module 3-slot (with ATM backplane interface)</p>
<p>Switching Modules Series Packet Channel Backplane for a Model 10 Packet Channel Backplane for a Model 17 Packet Channel and ATM Backplane for a Model 17 Convert A17 to include Packet Channel for a Model 17 12 port, 10BASE-T, 1-slot 24 port, 10BASE-T, 2 slot 10 port, 10BASE-FB/FL, 1-slot 20 port, 10BASE-FB/FL, 2-slot 12 port, 10BASE-T, FDDI DAS, 2-slot 10 port, 10BASE-FB/FL, FDDI 2-slot 2 port, Dual FDDI DAS, 1-slot 4 port, 100BASE-TX, 1-slot 4 port, 100BASE-FX, 1-slot Module Memory upgrade, 8 MB Module Memory upgrade, 16 MB Packet Channel/ATM Switch Module Nways ATM 1-Port 155 Mbps MMF I/O Card LAN Access Switch Module</p>
<p>Management Software for Windows Platform Nways Manager for Windows V2.0 (5801-AAR) LAN ReMon for Windows V1.0 (5801-AAR)</p>
<p>Management Software for AIX Platform Nways Campus Manager LAN for AIX V3.0, 8 mm tape Nways Campus Manager LAN for AIX V3.0, ¼ inch tape Nways Campus Manager LAN for AIX V3.0, 4 mm tape Nways Campus Manager LAN for AIX V3.0, CD-ROM Nways Campus Manager Suite for AIX (5697-B06) V3.0, 8 mm tape Nways Campus Manager Suite for AIX (5697-B06) V3.0, ¼ inch tape Nways Campus Manager Suite for AIX (5697-B06) V3.0, 4 mm tape Nways Campus Manager Suite for AIX (5697-B06) V3.0, CD-ROM LAN ReMon for AIX (5697-B17) V2.0, ¼ inch tape LAN ReMon for AIX (5697-B17) V2.0, 8 mm tape LAN ReMon for AIX (Advanced) (5697-B19) V2.0, ¼ inch tape LAN ReMon for AIX (Advanced) (5697-B19) V2.0, 8 mm tape</p>
<p>Management Software for HP-UX Platform Nways Campus Manager LAN for HP-UX V1.1, 4 mm tape LAN ReMon for HP-UX V1.0 (5801-AAR), 4 mm tape LAN ReMon for HP-UX V1.0 (Advanced) (5801-AAR), 4 mm tape</p>

Target Market The IBM 8260 is suitable for networks needed for mission-critical and client-server applications. These networks are characterized by:

- high-speed
- strong need for management
- high network security
- high need for network protection and fault tolerance
- high density media concentration

It is an ideal solution for customers who want to migrate to ATM.

Sales Tools The following sales tools are available for the IBM 8260:

<i>8260 Multiprotocol Intelligent Switching Hub</i> (spec sheet)	G325-3507-00
<i>8260 Multiprotocol Switching Hub</i> (brochure)	G520-7080-00
<i>IBM 8260 Ethernet Modules</i> (spec sheet)	G221-4048-00
<i>8260 Token-Ring Modules and Cards</i> (spec sheet)	G221-4203-00
<i>8260 Nways ATM Campus Solutions</i> (spec sheet)	G221-4293-02
<i>8260 Multiprotocol Intelligent Switching Hub</i> (brochure)	G325-3508-00
<i>IBM 8260 LAN Switch Modules</i> (spec sheet)	G224-4488-01

Information about the IBM 8260 is available via the IBM fax-back systems.

- IBM FAX (800-IBM-4FAX, product spec sheets, document #s 2661, 2662, 1588, 5627, 2120, 6193)
- IBM PCC FAX (800-IBM-3395, product spec sheet document #s 10018, 10031, 10035, 10036)

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Q's and A's

- Q) How much of the IBM 8260 technology is IBM technology versus 3Com?*
- A) The IBM 8260 is truly the result of shared technology. IBM contributed the technology required for the ATM networking portion of the 8260. 3Com is responsible for the Ethernet portion. The Token-Ring portion is the result of shared technology between 3Com and IBM.
- Q) Can 3Com modules be used with the IBM 8260?*
- A) Yes, because these hubs are the result of shared technology, 3Com modules can be used in the IBM 8260.
- Q) Is it possible to have some level of statistics on the 20-port or 40-port 10BASE-T Ethernet Media Modules without buying an Ethernet Media Access Control (EMAC)?*
- A) Yes, these modules include IEEE on board repeater statistics that will allow basic monitoring at a network level without the need for the EMAC/HEMAC. However, the EMAC with the support of 7 RMON groups and the HEMAC with the support of all RMON groups are useful for high level monitoring.

Q) What about integrated routing in the 8260?

A) The 8260 hub supports integrated routing functions for Ethernet networks with the 6-port Ethernet Interconnect Bridge/Router Module that is available. This module allows in front, two attachments that can be Ethernet, Token-Ring, or both.

Regarding the support of routing in other LAN media protocols, IBM is considering several solutions. 3Com and Cisco have an agreement under which Cisco routers will be integrated into ONline and ONcore hubs. The integration of these routers into 8250 and 8260 hubs is among the several solutions that IBM is considering. Of course, other solutions are also being worked by IBM.

Q) The 4-port 100Mbps ATM concentration modules are managed via a SNMP agent resident in the ATM Switch/Control point module. This agent handles the ATM MIB. Is this MIB available and how does the customer get the ATM MIB?

A) The ATM MIB is available. The customer can get the MIB from the IBM Web pages at: <http://www.raleigh.ibm.com/pub/products/lanprods/hub>.

This is the same location where you can get the other 8260 MIBs.

Competition

The IBM 8260 competes against high-end hubs from such major vendors as Cabletron and Bay Networks. The following table summarizes the strengths and weaknesses of the IBM 8260's primary competitors and how to sell against them.

	Strengths	Weaknesses	Selling Against
Cabletron MMAC-Plus	<ul style="list-style-type: none"> 14 slot chassis 3 backplane technologies <ul style="list-style-type: none"> -FNB (FDDI available) -INB (packet bus) -CTM (ATM backplane IH97) partners with Cisco for routing technology & inhouse tech. partner with Fore Systems for ATM technology Synthesis switched networking strategy (VLANs, SecureFast switching, Virtual Networking Services) Spectrum - 3rd in network management market share (artificial intelligence engine) mgmt. on each media module technology (i960 and C++ object-oriented programming) integrated bridging/switching/routing on every module 	<ul style="list-style-type: none"> expensive; markets MMAC-Plus but sells MMAC proprietary switching not known as WAN vendor – must partner with others much of MMAC-Plus not developed NO per port switching environment module not redundant no Ethernet security need to partner to develop complicated technology (ATM, TR switching) multiple ATM strategies (Fore, Cisco, inhouse) no Flexible Network Bus (FNB) to Internal Network Bus (INB) modules integrated bridging/switching/ routing on every module even if not required 	<ul style="list-style-type: none"> 10, 17 slot chassis investment protection – use 8250 modules in 8260 Dual Phase Lock Loop (DPLL) Token-Ring tech. <ul style="list-style-type: none"> -active/retimed at port -longer lobe distances -250 workstations inventory and power mgmt chassis includes 1 power supply and controller module stress warranty and 24x7 service and maintenance included in the price Ethernet security (1000 MACs)

	Strengths	Weaknesses	Selling Against
Bay Networks System 5000	<ul style="list-style-type: none"> • 8, 14 slot chassis • Ethernet and Token-Ring per port switching • Optivity network management industry standard • Support for SunNet Manger, OpenView and NetView for AIX • different backplanes provide: <ul style="list-style-type: none"> -Ethernet only -Ethernet and Token-Ring Ethernet, TR and FDDI -separate ATM model • redundant fans, power supplies and configuration storage • early to market with ATM external switch integration in 5000 (5/95) • BaySIS switched internetworking strategy • RMON 	<ul style="list-style-type: none"> • no investment protection • requires protocol dependent management module • limited number of DCEs per management module allowed • reliability & availability <ul style="list-style-type: none"> -supervisory module not redundant • TR uses "tank circuitry" <ul style="list-style-type: none"> -active at port; retimed onto backplane -132 workstations • 9 TR segments cause slot dependencies • NO internetworking modules • some Ethernet modules require DIP switch to select segment range • power and fans accessible from rear (14th slot) • no low-speed ATM • no Ethernet security • one year warranty - hardware; software - 90 days; 24x7 service, prices separately • active components on backplane • male pins on backplane • no Ethernet security • clocking done on backplane 	<ul style="list-style-type: none"> • 10, 17 slot chassis • investment protection - use 8250 modules in 8260 • single DMM manages 8260, not single LAN type • Dual Phase Lock Loop (DPLL) Token-Ring tech <ul style="list-style-type: none"> -active/retimed at port -longer lobe distances -250 workstations per ring • inventory, power and cooling management • open hub technology, provides standardized carrier card for future integration of standalone products (e.g., routers, bridges) • daughter card slot available on media module reduces management module cost • Ethernet security (1000 MACs) • RMON capabilities: <ul style="list-style-type: none"> -Ethernet all 9 groups - HEMAC -TR 13 groups - HTMAC • chassis includes 1 power supply and controller module • stress warranty and 24x7 service and maintenance included in price • leadership in ATM Forum • standards-based, end-to-end networking • integrated campus and desktop ATM capabilities

Key Selling Points When selling the IBM 8260, the following points should be emphasized:

- The ATM functions of the 8260
- The 8260 Intelligent Power System
- The 8260 Intelligent Cooling System
- The Distributed Management Design of the 8260
- The investment protection offered by the 8260
- The 8260's modularity
- The 8260's switching capability
- The 8260's hot pluggable modules
- The 8260's RMON Support (Token-Ring and Ethernet)
- The backplane design of the 8260
- The 8260's fault-tolerance options
- The IBM management software available for the 8260
- The warranty is on a "per hub" basis and not on a "per module" basis as with some of the 8260's competitors
- Investment protection offered by the IBM 8260
- The 8260 is compatible with all current IBM networking products
- IBM's customer support
- IBM's technology leadership and breadth of products

Nways Manager for Windows

Description	This product is an integrated suite of network management applications (packaged with NetView for Windows Version 2.1 and NetManage Newt V4.6) that works seamlessly with the IBM NetView for Windows management platform to remotely control and monitor IBM networking devices. It provides integrated fault, configuration and performance management functions for IBM bridges, routers, hubs, and switches. It also provides basic management functions for other SNMP components.
Positioning	The Nways Manager for Windows V2.0 management product is for customers with small to medium networks up to 250 devices. These customers have one or more IBM campus networking products and want a low cost management solution that provides complete device management.
Functions	<p>The Nways Manager for Windows provides remote control and coordination of IBM networking products through:</p> <ul style="list-style-type: none">• the ability to view and change subsystem configurations• color-coded system status at a glance, with real-time problem detection and the ability to set thresholds for error notification• realistic, graphical depictions of products to assist with component selection• graphical network topologies with a library of elements for easy creation of customized configurations• real-time event monitoring, with a time-stamped alarm log• tools to select, display and analyze information in the event log• microcode download for the supported products• integrated trouble-ticketing to gather information about and track network problems to resolution• a MIB browser to allow management of components not supported with a graphical interface• inventory management• collection and presentation of real-time and historical statistics• drag and drop of ports and VLAN support provided• telnet and FTP capabilities• RMON coupling with Nways RMON for Windows V1.0 supporting the 8230 and 8238 Token-Ring LAN hubs
Optional RMON	The Nways LAN Remote Monitor for Windows V1.0 can be purchased for RMON management support (see page 88).

Devices Supported The Nways Manager for Windows can be used to monitor and control the following devices:

- IBM 8235 Dial In Access to LANs (DIALs) Server (Models 001, 002, 011, 012, 021, 022, 031 ,032, 051, 052)
- IBM 8271 Nways Ethernet LAN Switches (Models 001, 108, and 216)
- IBM 8272 Nways Token-Ring LAN Switches (Models 108 and 216)
- IBM 8224 Ethernet Stackable Hub
- IBM 8225 Fast Ethernet Stackable Hub
- IBM 8230 (Models 3/13, 213, 4A/4P) family of Token-Ring hubs
- IBM 8238 Token-Ring Stackable Hub
- IBM 8250 Multiprotocol Intelligent Hub and modules
- IBM 8260 Nways Multiprotocol Switching Hub and modules
- IBM 6611 Network Processor
- IBM Nways 2210 Multiprotocol Router
- IBM Turboways 8282 ATM Workgroup Concentrator
- IBM 8281 ATM LAN Bridge
- IBM 8285 Nways ATM Workgroup Switch
- IBM 8210 Multiprotocol Switched Services Server (MSS)

Products and Options

Description
Nways Manager for Windows V2.0 (5801-AAR)

Sales Tools The following sales tools are available for Nways Manager for Windows:

<i>Nways Manager for Windows</i> (spec sheet)	G224-4452-00
<i>Nways Managers</i> (folder/spec sheet)	G224-4451-00
<i>Nways Manager for Windows</i> (spec sheet)	G325-3634-01

The following marketing aid is available on MKTTOOLS:

NMWDEMO PACKAGE - Demo overview of IBM's Nways Manager for Windows product

Information about Nways Manager for Windows V2.0 is available via the IBM fax-back system

- IBM FAX (800-IBM-4FAX, product spec sheet document #6513)

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

**LNM for AIX
Integration**

LNM for AIX works with NetView for AIX to facilitate management of LAN resources in the network. The functions of LNM for AIX are integrated with the NetView for AIX interface, enabling management of physical resources in a multiprotocol network from a single workstation. IP-addressable devices can be monitored and managed with NetView for AIX. LNM for AIX also enables management of devices in Token-Ring and FDDI environments that have SNMP agents (e.g., IBM 8229 and IBM 8230) and those that do not have SNMP agents. It provides topology views and status information for Token-Ring and FDDI networks.

LNM for AIX provides integrated fault, configuration, and performance management capabilities for Token-Ring and FDDI LAN segments. These functions are accomplished on a NetView for AIX platform.

LNM for AIX, in conjunction with agents, provides views of a logical topology of the LAN which allows different protocol views to be associated with the underlying physical topology. LNM for AIX also provides configuration, fault, and performance information for LAN resources. Other features include:

- Integrated view of the complete LAN on a single screen/window (Token-Ring, FDDI, bridges)
- LAN bridges and media management for SNMP LAN environments
- Integrated LAN management with other NetView for AIX management applications
- Critical resource monitoring and LAN access control
- Rich fault, performance, and configuration management and a graphical, object-oriented user interface built on OSF Motif and X-Windows
- Dynamic network discovery to maintain a current view of the LAN network topology
- Support for LNM for OS/2 V2.0

LNM for AIX can be used to monitor and control the following devices:

- IBM 8244 FDDI Workgroup Concentrator
- IBM 8230 Models 1 and 2 (in CMOL mode via LNM for OS/2 V2.0)
- IBM 8230 Models 3, 13, 213, 4A, 4P (in SNMP mode)
- Any SNMP bridge that implements MIB-II and either RFC 1286 or RFC 1493 such as:
 - IBM 8271-01 (EtherStreamer Switch)
 - IBM 8271-108 (Nways Ethernet LAN Switch)
 - IBM 8272-108 (Nways Token-Ring LAN Switch)
 - IBM 8229 (LAN Bridge)
 - IBM 8229 (8250/8260 Bridge Module)
 - IBM 8281 (ATM LAN Bridge)
 - IBM 2210 (Nways Multiprotocol Router)
- Existing two-port Logical Link Control (LLC) Bridges via LNM for OS/2 V2.0
- IBM 8240 and 8244 FDDI Concentrators
- OEM FDDI Concentrators
- IBM 8227 Wireless LAN Entry Access Point
- Token-Ring Media/Adapters via:
 - SNMP Agents
 - IBM 8230
 - IBM 8229 Token-Ring surrogate agent
 - LLC:
 - LNM for OS/2 V2.0
 - RMON Agents
 - IBM 8238
 - IBM 8260 TMAC
 - IBM 8250 TRMM V4.0
 - IBM 8230 (with RMON-enabled)

Nways Campus Manager LAN for AIX

- Description** Nways Campus Manager LAN for AIX V3.0 is an advanced package of integrated network management applications that enables complete management of Ethernet, Token-Ring or FDDI-based networks composed of IBM hubs, switches, bridges and concentrators. It also provides complete management of IBM (and selected OEM) routers.
- Positioning** Nways Campus Manager LAN for AIX is positioned for large-scale LAN management. Management applications on NetView for AIX provide the most comprehensive set of applications for both device and network management and support the largest networks.
- Functions** Nways Campus Manager LAN for AIX is an integrated suite of network management applications that work seamlessly with NetView for AIX to monitor and control IBM hubs, switches and routers. LAN Network Manager for AIX is now included in Nways Campus Manager LAN for AIX. Other common features include:
- advanced graphical user interface
 - SNMP support and capabilities
 - Token-Ring media management
 - NetView for AIX topology maps and expanded views
 - OSF/Motif™-based user interface
 - X Window System™ support
 - microcode updates
 - remote login via Telnet
 - multiple levels of alarms
 - TCP/IP device faults are isolated to simplify problem determination and error correction
 - object store database support for hub connected stations with user information accessible via import/export function
 - automatic discovery of IBM hub models and installed modules as well as IBM switches and routers
 - compatibility with IBM 6611 and 2210 configuration tools
 - access control by MAC address list
 - context-sensitive help
 - drag & drop interface for defining virtual switch domains, for easy resource monitoring, and for logical LAN creation
 - online documentation and help for better user efficiency
 - Netview for AIX Client/Server support
 - distributed management using Tivoli TME 10 distributed Router Monitoring capability along with Mid-Level Managers.

- Devices Supported** The Nways Campus Manager LAN for AIX can be used to monitor and control the following devices:
- IBM 8235 Dial In Access to LANs (DIALs) Server (Models 001, 002, 011, 012, 021, 022, 031, 032, 051, 052)
 - IBM 8224 Ethernet Stackable Hub
 - IBM 8225 Fast Ethernet Stackable Hub
 - IBM 8281 ATM LAN Bridge
 - IBM 8230 (Models 3/13, 213, 4A/4P) family of Token-Ring hubs
 - IBM 8238 Token-Ring Stackable Hub
 - IBM 8250 Multiprotocol Intelligent Hub and modules
 - IBM 8260 Nways Multiprotocol Switching Hub and modules
 - IBM 8271 Nways Ethernet LAN Switches (Models 001, 108, and 216)
 - IBM 8272 Nways Token-Ring LAN Switches (Models 108 and 216)
 - IBM 8229 LAN Bridge
 - IBM RouteXpander/2
 - IBM 6611 Network Processor
 - IBM Nways 2210 Multiprotocol Router
 - Selected OEM routers
 - Any SNMP bridge that implements MIB-II and either RFC 1286 or RFC 1493

Part Numbers

Description	
Nways Campus Manager LAN for AIX V3.0 (5697-B07)	8 mm tape
Nways Campus Manager LAN for AIX V3.0 (5697-B07)	¼ inch tape
Nways Campus Manager LAN for AIX V3.0 (5697-B07)	4 mm tape
Nways Campus Manager LAN for AIX V3.0 (5697-B07)	CD-ROM

Sales Tools The following sales tools are available for Nways Campus Manager LAN for AIX:

<i>Nways Managers</i> (folder/spec sheet)	G224-4451-00
<i>Nways Campus Manager LAN for AIX V3.0</i> (spec sheet)	G325-3632-01
<i>Proactive Management Solutions for the Campus and Wide Area Network</i> (brochure)	G325-3521-00

The following marketing aid is available on MKTTOOLS:

Nways AIX Package - technical marketing presentation on Nways Campus Manager LAN and ReMon.

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Nways Campus Manager LAN for HP-UX

- Description** This suite of Nways Campus management applications is functionally the same as Nways Campus Manager LAN for AIX, only ported to run on the HP Open View platform (V3.31). With this package of integrated network management applications, the network administrator has complete management of Ethernet, Token-Ring or FDDI-based networks composed of IBM hubs, switches, bridges and concentrators. (The functions provided by LNM for AIX and Router & Bridge Manager are not included.)
- Positioning** Nways Campus Manager LAN for HP-UX V1.1 is targeted at customers who run the HP Open View management platform.
- Function** Nways Campus Manager LAN for HP-UX V1.1 is comparable in function to Nways Campus Manager LAN for AIX. These functions include:
- status and configuration functions performed through a point-and-click interface
 - performance monitored through user-defined, rate-of-change realtime graphics that show the peak, mean and actual number of frames per user-specified polling period
- Devices Supported** The Nways Campus Manager LAN for HP-UX V1.1 can be used to monitor and control the following devices:
- IBM 8224 Ethernet Stackable Hub
 - IBM 8230 (Models 3, 13, 213, 4A/4P) family of Token-Ring hubs
 - IBM 8238 Token-Ring Stackable Hub
 - IBM 8250 Multiprotocol Intelligent Hub and modules
 - IBM 8260 Nways Multiprotocol Switching Hub and modules
 - IBM 8271 Nways Ethernet LAN Switches (Models 001 and 108)
 - IBM 8272 Nways Token-Ring LAN Switch (Model 108)
 - IBM 6611 Network Processor
 - IBM Nways 2210 Multiprotocol Router

Products and Options

Description
Nways Campus Manager LAN for HP-UX V1.1 (5801-AAR) 4 mm tape

Sales Tools The following sales tools are available for Nways Campus Manager LAN for HP-UX:

<i>Nways Managers</i> (folder/spec sheet)	G224-4451-00
<i>Proactive Management Solutions for the Campus and Wide Area Network</i> (brochure)	G325-3521-00

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Nways LAN Remote Monitor

Nways LAN ReMon for Windows

The Nways LAN Remote Monitor for Windows V1.0 provides management support for RMON (remote monitor) compliant agents over Token-Ring or Ethernet LANs. Statistical information on remote devices attached to the LAN can be accessed real-time. A graphical user interface (GUI) designed specifically to hide the complexity of the RMON standard, displays activity levels and alarm locations across the network and drills down to individual workstations. All activity on a LAN segment can be reviewed, even down to how specific hosts and pairs of hosts are impacting it.

This package provides:

- Standalone support for very small customers who do not use a management platform
- RMON management support for customers who have invested in the Nways Manager for Windows and would like to have both products integrated onto a single desktop view
- Summary screen for a high-level view of the entire LAN segment or ring
- Rapid fault discovery and response for identifying and solving network faults
- Graphical software for analyzing data and packets collected by remote probes
- Supports SNMP RFCs 1155, 1157, 1212, and 1213
- Supports IETF RMON 1 Working Group RFCs 1757 and 1513
- Coupling with Nways Manager for Windows V2.0 supporting the 8230 and 8238 Token-Ring LAN hubs.

Nways LAN ReMon for AIX and HP-UX

These two packages provide the same features and functions as does the LAN ReMon for Windows but for medium-to-large customers who use an AIX or UNIX-based management platform to manage their network devices. Additional functions also include:

- Address translation (MAC address to network layer address translation)
- Protocol distribution (detail higher layer protocol usage) is provided by LAN ReMon Advanced for AIX and HP-UX
- Capability to download software to remote probes in the network (provided by LAN ReMon Advanced for AIX and HP-UX)
- LAN ReMon "Base" provides support for the standard RFCs. LAN ReMon "Advanced" provides support for the standard RFCs, RMON II MIB extensions, as well as extensions for traffic generation to do "what if" scenarios.

Positioning

These programs are applicable for campus network environments and for companies that occupy several buildings in a campus environment. Prospects would have campus networks and want the advantages of being able to troubleshoot all LANs from one central workstation. The IBM LAN ReMon family lets experts work on several problems at once or troubleshoot a problem at more than one location. The following IBM hub products provide integrated, RMON-compliant agent support:

- **8225** Model 003
- **8230** Models 3, 13, 213, 4A, and 4P
- **8238** all models (Bronze, Silver, Gold, includes active and passive)
- **8250** when using the Ethernet RMON Probe Module or TRMM V4.0
- **8260** when using the EMAC/HEMAC or TMAC/HTMAC daughter cards
- **Other non-IBM** RMON-compliant probes

Products and Options

Description
LAN ReMon for Windows V1.0 (5801-AAR)
LAN ReMon for AIX V2.0 (5697-B17)
1/4 inch tape
8 mm tape
LAN ReMon for HP-UX V1.0 (5801-AAR)
4 mm tape
LAN ReMon for AIX V2.0 (Advanced) (5697-B19)
1/4 inch tape
8 mm tape
LAN ReMon for HP-UX V1.0 (Advanced) (5801-AAR)
4 mm tape

Sales Tools

The following sales tools are available for Nways LAN Remote Monitor:

Nways Campus Manager Remote Monitor for AIX (spec sheet) G325-3609-00
Nways Campus Manager Remote Monitor for AIX V2.0 (spec sheet) G325-3631-01

The following marketing aid is available on MKTTOOLS:

- **Nways AIX Package** - technical marketing presentation on Nways Campus Manager LAN and ReMon.

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Nways Campus Manager ATM for AIX

- Description** Nways Campus Manager ATM V2.0, combined with NetView for AIX (V3 or V4) provides complete management of your campus ATM network, including full ATM topology, fault, and performance management, from a single operator console on your AIX workstation.
- Positioning** Nways Campus Manager ATM is an integrated package of network management applications (including ATM Campus Manager, Campus ATM device management, and ATM LAN Emulation management) and is intended to replace individual, standalone applications that manage ATM campus networks.
- Functions** Nways Campus Manager ATM provides device configuration and ATM network topology views that enable administrators to quickly determine the state of the network and its components. Performance and fault management allow control and monitoring at the port and device level.
- Other features include:
- Automatic discovery, mapping, and monitoring of ATM campus devices (hubs, concentrators, bridges)
 - Integration with NetView for AIX for seamless management
 - Selection, tracking and storing of key performance counters in an ATM campus network
 - Device, module, and port configuration capabilities
 - Download of new microcode to ATM campus devices
 - A complete set of messages, traps and event notification integrated into NetView for AIX
 - Graphical connections tracking from end-to-end of the ATM cloud
 - Automatic discovery of LAN emulation entities (servers, clients, and proxy clients)
 - Dynamic display of LAN emulation topology (administrative domains, emulated LANs, lists of clients)
 - Configuration of LAN emulation entities and services (domains, policies, emulated LAN clients, servers)
 - ELAN status reflected in ATM device color status
 - ELAN fault management (central point for accessing servers error logs)
 - Security control for ELAN access
 - Drag and drop operations for add, remove and change on a configuration
 - Automatic discovery of non-IBM ATM devices (switches or edge devices)
 - Generic profile, configuration and fault management of non-IBM ATM devices (via standard SNMP MIBs)
 - Critical resource monitoring
 - Search facility using the Object Store database already used by Nways Campus Manager LAN for AIX

Devices Supported Nways Campus Manager ATM can be used to monitor and control the following devices:

- IBM 8260 Nways Multiprotocol Switching Hub (ATM Modules)
- IBM 8281 ATM LAN Bridge
- IBM 8282 ATM Workgroup Concentrator
- IBM 8281 ATM LAN Bridge Module (for the 8260)
- IBM 8285 Nways ATM Workgroup Switch
- IBM 8210 Multiprotocol Switched Services Server (MSS)

Products and Options

Description
Nways Campus Manager ATM for AIX V2.0, 8 mm tape
Nways Campus Manager ATM for AIX V2.0, 1/4 inch tape
Nways Campus Manager ATM for AIX V2.0, 4 mm tape
Nways Campus Manager ATM for AIX V2.0, CD-ROM

Sales Tools

The following sales tools are available for Nways Campus Manager ATM for AIX:

<i>Nways Campus Manager ATM for AIX</i> (spec sheet)	G325-3502-00
<i>Nways Campus Manager ATM for AIX V2.0</i> (spec sheet)	G325-3633-01
<i>Proactive Management Solutions for the Campus and Wide Area Network</i> (brochure)	G325-3521-00

Nways Campus Manager Suite for AIX

Description

Nways Campus Manager Suite for AIX is a packaging of the following three products:

- Nways Campus Manager LAN for AIX
- Nways Campus Manager ATM for AIX
- Nways Campus Manager Remote Monitor Advance for AIX

The suite price is less than purchasing each of the products separately. The functions of the suite are exactly the same as those of the separately orderable products.

Products and Options

Description	
Nways Campus Manager Suite for AIX V3.0 (5697-B06)	8 mm tape
Nways Campus Manager Suite for AIX V3.0 (5697-B06)	1/4 inch tape
Nways Campus Manager Suite for AIX V3.0 (5697-B06)	4 mm tape
Nways Campus Manager Suite for AIX V3.0 (5697-B06)	CD-ROM

LAN Network Manager for OS/2

- Description** LAN Network Manager (LNM) for OS/2 V2.0 provides generic physical media management of Token-Ring networks and Ethernet networks (through bridges) supporting multiple segments in those networks.
- Positioning** LNM for OS/2V2.0 is an industry-leading Token-Ring media management application managing from 1 to 256 segments (based upon tier purchased).
- Functions** LNM for OS/2V2.0 allows the customer to manage multi-segment Token-Ring and Ethernet networks either locally from a workstation or centrally from host NetView or from LAN Network Manager for AIX. In addition to selecting the managing operating environment, the customer also has the option of disabling the end user interface for unattended mode if screen viewing security is important. Other features include:
- Enhanced Graphical User Interface (GUI) improving panel navigation to simplify operation and to make it easier for the customer to obtain the desired management information.
 - Continuous monitoring of the customer's Token-Ring and Ethernet networks to assist the customer in problem determination and error recovery.
 - Token-Ring media management consisting of Logical Link Control (LLC), Media Access Control (MAC) and Common Management Information Protocol (CMIP).
 - LNM generates generic alerts, which are generated by LAN-attached devices when problem conditions occur.
 - Topology views which are dynamically drawn and updated, showing all devices and their physical and logical relationships.
 - Collection and display of performance statistics on Token-Ring to Token-Ring bridges and on 8209/8229 Token-Ring to Ethernet bridges.
 - Ring utilization when used in conjunction with 8230 models 3, 13, 213, 4A, 4P and IBM LAN Station Manager.
 - Asset management of 8230s and end stations when used in conjunction with LAN Station Manager.
 - TCP/IP agent interface to LAN Network Manager for AIX application running on top of NetView for AIX.
 - Support for the NetView MultiSystem Manager MVS/ESA.

Devices Supported LNM for OS/2 V2.0 can be used to monitor and control the following devices:

- IBM RouteXpander/2
- IBM 6611 Network Processor
- IBM 8230 Models 1, 2, 3, 13, 213, 4A, 4P (in CMOL mode)
- IBM 8209/8229 Bridges (in CMOL mode)
- IBM Local Token-Ring Bridge/DOS
- IBM Remote Token-Ring Bridge/DOS
- IBM LANStreamer Bridge/DOS
- IBM Frame Relay Token-Ring Bridge/DOS
- Token-Ring adapters
- Token-Ring media

Products and Options

Description
LNM for OS/2 V2.0, Tier 1 (1-2 Segments) (5871-AAA)
LNM for OS/2 V2.0, Tier 2 (1-9 Segments) (5871-AAA)
LNM for OS/2 V2.0, Tier 3 (1-256 Segments) (5871-AAA)

Sales Tools

The following sales tool is available for LNM for OS/2 V2.0:

LAN Network Manager for OS/2, V2.0 (spec sheet) G325-3432-00

Information about LNM for OS/2 V2.0 is available via the IBM fax-back systems.

- IBM FAX (800-IBM-4FAX, product spec sheet document # 2013)
- IBM PCC FAX (800-IBM-3395, product spec sheet document # 11292)

Information about IBM networking products is available on the Internet WWW Server via:

- URL: <http://www.raleigh.ibm.com/nethome.html>

Appendix 1

Switched Virtual Networking

Market Information

Network Computing

Network Computing (NC) has become the dominant computing environment in today's business, government and educational organizations. It represents a form of distributed computing in which a network of computing resources is viewed as a supplier of services. This network may comprise the enterprise or extend beyond it. It may involve a private or public network (such as the Internet, CompuServe or America Online). The challenge of Network Computing is to provide the end user (whether local or remote) with seamless, transparent access to the services and resources of the network, including databases, applications and processors.

Since networking is at the core of computing today, the actual network must be designed and implemented to maximize its effectiveness and meet the customer's demanding requirements. Today's networks are no longer able to satisfy current customer needs, much less support emerging applications such as multimedia.

Existing Networks

The predominant types of networks existing today are host-based and router-based networks.

- **Host-based networks** are characterized by the traditional corporate computing structure built around the use of large centralized processors. Traditionally, they use connection-oriented protocols and can, therefore, guarantee some service level for their applications. Their traffic patterns are relatively easy to predict and the networks are efficient and manageable. This comes at a price — a lack of flexibility.
- **Router-based networks** emerged to support the growing use of personal productivity tools and the resultant need to share the data they created. Router-based networks typically use connectionless protocols (e.g., TCP/IP). In a connectionless network, each packet is routed to its destination based on the conditions of the traffic at the time. Consequently, it is a very flexible environment which can adapt very easily to the changes in the network. In addition, the traffic patterns of the router-based network are not easily predictable. All of this makes the management of these networks a real challenge.

Trends Influencing Change

Today's networks are inadequate to meet the growing demands of Network Computing. Trends in both computing and business are requiring that networks change. These trends include:

- **Computing Trends:** Networks need to have higher speed, more bandwidth, network integration across platforms and protocols, network scalability and bandwidth on demand.
- **Business Trends:** Customers want a network that provides options to address the range of needs of individual workers with minimal impact to the desktop. They want a network with scalability, guaranteed service and sophisticated management capabilities, for the lowest cost possible.

Switched Networks

With these pressures on today's networks, the movement is toward a switched infrastructure rather than a shared one. The advantages of moving to a switched network are dedicated bandwidth where needed, elimination of bottlenecks, and the enablement of advanced applications such as multimedia. Customers have a choice of implementing Switched LANs (Ethernet or Token-Ring) or ATM. Many will probably decide to implement both Switched LANs and ATM and attach existing LANs to higher bandwidth servers and backbones.

Switching vs. Routing

With new bandwidth-hungry applications, routers are likely to cause latency in the data stream that is perceivable by the end user. Removing the routing function from the data path eliminates this latency and allows high bandwidth applications and end users to have direct connections.

Routers do their routing at level 3 in the protocol stack and do the route determination in the processor with software. LAN Switching and ATM do route determination at level 2 and in hardware, which is much faster. This eliminates the processor bottleneck and gets routing out of the data path.

IBM Solution

To build a network to satisfy these computing and business needs, IBM believes the solution is Switched Virtual Networking (SVN), with ATM technology as an enabling technology. SVN is a comprehensive approach for building and managing switched-based networks. It combines the virtues of LAN switching, bridging, routing, ATM switching and other switched services. IBM's recommendations are:

- At the desktop — LAN switching and ATM connections
- Building/campus — ATM backbone
- WAN backbone — broadband switch for frame relay and ATM
- Branch offices — frame relay or ATM attachment across the WAN

Switched Virtual Networking

SVN

Switched Virtual Networking is IBM's strategy for addressing networking challenges. It offers a switching infrastructure with maximum flexibility and price/performance benefits. Switched Virtual Networking is part of IBM's Open Blueprint and is consistent with Network Computing (NC). IBM's strategy is to utilize ATM for the core backbone. The previously existing infrastructures and function, such as routing, SNA, TDM, bridging, and voice switching, will be moved to the periphery. The key functional elements of the SVN strategy for both campus and wide area environments include:

- Periphery Switching
- Backbone Switching
- Advanced Network Services
- Network Management

SVN resolves many of the networking problems that customers face today. Specifically, the problems that SVN addresses are:

- congestion at the router and servers
- congestion of subnets
- congestion at the backbone
- cost for network administration
- enablement of virtual groups
- enablement of advanced multimedia applications

Periphery Switching

Any end station on the network will be able to access a high-speed, switched backbone. Extending the switching function to the periphery protects investment in existing multivendor systems by allowing a mix of traffic types. Many products are available from IBM to provide periphery switching services for LANs, WANs, and ATM devices.

Backbone Switching

The backbone network carries the traffic to be distributed to many parts of the network. Backbone switching provides high performance connections between periphery switches. ATM provides backbone networks with high-speed connectivity as well as reliability and quality of service between periphery switches. This enables the support of consolidated traffic types. In addition, ATM provides the capabilities that a backbone network will need to support future applications, such as:

- congestion and flow control
- high availability
- sophisticated network control
- dynamic user group management
- effective traffic management
- support for industry standards

Advanced**Network Services**

An example of Advanced Network Services is the Networking BroadBand Services (NBBS) architecture. NBBS provides end-to-end control functions designed for high-speed switched networks. NBBS provides the following functions:

- allows network consolidation to a single infrastructure
- maps all protocol and information types to ATM
- provides guaranteed quality of service and bandwidth reservation
- minimizes the resources required to support consolidated traffic
- manages virtual circuits and virtual paths across the LAN & WAN backbone

NBBS has been extended beyond its original focus on the wide area specific functions of Access, Transport and Advanced Network Control Services. It now also includes the local area Multiprotocol Switched Services, which provide:

- **Distributed Routing.** Multiprotocol Switched Services remove the router from the data path and distribute layer 3 routing function to the network periphery. It provides a seamless migration path for existing routers and provides routing between virtual LANs, Classical IP, and LAN emulation.
- **Enhanced ATM Forum-Compliant LAN Emulation.** It supports larger emulated LANs, provides broadcast management to reduce overhead traffic, and supports multiple LAN emulation servers. A user can be a member of multiple emulated LANs.
- **Virtual LANs Support.** A Virtual LAN (VLAN) is a logical grouping of users and servers independent of physical location. Virtual LANs enable the formation of closed user groups. VLANs have several advantages including minimizing the impact of broadcast traffic, consolidating servers in a secure location, and simplifying moves/adds/changes.

Advanced network control is also part of NBBS. It provides congestion control, traffic management, topology services, path selection, multicast services and directory services.

Network**Management**

IBM's Switched Virtual Networking provides end-to-end management across both the LAN and WAN. Included are:

- ATM support for topology and fault tolerance
- multiple management platforms and operating systems
- multivendor equipment support
- scalable enterprise management with integrated views
- graphical Virtual LAN management

**IBM's SVN
Implementation**

Many of IBM's current products already support the SVN model. Therefore, customers can immediately begin implementing a switched virtual networking environment. An ideal SVN environment is illustrated on the following page.

Current products that support SVN are:

Periphery Switching

IBM 8271 Nways™ Ethernet Switch
IBM 8272 Nways Token-Ring Switch
IBM 8281 Nways ATM LAN Bridge
IBM 8285 Nways ATM Workgroup Switch
IBM 8260 Nways Multiprotocol Switching Hub
IBM 8282 Nways ATM Concentrator
IBM 3172 Nways Interconnect Controller
IBM 2220 Nways BroadBand Switch
IBM 3746 Models 900, 950 Nways Communications Controllers
IBM 2218 Nways Frame Relay Access Device
IBM 2219 Nways Frame Relay Switch
IBM 2225 Nways Multiservice Switch

Backbone Switching

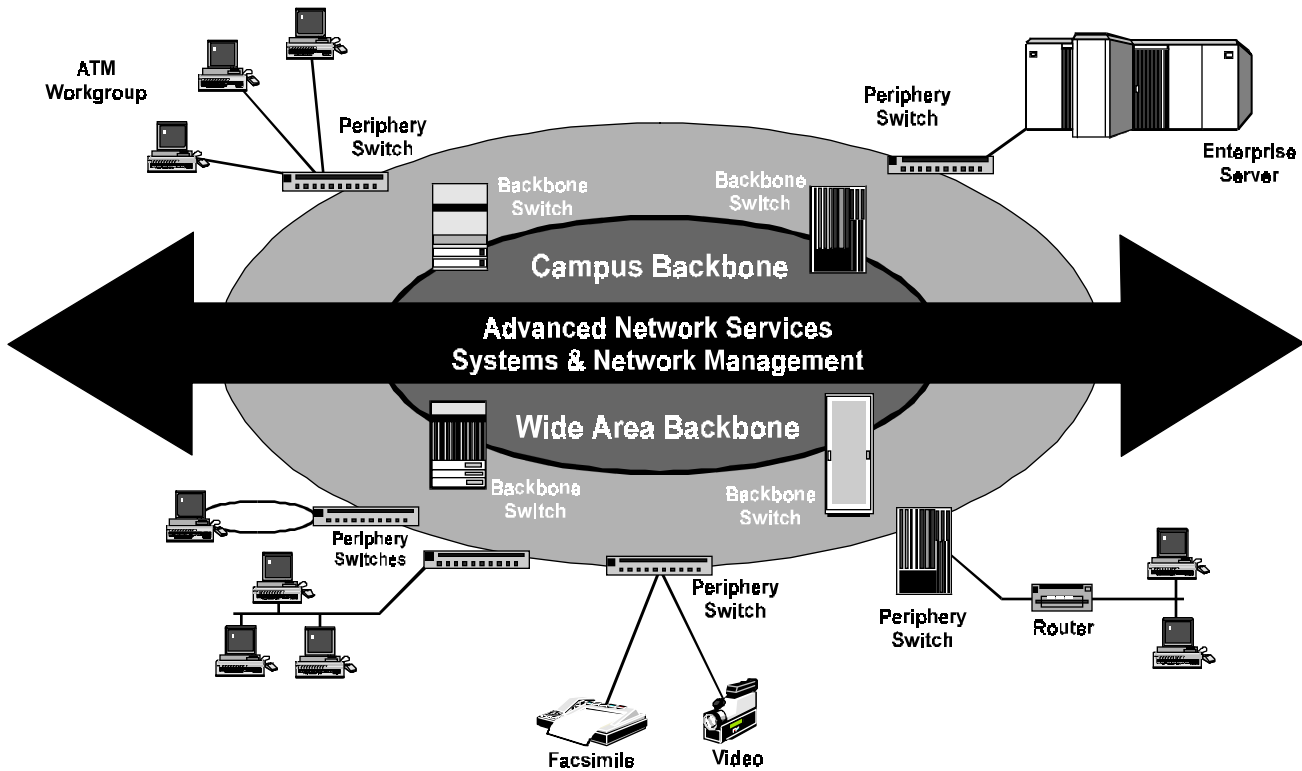
IBM 2220 Nways BroadBand Switch
IBM 8260 Nways Multiprotocol Switching Hub Models A10, A17, and G17
IBM 2225 Nways Multiservice Switch
IBM 2230 Nways ATM Switch

Networking BroadBand Services (NBBS)

IBM 2220 Nways BroadBand Switch
IBM 8260 Nways Multiprotocol Switching Hub Models A10, A17, and G17

Network Management

SystemView for AIX
Nways Campus Manager LAN for AIX
Nways Campus Manager ATM for AIX
Nways Campus Manager Remote Monitor for AIX



IBM's Switched Virtual Networking

References

For information on additional IBM networking products, please consult the following IBM Sales Guides.

- Network Adapter Sales Guide
- LAN Switch Sales Guide
- ATM Sales Guide
- Bridge/Router Sales Guide
- Remote Access Sales Guide

Glossary

Active Hub	An active hub regenerates signals and may monitor traffic for network management.
ANSI	American National Standards Institute.
AUI	Also known as thickwire, thick net or 10BASE5. This type of Ethernet connector has a 15 pin D type connector.
ATM	Asynchronous Transfer Mode. An international standard for cell relay that defines a fixed length 53-byte packet or cell. Common network speeds range from 25 Mbps. to 622 Mbps.
AUS	Automatic Update Service. A subscription for the 8250 that ensures that the modules are automatically updated during a three-year period with the latest code enhancements and extensions. This service is free for the 8260 modules.
BNC	A commonly-used connector for coaxial cable.
Cascade	To connect the output of a device into the input of another device.
CAU	Controlled Access Unit. Intelligent Token-Ring hub from IBM.
CMIP	Common Management Information Protocol. Network management protocol from ISO.
CMOL	"CMIP Over Logical Link Control." An implementation of the CMIP management protocol over the second layer of the OSI protocol stack.
CRS	Configuration Report Server. An IBM Token-Ring 8260 MIB extension that allows the TMAC to gather ring station information, report topology changes, and remove station(s) from the ring.
DAS	Dual Attachment Station. A station that offers two attachments to a FDDI network that are capable of accommodating a dual (counter-rotating) ring.
DMM	Distributed Management Module. Allows one to fully manage and control the 8250/8260 modules in an 8260.
DRR	Dual-Ring Redundancy. Feature of the IBM 8230.
EMAC	Ethernet Media Access Control daughter card. Physically mounted on either the 8260 media module or DMM with carrier. Provides statistical gathering for the network on which it is installed.
EMM	Ethernet Management Module for the IBM 8250.

FDDI	Fiber Distributed Data Interface. An ANSI standard that defines a dual counter rotating ring which operates at a rate of 100 Mbps over fiber.
FOIRL	Fiber Optic Inter Repeater Link. IEEE standard for fiber optic Ethernet.
FTP	Foiled Twisted Pair.
Hub	A physical layer device that creates the network infrastructure.
ICS	IBM Cabling System.
Intelligent Hub	See Active Hub.
ISO	International Standards Organization.
JAC	Jitter Attenuator Card in IBM 8260. The JAC filters out excessive amounts of jitter that may have accumulated before passing the signal to the 8260 Token-Ring backplane.
LAM	Lobe Attachment Module. The name of a component that can attach up to 20 devices on a ring to the base unit of the IBM 8230. The LAM attaches devices using sections of cable referred to as lobes.
LIU	Lobe Insertion Unit. The name of a module that inserts into a slot in the base unit of the IBM 8230. LIUs include a wide variety of modules for this product.
MAU	Multi-station Access Unit. Central hub in a Token-Ring LAN. Also known as an 8228 in the IBM product line.
MIB	Management Information Base. In an SNMP managed network, a MIB is a database of objects representing the characteristics and status of the managed devices.
MPEG-2	An international standard that provides a transport stream for synchronized video and voice.
NTSC	National Television Standards Committee. An analog, baseband video format used in the U.S., Japan, and parts of South America.
PAL	Phase Alternation by Line, which is an analog, baseband video format used in parts of the world other than the U.S., Japan, and parts of South America.
Passive Hub	Passive hubs add nothing to the data being transmitted through them.
PPS	Per Port Switching. Port switching allows individual ports on a module to be assigned to different networks on the backplane.

REM	REM can refer to two different terms, depending on the context: <ul style="list-style-type: none">• Ring Error Monitor is an IBM Token-Ring 8260 MIB extension that allows the TMAC to monitor, collect, and analyze errors as well as to assist in fault isolation.• Router Engine Module is the basis for the new 8250 6-port Ethernet Switch and Bridge modules.
RLAM	Remote Lobe Attachment Module. The name of a component that attaches to the base unit of the IBM 8230. The RLAM can attach up to 16 additional workstations to the Token-Ring and can be connected up to 100 meters from the IBM 8230 Model 3/13/213.
RMON	Remote Monitoring Specification. An SNMP protocol used to manage networks remotely.
SAS	Single Attachment Station. A station that offers one attachment to the FDDI network. See Dual Attachment Station.
SDLC	Synchronous Data Link Control. A bit-oriented synchronous communications protocol developed by IBM for SNA networks.
SLIP	Serial Line IP. TCP/IP protocol that allows IP packets to be transmitted over a serial link, such as a dial-up or private telephone line.
SMT	Station Management standard. Standards-based network management protocol on FDDI networks.
SNMP	Simple Network Management Protocol. Widely-used network monitoring and control protocol. Data is passed from SNMP agents which are hardware and/or software processes reporting activity in each network device to the workstation console used to oversee the network. The agents return information contained in a MIB.
Spanning Tree	The Spanning Tree algorithm enables transparent bridges to dynamically discover a loop-free network and provide a single physical path between any two stations attached to the network.
SR	Source Routing. A method used by a bridge to move data between two networks. The bridges forward frames based on a Routing Information Field (RIF) which is part of the MAC frame header. The RIF defines the route that a frame will take to get from source to destination.
SRT	Source Route Transparent. The Source Routing Transparent Bridge is able to perform Source Route Bridging and Transparent Bridging simultaneously.
SRTB	Source Route Translational Bridging. This bridging method allows Source Route Token-Ring frames to be translated to Transparent Bridge Ethernet frames.
STP	Shielded Twisted Pair.

TB	Transparent Bridge. This bridge forwards frames based on the destination address. If the destination address of a frame is known to be on the same LAN as the source address, then no forwarding will take place. If the destination address is not known on the same LAN as the source address, then the bridge will forward the frame. Used primarily to connect Ethernet LANs.
Telnet	A TCP/IP protocol that governs the exchange of character-based terminal data.
TMAC	Token-Ring Media Access Control daughter card. Physically mounted on any 8260 Token-Ring media. Provides statistical gathering for the network on which it is installed.
TRMM	Token-Ring Management Module for the 8250.
UTP	Unshielded Twisted Pair.
VLAN	Virtual Local Area Network. A logical association of switch ports based upon a set of rules or criteria such as MAC address, protocols, network address or multicast address.
10BASE-FL	This type of Ethernet uses a bus topology with fiber optic cable.
10BASE-T	This type of Ethernet network uses a star topology with two pairs of unshielded twisted pair cable. It is used for a single, point-to-point connection between a computer and a hub or switch.
10BASE2	This type of Ethernet uses a bus topology with a thin coaxial cable (thin net). It is generally used for small networks, departmental networks or wiring a number of nodes together in the same room.
10BASE5	This type of Ethernet uses the bus topology with thick coaxial cable (thick net).
100BASE-FX	Fast Ethernet running at 100 Mbps over one pair of multimode fiber.
100BASE-TX	Fast Ethernet running at 100 Mbps over 2-pairs of 100-ohm category 5 UTP.
100BASE-T4	Fast Ethernet running at 100 Mbps over 4-pairs of 100-ohm category 3 UTP.