ATM
Sales Guide

Third Edition, Spring 1997

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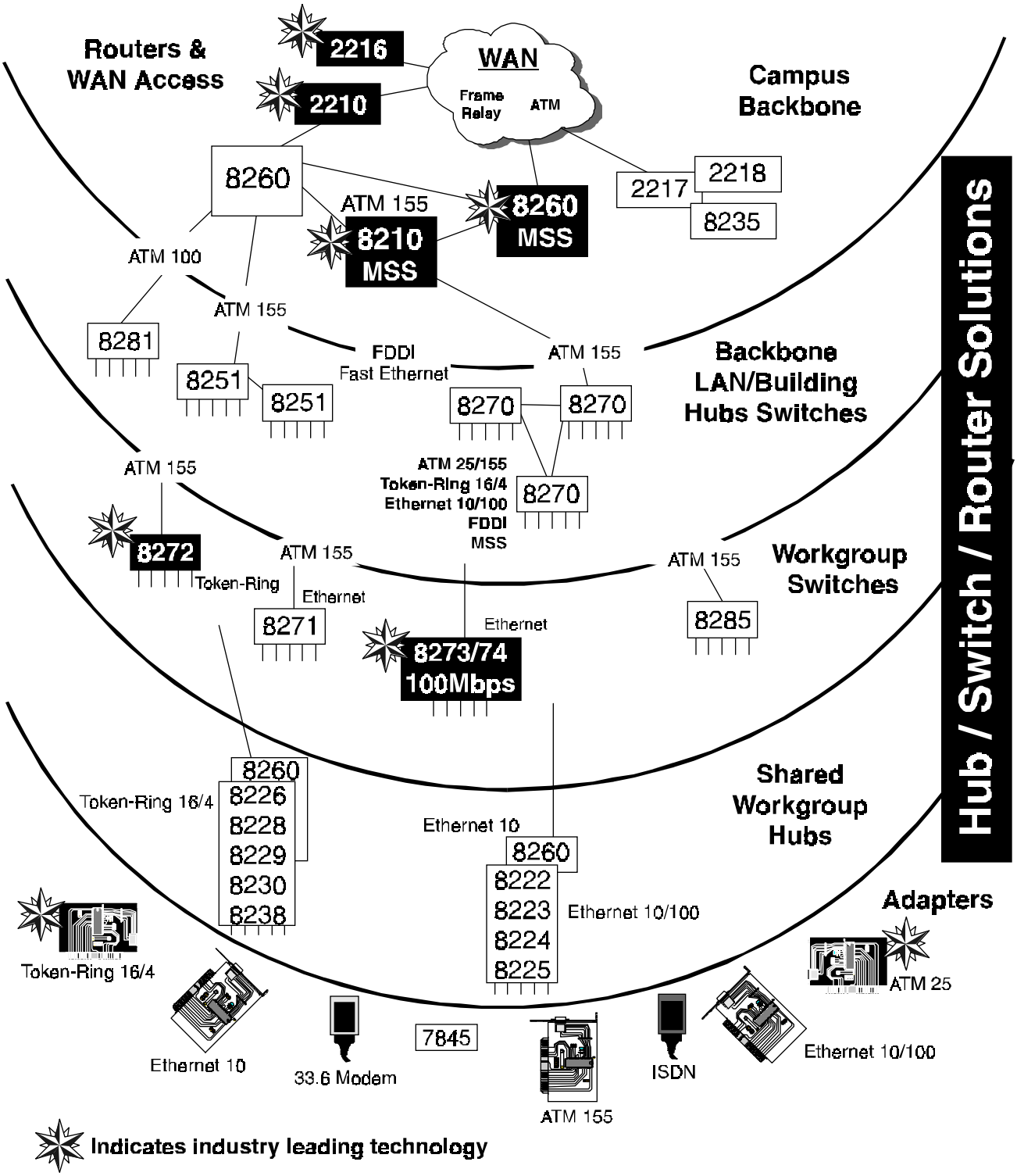

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Edition 3

Background

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 the 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.

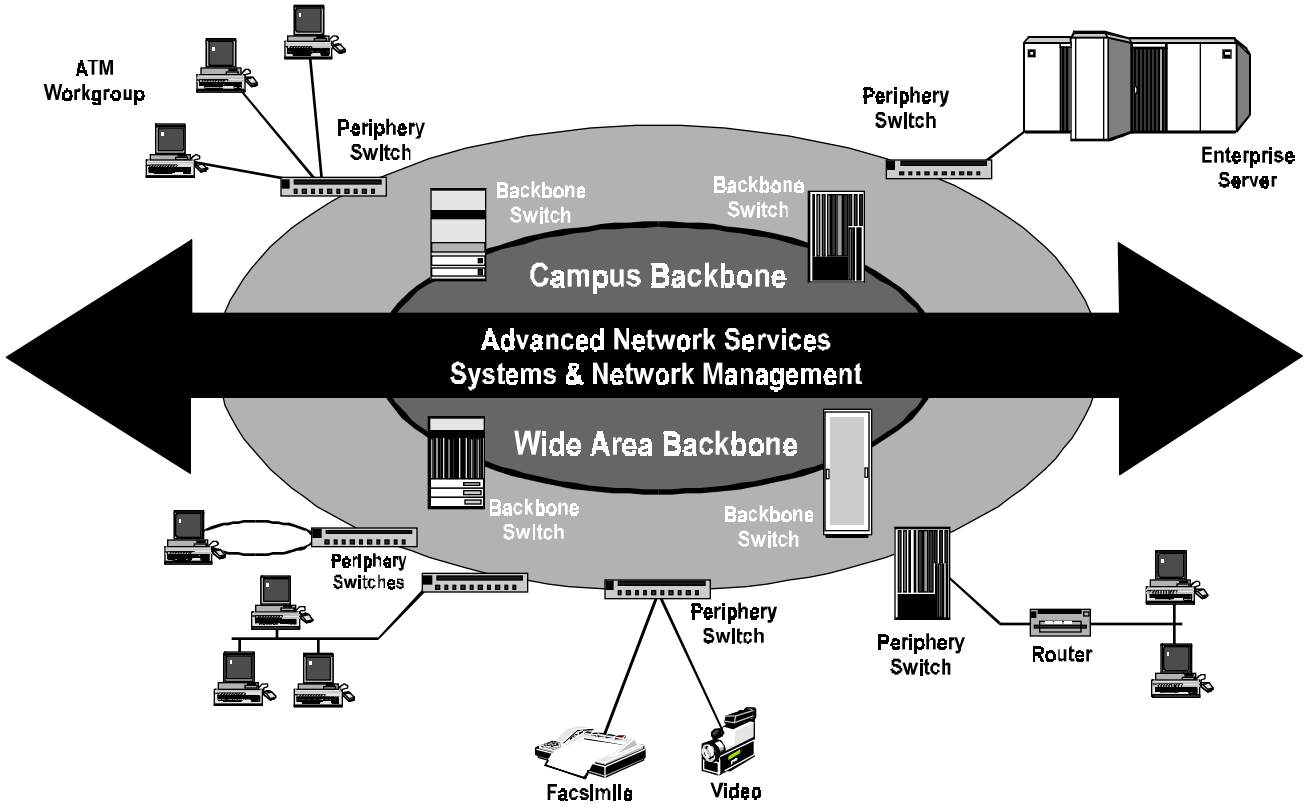
Current products that support SVN are:

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 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 Models A10 and A17 Intelligent Hub
IBM 2225 Nways Multiservice Switch
IBM 2230 Nways ATM Switch

Networking BroadBand Services (NBBS)
IBM 2220 Nways BroadBand Switch
IBM 8260 Models A10 and A17 Intelligent Hub

Network Management
NetView Family
Nways Campus LAN Manager
Nways ATM Manager
Nways ReMon



IBM's Switched Virtual Networking

IBM ATM Products

ATM

Asynchronous Transfer Mode (ATM) is the international standard for cell relay that the industry is developing to:

- support both public and private networks
- use the same technology for local area, metropolitan area and wide area networks
- multiplex voice, video and data (including image) traffic
- deliver bandwidth on-demand
- offer low-cost networking and use low-cost technology

ATM is a high speed, high bandwidth technology that combines the flexibility and efficiency of packet-switching with the minimal delay characteristics of circuit switching. ATM enables voice, video and data signals to travel at exceptionally high speeds over a single network line. ATM is the technology that will provide guaranteed bandwidth and quality of service to applications such as multimedia, imaging, advanced engineering and visualization.

IBM Products

IBM is committed to becoming a major provider of ATM networking hardware and software. Its Nways family of ATM products extends from the desktop to the enterprise backbone to the wide area. IBM's ATM products are positioned to bring ATM capabilities all the way to the desktop PC and provide a cost-effective migration path from today's shared LAN environment to LAN switching and ultimately to the high-performance, dedicated connections of ATM, while preserving customer investment in cabling and applications.

IBM Product Features

IBM's ATM product line offers many impressive features, including:

- **Bandwidth Options**. ATM offers customers scalable options for bandwidth. Currently, adapters are available for 25 Mbps, 100 Mbps and 155 Mbps, and future offerings will include client and server options ranging to 622 Mbps.

- **Scalability**. Because ATM is scalable, investment in current ATM products is preserved, since they will interoperate with future higher speed ATM products.

- **LAN Emulation**. This capability gives existing network devices transparent access to the ATM network. LAN emulation defines how LAN addresses are mapped to ATM addresses. With LAN emulation, a customer's current network applications will work with an ATM switch-based network. LAN emulation lets existing workstations and applications run on an ATM network without modifications.

ATM can be installed in a step-by-step fashion, without having to make wholesale changes to workstations at the outset. Both Token-Ring and Ethernet LANs can be emulated. The LAN Emulation client runs on ATM workstation adapters. The LAN emulation server is included on the Nways 8285 ATM Workgroup Switch, as part of MSS for the 8260, and as a standalone device for non-IBM switches. Client software is available for machines running DOS, OS/2, Windows, AIX and NetWare. LAN emulation is provided free of charge with the adapters. Forum-compliant LAN Emulation is available now.

- **Application Protection**. Using ATM LAN emulation, existing applications run transparently on the ATM network. This capability protects customers' investments in network applications.

- **Cabling Support.** Both UTP and STP wiring are supported, thus minimizing the customer's migration cost to high-speed networks.

- **Standards Support.** IBM is an active member of the ATM Forum standards-setting body. As new standards emerge, IBM will ensure its products meet specifications.

- **Interoperability**. IBM's ATM products are designed to be interoperable with ATM networks built on other vendors' equipment. IBM also participates in interoperability tests at the University of New Hampshire.

TURBOWAYS Adapters

Product Description

There are currently several kinds of ATM adapters in IBM's ATM product line.

- The **TURBOWAYS 25 ATM Adapter** is positioned as a low cost client adapter that brings high bandwidth ATM connectivity to Micro Channel™, Sbus, ISA- and PCI-bus desktop PCs running under DOS, Windows, OS/2, Solaris, or SunOS.

- The **TURBOWAYS 100 ATM Adapter** is positioned as a high performance Micro Channel™ adapter that provides ATM connectivity for the RS/6000 Series 300, 500 and 900 and high-end PS/2s over a local area network. Operating systems supported include AIX®, NetWare, and OS/2. The TURBOWAYS 100 provides dedicated 100 Mbps ATM connection for high performance servers or workstations.

- **TURBOWAYS 100 ATM Adapter** for the 3172 Interconnect Controller Model 3 provides a 100 Mbps LAN-to-host ATM gateway via the IBM 3172.

- The **TURBOWAYS 155 ATM Adapter** offers Micro Channel™ or Sbus connections providing 155 Mbps dedicated bandwidth for high-end workstations and servers.

- The **IBM 155 ATM S/390 Open Systems Adapter 2** (OSA-2) offers high-speed connections between desktop workstations and host systems, turning the S/390 mainframe into a powerful LAN server. It supports Ethernet and Token-Ring LANS, and ATM and FDDI environments.

- **Interphase 155 ATM Adapters** bring high-speed connectivity for devices with PCI, GIO, or EISA bus support.

TURBOWAYS 25

IBM is the leading provider of 25 Mbps ATM adapters for the desktop. It offers four TURBOWAYS 25 ATM Adapters, providing a 25 Mbps full-duplex connection to the ATM network, and utilizing either ISA, PCI, Micro Channel™ or Sbus connections. The ISA and PCI adapters operate in PCs running DOS or Windows; the Micro Channel™ adapter functions in an OS/2 system; and the Sbus adapter works with the Solaris and SunOS operating systems. The ISA, PCI and Micro Channel adapters operate in ATM Forum-compliant LAN Emulation or Classical IP environments; the Sbus adapter is available only with Classical IP support. Each of the four adapters use existing STP or UTP (category 3, 4, or 5) wiring.

The TURBOWAYS 25 connects to the ATM network via the IBM 8285 Nways ATM Workgroup Switch or the IBM 8282 ATM Workgroup Concentrator. The Switch can use a 25 Mbps ATM adapter in a PC as a server for the workgroup environment. The adapter comes with LAN Emulation and supports up to 32 full-duplex virtual circuits. A maximum of one TURBOWAYS 25 Adapter may be installed in a system.

The TURBOWAYS 25 ATM Adapters are the most complete line of 25 Mbps adapters available from any single vendor today. They are positioned primarily as client adapters, although the OS/2 and Windows NT drivers may also make them attractive as application servers.

The **TURBOWAYS 25 ISA** features include:
- a specialized ATM chip for handling the cell segmentation and reassembly (SAR) function
- easy to use configuration
- easy to use diagnostics
- signaling channel setup
- virtual connection setup and tear down
- bandwidth allocation and management
- capability to transmit and receive data on virtual connections
- a reliable, connection-oriented circuit between an ATM Forum version 3.0 SVC component and the ATM switch
- Token-Ring and Ethernet ATM Forum-compliant LAN Emulation or Classical IP
- ISA Busmaster
- lifetime warranty

The **TURBOWAYS 25 PCI** features include:
- AAL-5 adaptation layer interface
- High throughput by implementation of a specialized chip that handles ATM segmentation and reassembly
- Configuration, installation and diagnostics
- Bandwidth allocation and management
- Virtual connection setup and teardown
- PCI busmaster
- A lifetime warranty

The **TURBOWAYS 25 Micro Channel™** features include:
- Micro Channel™ bus
- A lifetime warranty

The **TURBOWAYS 25 Sbus** features include:
- TCP/IP protocol support in a Classical IP environment
- lifetime warranty

IBM TURBOWAYS 25 ATM adapters support drivers for a variety of operating systems:

- OS/2 2.11 or higher (MC bus)
- OS/2 Warp 3.0 (MC or PCI bus)
- PC DOS 6.3 or higher (PCI bus)
- MS-DOS 6.2 or higher (PCI bus)
- Windows 3.1 or Windows NT 3.5 (PCI or ISA bus)
- Windows 95 (PCI or ISA bus)
- Solaris 2.3 and 2.4 (Sbus)
- SunOS 4.1.3 (Sbus)

TURBOWAYS 100

The TURBOWAYS 100 ATM Adapter is a Micro Channel™-based adapter for RS/6000™ and high-end PS/2 connectivity to ATM networks. It provides dedicated bandwidth of 100 Mbps between the RS/6000, PS/2 and other devices on the ATM network. Up to two TURBOWAYS 100 Adapters can be installed in a single client or server. These adapters provide high bandwidth application or file servers for the ATM workgroup, and may also be positioned as high bandwidth client adapters.

The features of the TURBOWAYS 100 include:

- on-board i960 processor plus a specialized chip set to handle ATM segmentation and reassembly, resulting in extremely high throughput
- SNMP sub-agent
- easy-to-use configuration
- signaling channel setup
- virtual connection setup and tear down
- bandwidth allocation and management
- capability to transmit and receive data on up to 1024 virtual connections
- a reliable, connection-oriented circuit between an ATM Forum version 3.0 SVC component and the ATM switch
- process synchronization
- Micro Channel streaming
- handling of hardware and software interrupts
- support of ATM Forum-compliant LAN Emulation (PS/2) or Classical IP for AIX environments
- supports OS/2 running Classical IP
- supports IBM LANE for OS/2 and NetWare, and ATM LANE for OS/2
- full-duplex capabilities
- multimode fiber wiring
- one year warranty

TURBOWAYS 100 ATM Adapters support drivers for the following operating systems:

- AIX 3.2.5, AIX 4.1.4, and AIX 4.2 (RS/6000)
- NetWare 3.1.2 and 4.01 or higher (PS/2)
- OS/2 2.0 or higher (PS/2)

TURBOWAYS 100 for 3172

This adapter provides 3172 Interconnect Controller Model 3 users with direct access to high-bandwidth, high-speed ATM LANs. In addition, the adapter provides Token-Ring and Ethernet LAN emulation, allowing users to connect existing applications transparently to the ATM network. Other features include:

- switched virtual circuit (SVC) support
- ATM Adaptation Layer 5 (AAL-5)
- transmission and receipt of data on virtual connections

TURBOWAYS 155

The IBM TURBOWAYS 155 is a high performance adapter designed to operate with computers having Micro Channel™ or Sbus connections. The adapter is available as a high bandwidth file server or client, and offers the following features:

- SNMP subagent support for TCP/IP network management capability
- on-board processor plus a specialized chip set to handle ATM segmentation and reassembly, resulting in extremely high throughput
- support for the following interfaces: ATM Forum UNIX Specification V3.0 for SVCs; ATM Adaptation Layer 5 (AAL-5); Open Data Link Interface (ODI); and, Network Driver Interface Specification (NDIS)
- support for NetBIOS, SNA, Internetwork Packet Exchange (IPX) and TCP/IP through LAN Emulation, and TCP/IP through AIX®
- support for OS/2 running Classical IP
- support for Token-Ring and Ethernet ATM Forum-compliant LAN emulation on NetWare (available December 27, 1996)
- multimode fiber or UTP5/STP wiring
- a lifetime warranty

TURBOWAYS 155 ATM adapters support drivers for the following operating systems:

- AIX 3.2.5, AIX 4.1.4, and AIX 4.2 (RS/6000)
- AIX 4.1.5 for RS/6000 servers for TCP/IP over Forum-compliant LAN Emulation (PRPQ P91164)
- NetWare 3.x and 4.x and higher (PS/2)
- OS/2 2.11 or higher or OS/2 Warp 3.0 for Forum-compliant LAN Emulation (PS/2)
- Solaris 2.3 or 2.4 (Sbus)
- SunOS 4.1.3 (Sbus)

IBM 155 ATM S/390 Open Systems Adapter 2

The 155 ATM S/390 Open Systems Adapter 2 (OSA-2) delivers high bandwidth ATM connections between S/390 mainframes and Ethernet, Token-Ring, or FDDI environments. Its features are as follows:

- directly links an S/390 to FDDI, Token-Ring and Ethernet environments
- support for TCP/IP and IP communication protocols
- ATM Forum-compliant LAN Emulation for Ethernet and Token-Ring LANs
- extends the S/390 mainframe's unmatched data security, unlimited storage and centralized management to networks
- faster response time and higher throughput for database, Web server or other application access to S/390 enterprise servers
- supports SNA/APPN
- multimode or single mode fiber connections
- one year warranty

INTERPHASE 155

IBM offers three Interphase 155 ATM adapters that support PCI, GIO, and EISA buses: the 5515 PCI adapter for PCI 2.1 compliant or PowerPC workstations, the 4915 GIO adapter for GIO-based workstations, and the 4815 EISA adapter for Intel EISA V.3.12 workstations.

The 5515 PCI and 4815 EISA adapters feature:

- UTP (category 5) or multimode wiring
- support for ATM Forum-compliant LAN Emulation, Classical IP for Windows NT, and SMP environments
- support for NetBIOS, SNA, IPX, and TCP/IP
- a one year warranty

The 4915 GIO adapter features:

- UTP (category 5) or multimode wiring
- TCP/IP protocol enabling
- ATM Forum-compliant LAN Emulation and Classical IP support
- a one year warranty

Interphase 155 ATM adapters support the following operating systems:

- NetWare 3.x or 4.x (PCI or EISA bus)
- Windows NT 3.5.1 (PCI or EISA bus)
- IRIX 5.3 (GIO bus)

Products and Options

Description
TURBOWAYS 25 ATM ISA Adapter (single) TURBOWAYS 25 ATM ISA Adapter (5 pack, per unit) TURBOWAYS 25 ATM PCI Adapter (single) TURBOWAYS 25 ATM PCI Adapter (5 pack, per unit) TURBOWAYS 25 ATM PCI Adapter (30 pack, per unit) TURBOWAYS 25 ATM MC Adapter (single) for PS/2 TURBOWAYS 25 ATM MC Adapter for PS/2 (5 pack, per unit) TURBOWAYS 25 ATM SBus Adapter (single) TURBOWAYS 25 ATM SBus Adapter (5 pack, per unit)
TURBOWAYS 100 ATM MC Adapter (single) for PS/2 TURBOWAYS 100 ATM MC Adapter (5 pack, per unit) for PS/2 TURBOWAYS 25 ATM MC Adapter (single) for RS/6000 --Device Drivers for TURBOWAYS 100 for RS/6000 TURBOWAYS 100 ATM Adapter for 3172-3 (single) TURBOWAYS 155 ATM Adapter for 3172-3 (single)
TURBOWAYS 155 ATM MC MMF Adapter for PS/2 (single) TURBOWAYS 155 ATM MC MMF Adapter, RS/6000 (single) TURBOWAYS 155 ATM MC UTP Adapter for PS/2 (single) TURBOWAYS 155 ATM MC UTP Adapter, RS/6000 (single)
TURBOWAYS 155 ATM SBus Adapter, UTP5 TURBOWAYS 155 ATM SBus Adapter, UTP5 (5 pack, per unit) TURBOWAYS 155 ATM SBus Adapter, MMF (single) TURBOWAYS 155 ATM SBus Adapter, MMF (5 pack, per unit)
IBM 155 ATM S/390 OSA-2 MMF IBM 155 ATM S/390 OSA-2 single mode fiber
INTERPHASE 155 ATM 5515 PCI UTP Adapter INTERPHASE 155 ATM 5515 PCI MMF Adapter INTERPHASE 155 ATM 4915 GIO UTP Adapter INTERPHASE 155 ATM 4915 GIO MMF Adapter INTERPHASE 155 ATM 4815 EISA UTP Adapter INTERPHASE 155 ATM 4815 EISA MMF Adapter

Products and Options

Fiber cables are not provided with the TURBOWAYS 100 and 155 ATM adapters or the Interphase 155 adapters. They must be purchased separately.

Cable
MIC to SC, Cable ASM, 2-meter fiber MIC to SC, Cable ASSM, 4-meter fiber MIC to SC, Cable ASM, 6-meter fiber MIC to SC, Cable ASSM,10-meter fiber MIC to SC, Cable ASSM, 20-meter fiber MIC to SC, Cable ASSM, 40-meter fiber MIC to SC, Cable ASSM, custom lengths
ST to SC, Cable ASM, 2-meter fiber ST to SC, Cable ASSM, 4-meter fiber ST to SC, Cable ASM, 6-meter fiber ST to SC, Cable ASSM, 10-meter fiber ST to SC, Cable ASSM, 20-meter fiber ST to SC, Cable ASSM, 40-meter fiber ST to SC, Cable ASSM, custom lengths
SC to SC, Cable ASM, 2-meter fiber SC to SC, Cable ASSM, 4-meter fiber SC to SC, Cable ASM, 6-meter fiber SC to SC, Cable ASSM, 10-meter fiber SC to SC, Cable ASSM, 20-meter fiber SC to SC, Cable ASSM, 40-meter fiber SC to SC, Cable ASSM, custom lengths

Target Market

Customers who are ideal prospects for ATM will be those who need to:

- increase LAN bandwidth
- avoid re-segmenting via dedicated ATM connections
- improve overall network performance
- enable new, high bandwidth application development
- reduce network latency
- meet multimedia requirements of mixed data streams such as voice, video, and data at the desktop

Initially, the best candidates for ATM are those who have a strategic need for high-speed, high-bandwidth network applications. If the application is vital to their success, a customer is far more likely to make the change to a new technology. Customers with less pressing needs will wait until the technology has evolved to a standards-based and widely implemented solution.

Specifically, the ATM 25 adapters may be best for those who are just entering the ATM market, and want a cost-effective upgrade to their existing Ethernet or Token-Ring network. Their low price make the improved throughput and guaranteed quality of service of ATM affordable to the desktop.

The TURBOWAYS 100 adapter is for customers who want ATM connectivity for their client/servers or who have intensive multimedia applications.

The TURBOWAYS 155 adapter is for customers who need great versatility; the adapter comes with either multimode fiber or copper wiring, and SNMP subagent support for TCP/IP.

The IBM 155 ATM S/390 Open Systems Adapter 2 (OSA-2) is suited for customers who need high-speed connections between the desktop and host systems, and who wish to have the S/390's power and its security, storage, and management features extended to the network level.

Sales Tools

IBM provides a broad range of selling tools to assist you in your sales efforts with network adapters. These tools include collateral materials, special bid programs, loaner programs and presale hotline support. Articles about IBM's ATM adapters can be obtained from:

http://www.raleigh.ibm.com/per/perprod.html

Q's and A's

Q) Since the TURBOWAYS 25 ATM Adapter does not have its own processor, will ATM processing be off-loaded onto the PC causing applications to fail?

A) There are no performance problems with PC applications. Cell segmentation and reassembly (SAR) is handled by specialized logic on the TURBOWAYS 25, so the only communication with the host is through direct memory access (DMA), which doesn't consume CPU cycles.

Q) Is 25Mbps fast enough to run ATM applications such as desktop video?

A) IBM tests have shown that users can set up multiple compressed interactive video windows (applications that are both bandwidth-and compute-intensive) over a single 25Mbps connection.

Key Selling Points When selling the IBM TURBOWAYS ATM adapters, the following key points should be emphasized:

- complete IBM ATM solution
- scalability offered by the adapters
- high performance levels of the adapters
- ideally suited for high volume, high capacity applications
- adherence to standards
- protection of investment in cabling, applications and hardware
- interoperability with other vendors' equipment
- IBM service and support
- IBM technology leadership and breadth of product

IBM 8210

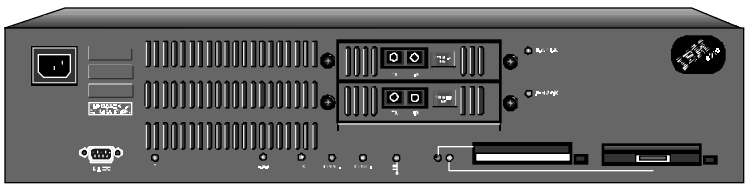
Multiprotocol Switched Services (MSS)

Multiprotocol Switched Services (MSS) includes those hardware and software products that provide IBM's solution to switched virtual networking in a campus or Metropolitan Area Network (MAN) ATM environment. With its distributed client/server approach and ATM core, MSS allows traditional networking equipment to exploit the ATM's characteristics and provides a solution that is more scalable and more easily managed than traditional internetworking options like routers. Because MSS separates physical topology from user connections, making large virtual networks feasible, companies are able to replace complicated router administration with graphical virtual LAN reconfiguration. Customers can build efficient, flexible, virtual LANs for multiple protocols over an ATM backbone, using ATM for backbone servers, desktop ATM for demanding applications, or a combination of these. MSS is the solution for integrating switched, bridged or routed LANs with new ATM networks.

The core functions of MSS include support for LAN Emulation, distributed routing, broadcast management, and single system network management and configuration. MSS has been accepted by the new Network Interoperability Alliance (NIA), a group of industry leaders, including IBM, dedicated to helping customers simplify, standardize, and enhance the design and development of LANs. MSS extensions have also been submitted to the ATM Forum.

Product Description

The IBM 8210 Nways Multiprotocol Switched Services (MSS) Server functions as the "server" portion of MSS, offering customers a multiprotocol networking solution for the ATM environment. It provides a seamless approach for customers to migrate their networks from legacy shared LANs to high-speed ATM backbones and to ATM on the desktop. The 8210 Nways MSS Server offers 155 Mbps multimode or single-mode fiber ATM connections to an ATM switch, ATM Forum LAN Emulation, emulated LANs, standards-based routing for IP and IPX over ATM, standards-based transparent and source route bridging to connect multiple emulated LANs, enhanced broadcast management in emulated LANs, and a link between IBM LAN Emulation, ATM Forum-compliant LAN Emulation, and Classic IP.



IBM 8210 Nways Multiprotocol Switched Services (MSS)

Positioning

With the 8210 Nways MSS Server attached to an ATM switch such as the IBM 8260 or 8285, customers can form a high-performance multiprotocol backbone, maximizing the effectiveness of existing networks while positioning the company for the demanding high-speed, low-delay applications of the future. Switched Virtual Networking with the MSS Server minimizes the need for routers in the data path and provides higher throughput and lower latency than router networks or switched networks without Multiprotocol Switched Services. The Nways MSS Server provides the link required to move from the old LAN-based bridge/router world to the new switched-based ATM world.

Features/Functions

Feature	Function
Basic package	• Base logic card: —603E 100 Mhz Power PC processor —512KB L2 cache —Two PCMCIA slots —12 MB of flash memory —One EIA 232-D port (9-pin D shell) for direct attachment or modem attachment. Maximum speed of 38.4 Kbps 32MB DRAM memory • One PCMCIA hardfile for code and configuration storage, and for first failure data capture of logging, trace and dump information • Two internally accessible adapter slots • One AC power supply input • PCMCIA voice/data/FAX modem (US and Canada only) supporting a V.34 protocol • 1-port 155 Mbps multimode fiber ATM adapter OR a 1-port 155 Mbps single mode fiber ATM adapter. Each has 8MB of packet memory and 2MB of control memory for high-performance support • FDDI adapter with Dual Ring SC connector • MSS Microcode Release 1.1, pre-installed The PCMCIA devices are hot-pluggable
Front Panel Controls	All controls and indicators are on the front of the machine and include: • LEDs. 12 LEDs give status information about the power, temperature, SIMMS, PCMCIA slots and adapter ports • Power receptacle for the power cord • Front panel reset switch
Easy Installation	Installation takes 30-40 minutes. The MSS Server can be set on a surface or mounted on a standard 19" rack. Rack mounting requires an additional 10 minutes. The Nways MSS Server node is a self-sustaining entity, with sufficient non-volatile storage to maintain 3 copies of its code and 4 copies of the configuration for each code load (8 total).

Feature	Function
ATM Forum-compliant LAN Emulation	• Allows ATM networks to appear as Ethernet or Token-Ring LANs, providing a migration path to ATM that protects customers' investments in current LAN hardware and software. • Offers the opportunity to connect ATM devices with Ethernet or Token-Ring devices, supporting ATM backbones and gradual migration to ATM for workstations. • Complies with the ATM Forum LAN Emulation specification, version 1.0
Virtual LAN Support	Emulated LANs are not based on physical topology (like most current LANs), but are, instead, logical groupings of end stations. Having the stations logically grouped allows much greater flexibility in handling moves, adds, or changes to the end station. No wiring modifications are needed to move stations from one emulated LAN to another. All stations on an emulated LAN must be either on an Ethernet or Token-Ring network.
Enhanced LAN Emulation Fault Tolerance	IBM extensions support multiple Redundant LAN Emulation Servers with automatic recovery in case of failure.
Enhanced LAN Emulation Broadcast Management	• Enhanced support for LAN emulation for IP, Novell IPX, NetBIOS, and source route bridge broadcasts. • IBM extensions handle broadcast frames by sending them only to interested LAN emulation clients. Reducing broadcasts reduces network traffic and allows better performance and scalability.
Redundant ARP Server	• Classical IP RFC 1577 ARP Server • Multiple MSS Servers can be configured to provide a fault tolerant ARP server with automatic recovery in case of failure.

Broadcast Management Within Virtual LANs	• Bus performance over 100,000 packets per second.
	• The 8210 Nways MSS Server's Broadcast Manager (BCM) function is an extension to the BUS that directs broadcasts only to those devices that need to receive them. Broadcasts in ATM travel through the BUS at layer 2, so all protocol broadcasts (layer 3 traffic) would by default be sent over the ATM backbone, unnecessarily using up bandwidth. IBM uses its Broadcast Manager to map layer 3 addresses to layer 2 MAC addresses and sends these broadcasts to the correct ATM client. The broadcast has been modified so that it is sent to the correct destination, not to everyone connected to the network, saving bandwidth and device processing.
	• The benefits of Broadcast Management are:
	  • to improve overall performance and efficiency by reducing both network traffic and end station processing overhead associated with filtering nuisance frames
	  • to enable practical deployment of larger emulated LANs

Feature	Function
Standards-based Bridging and Routing Support	• The 8210 Nways MSS Server supports the four commonly used bridging techniques (source route bridging between Token-Ring emulated LANs, transparent bridging between Ethernet emulated LANs, source route transparent bridging, and source route to transparent bridging). • Standards-based IP routing support on ATM, including support for Classical IP and routing between an emulated LAN and Classical IP. • Redundant Default IP Gateway allows end stations with manually configured default gateway IP addresses to continue passing traffic to other subnets after their primary gateway goes down. • The 8210 Nways MSS Server's extensive IP implementation includes OSPF, multicast support, and classless addressing, in addition to basic IP support like ICMP, UDP, TCP, ARP, and RIP. • NHRP function, one of the expected main functions of the coming MPOA standard, allows NHRP clients to set up a data-direct VCC and forward IP data frames without transversing intermediate routers. • Standards-based Novell IPX routing support on ATM between emulated LANs complies with Novell's IPX Router Specification. • The 8210 Nways MSS Server's bridging and routing support allows emulated LANs to be partitioned for better manageability and provides Ethernet to Token-Ring communication for mixed customer environments. • The 8210 Nways MSS Server supports the migration of SNA networks to ATM. • AppleTalk routing • RFC 1483 bridging support
Configuration Options	• Use an ASCII terminal locally attached via the service port or remotely attached via a modem connected to the service port or the integrated modem feature. • Use an IP workstation with telnet support to establish a SLIP connection via ATM or a modem attached to the service port or the integrated modem feature. • Use an IP workstation with an HTML 2.0 or later web browser to establish a SLIP connection via ATM or a modem attached to the service port or the integrated modem feature. • Use the Multiprotocol Switched Services Configuration Program shipped with the initial order. The program will operate a PS/2 or compatible using DOS 5.0 or higher, OS/2 2.1 or later, or a RS/6000 POWERstation or POWERserver using AIX V3.2.5 or higher with TCP/IP enabled.

Feature	Function
QoS Support	One of the advantages of ATM is the ability to negotiate QoS. Release 1.1 provides the ability to define a QoS level for LAN Emulation Client (LEC), an emulated LAN or an ATM interface. When this standard is finalized, IBM will provide compliance.
User-Friendly Environment	• Graphical configuration tool with integrated contextual help information. • Streamlined configuration support running with a minimum of configuration input. • Default configuration includes a configuration needed for a test bed environment. • HTTPD/HTML for command line monitoring and configuration using a web browser. • Integrated voice/fax modem provides modem support and the ability to have faxes sent for reports or alerts, interact with a voice response unit to perform basic configuration, retrieve monitoring information, or dial a pager in the event of a fault.
Interconnectivity	Interconnection between IBM LAN Emulation, ATM Forum-compliant LAN Emulation and Classic IP.
Super VLAN Support	MSS Server Release 1.1 delivers an IBM exclusive extension to Forum-compliant Emulated LANs within the Super VLAN concept. The Super VLAN is a collection of LANs emulating a single large ELAN. Distribution of LAN Emulation services is accomplished with a function called Short-Cut Bridging (SCB). SCB forward LE control frames between ELANs allowing direct links between LE clients in different ELANs. Dynamic Protocol VLANs (D-PVLAN) function is also added to Release 1.1. D-PVLAN keeps track of what protocols and what subnets are on each of the LAN Emulation Server (LES) domains. D-PVLAN partitions the Super VLAN into protocol specific VLANs. The MSS Server's broadcast management functions are also leveraged across the Super VLAN by an en extension called Bridging BroadCast Manager (BBCM). This powerful combination of services enables an extremely flexible simple, scalable ATM infrastructure ideal for backbones transporting and concentrating legacy LANs.
Security	• Controlled access to node management functions through passwords applying at different levels. • Critical information or files (alerts and key network operations) time/date stamped. • User management is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.
Warranty	One year warranty

Feature	Function
Management Options	• Uses an ASCII terminal locally attached via the service port or remotely attached via a modem connected to the service port or the integrated modem feature. • Remote login via a telnet session allows management using the command line interface. • Remote connection via an HTML 2.0 or later web browser allows management using the command line interface. • Management from a network management station that supports SNMP.
Management Features	• Transportation of SNMP messages between the 8210 Nways MSS Server and Network Management Stations. • Configurable MIB information access. • Comprehensive set of standard and enterprise specific SNMP MIBs for monitoring and managing resources. • A PTF to the Nways Campus Manager ATM for AIX V2.1 will provide the following support for the 8210 Nways MSS Server: • Discovery and display of the 8210 Nways MSS Server. • A full graphical end user interface provided by the 8210 Nways MSS Server Product Specific Module (PSM). The Nways MSS Server PSM will provide full trap support and limited configuration options. • The PTF will be available from an IBM Conference Disk at no charge until the function is integrated into the Nways Campus Manager LAN.

Products and Options

Description
8210 Nways MSS Server
Service Kit
1 port 155 Mbps MMF ATM adapter
1 port 155 Mbps SMF ATM adapter
Hardfile
MSS Microcode R1.1
FDDI adapter

Target Market The IBM 8210 is ideal for customers whose current network is reaching capacity, who are looking to increase network performance, or who are looking for the benefits that an ATM network would provide.

Regardless of a customer's existing campus or data center infrastructure, whether shared or switched, these customers can benefit from installing an ATM backbone. This backbone can support existing LAN devices and applications as well as introduce ATM workstations for demanding roles such as servers. The 8210 Nways MSS Server supports these needs through its LAN emulation support.

For customers who currently have IBM ATM networks using IBM LAN Emulation, the 8210's LAN Emulation Client allows them to start to install Forum-compliant LAN Emulation or Classic IP.

Typical customers for the IBM 8210 are those who:

- need to support a mixed environment with existing LANs, Ethernet or Token-Ring, and ATM devices
- need to replace an existing LAN backbone with a high performance, scalable ATM backbone
- need to support a large ATM-emulated LAN
- need to control broadcasts in ATM-emulated LANs
- need to bridge or route between multiple emulated LANs, including between Ethernet and Token-Ring
- need to support a large Classical IP environment
- need to communicate between Classical IP stations and ATM Emulated LAN stations
- need a highly available emulated LAN

Q's and A's

Q) What is the customer value of MSS?

A) The value of MSS is really the value of ATM. MSS is the all-purpose tool for ATM networks. Customers who are installing ATM have many different needs; some need a large network, some need 100% availability of the network, some need incredible performance, and some need it all. MSS provides more tools than any one customer will ever need. Different customers will need different capabilities. In aggregate, all the tools will be needed by someone.

Q) How does MSS Server Release 1.1 help us compete against Cisco?

A) Our Super VLAN capability is an IBM exclusive. To match our new distributed ARP server function, Cisco will have to use multiple routers. Further illustrating how we have put the function of multiple boxes into a single box with MSS-a simpler and cheaper solution for our customers.

Q) What can I now do that I could not do before? What problem does this solve?

A) You can build highly reliable, expandable ATM networks. MSS's Super VLAN and its redundancy capability makes network size limitations and reliability concerns disappear.

Q) Will MSS be MPOA-compliant? When?
A) Yes. MSS will be MPOA-compliant by 1Q98.

Q) What is the role of MSS in an IP switching environment?
A) MSS will support IP switching in the flavor of IFMP in 1Q98.

Q) Are there other IBM products that offer similar features or functions?
A) MSS is unique. Nothing else in the world has its complete set of functions. The 8260 and the 8285 have LES and BUS functions. These functions are suitable for small ATM environments. They do not scale to large ATM networks. The 2216 will provide routing function for LAN Emulation and RFC 1483 environments, but it does not provide the LAN Emulation server functions.

MSS Server is available as a module for the 8260 ATM switch. It is functionally equivalent except that it does not support the port features of the 8210. No other product provides the IBM value add that MSS offers, for example, functions like a Broadcast Management and Super VLAN.

Sales Tools

Spec sheets for the 8210 Nways MSS Server and related ATM campus products are available electronically through MKTTOOLS, IBM FAX, HONE PROPOSAL, HONE DEMOSPRES, and IBMLINK.

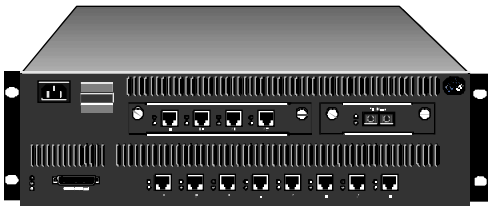
Key Selling Points

- The 8210 won the “Best of Show” award at the 1996 Network Interop conference
- Protects customer investment in ATM equipment
- Interoperability through standards compliance to easily integrate with and support customers’ existing networks.
- Value-added Broadcast Manager function tames the layer 3 broadcast problems that have plagued network managers
- Forum-compliant LAN Emulation and IBM LAN Emulation allows for coexistence and migration for current ATM LAN Emulation networks.
- Bridging support between multiple emulated LANs
- Super VLAN functions enable unlimited scalability of the LANE environment with high performance, low latency, fault-tolerance and quality of service
- Support for emulated LANs provide flexibility to network administrators for workstation moves, adds and changes
- Single side access to all indicators, controls and connectors
- Attaches to any ATM switch

IBM 8282

Product Description

The IBM TURBOWAYS 8282 ATM Workgroup Concentrator is available in an 8 or 12 port version to connect 25 Mbps ATM workstations to a single, 100 Mbps ATM switch port. The 8282 ATM Workgroup Concentrator is available in a base model with an optional feature card. The **8-Port base unit** has eight 25 Mbps links and one 100 Mbps uplink. Adding the 4-port feature card to the base model expands the concentrator to twelve 25 Mbps links.



IBM 8282 ATM Workgroup Concentrator

Positioning

Used with the IBM TURBOWAYS 25 ATM Adapters, the 8282 provides a cost-effective means of delivering ATM to the desktop. Because the 8282 supports category 3 UTP cable, this enables customers to install ATM without the expense of upgrading their existing cable.

Features/Functions

The IBM 8282 ATM Workgroup Concentrator offers the following features.

Feature	Function
Management	Supports SNMP over Classical IP and ILMI (SNMP over AAL)
RS-232 Port	Can be used for configuration, management or microcode upgrades
Configuration Tool	Includes a graphical, PC-based configuration tool for simplified management
Standards Support	Supports ATM Forum UNI 3.0 specification for SVC or PVC signaling
Cabling	STP or category 3, 4, or 5 UTP cable (RJ-45 connector) is supported from the 25Mbps adapter. To the ATM switch, 62.5 micron plenum-rated multimode fiber terminated is supported (SC connector)
LEDs	• Power • Concentrator status • 25 Mbps port status • ATM port status
Warranty	One year warranty

Management Software

Customers have several management options, including out-of-band management from the RS-232 port and remote management from an SNMP management station. IBM offers Nways Manager for Windows™, an SNMP-based management application that runs on NetView® for Windows with a graphical user interface. For more information see page 75.

8282 Products and Options

Description
ATM Workgroup Concentrator
8-port Concentrator
4-port 25 Mbps Feature Card
Nways Manager for Windows V2

Target Market

The 8282 is targeted at customers who want to bring 25 Mbps ATM to the desktop. It should be sold in conjunction with IBM's TURBOWAYS 25 ATM Adapters.

Handling Sales Objections

I don't need 25 Mbps ATM because I can easily implement full-duplex Ethernet technology for 20 Mbps.

ATM is also a full-duplex technology. This means that it can send 25 Mbps and receive 25 Mbps. Therefore, there is more than twice the bandwidth of full-duplex Ethernet.

Q's and A's

Q) Into what ATM switch can you plug the 8282?

A) The 8282 can be plugged into the IBM 8260 with the 100 Mbps ATM module or any ATM switch that supports PVC or 3.0 SVC.

Sales Tools

The following brochures are available for the IBM 8282.

ATM Campus Networking Products G221-4190

Key Selling Points

When selling the IBM TURBOWAYS 8282 ATM Workgroup Concentrator, the following points should be emphasized:

- IBM's complete ATM product family for high performance ATM networking
- 8282's support of industry standards, especially ATM Forum standards
- 8282's management, configuration, and diagnostic features
- Ability to integrate IBM's ATM products into existing networks
- IBM's customer support and service
- IBM's technology leadership and breadth of products

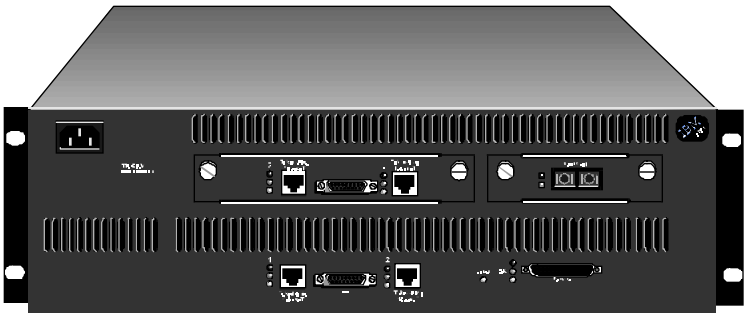
IBM 8281

Product Description

The IBM 8281 ATM LAN Bridge is a high-speed bridge that links traditional LANs with ATM networks. This product enables customers to migrate to ATM without disrupting their current networking environments. The 8281 is a multiport bridge that can link:

- LAN to LAN locally
- LAN to LAN across an ATM network
- LAN to ATM-attached workstation

The 8281 comes with two LAN interface ports (expandable to four ports) that can be configured as either Ethernet or Token-Ring. A 100 Mbps ATM connection can be added whenever needed, as well as two more Ethernet/Token-Ring ports. RJ-45 connectors can be used for either Ethernet or Token-Ring and one AUI connector is provided for Ethernet.



IBM 8281 ATM LAN Bridge

Performance

The 8281 ATM LAN Bridge offers extremely high performance, as evidenced by the following data:

Latency

- 160 Microseconds: Token-Ring to Token-Ring, both attached to the 8281
- 500 Microseconds: Ethernet to Ethernet, both attached to the 8281
- 500 Microseconds: Token-Ring to Token-Ring over ATM
- 800 Microseconds: Ethernet to Ethernet over ATM

Maximum Throughput

- 64 Mbps (4 x 16 Mbps) Token-Ring
- 40 Mbps (4 x 10 Mbps) Ethernet

Maximum Packet Rate

- Token-Ring - Token-Ring = 45,000 packets per second
- Token-Ring - ATM - Token-Ring = 28,000 packets per second
- Ethernet - Ethernet = 24,000 packets per second
- Ethernet - ATM - Ethernet = 17,000 packets per second

Positioning The 8281 ATM LAN Bridge enables customers to migrate easily to ATM. It provides a high throughput connection between ATM and traditional LANs, and is an ideal solution for customers who want to move servers off current LAN segments onto an ATM backbone.

Features/Functions The IBM 8281 ATM LAN Bridge offers the following features.

Feature	Function
ATM Gateway	ATM Forum-compliant LAN Emulation lets LAN workstations communicate with ATM workstations as if they were both on bridged LANs. ATM workstations are addressed from Ethernet or Token-Ring with MAC addresses. These are mapped to an ATM address and sent over a Virtual Channel Connection between the bridge and the ATM workstation. With ATM LAN Emulation, LANs connected to ATM networks via the 8281 can participate fully in MSS-based virtual LANs.
Bridging	Provides Source Route Bridging (SRB) for Token-Ring and Transparent Bridging for Ethernet.
Filtering	Provides extensive filtering to keep unnecessary traffic from congesting the network. **For Ethernet, the following inbound filtering is supported:** • MAC address • Source SAP • Ethertype **For Token-Ring, the following inbound filtering is supported:** • hop count • MAC address • ring number • source SAP • SNAP header
Management	Supports SNMP management.
RS-232 Port	Can be used for configuration, management or microcode upgrades.
Standards Support	Supports ATM Forum UNI 3.0 specification, SNMP, Ethernet v.2 , 802.3 and 802.5. Frames are transferred across ATM using AAL-5.
Warranty	One year warranty.

Management Software

Customers have several management options, including out-of-band management from the RS-232 port and remote management from an SNMP management station. IBM offers Nways Manager for Windows, an SNMP-based management application that runs on NetView for Windows with a graphical user interface.

8281 Products and Options

Description
ATM LAN Bridge Model
2-Port Ethernet/Token-Ring Adapter feature
100 Mbps ATM Adapter Feature
Nways Manager for Windows V2

Target Market

The 8281 is targeted at customers who are installing ATM backbones. The 8281 will provide the LAN to ATM connection.

Q's and A's

Q) How many virtual circuits does the 8281 support?

A) Today the 8281 supports 512 virtual circuits.

Q) Can I mix Ethernet and Token-Ring LAN connections on the 8281?

A) The 8281 requires that only one kind of LAN topology be connected to it.

Q) Does the 8281 support Forum-compliant LAN Emulation?

A) Yes, via a microcode update, available via FTP, the World Wide Web, or bulletin boards.

Sales Tools

The following brochures are available for the IBM 8281.

8281 ATM LAN Bridge G224-4423

Key Selling Points

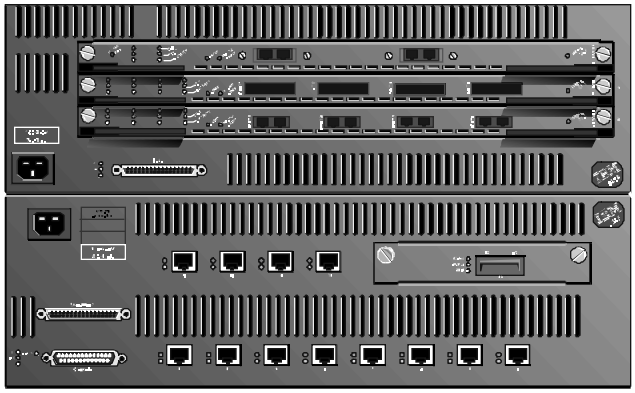
When selling the IBM 8281 ATM LAN Bridge, the following points should be emphasized:

- IBM's complete ATM product family for high performance ATM networking
- 8281's support of industry standards, especially ATM Forum standards
- 8281's ability to ease migration to ATM by preserving investment in existing systems, software, and training
- 8281's extensive filtering capabilities
- 8282's management options
- IBM's customer support and service
- IBM's technology leadership and breadth of products

IBM 8285

Product Description

The IBM 8285 Nways ATM Workgroup Switch is a multipurpose, expandable ATM switch that simplifies ATM implementation. It has twelve 25 Mbps ATM ports for desktop or server connections, and a feature slot for optional, 155 Mbps I/O cards for connecting to a server or another switch. I/O cards for 155 Mbps ATM on multimode and single-mode fiber are supported.



IBM 8285 Nways ATM Workgroup Switch

The IBM 8285's capabilities can be extended via an optional expansion unit, that can accommodate up to three IBM 8260 ATM modules. The ATM modules that can be used are the:

- 25 Mbps, 100 Mbps and 155 Mbps ATM concentration modules
- IBM 8281 ATM LAN Bridge Module
- Future ATM modules and modules developed under the ATM Kit Development program

The expansion unit allows the 8285 to handle larger workgroups or act as a building switch.

Positioning

The IBM 8285 can be used as a standalone workgroup switch, as a floor switch connected to campus ATM backbones, or as a switch within a campus network. Two or more 8285s can be clustered together to function as a larger ATM switch, using either 155 Mbps or 25 Mbps links (single, multiple, or in combination).

Features/Functions The IBM 8285 Nways ATM Workgroup Switch offers the following features:

Feature	Function
LAN Emulation	Includes two sets of an integrated ATM-Forum Compliant LAN Emulation Server and Broadcast Unknown Server, eliminating the need for an external LAN Emulation Server (although network administrators can choose to use one). An emulation function resolves MAC-to-ATM address translation and performs broadcasts and point-to-multipoint multicasts. Both Ethernet and Token-Ring are supported. Clients can be assigned to up to two virtual LANs. Clients can use either ATM Forum UNI 3.0 or UNI 3.1.
Performance	The 8285 contains many performance boosting features: • Early frame discard, which discards incomplete ATM frames rather than propagate them as other switches do • Link aggregation, which combines several physical links to form a single logical ATM link with traffic balanced among the physical links • Flow control and back pressure to avoid cell loss • Auto-topology and dynamic route determination • Low Latency (30 microseconds or less) under any load with input and output cell buffers (4000 in each direction)
ATM Control Point	• An integrated ATM Control Point integrates ATM cell-switching functions and network control functions such as call setup processing, topology discovery, and route selection. It takes full advantage of the capabilities of the IBM 8260. • The switch portion switches incoming cells from an ATM 25.6 Mbps port, an 155 Mbps interface, or an ATM 8260 module to the appropriate destination ATM port. • The control point portion: ◆ learns about machine resources, port speeds, and network topology ◆ performs all route computations ◆ automatically bypasses failed nodes and links ◆ provides built-in troubleshooting tools ◆ provides a command-line interface for performing management operations and displaying online help ◆ incorporates rewritable flash memory for easy code updates and future enhancements

Feature	Function
Configuration	A DB-25, EIA 232 connector can be used to attach an ASCII terminal for initial configuration. A SLIP interface is available, and SNMP management is also supported. Operators can trace selected functions, initiate and save dumps, and transfer files for remote analysis. The terminal dialog is the same as for the 8260.
ATM Specifications	The 8285, in common with the IBM 8260 hub, supports: • Switched and Permanent Virtual Circuits (SVCs and PVCs) • PVC set, recording and support • Simultaneous connections to UNI .30 and 3.1 devices and dynamically maps one into the other, easing support of mixed level devices • SVC signaling and connection support that complies with ATM Forum UNI Specification V3.0 and V3.1 • Point-to-point and point-to-multipoint connections • Reserved bandwidth (CBR and VBR) and best effort (UBR) classes of service with independent queuing capability • Topology services and automatic route computation that uses available trunk bandwidth and bypass failed nodes and links • Interfaces between switches based on an extension of the ATM Forum PNNI-1 framework • Interim Inter-Switch Protocol (IISP) • Interconnection of local ATM networks over an ATM WAN, providing Permanent Virtual Path (VP tunneling) for switched connections between end systems
Switch-on-a-Chip	A high performance ATM switch chip. By using output queues that are configured as dynamically shared memory and built-in flow control, the switch delivers high performance without discarding any packets. This shared memory can be expanded by linking multiple switch elements. The Switch-on-a-Chip design allows for transmission rates up to 1.6 gigabits/second per port.
Plug-in I/O Cards and 8260 Modules	Network managers can upgrade the 8285 as new cards are released. This protects current networking investment.
Easy Installation	Installation of an 8285 (or 8260) ATM network is nearly as easy as installing a shared media LAN because of : • integration of the Control Point in the base unit • dynamic detection of the machine resources, port speeds, and network topology

Feature	Function
Management	Includes an SNMP agent that supports: • Full SNMP (get, getnext, set and traps) • ATM Forum LAN Emulation or Classical IP over ATM (RFC 1577) • MIB-II • Full ILMI (ATM Forum UNI 3.0 and 3.1) • IETF AToMIB (RFC 1695) • MIB support for topology and route computation management • IBM-specific extensions No mandatory software is required to operate the IBM 8285. However, to receive the full benefit of the SNMP-compliant MIB extensions, the 8285 MIB should be installed. The latest version of the 8285 MIB can be obtained from a public library Internet :FTP to 'venera.isi.edu'
Common IBM Technology	• The IBM 8285 is based on the powerful architecture of the IBM 8260 ATM hub. Its software Control Point, Switch-on-a-Chip and traffic management technologies are common to the whole hub family. • High speed ATM link capabilities enable the IBM 8285 to be used as a client/server workgroup, a floor ATM switch in a collapsed backbone configuration, or as part of a larger meshed network, including other IBM 8285 switches or 8260 hubs. • Support for networks made of isolated switches, clusters of ATM switches, or ATM subnetworks allows scalability without major configuration changes.
ATM 25 Mbps Cabling	Supports UTP Category 3, 4, 5, 120-ohm Category 4 and 5, and 150-ohm STP cabling between the switch and attached devices as follows: • UTP Category 3: 100m (328 ft) • UTP Category 4: 150m (492 ft) • UTP Category 5: 160m (524 ft) • STP: 300m (984 ft)
Front Panel Connections	Simplifies connections and allows 8285 to be rack-mounted.

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Management Software

Network management support will be provided by no-charge updates to the Nways Campus Manager for Windows and the Nways Campus Manager ATM for AIX and HP-UX. Support for the 8285 base model is now available for Windows and AIX. For more information about these products, see the *Management Software* section of this Sales Guide.

Optional Package

The IBM Nways ATM Workgroup Solutions combine the IBM 8285 12-port 25 Mbps Nways ATM Workgroup Switch and expansion unit with the appropriate number of either ISA or PCI 25 Mbps TURBOWAYS adapters. Workgroup Solutions are available in 12-, 24-, 36- and 48-port versions, making ATM workgroup networking attractive to any organization at a price that is comparable to other high-speed LAN technologies. In addition, integrated ATM Forum-compliant Token-Ring and Ethernet LAN Emulation and Classic IP are included in these Solutions at no additional charge.

IBM Workgroup Solutions further extend the implementation of IBM's Switched Virtual Networking (SVN) architecture by providing low-cost switched ATM to the desktop. These Solutions protect existing application, cabling and hardware investment.

Products and Options

Two models of the 8285 are available, Models 00B and 00P. They are technically equivalent, but are priced differently. Model 00B has a list price that is discountable, as is usually done for other hubs (8250/8260). Model 00P cannot be discounted. It is offered at a special bundled price, included are Turboways ISA/PCI adapters for each ATM 25 Mbps port. The bundled prices are calculated to drive down today's U.S. price per port.

Description
8285 Base Unit 155 Mbps I/O card (multimode fiber) 155 Mbps I/O card (single-mode fiber) Universal Code Download Kit 8285 Base Unit (includes 12 ISA or 12 PCI Adapters) 12 PCI Adapters 12 ISA Adapters
8285 Expansion Unit 8285 Expansion Unit with 12-port ATM 25 module and 12 PCI Adapters 8285 Expansion Unit with 12-port ATM 25 module and 12 ISA Adapters 12-port ATM 25 module and 12 PCI Adapters 12-port ATM 25 module and 12 ISA Adapters

Modules for Expansion Unit

Description
ATM 25 UTP Concentrator Module (12 port)
ATM 155 Mbps OC-3 I/O Card (1 port)
ATM 100 MIC Fiber Module (4 port)
ATM 100 SC Fiber Module (4 port)
ATM 155 Flexible Module (2 port)
ATM 155 MMF I/O Card (1 port)
ATM 155 SMF I/O Card (1port)
ATM 155 UTP/STP I/O Card (1port)
8281 ATM LAN Bridge Module (4 port)
Utopia 1 ATM Carrier 1-slot
Utopia 1 ATM Carrier 2-slot

Nways Workgroup Solutions

Description
with 12-port ISA (requires expansion unit)
with 12-port PCI (requires expansion unit)
with 24-port ISA (requires expansion unit)
with 24-port PCI (requires expansion unit)
with 36-port ISA (requires expansion unit)
with 36-port PCI (requires expansion unit)
with 48-port ISA (requires expansion unit)
with 48-port PCI (requires expansion unit)

Management Software

Description
Nways Campus Manager LAN for AIX V.3 (5697-B07)
Nways Campus Manager for HP-UX (5801-AAR) 4mm tape
Nways Campus Manager ATM for AIX V2 (5697-B08)
Nways Manager for Windows V2

Target Market

The IBM 8285 is an ideal product for customers still hesitant about ATM, who are making their first entry into this technology. It is also ideal for customers who want the benefits of ATM in a small configuration, without necessarily linking to a large backbone.

Q's and A's

Functions

Q) How can the IBM 8285 be used in a client/server mode?

A) A server may be attached to the 155 Mbps of the base 8285 unit or to any of the 25.6 Mbps ATM modules.

Q) As my business grows, can I expand my computer system using the 8285?

A) Yes. An 8285 expansion unit may be added to the base unit, providing the capability to use up to three IBM 8260 ATM modules, and thus a total of 48, 25 Mbps ports. When more than 48 ports are needed, a network of two IBM 8285s can be created.

The IBM 8285 can also build a meshed ATM network, where a group of IBM 8285s may be viewed as an ATM cluster interfacing with IBM 8260s or other IBM 8285s.

Q) How does the IBM 8285 function as a floor wiring concentrator?

A) In larger networks, the IBM 8285 can handle the local ATM floor switching, while a larger ATM backbone handles the computer traffic between floors. This allows you to bring ATM to the desktop via the 8285, leaving the 8260 to focus on campus and backbone switching.

Product Comparisons

Q) How does the IBM 8285 compare with other LAN technologies?

A) It combines the power of ATM with the simplicity of LAN. The 8285 offers a packaged solution for implementing 25 Mbps ATMs, puts ATM pricing in line with other LAN technologies, and removes cost barriers for installing ATM now.

Q) How does the IBM 8285 compare with the IBM 8282 ATM Concentrator?

A) The IBM 8282 ATM 25 Mbps is an ATM concentrator, and the IBM 8285 is an ATM Switch. Using the IBM 8282 requires that it be attached to an ATM Switch in the network. The 8285 is fully autonomous in terms of ATM switching and can be used either as a workgroup or as an ATM node of a larger network.

Q) How does the IBM 8285 compare with the IBM 8260 ATM Hub?

A) The 8285 is an ATM Switch addressing mainly small configurations of up to 48 ATM stations. It allows customers to take advantage of new multimedia applications without necessarily attaching to a large ATM network. The 8260 is more dedicated to backbone switching by focusing on higher ATM speed interfaces. It also has the advantage of mixing ATM technology with Ethernet, Token-Ring, and FDDI networks.

***Q) Is ATM technology a viable option for** the desktop, given the continued success of Ethernet and Token-Ring LANs?*

A) Yes. Although currently much of the industry recognizes ATM as a backbone technology, the debate is still open on the choice of desktop technology. Some view ATM as the only long-term solution because of its many features. A comparison of ATM features with those of other LANs is given below:

Feature	ATM 25 Mbps with Uplink	LAN Switch with Uplink
Bandwidth	25 Mbps full duplex	10-16 Mbps half/full duplex
QoS	CBR, VBR, ABR, UBR	none
Flow Control	End to end per connection	Global from LAN Switch to LAN Switch
Multi-cast	Built-in	None
Latency	10-30usec	More than 100usec
Scalability	Multiple uplinks	Single uplink from LAN Switch
Network Access Control	Control per connection at call set up	Control per MAC address per frame
Multiple Routes	Route selection per connection	Global from LAN Switch to LAN Switch

Sales Tools

The following sales tools are available for the IBM 8285:

IBM 8285 Nways ATM Workgroup Switch (spec sheet)	GA33-0380
ATM Workgroup Switch Installation and Operating Guide	SA33-0381
IBM 8285 Nways ATM Workgroup Switch, ATM Command Reference Guide	SA33-085
NWays ATM Campus Networking	G325-3505
Connectivity Services	G544-6001
Customer Solution Center Services	G544-6236
Environmental Equipment Services	G544-6283

Key Selling Points

When selling the IBM 8285 Nways ATM Workgroup Switch, the following points should be emphasized:

- The IBM 8285 base unit is an ideal ATM entry solution. Network managers can start with independent workgroups and later add ATM backbone or server connections.
- The IBM 8285 is fully autonomous and provides all the ATM features and performance levels to handle any multimedia traffic (voice, data, video) at a competitive price.
- The integration of the LAN Emulation Server and the Broadcast Unknown Server eases the migration from conventional LANS to ATM. IBM is among the first suppliers to implement Forum-compliant LAN Emulation.
- With its 155 Mbps optional interface card, customers may have a local link to a server, or may want to link later to an ATM backbone.
- When used on the floors of a building, the IBM 8285 allows you to bring ATM to the desktop, and distributes the ATM switching at the building level via an IBM 8260. This improves the network's performance.
- The optional expansion unit allows the 8285 to handle larger workgroups or to act as a building switch. It enables you to plug IBM 8260 ATM modules into one of its three available slots to support as many as forty-eight 25 Mbps devices. With the 155 Mbps I/O cards on the 25 Mbps port modules, the 8285 has up to 4 OC-3 ports, making it an extremely capable, cost effective, entry ATM switch.
- The IBM 8285 is based on, and is fully compatible with the powerful and proven architecture of the IBM 8260 ATM hub. By offering a total ATM solution from desktop to high-speed backbone, you do not need to learn different interfaces, languages, or mode of operations. All ATM equipment will have the same look and feel.
- When used in combination with the IBM Nways Campus Manager products, management of ATM networks is greatly simplified.
- The IBM 8285 Nways Workgroup Solutions provides powerful ATM technology to the desktop at entry-level prices. Its integrated solution makes implementation easy.
- IBM’s customer support and service.
- IBM’s technology leadership and breadth of products.

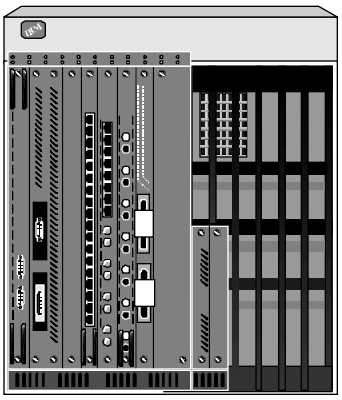
IBM 8260

Product Description

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

- **Model 017** has 17 slots. The Redundant Fault-Tolerant Controllers do not require a slot. They are hot-pluggable and front-loadable into special compartments outside the slot area. This model is field-upgradable to be ATM-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-ready.
- **Model P10** is a 10-slot version with a new 2 Gbps, 3.4 million packet-per-second 8260 packet backplane.
- **Model P17** is a 17-slot version with a new 2 Gbps, 3.4 million packet-per-second 8260 packet backplane.

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. It is backward compatible with 8250 modules. In addition, the IBM 8260 offers new capabilities such as ATM networking, the 8260 Intelligent Power System, the 8260 Distributed Management design, and additional LAN segments.



IBM 8260 Multiprotocol Hub Model 010

ATM Models

Three 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.
- **Model G17** is a 17-slot version with a new 2 Gbps, 3.4 million packet-per-second 8260 packet backplane and an ATM backplane.

Upgrades are available for converting from Models 010, 017 and A17 to Models P10, P17, and G17, respectively.

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, and LAN 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	Models 017/A17/G17 support up to 17 Token-Ring, 8 Ethernet or 8 FDDI networks per backplane in addition to ATM switching.
Fault Tolerant Options	Redundant units can be installed for any module including the fault-tolerant controller. Redundant mode for power is also an option, as well as redundant ATM Switch Control Point.
Early Packet Discard	Efficiently utilizes bandwidth by minimizing unnecessary retransmissions.
Logical Links	Allows multiple logical interfaces serving different destinations to be serviced over a single interface.
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 (for Model 17 and three for Model 10) can be added. Intelligent Power System dynamically distributes the load evenly between the power supplies. Redundant mode (N+1 load sharing) assures that no single point of failure can bring the system down.
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.

Feature	Function
Distributed Management Design	• 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), or by the Switch/Control Point module for ATM-only configurations. • LAN-specific management (RMON support, monitoring and collecting statistics) are incorporated in Media Access Control (daughter cards) plugged into a media module, not a hub slot.
Advanced LAN Backplane Architecture	• Includes passive backplane for reliability. • Clocking and relays are on the individual modules, not on a hub, to prevent a 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.
Management Options	• 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 Switching	Provides the industry's best integration of LAN functions in a single hub. It provides a smooth migration path to ATM networking while preserving existing LANs. Model A17 comes with an ATM backplane and existing Models 017s 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.
Compatibility	The IBM 8260 is fully compatible with the IBM 8285 ATM Workgroup Switch. All the 8260 features may be used in the IBM 8285's Expansion Unit.
Warranty	One year warranty.

Feature Modules

IBM offers a wide choice of feature modules for the IBM 8260:

- 8260 MSS Server Module
- 8260 ATM Modules
- 8260 Token-Ring Modules
- 8260 Ethernet Modules
- 8260 Management Modules
- 8260 Interconnect Modules
- 8271 and 8272 LAN Switch Modules for the 8260
- Any IBM 8250 Feature Module

8260 MSS Server Module

The MSS Server Module offers all of the features and benefits of the IBM 8210 Nways MSS Server. With the MSS Server Module in the 8260 Hub, customers will benefit from an integrated, complete solution for a high-performance multiprotocol backbone in the ATM environment. In the same hub, you can mix legacy LAN modules, ATM modules (switch and concentration modules), or LAN switch modules, plus capitalize on the 8260's many features. The 2-slot Module runs in the 8260 Model A10 or A17 and requires one 8260 ATM Switch Control Point and one ATM media module. For complete details on the capabilities of the MSS Server Module, see the 8210 Nways MSS Server information, pages 20 through 27.

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 A10, A17 or G17. The ATM backplane is a dedicated set of connections providing a high-speed interface between ATM devices or concentration modules in the 8260 and the ATM Switch/ Control Point Module.

- The **ATM backplane** supplements the existing 8260 backplane and serves all of the slots of the 8260 hub A10, A17 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. Two stars of dedicated connections are available on Model A17 and G17 for switch back-up capabilities.

- The **ATM Switch/Control Point Module 3.0** integrates the ATM cell-switching functions and network control functions. This is a two-slot module, possessing an M Zurich "Switch-on-a-Chip" with an aggregate throughput of 4.2 Gbps. It makes the 8260 Model A17 the first ATM switch with full redundancy for critical operations. The module also supports ATM Forum UNI specifications V3.0 and V3.1 and is upgradable to V4.0 and follow-ons. It also supports Interim Inter-Switch Signalling (IISP) and Private Network-to-Network (PNNI-1) according to ATM Forum specifications. With PNNI-1 implementation, network managers can let the network automatically select the least loaded route or the managers can set the ATM links to utilize some lines over others. The module also supports VP link aggregation to maintain the consistency of Quality of Service levels on a virtual path crossing from a campus network to a WAN network or vice versa as well as providing link redundancy. It requires 16 MB of memory.

Switch/Control Point Module 2.2 requires 16 MB of memory. It brings new LAN Emulation functions such as the LAN Emulation Server/Broadcast Unknown Server (LES/BUS) function. V2.2 operates in one of either of the following modes:

- Interim Inter-Switch Protocol (IISP) and IBM pre-standard PNNI-1 Switch to Switch Protocol (SSI)
- Interim Inter-Switch Protocol (IISP) and LAN Emulation Server/Broadcast Unknown Server

Several management features of the Switch/Control Point Module add flexibility and reduce cost:

- In-band monitoring is supported in Classical IP, Ethernet, Token-Ring or ATM Forum-compliant LAN Emulation environments.
- Chassis monitoring from the Switch/Control Point Module monitors the entire system in ATM-only configurations without needing a DMM. Functions available are inventory and power management as well as module and port management.
- LAN Emulation Forum-compliant MIB support. Using SNMP, operators can obtain information on the configuration and status of the LAN emulation client (LEC) and set parameters as the ATM address of the LAN Emulation server (LES).
- LAN Emulation Server/Broadcast Unknown Server (LES/BUS) Function. Allows an easy migration from conventional LANs to ATM. Supports Ethernet and Token-Ring networks, a mix of UNI 3.0 and 3.1 LAN Emulation clients, and a maximum of 800 downstream LAN workstations with up to 500 broadcast frames per second (512 bytes maximum frame size).
- Switch redundancy provides automatic backup when two switches are installed and one fails. Automatic mirroring is provided to avoid duplicating error-prone configurations.
- Permanent virtual circuits (PVCs) can be set up from a local console.
- Out-of-band Telnet support is provided using SLIP, as well as in-band.
- 8260 configurations can be retrieved with a utility program and TFTP.
- Stations that do not support the ILMI registration can be connected to the ATM network.

Features of the latest version of the ATM Switch/Control Point microcode:

- quadruples the number of ATM connections to 4000 per ATM modules.
- supports larger buffer pools to better support LAN Emulation.
- adds support for available bit rate (ABR) flow control for maximum network resource utilization, combined with early packet discard or partial packet discard.
- supports a variable range of VPC and VCC values to optimize a range of destinations and connections per site.

- **4-Port 100 Mbps ATM Fiber Concentration Module** is a single slot, 4-port, 100 Mbps module. This module provides an excellent way to bring ATM support to workgroups at a cost comparable to other high speed technologies. The module implements ATM Forum UNI 3.1 signaling and supports UNI, SSI and NNI interfaces in any combination. The module has SC and MIC connectors, is hot-swappable and implements 8260 power and inventory management. It supports ATM switch redundancy when configured with two ATM Switch/Control Point Modules in an 8260 Model A17. It may be used to connect 8260s together, or it may be used with a 100 Mbps ATM adapter.

- **ATM 12-Port 25 Mbps Concentration Module** is a single slot, 12-port, 25 Mbps module. This module provides an excellent way to bring ATM support to workgroups at a cost comparable to other high speed technologies. The module implements ATM Forum UNI 3.1 signaling and supports UNI, SSI and NNI interfaces in any combination. It supports UTP 3, 4 and 5, FTP, and STP 100-, 120-, and 150-ohm wiring to adapters as far as 300 m (984 ft) away. The module is hot-swappable and implements 8260 power and inventory management. It supports ATM switch redundancy when configured with two ATM Switch/Control Point Modules in an 8260 Model A17 and G17. The **1-Port ATM 155 Mbps I/O MMF card,** fits on the ATM 12-Port 25 Mbps Module and allows users to attach one ATM 155 Mbps port using a 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 ATMFlex 155-Mbps Media Module** is a single slot, 2-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. It supports the ATM Forum SONET/SDH "Lite" specification. Two 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.

- **ATM 155 Mbps I/O Cards** install on the ATMFlex Module. These I/O cards are single-port cards with shielded RJ-45 connectors. They occupy one of the two card positions on the ATMFlex Module. Two 155 Mbps ATM UTP5 and STP I/O cards can be installed on the ATMFlex module, or the UTP 5 and STP I/O cards can be mixed with single mode and multimode fiber I/O cards. The ATMFlex module automatically senses what cards are installed and reports the configuration to the management modules. ATMFlex module I/O cards can be installed or changed in the field by customers.

There are three types of ATM 155 Mbps I/O Cards:

- Multimode fiber type, for distances of up to 2 kilometers (6600 ft)
- Single-mode fiber type, for distances of up to 20 kilometers (66,000 ft)
- UTP5/STP copper type. Distances supported vary by type of media:
  - 100 m (328 ft) for 100-ohm UTP5, FTP and SFTP
  - 100 m (328 ft) for 120-ohm FTP and SFTP
  - 150 m (492 ft) for STP

The ATMFlex Module supports UNI, SSI and NNI interfaces in any combination. ATMFlex Modules can coexist with any other ATM module in the same 8260 and work in conjunction with the 8250 Switch/Control Point Module to connect workstations, other switches or other 8260s. Multiple ATMFlex Modules can be used to build parallel links between 8260s for a very high-speed backbone, with traffic on the links balanced for maximum throughput by the ATM Switch/Control Point Modules.

- The **ATM 155 Mbps Concentration Module**, with three ports, offers a 50% increase in the number of 155 Mbps ATM ports available when compared to earlier modules.

- 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 an 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.

- **ATM Carrier Module** inserts into the IBM 8260 Switching HUB and acts as a generic motherboard that accepts one or two daughter boards. The motherboard contains all ATM backplane and system control specific components, and uses a standard interface (UTOPIA 1) for communication with the daughter cards. The module comes in 1-slot or 2-slot versions. The ATM Carrier Module is being utilized in IBM's ATM Kit Program, which is an industry-unique vehicle through which independent developers or vendors can build cards for the Carrier Module. This newly developed function benefits from the advanced features of the 8260 platform, and from the features of the module itself. The module features are:
  - access to the two ATM switches with 8260 Model A17 (primary and secondary)
  - use of different priority queues for traffic with different Class of Service, and for all ATM Adaption Layers (AAL)
  - access to ATM Switched and Permanent Virtual Circuits (SVC and PVC) with ATM Forum-compliant interfaces
  - access to Point-to-Multipoint Virtual Circuits for multicast services
  - direct access to the ATM Switch speed, enabling the development of applications that cannot be deployed as an external device with links at 100 Mbps or 155 Mbps

By opening the IBM 8260 technology to outside developers, it can be marketed to end users as an open platform, which gives it a significant marketing and technical advantage in comparison to other ATM switch vendors. The Integrated IBM 8281 ATM/LAN Bridge is an example of an application specifically designed for the ATM Carrier Module. The ATM Kit Program Developer Package includes:

- specifications for daughter board interfaces
- an 'ATM class' that covers both the 8260 system architecture and information on daughter board development

- **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. It provides local LAN bridging functions as well as LAN to ATM bridging using IBM LAN Emulation protocol. It supports T/R source route bridging and Ethernet Transparent Bridging with filtering options.

- **ATM WAN Modules** allow direct communication between ATM 8260 networks residing in different locations, as, for example, in a campus setting. The WAN interface can be used to interconnect several corporate networks or universities, or to link a main site to a large number of small locations, such as in remote distance learning or interactive video.

  The ATM WAN module is a 1-slot module based on the IBM 8260 Carrier and can host up to 2 daughter cards of any of the following types:
  - 1-port E3 I/O card (34 Mbps) with BNC connector
  - 1-port DS3 I/O card (44 Mbps) with BNC connector
  - 1-port STM1 (155 Mbps) with SC-Duplex optical connector over single mode fiber allowing connections up to 20 km
  - 1-port STM1 (155 Mbps) with SC-Duplex optical connector over multimode fiber allowing connections up to 2 km
  - 1-port OC3 (155 Mbps) with SC-Duplex optical connector over single mode fiber allowing connections up to 20 km
  - 1-port OC3 (155 Mbps) with SC-Duplex optical connector over multimode fiber allowing connections up to 2 km

  The STM1 and OC3 interfaces implement, respectively, full SDH and SONET support. All of the daughter cards can be installed by customers. The ATM WAN Module supports UNI and NNI interfaces and PVC, SVC and Point-to-Multipoint connections.

The ATM WAN 2 module provides 8260 users with an option to utilize reduced line costs of E1/T1/J1 connections yet still support all AAL types and Quality of Service (QoS). The WAN 2 module is a single-slot module, with room for up to 2 I/O cards, each with an 4-port E1/T1/J1 interface. The same daughter 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 Mpbs) interface which uses twisted pair cable.

8260 Token-Ring Modules

The **Token-Ring modules** for the 8260 include several media modules that offer passive and active modules, per-port switching and per-module switching, beacon recovery, and speed-detect. These media cards can host daughter cards such as the **Jitter Attenuator Card (JAC)** for improved signal retransmission 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 is minimized, allowing 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 or concentrator. The 8260 is also provided with an industry-unique active technology which uses DUN Phased Lock Loop (DPLL) active retiming of the signal.

The TMAC enables statistics to be gathered about the Token-Ring segment to which it is attached; it then transmits this information to the Distributed Management Module (DMM). The TMAC supports seven RMON groups and IBM-added functions 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 as a single network interface and can be placed on any of the 8260 Token-Ring media modules using the same daughter card position as the TMAC. It can be sued 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), the embedded functionsrun 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 to full seven layer data collection.

	18-Port Active Media Module	20-Port Passive Media Module	Dual Fiber Repeater Module	18-Per Port Switching Module
RJ-45 Connectors	18	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 1 possible isolated	10 possible on backplane and 1 possible isolated
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 Mbps
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

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 on the DMM with Ethernet Carrier. 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 with Ethernet Carrier. The HEMAC provides two network interfaces, allowing one card 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.

	24-Port 10BASE-T	10-Port 10BASE-FB	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 on 8 backplane and 8 isolated
Module Media	UTP	Fiber	UTP, STP, FTP	UTP, STP, FTP	UTP, STP
Maximum Distance	150 m 150m (UTP-4) 150 m (FTP-5,SFTP-5) 200m (STP-1,2)	2 km link4 km network	125m (UTP-3) 150m (UTP-4) 150m(FTP-5,SFTP-5) 200m (STP-1,2)	125m(UTP-3) 150m(UTP-4) 150m(FTP-5,SFTP-5) 200m(STP-1,2)	100m UTP 100m STP
Optional DaughterCards	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 following modules are for 10BASE-T Ethernet cards:

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 10BASE-2 with BNC connectors
- 3-port 10BASE-5 with male AUI connectors
- 3-port 10BASE-5 with female AUI connectors

Each port on the **Ethernet Modular Board** is switchable under software control to any 8260 backplane segment or to 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. Only one is required per hub when LAN modules are present. 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 be fit on the DMM with Ethernet Carrier. They provide in-band communication and segment management. One daughter card is suggested per managed segment. The **Advanced DMM/ Controller** integrates the DMM and Controller functions on a single module that occupies a controller slot, saving a payload slot in the hub. This Advanced DMM/ Controller delivers significant improvements in performance over the DMM.

If the Advanced DMM/Controller is installed in the same hub with a Controller module or a DMM or DMM/EC, it must run the following software:

- V1.11 or later for the Controller module
- V3.0 or later for the DMMs

8271 & 8272 LAN Switch Modules for the IBM 8260

These modules include all the functions of the standalone **8271 Nways Ethernet LAN Switch** and **8272 Nways Token-Ring LAN Switch**, and also inherit such 8260 features as intelligent, redundant power supplies, comprehensive management and hot-pluggability. (For information on the Nways Ethernet and Token-Ring LAN Switches, see the *LAN Switch Sales Guide*, Market Tools, List3820.)

With these LAN Switch Modules, the 8260 Hub becomes

- the industry standard for combining, within a single chassis, LAN media concentration, LAN Token-Ring and Ethernet switching, and ATM switching modules.
- a platform that moves smoothly from shared LAN networks to switched LANS with high-speed ATM backbones, and to ATM desktop switching.

The 8271 (Ethernet) and 8272 (Token-Ring) modules are available in 2 or 3- port formats, and offer the following functions:

- Cut-through, store-and-forward, and adaptative cut-through switching
- Half or full-duplex capacity on an individual port basis
- Low latency switching
- Virtual switch support, allowing subdivision of a single physical LAN switch module into two to eight virtual switches
- Transparent bridging and filtering
- Support for a maximum of 1700 active LAN station addresses per port and 10,000 per module
- Support for up to 28 Ethernet segments or 24 Token-Ring segments
- Packet-to-ATM cell conversion
- Direct connection between the switch modules and the 8260 ATM backplane

The IBM 8272 Switch module also offers these additional features:

- Auto-sense and auto-configure capabilities
- Source route switching, designed to support high-performance switching in source routing Token-Ring networks

By using the 8271 and 8272 LAN Switch modules with the 8260 hub, up to 160 Ethernet switch ports or 128 Token-Ring switch ports may be interconnected. Thus, the 8260 hub with 827x modules is a cost-effective solution for segment switching (multiple users per port) rather than for desktop switching (one user per port) with direct backplane connections to the ATM network. A new ATM UFC supports 155 Mbps ATM uplinks for Ethernet or Token-Ring.

NOTE: IBM recommends that customers have a 415-watt power supply for the 8260 hub when using 827x LAN Switch modules, in order to avoid difficulties in using the Universal Features Cards (UFCs). The UFCs available for the standalone 8271 and 8272 LAN Switches are also supported by these 827x LAN Switch Modules.

Switching Module Series

These features are a set of Ethernet and FDDI switching modules for packet-channel equipped 8260 models (P10, P17 or G17) 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 an OC3 multimode fiber interface with a 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 back-up 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.

Interconnect Modules

These modules provide local bridge/routing functions in the 8260 chassis, with connectivity to six Ethernet networks on the backplane. The two-slot version has room for two I/O cards for either Ethernet or Token-Ring connections.

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.

IBM 8271, 8273, and 8274 Links to the 8260

The 8271, 8273, and 8274 Switches can be connected to the 8260 via an ATM uplink. See the *LAN Switch Sales Guide* for more information on these products.

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 dependent upon the platform the customer chooses for management applications. For more information, see the pages referenced below.

NOTE: In the case of management from an SNMP management station, the 8260 MIB should be installed. The latest version of the 8260 MIB can be obtained from a public Internet library by following the steps below:

FTP to 'www.raleigh.ibm.com'
Enter to login name 'anonymous'
Enter your full Internet email address as the password
Change to the MIB directory using the 'cdpub/products/lanprods/hub' command
List the contents of the directory using the 'ls -1' command and use CTRL-S to pause the display to view the available IBM entries. Use Ctrl-Q to continue the display.
Copy the MIB file to your current directory using the command 'get 8260.mib'.
Exit FTP using the 'quit' command

Platform	Management Solution
AIX	Nways Campus Manager LAN for AIX V3.0 (see p. 77)
Windows	Nways Manager for Windows V2 (see p. 75)
HP-UX	Nways Campus Manager LAN for HP-UX V1.1 (see p. 79)

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.

Products and Options

Description
IBM 8260 Chassis (does not include redundant Fault-Tolerant Controller Module and power supply; order separately) Model 017, 17-slot Model 010, 10-slot Model P10, 10-slot Model P17, 17-slot Model A17, ATM-ready, 17-slot Model A10, ATM-ready, 10-slot Model G17, ATM-ready, 17-slot MES for 010 to P10 conversion MES for 017 to P17 conversion MES for 017 to G17 conversion MES for A17 to G17 conversion
Chassis Options 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 Download Kit
MSS Server Module MSS Server Module (A10/A17/G17) Hard Disk PCMCIA Card (A10/A17/G17) MSS Microcode Release 1.1

Products and Options

Description
ATM Modules
ATM Backplane for 10-slot model
ATM Firmware Upgrade for the 8260 and 8285
ATM Switch/Control Point Module[1] (8 MB RAM)
ATM Switch/Control Point Module 2.2 (16 MB RAM)
MES ATM Switch/Control Point Module Upgrade (for F/C 5000)
ATM Switch/Control Point V3.0
4-port 100 Mbps ATM Fiber Concentration Module - MIC
4-port 100 Mbps ATM Concentrator Module - SC
3-port, 1-slot 155 Mbps ATM Concentration Module
Nways ATM 12-Port 25 Mbps Concentration Module
ATM 1- Port 155 Mbps Multimode Fiber I/O Card
Nways ATM FLEX 155 Mbps Media Module
Nways ATM 1-port Multimode Fiber I/O Card
Nways ATM 1-port Single Mode Fiber I/O Card
Nways ATM 1-Port UTP5/STP I/O Card
Nways 8281 ATM TR - Ethernet LAN Bridge Module
ATM WAN Module
ATM WAN 1-port E3 I/O card
ATM WAN 1-port DS3 I/O card
ATM WAN 1-port STM1 I/O card (SMF)
ATM WAN 1-port STM1 I/O card (MMF)
ATM WAN 1-port OC3 I/O card (SMF)
ATM WAN 1-port OC3 I/O card (MMF)
ATM WAN 2 Module
ATM WAN 2, 4-port E1/T1/J1 I/O card
Token-Ring Modules
TR 20-port, Passive, Media Module
TR Media Access Card (TMAC) (RMON Support)
High-End TMAC (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 Crossover Cable

1. Does not support full chassis monitoring function.

Products and Options

Description
Ethernet Modules
Ethernet 10BASE-T 24-port PPS TELCO Module
Ethernet 10BASE-T 20-port PPS RJ-45 Module
Ethernet 10BASE-T 40-port PPS RJ-45 Module
Ethernet 10BASE-T 36-port 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
Management Modules
Advanced DMM/Controller
Distributed Management Module (DMM) standalone
DMM with Ethernet Carrier (EC-DMM)
Distributed Management Module (DMM) standalone V3.0
DMM with Ethernet Carrier (EC-DMM) V3.0
MES[1] Upgrade to DMM V3.0 or EC-DMM V3.0

1. MES - Miscellaneous Equipment Specification

Products and Options

Description
LAN Switches
2-slot 8271 LAN Switch for Ethernet
3-slot 8271 LAN Switch for Ethernet
8271 LAN Switch UFCs:
4-port 10BASE-T
3-port 10BASE-FL
1-port 100BASE-Tx
1-port 100BASE-Fx
2-slot 8272 LAN Switch for Token-Ring
3-slot 8272 LAN Switch for Token-Ring
155 Mbps ATM Ethernet Multimode fiber
155 Mbps ATM Token-Ring Single-mode fiber[1]
2-slot 8271 LAN Switch Module for ATM[2]
3-slot 8271 LAN Switch Module for ATM[2]
8260 ATM Backplane Upgrade for the 8271[2]
2-slot 8272 LAN Switch Module for ATM[2]
3-slot 8272 LAN Switch Module for ATM[2]
8272 LAN Switch Enhanced UFCs:
4-port Token-Ring UTP/STP
2-port Token-Ring Fiber
1-slot, 12-port 10BASE-T LAN Switch Module
2-slot, 24-port 10BASE-T LAN Switch Module
1-slot, 10-port 10BASE-FB/FL LAN Switch Module
2-slot, 20-port 10BASE-FB/FL LAN Switch Module
2-slot, 12-port 10BASE-T FDDI DAS LAN Switch Module
2-slot, 10-port 10BASE-FB/FL FDDI DAS LAN Switch Module
1-slot, Dual FDDI DAS LAN Switch Module
1-slot, 4-port 10BASE-TX LAN Switch Module[2]
1-slot, 4-port 100BASE-FX LAN Switch Module
Packet Channel/ATM Switch Module[2]
LAN Access Switch Module[3]
8MB LAN Switch Memory Upgrade
16MB LAN Switch Memory Upgrade
Interconnect Modules
Ethernet Interconnect Module 1-slot
Ethernet Interconnect Module 2-slot
10BASE-T I/O Card
10BASE-2 I/O Card
10BASE-5 I/O Card
Token-Ring I/O Card

1. Also operates in the IBM 8270 and 8272 Switches
2. Available 6/97
3. Available 4/97

Products and Options

Description
Management Software Products
Nways Manager for Windows V21
Nways Manager for Windows V2 Additional License with Certificate
Nways Campus Manager Suite for AIX V3 (5697-BO6)
Nways Campus Manager LAN for AIX V3.0 (5697-BO7)
Nways Campus Manager LAN for HP-UX (4 mm tape)
Nways Campus Manager ATM for AIX V2.0 (5697-BO8)
Intelligent Hub Mgmt Program for DOS Entry V2 (5801-AAR)
Update to Nways Campus Manager Suite for AIX V3 from Nways Campus Manager Suite for AIX V2 (5697-BO6)
Upgrade from Nways Campus Manager Suite for AIX V3 from Nways Campus Manager LAN for AIX V2 (5697-BO6)
Upgrade to Nways Campus Manager Suite for AIX V3 from Nways Campus Manager ATM for AIX V1 (5697-BO6)
Upgrade to Nways Campus Manager Suite for AIX V3 from Nways Campus Manager ReMon for AIX V1 (5697-BO6)
Upgrade to Nways Campus Manager Suite for AIX V3 from Nways Campus Manager AIX V1 (5697-BO6)
Upgrade to Nways Campus Manager LAN for AIX V3 from Nways Campus Manager LAN for AIX V2 (5697-BO7)
Upgrade to Nways Campus Manager ReMon for AIX V1 (5697-B17)
Upgrade to Nways Campus Manager ReMon Advanced for AIX V2 from Nways Campus Manager ReMon Advanced for AIX V1 (5697-B17)
Upgrade to Nways Manager for Windows V2 from Nways Manager for Windows V1
Upgrade to Nways Manager for Windows V2 from NetView for Windows V2
Upgrade to Nways Manager for Windows V2 from Nways Manager for Windows V1 Additional License with Certificate
Upgrade to Nways Manager for Windows V2 from NetView for Windows V2 Additional License with Certificate

Sales Tools

The following sales tools are available for the IBM 8260:

8260 Multiprotocol Intelligent Switching Hub (spec sheet)	G325-3507
8260 Multiprotocol Intelligent Switching Hub (product description)	GA33-0315
8260 Multiprotocol Switching Hub	G520-7080
IBM 8260 Ethernet Modules (spec sheet)	G221-4048
8260 Token-Ring Modules and Cards (spec sheet)	G221-4203
IBM 8260 ATM Solutions (spec sheet)	G221-4293
8260 Multiprotocol Intelligent Switching Hub	G325-3508
8260 LAN Switch Modules	G224-4488
Switch-on-a-Chip	G325-3512
8260 Networking for Today and Tomorrow	G325-3508
8260 More Capacity and Greater Capability for Operating	G221-4047
8260 The Super Hub for Today and Tomorrow	G520-7080
Nways ATMkit Technical Overview	GA33-0370
Nways ATMkit Flyer	GA33-0371
Nways ATMkit Folder	GA33-0373

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

- IBM FAX (800-IBM-4FAX, product spec sheet document #2661)
- IBM PCC FAX (800-IBM-3395, product spec sheet document #s 10127, 10129)

The latest microcode updates of ATM and non-ATM 8260 modules can be obtained from the IBM Web site:
http:\\www.raleigh.ibm.com/826/826fix/html

Q's and A's

Q) How much of the IBM 8260 technology is IBM technology versus 3Com/ ISD?

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/ISD is responsible for the Ethernet portion and the Token-Ring portion is the result of shared technology between 3Com and IBM.

Q) What about integrated routing in the 8260?

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

Competition

The IBM 8260 competes well against high-end hubs from such major vendors as Cabletron and Bay Networks. The following two tables compare the IBM 8260 to its primary competitors.

Feature	IBM 8260	Fore Systems ASX-200BX	Fore Systems ASX-1000	Bay Systems 5000AH
No. of slots	10/17	4	16	14
Max. no. of ports				
100Mbps ATM	56	24	96	0
155 Mbps ATM	42	16	64	16
622 Mbps ATM	7	4	16	0
Fault-Tolerant				
Controller Module	Yes (2)	No	Yes	No
Hot-Swappable				
Network Modules	Yes	Yes	Yes	Yes
Redundancy Power				
Supplies	4	2	2	3
IEEE 802.3 Ethernet				
Segments	8	Yes	Yes	12
IEEE 802.5 Token-Ring				
Segments	17	No	No	9
FDDI Segments	8	No	No	5
SNMP Network				
Mgmnt. Support	Yes	Yes	Yes	Yes
RMON Support for				
Ethernet/Token-Ring	Yes/Yes	N/A	N/A	Yes/Yes
Automatic Network				
Configuration	Yes	Yes	Yes	N/A
LAN Emulation				
RFC 1483/1577	Yes	Yes	Yes	Yes
PNNI-1	Yes	Yes	Yes	No
ATM UNI V3.0 or	Both (AutoSense)	3.0	3.0	3.0
3.1 support	4.0	2.5	10 (2.5 x 4)	5 (2.5 x 2)
Switch Capacity (G/bps)	2	1	4	1
No. of Switches				
Redundant Switch	4.0	N/A	5.0	N/A
Capacity (G/bps)				
Cells per Port	4000	13,312	13,312	1,024
Switched Virtual				
Circuits	Yes	Yes	Yes	Yes
Non-blocking/Modular				
Architecture	Non-blocking	Non-blocking	Non-blocking	Non-blocking
Multicast/Broadcast				
Capabilities	Multicast	Both	Both	Both
ATM Carrier Module				
(3rd Party Functions)	Yes	N/A	N/A	No
Warranty	1 year	1 year	1 year	1 year

Feature	IBM 8260	Digital Equipment GIGAswitch	Cisco 1010	3Com Cellplex 7000	Cabletron MMAC Plus
No. of slots	10/17	14	5	4	14
Max. no. of ports					
100 Mbps ATM	56	0	0	0	24
155 Mbps ATM	42	52	8/32	16/32	16
622 Mbps ATM	7	13	8	16	4[1]
Fault-Tolerant					
Controller Module	Yes (2)	Yes	No	N/A	No
Hot-Swappable					
Network Modules	Yes	No	Yes	Yes	Yes
Redundancy Power					
Supplies	4	2	Yes	2	6
IEEE 802.3 Ethernet					
Segments	8	No	No	12/48/144	No
IEEE 802.5 Token-Ring					
Segments	17	No	No	No	No
FDDI Segments	8	No	No	No	4
SNMP Network					
Mgmnt. Support	Yes	Yes	Yes	Yes	Yes
RMON Support for					
Ethernet/Token-Ring	Yes/Yes	No	No	No	Yes
Automatic Network					
Configuration	Yes	Yes	Yes	N/A	Yes
LAN Emulation					
RFC 1483/1577	Yes	Yes	No	Yes	Yes
PNNI-1	Yes	No	Yes	No	No
ATM UNI V3.0 or	Both	Both	3.0	Both	3.0
3.1 support	(AutoSense)	10.4	5.0	2.56/5.0	2.5
Switch Capacity (G/bps)	4.0	1	1	2	1
No. of Switches	2				
Redundant Switch	4.0	No	N/A	2.5	N/A
Capacity (G/bps)					
Cells per Port	4000	N/A	65,536 (shared)	75-300	13,312
Switched Virtual					
Circuits	Yes	Yes	Yes	Yes	Yes
Non-blocking/Modular					
Architecture	Non-blocking	Non-blocking	Non-blocking	Non-blocking	Non-blocking
Multicast/Broadcast					
Capabilities	Multicast	Both	Both	Multicast	Both
ATM Carrier Module					
(3rd Party Functions)	Yes	N/A	N/A	No	N/A
Warranty	1 year	1 year	90 days	1 year	90 Days

1. Fore Module

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 advanced backplane design of the 8250 is used 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
- One-year warranty
- 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
- Industry-unique combination of LAN and ATM features
- End-to-end solution provided by a single vendor

Nways Wide Area Switch Family

The Nways Wide Area Switch family consists of four products: the 2219 Nways Access Switch, Model 250; the 2220 Nways BroadBand Switch, Models 300, 500, and 501; the 2225 Nways MultiService Switch, Models 400 and 450; and the 2230 ATM Switch, Models 600 and 650. The family brings the following advantages to networking:

- supports existing and new networking devices with a standard interface
- supports existing and new wide area links from low to very high speeds
- supports existing and emerging applications
- reduces costs with bandwidth optimization
- provides continuous network availability through a distributed architecture that integrates redundancy and non-disruptive system operations features

Following a description of each product, a comparison chart is provided for summary purposes.

IBM 2219

Product Description The IBM 2219 Nways Access Switch is a 6-slot, modular Frame Relay Switch utilizing a RISC processor. Its symmetrical architecture gives any port on the module the flexibility to act as a user port, a network port, or an interswitch trunk. The switch allows for in-band management via an Ethernet port directly connected, through an Internet Protocol (IP) network connected via Frame Relay, and out-of-band management via an RS232 port.

IBM 2220

Product Description The IBM 2220 Nways BroadBand Switch is a set of fast packet and ATM cell switches based on IBM's Networking BroadBand Services (NBBS) architecture. The Nways Switch is a cost-effective solution for providing network access, transport, and switching for fast-packet and ATM cell applications. At this time, the switch provides Circuit Emulation Service (CES), voice, HDLC and frame relay access services.

The 2220 Nways Switch consists of components that are installed on one or two IBM 19-inch racks, depending on the model. Currently, there are three models of the 2220 available:

- Model 300 provides 6 adapter slots
- Model 500 contains 10 adapter slots
- Model 501 is an expansion of Model 500 and provides an additional 6 adapter slots

Adapter slots provide line attachments, control point function and voice compression/ echo cancellation function.

Features/Functions The IBM 2220 Nways BroadBand Switch offers the following features.

Feature	Function
Architecture	Built around a 16 x 16 cell switch fabric that is a nonblocking, self-routing switch.
Reliability	Offers optional redundancy for key elements such as switch, clock and power. Also offers online performance monitoring, diagnostics and maintenance. Nondisruptive route switching function is provided by NBBS architecture.
Management	Network management is accomplished through the IBM Nways BroadBand Switch Manager for AIX running on NetView for AIX.
Administration	Provides fault management, accounting management, performance management, operational control, and automation capabilities. Includes alarm filtering, thresholding, discrimination and logging.
Investment Protection	Supports existing application without change and accommodates new applications such as video conferencing, interactive TV, and distance learning.
Guaranteed Level of Service	Guaranteed Level of Service for time-sensitive traffic with minimized latency and resultant jitter. At the same time it maximizes bandwith utilization for effective transport of large, less time-sensitive data and image traffic.
Modular Design	Allows easy, cost-effective deployment. External controllers, routers, switches, PBXs, codecs or other devices connect to the 2220 network through ports on individual 2220 switches.

IBM 2225

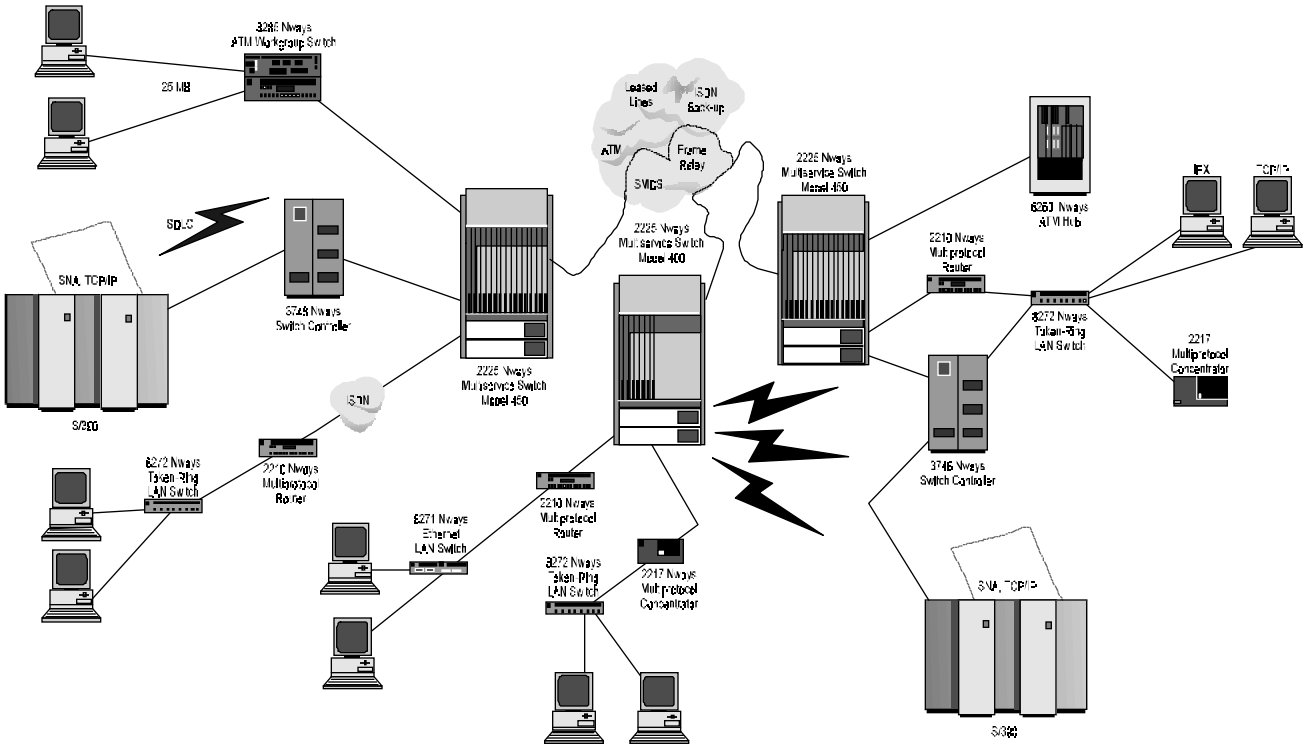
Product Description

The IBM 2225 Nways MultiService Switches Models 400 and 450 provide a flexible, cost-effective multiservice WAN platform based on ATM cell switching for interworking among Frame Relay, SMDS and ATM. Interworking offers a clear migration path to ATM while taking advantage of today's Frame Relay and SMDS services. It also allows different technologies at either end point of a connection to communicate seamlessly with one another or make use of new network transport services.

Model 400 is an 8-slot modular platform designed to meet the needs of low to medium density sites within public network carriers and enterprise end-user networks.

Model 450 is a 16-slot, high capacity, modular platform packaged to accommodate large networks with high bandwidth requirements.

The following diagram illustrates the interworking capabilities of the 2225:



WAN to Campus Connectivity

Features/Functions The IBM 2225 Nways MultiService Switches offer the following features:

Feature	Function
Architecture	Symmetrical RISC multiprocesser consisting of a Control Processor (CP) and multiple I/O modules. Provides network and system management and network routing functions in support of the real-time switching functions provided by the I/O modules. A full-duplex throughput of 1 Gbps and a 1.2 Gbps backplane are supported.
Reliability	• Fully redundant CP, I/O modules, power supplies and fan modules for high reliability in mission-critical applications. • Hot-pluggability and hot-swap of all CP and I/O modules, power supplies and fan modules to ensure maximum network availability. • Dynamic re-routing of PVCs using an Open Shortest Path First (OSPF) algorithm in the event of a network outage. • Dynamic re-routing of PVCs using an Open Shortest Path First (OSPF) algorithm in the event of a network outage. • Data center backup (re-route all PVCs). • Trunk failure recovery over ISDN. • Access port failure recovery over IDSN (DTE initiated).
Scalability	Scalable, high performance packet switching for ATM and high bandwith transmission environments or high-port density configurations.
Management	An SNMP agent supports enterprise MIB that includes standard MIB II and other MIBs required by the Frame Relay and ATM Forums. Network management capabilities include: standards-based (OSPF) routing of virtual circuits, rate monitoring, sophisticated congestion management, diagnostics, and usage statistics generation.
Software	• Public packet networks based on Frame Relay, ATM, or SMDS can be used as trunk links between switches. All ports are software-defined as trunks, Network-toNetwork Interface (NNI), or User-to-Network Interface (UNI) links. Any port can be used for any of the software configurable interfaces whether it is frame relay, SMDS or ATM services.

Feature	Function
Flexibility	• Flexible port capacity, with a full range of port speeds on one platform: 9.6 Kbps to 45 Mbps • Easy expansion through modular design • Frame Relay, SMDS, and ATM services on a single platform • Flexible software implementation
I/O Modules	• User network connection and interswitch trunk connections can be mixed on any single I/O module, resulting in high capacity and economical use of I/O module cards. • The Control Processor and I/O modules utilize passive I/O adapters, allowing any failed I/O modules, power supply or fan module to be removed under power without disconnecting cables.
ATM Capabilities	Supports ATM DXI and ATM UNI Version 3.1. Models 400 and 450 are compliant with ATM UNI specifications. Existing network services can make use of an ATM network backbone or convert these services to ATM utilizing the established standards for ATM Adaptation (AAL 1, 5, and frame relay to ATM Interworking standards).

Part Numbers and Prices

Please contact your local IBM branch sales rep. for prices

IBM 2230

Product Description

The 2230 Nways ATM Switch Model 600 and 650 is a 16-slot modular platform high-performance cell based on crosspoint technology as its core switch fabric.

Model 600 runs on a 4x4 switch fabric that operates at 640 Mbps for a capacity of 2.5 Gbps, with 64k cell buffers.

Model 650 has an output-buffered, self-routing 8x8 matrix, and individual ports run at 640 Mbps for a total capacity of 5 Gbps, with 128k cell buffers.

Feature/Function Features of the 2230 are as follows:

Feature	Function
Architecture	• 2 slots dedicated to the ATM Switch Module and optional redundant switch; 14 slots available for high density I/O modules • Symmetrical RISC multiprocessing with RISC CPUs on every I/O and switch module, combined with dedicated silicon for highest overall performance and richest value-added features in the industry
Modules	8-port T3/E3 and 4-port OC3c/STM-1 I/O modules; single port OC 12c/STM-4 I/O modules; optional ABR/UBR Flow Control Processor Module
Redundancy	Fully redundant switch fabric, fans, and power supplies
Hot-Swappability	Hot-swappable components for maximum network availability
Scalability	Scalable to 5 Gbps non-blocking switching capacity
Operating Systems	• 112 DS3/E3, and 56 OC3c/STM-1 in one platform • Supports an industry standard PCMCIA interface to support Ethernet, modem, or hard disk.

Prices/Part Numbers

Please see your local IBM branch sales rep. for prices and part numbers.

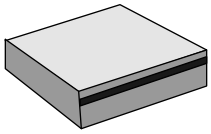
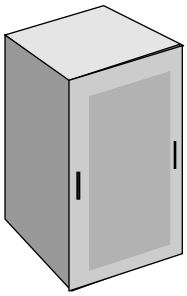
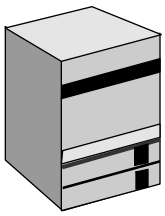
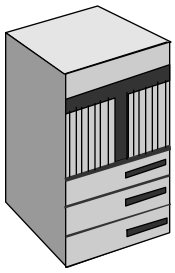
Sales Tools The following brochures are available for the IBM Nways Wide Area family:

IBM Wide Area Network Switch Family (2219/2220/2225/2230, spec sheet)	G224-4494
2219 Nways Access Switch, Model 250	G224-4491
2220 Nways BroadBand Switch (spec sheet)	G224-4495
2225 Nways Multiservice Switches, Models 400 and 450	G224-4493
2230 Nways ATM Switch, Models 600 and 650	G224-4492
Foxwoods Casino, Best on IBM for Its Multimedia Network (appl. brief)	G224-4497
Integrated Network for Canada's Largest Railroad (CN)	G224-4498

Nways Wide Area Switch Comparison

The following chart provides a comparison between the four members of the Nways Wide Area Switch Family:

IBM Nways Wide Area Switch Family
General Comparison

	Nways 2219 250	Nways 2220 300/500	Nways 2225 400/450	Nways 2230 600/650
				
Configurable Bandwidth Range	2.4 Kbps - 4 Mbps	2.4 Kpbs - OC3	2.4 Kpbs - OC3	T1-T3-OC3-OC12
Network Services	Frame Relay	Frame Relay, HDLC, CES, Voice ATM, X.25	Frame Relay, SMDS, ATM, ISDN	ATM
Trunk Services	Leased Line FR Service	Leased Line ATM/PTM	Leased Line ATM, SMDS FR Service	Leased Line ATM Service
Network Management Station	HP Openview	NetView for AIX	HP Openview	HP Openview

More information about the IBM Nways Wide Area Switch Family is available on IBM's home page:
http://www.raleigh.ibm.com

Nways Manager for Windows™

Description

This product is an integrated suite of network management applications 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™ management product is for customers with small to medium networks of up to 200 devices linked via Ethernet, Token-Ring, ATM, or a combination. These customers have one or more IBM campus networking products and want centralized management for several devices.

Functions

The Nways Manager for Windows™ provides remote control and coordination of IBM networking products through:

- remote login via Telnet
- 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 networking hardware 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 supported products
- integrated trouble-ticketing to gather information and track network problems to resolution
- a MIB browser to allow management of components not supported with a graphical interface
- drag and drop VLAN configuration

Version 2 of Nways Manager for Windows offers the following enhancements for managing small networks and workgroup environments:

- enhanced ATM management capabilities
- virtual LAN management using a drag and drop interface
- enhanced operator productivity through coupling the Nways Manager for Windows and the Nways LAN Remote Monitor for Windows
- an improved TCP/IP stack optimized for the Windows environment
- inclusion of NetView for Windows Version 2.1
- RMON interface enhancements for end users
- comprehensive device management for IBM networking hardware devices

Optional RMON The Nways LAN Remote Monitor for Windows can be purchased for RMON support (see page 80).

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

- IBM 8271 Nways Ethernet LAN Switch
- IBM 8272 Nways Token-Ring LAN Switch
- IBM 8224 Ethernet Stackable Hub
- IBM 8230 (Models 3/13, 2/13, 4A/4P) family of Token-Ring hubs
- IBM 8238 Nways Token-Ring Stackable Hub
- IBM 8250 Multiprotocol Intelligent Hub and modules
- IBM 8260 Multiprotocol Intelligent 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 ATM Workgroup Switch

Products and Options

Description
Nways Manager for Windows V2
Upgrade to Nways Manager for Windows V2 from Nways Manager for Windows V1
Upgrade to Nways Manager for Windows V2 from NetView for Windows V2
Upgrade to Nways Manager for Windows V2 from Nways Managaer for Windows V1 Additional License with Certificate
Upgrade to Nways Manager for Windows V2 from NetView for Windows V2 Additional License with Certificate

Sales Tools The following sales tool is available for Nways Manager for Windows:

Nways Manager for Windows (spec sheet) G325-3634

Nways Campus Manager LAN for AIX

Description

Nways Campus Manager LAN for AIX is an integrated suite of 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 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. Other features include:

- remote login via telnet
- 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 network hardware 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
- drag and drop VLAN configuration
- fully integrated LAN topology management
- critical resource monitoring

Version 3 of Nways Campus Managers for AIX offers the following improvements for managing medium-to-large LANs:

- support for storing, searching and retrieving key network management information using an open ObjectStore database
- distributed polling using the TME 10 Mid-Level Manager
- virtual LAN management using ATM Forum-compliant LAN Emulation
- simpler LAN Emulation administration
- easy to use, graphical management of ATM networks, including topology managment
- support for non-IBM devices that use ATM Forum-compliant MIBs
- support for the emerging RMON standard
- comprehensive device management for IBM networking hardware devices

Devices Supported The Nways Campus Manager LAN for AIX can be used to monitor and control the following networking devices:

- IBM 8224 Ethernet Stackable Hub
- IBM 8230 (Models 3/13, 2/13, 4A/4P) family of Token-Ring hubs
- IBM 8238 Nways Token-Ring Stackable Hub
- IBM 8250 Multiprotocol Intelligent Hub and modules
- IBM 8260 Multiprotocol Intelligent Switching Hub and modules
- IBM 8271 Nways Ethernet LAN Switch
- IBM 8272 Nways Token-Ring LAN Switch
- IBM 6611 Network Processor
- IBM Nways 2210 Multiprotocol Router
- selected OEM routers

Products andOptions

Description
Nways Campus Manager LAN for AIX V3.0 (5697-BO7)
Upgrade to Nways Campus Manager LAN for AIX V3 from Nways Campus Manager LAN for AIX V2 (5697-BO7)

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, but is ported to run on the HP OpenView 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.

Positioning

Nways Campus Manager LAN for HP-UX is targeted at customers who run the HP OpenView management platform.

Function

Nways Campus Manager LAN for HP-UX provides some functions of the Nways Campus Manager LAN for AIX. These functions include:

- remote login via telnet
- 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

Devices Supported

The Nways Campus Manager LAN for HP-UX can be used to monitor and control the following devices:

- IBM 8224 Ethernet Stackable Hub
- IBM 8230 (Models 3/13, 2/13, 4A/4P) family of Token-Ring hubs
- IBM 8238 Nways Token-Ring Stackable Hub
- IBM 8250 Multiprotocol Intelligent Hub and modules
- IBM 8260 Multiprotocol Intelligent Switching Hub and modules
- IBM 8271 Nways Ethernet LAN Switch
- IBM 8272 Nways Token-Ring LAN Switch
- IBM 6611 Network Processor (performance and health monitoring)
- IBM Nways 2210 Multiprotocol Router (performance and health monitoring)

Products and Options

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

Nways LAN Remote Monitor

Nways LAN ReMon for Windows

The Nways LAN Remote Monitor for Windows 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 down to individual workstations. All activity on a LAN segment can be reviewed, including 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 1Working Group RFCs 1757 and 1513

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 anAIX or UNIX-based management platform to manage their network devices. An advanced version of the AIX and HP-UX packages include RMON 2 extensions. These extensions provide:

- Address translation (MAC address to network layer address translation)
- Protocol distribution (detail higher layer protocol usage)
- Traffic transmission analysis software to help managers identify causes of problems using 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:

- **8230** Models 3, 13, 213, 4A, and 4P
- **8238** Models Silver (includes active and passive) and 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 daughter cards

Products and Options

Description
LAN ReMon for Windows (5801-AAR) LAN ReMon for AIX V2 (5697-B17) LAN ReMon for HP-UX (5801-AAR) 4 mm tape LAN ReMon for AIX Advanced V2 (5697-B17) LAN ReMon for HP-UX Advanced (5801-AAR) 4 mm tape Upgrade to Nways Campus Manager ReMon for AIX V2 from Nways Campus Manager ReMon for AIX V1 (5697-B17) Upgrade to Nways Campus Manager ReMon Advanced for AIX V2 for Nways Campus Manager ReMon Advanced for AIX V1 (5697-B17)

Nways Campus Manager ATM for AIX or HP

Description

This product is an integrated software package of network management applications which interoperates with NetView, providing graphical ATM network management and seamless interaction with other management applications. It also monitors and controls network resources, allows selection of and tracks the variations of key performance counters, logs events and solves problems, and displays virtual connections. Nways Campus Manager offers full integration with Nways Campus Manager LAN products.

Positioning

The Nways Campus Manager ATM for AIX or HP is for customers with ATM devices such as hubs, concentrators, and bridges, in an AIX or HP networking environment. These customers have one or more ATM campus networking products and want to improve the management of their ATM networks.

Functions

The Nways Campus Manager ATM for AIX or HP provides monitoring and control of ATM devices through:

- quick recognition of network management information, even if from varying sources
- improved response time for error conditions, resulting in improved network availability
- automatic detection, mapping and monitoring of campus ATM devices
- automatic identification and updating of network changes
- graphic panel display with resizable network views and device configuration
- tracking of variations in key performance counters
- a complete set of messages, traps and event notifications which, through shared application databases, track resources, determine problems and identify problem sources
- easy distribution of fixes and migration of functions
- graphical display of any virtual connection, showing all actual hardware resources supporting the entire connection path, and allowing for the launch of other management functions on these resources
- download code upgrades to ATM devices

Nways Campus Manager ATM for AIX also provides comprehensive support for LAN Emulation, including:

- automatic discovery of LAN Emulation servers, clients and proxy clients
- use of discovered topologies to build displays that are dynamically updated to show color-coded device status and the devices assigned to virtual LANs
- adding, removing, or changing components of a virtual LAN with a drag and drop interface
- provision of templates to automate virtual LAN configurations by grouping a set of individual actions and executing them with a single command
- fault management, performance monitoring, and security control

Devices Supported The Nways Campus Manager ATM for AIX or HP can be used to monitor and control the following devices:

- ATM Switch/Control Point
- IBM 8260 Nways Hub
- IBM 8281 Nways ATM/LAN Bridge
- IBM 8282 Nways ATM Concentrator

Products and Options

Description
Nways Campus Manager ATM for AIX V2 (5697-BO8)
Nways Campus Manager ATM for HP V1.1, 4 mm tape (5803-AAR)

References

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

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

Glossary

ATM Asynchronous Transfer Mode. This is a fast, cell-switched technology based on a fixed-length 53-byte cell. All broadband transmissions (whether audio, data, imaging or video) are divided into a series of cells and routed across an ATM network consisting of links connected by ATM switches. Each ATM link comprises a constant stream of ATM cell slots into which transmissions are placed or left idle, if unused.

DMM Distributed Management Module. Allows one to fully manage and control the 8250/8260 modules in an 8260.

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.

FTP Foiled Twisted Pair.

HEMAC High End Ethernet Media Access Control daughter card. See EMAC above.

Hub A physical layer device that creates the network infrastructure.

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.

LAN Emulation LAN Emulation gives existing networking devices transparent access to the ATM network. With LAN Emulation, a customer's current network applications will work with an ATM switch-based network.

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.

NBBS Network BroadBand Services. An architecture that provides end-to-end control functions designed for high-speed switched networks.

NC Network Computing. A form of distributed computing in which the network of computing resources is viewed as the supplier of services.

NDIS Network Driver Interface Specification. Microsoft specification for hardware-independent drivers at the data link (media access control) layer. When transport protocols are written to NDIS, network adapters with NDIS-compliant MAC drivers can be freely interchanged.

ODI Open Data Link Interface. Common interface for network drivers developed by Novell. It allows multiple transport protocols to run on one network adapter.

PPS Per Port Switching. Port switching allows individual ports on a module to be assigned to different networks on the backplane.

REM 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.

RMON Remote Monitoring Specification. An SNMP protocol used to manage networks remotely.

SAR Cell Segmentation and reassembly.

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.

Source Route Bridging 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.

SNMP Simple Network Management Protocol. The protocol governing network management and monitoring of network devices and their functions. SNMP came out of the TCP/IP environment.

STP Shielded Twisted Pair.

SVC Switched Virtual Circuit. A connection across a network. It is established on an as-needed basis and can provide connection to any other user in the network.

SVN Switched Virtual Networks. 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.

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.

Transparent Bridging This type of bridge forwards frames based on a 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.

TRMM Token-Ring Management Module for the 8250.

UTP Unshielded Twisted Pair.

VLAN Virtual LAN. A logical grouping of users and servers independent of physical location.