IBM Solutions for the Expanding Campus Network Fact Sheet

Large office, small office, home office, or no office - let us bring your users together.

28 May 1996

Announcement Summary

Campus networks are continuing to experience rapid, dramatic changes, driven by needs for increased capacity and remote access, and by cost and resource pressures. Campus networks are being converted from shared to switched networks for additional capacity. Remote LAN access is now used by more than 80% of organizations with LANs. Network managers continue to place heavy emphasis on cost reductions and less dependence on skilled technicians, as they react to pressures from their management to stabilize or reduce costs.

Switched Virtual Networking (SVN) is IBM's standards-based framework for both campus and wide area networks. SVN allows network managers to build switched networks at their own pace, preserves their investments in current technology, incorporates new technology that can save money, and ensures a path to ATM. These anouncements further implement IBM's SVN solution. IBM continues to address customer requirements with flexible product offerings that provide the building blocks for networking solutions. This update adds new switched support, adds extensively to Fast Ethernet and remote LAN access, enhances IBM's integrated Nways Managers, and offers several enhancements that directly lower costs and skill requirements.

Announcement Highlights

This fact sheet covers new announcements as well as recent announcements not previously described in a summary fact sheet. Previously announced products covered here include:

- IBM 8272 Nways Token-Ring LAN Switch Model 216 with 16 UTP/STP ports and slots for 2 Universal Feature Cards (UFCs)
- 100BASE-FX UFC for the IBM 8271 Nways Ethernet LAN Switch with one port
- IBM 8223 100BASE-TX Ethernet Workgroup Hub with eight RJ-45 ports
- IBM Wake-On-LAN ISA Adapter
- Basic rate ISDN support for IBM 8235 Dial In Access to LANs (DIALs) servers and clients and DIALs server software Release 4.0
- Updates for the IBM Nways Campus Manager for Windows

New announcements include:

- Expanded IBM 8271 Nways Ethernet LAN Switch Model 216 with 16 10BASE-T ports and slots for 2 UFCs
- Integrated, 8271 and 8272 LAN Switch Modules for the IBM 8260 Nways Multiprotocol Switching Hub
- A new 8260 module that combines the Distributed Management Module (DMM) and Controller functions to free up the 8260 slot previously required for the DMM
- IBM 8260 wide area adapters for ATM connections to T3/E3, STM1/SDH, and OC3/SONET networks that extend campus ATM networks
- Wide range of new device drivers for 25-Mbps, 100-Mbps, and 155-Mbps TURBOWAYS ATM adapters
- New 155-Mbps ATM adapters for PCI, EISA, and Silicon Graphics GIO bus types with ATM Forum-compliant LAN Emulation and Classical IP for Windows NT, NetWare, and IRIX systems. These are Interphase Corporation adapters offered by IBM as complementary products
- IBM 8225 100BASE-TX Stackable Ethernet Hub for Fast Ethernet workgroups and backbones
- IBM 8235 DIALs servers Models 051 and 052 with two ports for less expensive remote access to small office environments
- IBM 8235 Model I40 DIALs Switch with high-capacity remote access for large offices with Ethernet
- IBM Nways Campus Manager LAN for AIX Version 2 with new media management support and Virtual LAN (VLAN) management using a drag and drop interface
- Updates to the IBM Nways Campus Manager ATM for AIX, and the IBM Nways Campus Manager LAN for HP/UX

Customer Environments

Challenges

The need for additional capacity, growing numbers of remote access users, easy access to the Internet and corporate intranets, and continuing interconnection and consolidation of organization networks present challenges. Network managers seek solutions that:

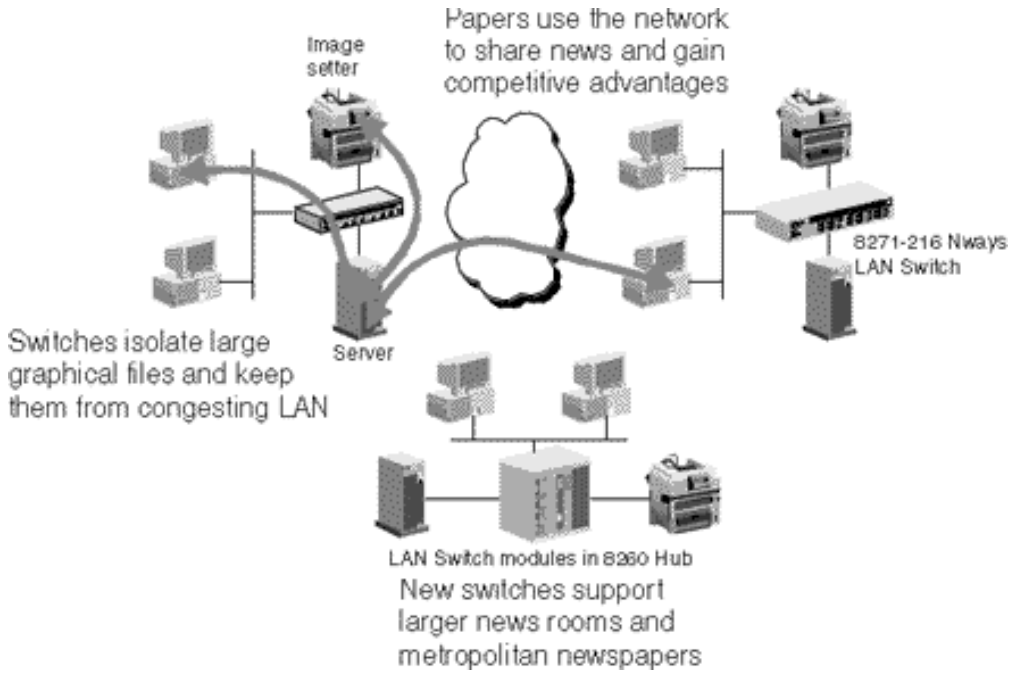
- Are flexible and standards-based for interoperability
- Allow them to make incremental additions where their needs are greatest
- Accommodate new applications and emerging technologies
- Incorporate switching for high capacity and bottleneck removal

They want solutions that have immediate benefits, but can be part of a longer-term strategy. IBM meets these challenges with solutions that address network manager needs across their entire organization. In this section, we present five customer situations that demonstrate challenges that network managers face and show how IBM can help meet those challenges.

LAN Switching to Help a Newspaper Adopt Automated, Full-Page Composition

Automated, full-page newspaper composition has immediate benefits over manual cut-and-paste in the high-pressure world of daily deadlines and late-breaking news. Stories and pictures in digital form can be used by other papers in a newspaper chain to save them both time and money. The large image files, however, can put intolerable burdens on networks designed for simple text processing. Writers and editors can work with low-resolution pictures during composition to minimize the demand on the network, but the high-resolution copy of the picture has to be moved from the server to the image setter to produce film for the page eventually, and even this movement can severely congest the LAN and cause delays and outages.

Figure 1. IBM LAN switching helps a national newspaper chain



A national newspaper is using IBM LAN switches to automate composition, with significant decreases in the time and cost required to produce its newspapers. Using IBM Nways LAN Switches to reduce congestion can increase the effective available bandwidth by as much as eight times. No other changes to adapters, wiring, hubs, or routers are required. As workgroups grow, newspapers can add ports with UFCs or install larger switches. The papers also benefit from IBM's integrated, easy-to-use, graphical Nways Managers which help them keep the network running smoothly at the lowest possible cost of operation.

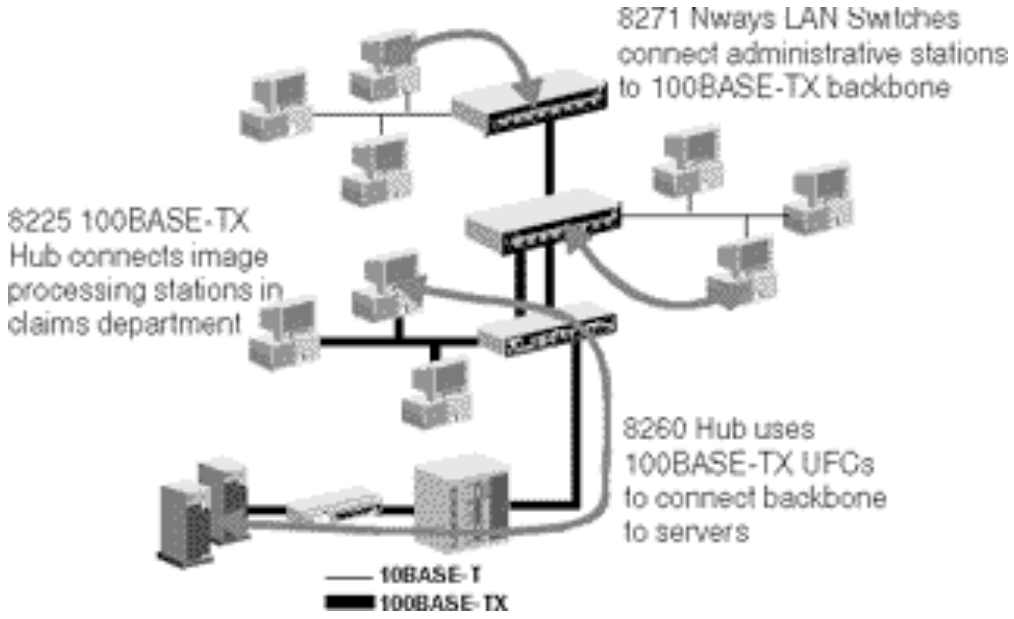
IBM Nways Switches support a range of configurations from small workgroups to large workgroups. Network managers can also add switch modules to their IBM 8260 Nways Hubs, giving them the flexibility to tailor configurations for networks ranging in size from a few to hundreds of users.

IBM also made some additional announcements that helped the newspaper improve service and control costs. IBM reduced the price of its Ethernet and token-ring LAN adapters by up to 30%. In addition, IBM announced new, cost-saving drivers and features like Wake Up On LAN that let administrators update PCs during off-shift periods, making IBM an even better choice for LANs.

Fast Ethernet to Help an Insurance Claims Office Add Pictures to Claims Reports

Claims processing requires careful investigation, collecting and organizing diverse information, and thoughtful analysis. Clients might have experienced serious losses and might need rapid resolution of their claims. Successful insurance companies continually look for ways to increase claims processing effectiveness, to provide better service to their clients and to provide settlements that are fair both to the client and to the insurance company.

Figure 2. IBM Fast Ethernet helps an insurance company



One of the obstacles to improved claims processing is comprehensive information collection and retention. Insurance companies can improve effectiveness, speed responses, and save money by maintaining consolidated claims files in digital form. However, many have not been able to incorporate pictures into their files. Claims adjusters need these pictures to accurately assess the loss. In addition, having the pictures available digitally makes it easier to realize further benefits. Once the pictures have been digitized, they can be archived for later comparison, sent to specialists to help determine settlements, or retrieved from the field without requiring adjustors to travel to the loss site.

Existing Ethernet networks might not be able to handle the added stress of retrieving, exchanging, and processing these pictures. Fast Ethernet can provide the added capacity within workgroups handling pictures or for a backbone linking workgroups to servers.

An insurance company found the solution it needed for claims processing. Using IBM's Fast Ethernet hubs and adapters, along with Nways Ethernet LAN Switches, the company was able to fully integrate and consolidate its claims processing. The company now includes all the information it needs in its claims records—text, pictures, and even audio segments. Since their claims records are more complete, they can make sure their adjusters have everything they need to assess the

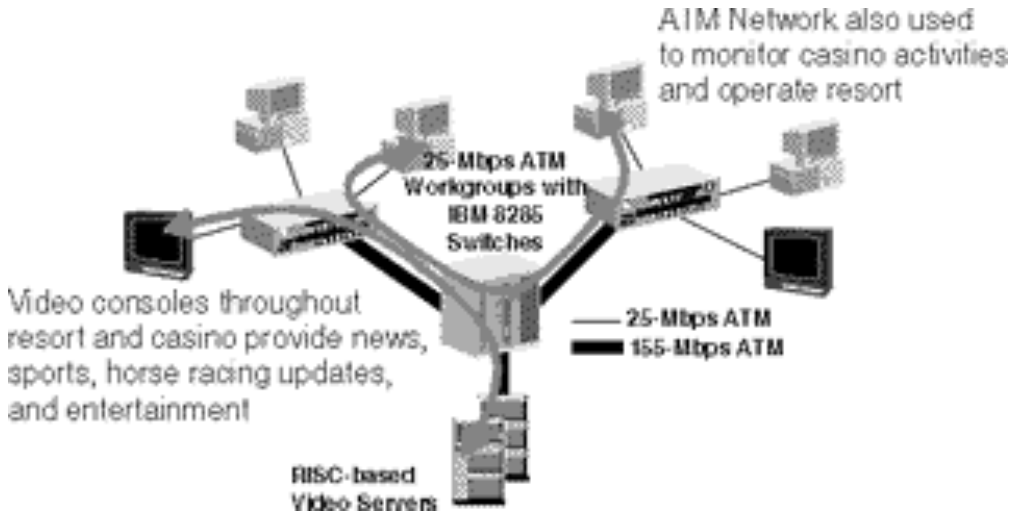
loss. Since the claims records are totally electronic, they can easily forward them to experts if needed. Claims are processed more quickly, more equitably, and for less money.

ATM Helps a Casino Bring Live Video Entertainment to Its Clients

Electronics have revolutionized many entertainment fields, and gambling is no exception. However, use of electronics has not often extended to computer networks, until recently. Working with IBM, the fastest-growing resort and casino in the northern United States found it could bring new services to its patrons and improve the efficiency of its internal operations by implementing inexpensive, 25-Mbps ATM from IBM.

With their new network, they are able to deliver real-time video—sporting events, entertainment, or educational video—to their patrons throughout the resort. The patrons find this unique offering very attractive and find the resort more attractive as a result. In addition to real-time video, the casino also uses the ATM network to improve its operations by monitoring activities on the casino floor. This gives them a better understanding of what's popular and helps them understand and accommodate the needs of their clients.

Figure 3. Inexpensive 25-Mbps ATM



IBM's 25-Mbps ATM support is surprisingly inexpensive. The cost of 25-Mbps ATM adapters and the IBM 8285 Nways ATM Workgroup Switch is less than most other alternatives, like FDDI or Switched Fast Ethernet, especially when you consider the fact that 25-Mbps ATM operates over the category 3 UTP wiring found in many installations, and does not require wiring changes. Network managers can add 25-Mbps ATM with the 8285 for workgroups of between 12 and 48 users, or implement larger networks with the IBM 8260 and 25-Mbps ATM modules. They can also manage their Ethernet, token-ring, and ATM networks with integrated graphical Nways Managers for more effective operations and lower costs.

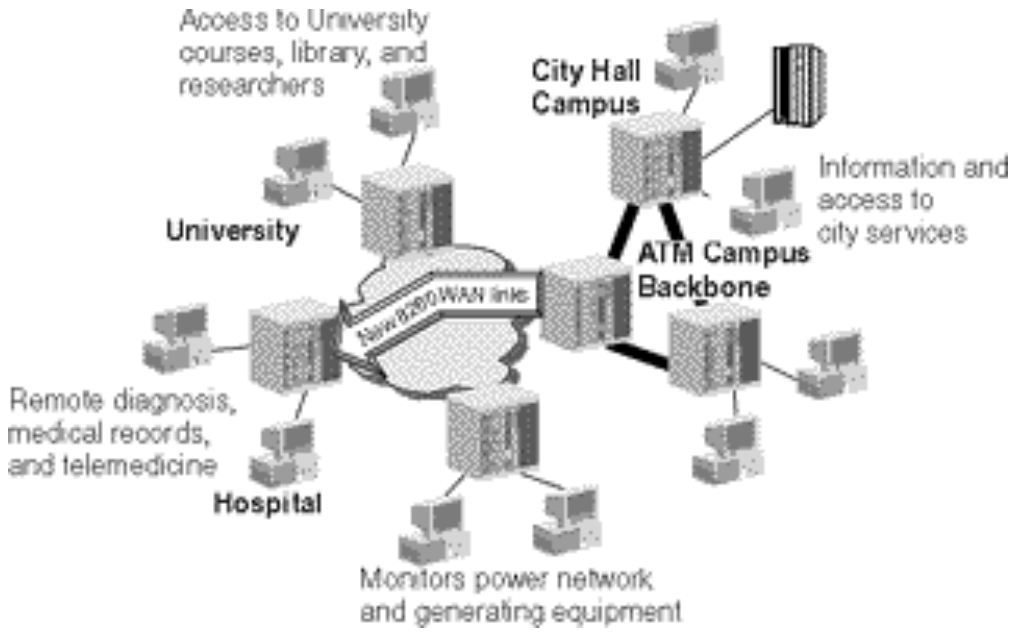
ATM to Help a City Improve Services for Its Citizens

ATM also can be used for backbone networks, bringing the advantages of ATM to existing Ethernet or token-ring workgroups without any changes to workstation adapters and applications, hubs, routers, or wiring.

Large cities, like large businesses, are challenged today to improve services to their constituency. Although cities have a wealth of information and resources, they might not be able to use the

information effectively or provide access to it because it is too dispersed. Working with IBM, a large European city was able to link its administrative offices together with a city-run hospital, university, and municipal power plant so that the city could improve its own operations and provide better services to its citizens.

Figure 4. IBM ATM helps a city



Using IBM's ATM campus and wide area products, the city is now ready to handle its information today and for the foreseeable future. Citizens can access information about themselves and participate in programs of which they previously had little knowledge. The university can access international research networks and offer video instruction within the city and to outlying areas. Doctors at the hospital can access patient records and consult electronically with specialists. The municipal power plant can monitor its power network more thoroughly, anticipate problems better, and recover more rapidly from failures.

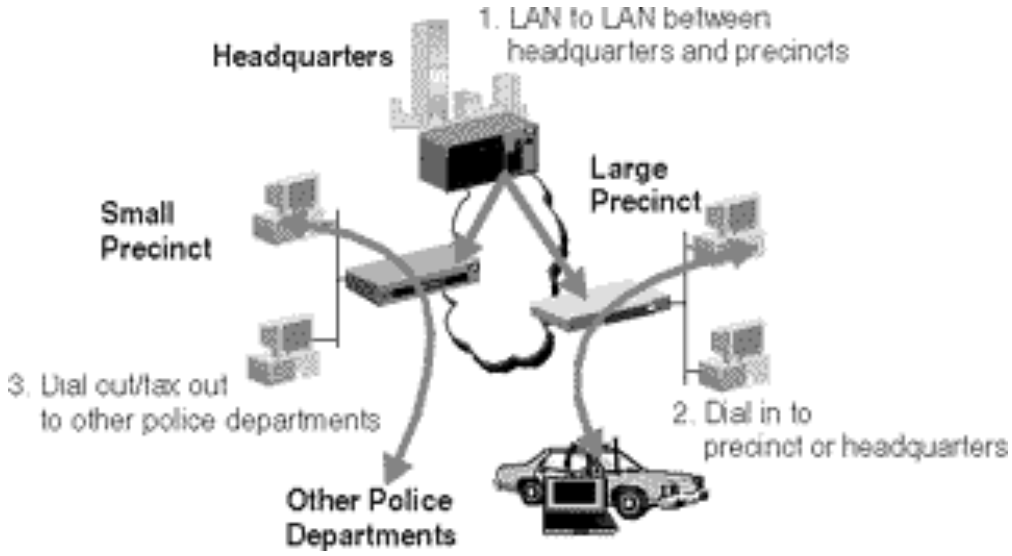
IBM provides ATM adapters for client workstations, high-powered workstations, and servers. Its new support for the S/390 effectively ties mainframes into ATM networks as super-servers. IBM also provides campus ATM switches, ranging from switches for small workgroups to switches implemented in IBM's 8260 super-hub for large workgroups or buildings. IBM also provides ATM for backbone networks—campus backbones to tie Ethernet, token-ring, or ATM workgroups together, or wide area backbones that span cities, countries, or the world. In addition, IBM also ties all these components together with an integrated family of Nways Managers for an up-to-the-second view of the network and speedy responses to problems.

Remote Access to Help a Metropolitan Police Department Save Money while Improving Information Delivery to Its Officers

Don't limit your perception of remote LAN access to telecommuters and travelers. A metropolitan police department is using the IBM 8235 Dial In Access to LANs servers not only to provide remote LAN access for its officers, but also to link substations to headquarters, and to link their police force to others.

Remote LAN access can improve the effectiveness of any telecommuter or traveler. It also can keep mobile workers up-to-date, with critical information they need to perform their jobs—information that for police and rescue workers might even save lives. With IBM remote LAN access, the police department distributes situation reports, criminal and stolen property bulletins, and other information out to its substations and officers, keeping them up-to-date and better able to protect people and property in their precincts.

Figure 5. IBM Remote Access saves money



IBM remote LAN access also provides LAN-to-LAN routing for IP and IPX. The police department uses this feature to eliminate the need for separate routers, saving more than $80,000 a year. In addition, the dial-out and fax-out capabilities allow the police department to communicate with other police forces in the area and throughout the nation, further saving money and improving service.

With IBM remote LAN access, the police department was able to redesign their network, consolidating it and saving both money and people. With money and people saved, the police department is now able to have more officers patrolling the city—a benefit both they and the citizens appreciate.

IBM—Eager to Help Find A Solution for Your Challenges

While these five situations provide a good overview of IBM's capabilities to help its customers, they by no means tell the entire story. IBM's wide range of LAN and ATM solutions for campus networks with integrated management to keep it running smoothly makes it likely that IBM has a solution to most customer challenges—including yours.

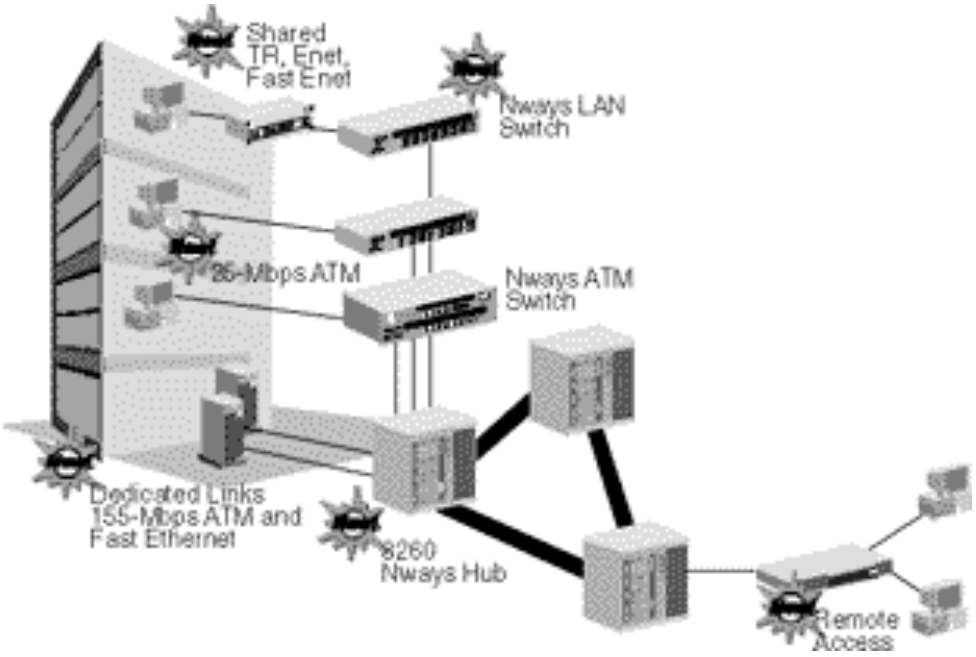
Additional Technical Details

Nways LAN Switches

IBM announced two new models of its ATM-capable LAN switches for Ethernet and token ring. These new models each offer 16 ports and 2 expansion slots for twice the capacity of the earlier

models.

Figure 6. Newly announced support



Each of the 16 ports on the new switches can forward Ethernet or token-ring frames among up to 16 shared or dedicated segments connected to the switch using 10BASE-T or UTP/STP twisted-pair media via RJ-45 connectors. The switches can maintain media-speed frame transfer between each of the possible eight pairs of ports simultaneously. The 8271 Model 216 Ethernet LAN Switch provides aggregate bandwidths of up to 160 Mbps when all of the fixed ports are configured for full-duplex operation and up to 240 Mbps when the switch is configured with 24 ports using two, 4-port 10BASE-T UFCs. The 8272 Model 216 Token-Ring LAN Switch provides aggregate bandwidths of up to 256 Mbps when all of the fixed ports are configured for full-duplex operation and up to 384 Mbps when the Model 216 is configured with 24 ports using two, 4-port Token-Ring UTP/STP UFCs.

The two new 16-port switches are functionally similar to the 8-port models. Both LAN switches support:

- Half- or full-duplex operation on each port
- Cut-through, store and forward, or adaptive cut-through switching
- Up to four Etherpipe or Token-Pipe links between switches, with up to four ports per link
- Up to 1700 LAN station addresses per port and up to 10000 LAN station addresses per switch
- Two or four virtual switches consisting of non-overlapping sets of two or four ports
- EtherProbe or TokenProbe network monitor ports

- In-band and out-of-band management support via a serial port, Telnet, or an SNMP manager like the Nways Managers
- Table top or rack mounting, using a standard 19-inch rack

The 8272 Nways Token-Ring LAN Switch Models 108 and 216 also support:

- Auto-sense and auto-configure capabilities that reduce the time and skills required to configure the switch
- Source Route Switching for high performance switching in token-ring networks using source routing

Customers with existing 8271 Ethernet LAN Switches or 8272 Token-Ring LAN Switches can order microcode upgrades that support new UFCs and other new functions like IEEE 802.3 framing for SNMP or Source Route Switching.

Figure 7. IBM 8272 Nways Switch



IBM also announced a new 100BASE-FX UFC for the 8271 Models 108 and 216 for high-speed, half-duplex uplinks to Fast Ethernet backbones or high-capacity, full-duplex connections to a server or another switch. This UFC provides one port with an ST fiber connector to connect shared segments to a 100-Mbps repeater or a dedicated connection to an adapter. This UFC supports multimode fiber connections that fully comply with IEEE 802.3u specifications for links as long as 2 km (6560 ft). The 100BASE-FX port can be configured similarly to the 10BASE-T ports except that it may not be combined with other ports to form a multilink EtherPipe connection and it cannot be monitored using the EtherProbe port.

8260 Nways Multiprotocol Switching Hub

The 8260 Nways Multiprotocol Switching Hub was enhanced with new LAN Switch Modules, a module that combines the Distributed Management Module (DMM) and hub controller functions, and a new version of the microcode for the ATM Switch/Control Point Module.

The integrated 8271 and 8272 LAN Switch Modules for the 8260 include all of the award-winning functions of the 8272 Nways Token-Ring and 8271 Nways Ethernet LAN Switches, in addition to

the capabilities they inherit from the 8260, such as intelligent, redundant power supplies, comprehensive management, and hot-pluggability. The new 12-port Ethernet and 8-port token-ring 8271 and 8272 LAN switch modules come in two-slot versions with room for two UFCs and three-slot versions with room for four UFCs. The 8272 LAN Switch Modules (token ring) support configurations from 8 UTP/STP ports (no UFCs) to 24 ports (4 UFCs). The 8271 LAN Switch Modules (Ethernet) support configurations from 12 10BASE-T ports (no UFCs) to 28 ports (4 UFCs). Any appropriate UFC can be used. Multiple switch modules can be connected to build larger configurations. IBM recommends using the 415-watt power supply with the new LAN switch modules. Users now have the ability to deploy switched LANs to one or more workgroups with stand-alone 827x LAN switches or to build backbone switches with multiple LAN Switch Modules in a 10-slot or 17-slot 8260 hub.

IBM also announced a new Wide Area Network ATM Module, with room for up to two I/O cards for connections to ATM networks via DS3 (44.736 Mbps), E3 (34 Mbps), STM1/SDH (155 Mbps), and OC3/SONET (155 Mbps). These one-port I/O cards can be used to connect campus ATM backbones to an ATM wide area network, to interconnect campuses, or to connect a campus to small remote sites. These I/O cards support PVC, SVC, and point-to-multipoint connections on UNI and NNI interfaces. The 8260 has the unique capability to support multiple logical links over PVC services giving customers the capability of SVC connections. Early Packet Discard that minimizes unnecessary retransmissions and Peer Groups that allow customers to logically group switches and manage them as a group are some of the functions that minimize WAN traffic and make the 8260 with its Wide Area Network support especially well suited for campus ATM connections to wide area ATM networks.

The new DMM/Controller module combines the functions of the DMM and the controller in a single module. This eliminates the need for a separate DMM module and makes the hub slot previously used by the DMM available for other modules. In addition, the DMM processor on the new integrated module is more powerful than the processor in the stand-alone DMM. Customers with token-ring or Ethernet LANs who need the DMM should consider specifying the combined DMM/Controller when they order their 8260. Customers who use the 8260 exclusively for ATM do not need a DMM.

Version 2.2 of the microcode for the ATM Switch/Control Point Module provides full 8260 monitoring, eliminating the need for a DMM in an ATM-only configuration. Full chassis monitoring is provided via the local console port, remotely via Telnet, or through the Nways Campus Manager ATM for AIX or HP OpenView. In-band management is provided via Classical IP, Ethernet LAN Emulation, or token-ring LAN Emulation. In addition, the new microcode also adds support for the 25-Mbps ATM Concentration Module and an ATM Forum-compliant LAN Emulation Server.

ATM

IBM announced a wide range of new drivers for 25-Mbps, 100-Mbps, and 155-Mbps TURBOWAYS ATM Adapters and an agreement with Interphase Corporation for IBM to sell Interphase ATM Adapters in environments not currently supported by IBM. These announcements further strengthen IBM's already industry-leading range of ATM adapters.

Table 1. New Driver Support for ATM Adapters

25-Mbps ATM Adapters

Operating System	ISA		PCI		MCA	
	CIP	LANE	CIP	LANE	CIP	LANE
Windows NT 3.5	6/96	8/96	6/96	8/96		
NetWare 3.X						
NetWare 4.X						
OS/2	8/96	8/96	8/96	8/96		8/96E
IRIX 3.5						

155-Mbps ATM Adapters

Operating System	PCI		EISA		MCA		GIO	
	CIP	LANE	CIP	LANE	CIP	LANE	CIP	LANE
Windows NT 3.5	8/96	6/96E	8/96	6/96				
NetWare 3.X			8/96T		7/96			
NetWare 4.X			6/96E		7/96			
OS/2						9/96		
IRIX 3.5							8/96	6/96E,8/96T

100-Mbps ATM Adapters

Operating System	MCA	
	CIP	LANE
Windows NT 3.5		
NetWare 3.X		
NetWare 4.X		
OS/2		9/96
IRIX 3.5		

Inexpensive, 25-Mbps ATM is supported by IBM with adapters, its 8285 ATM Workgroup Switch, and its 8260 hub. This technology operates with effective throughputs comparable to the fastest available LAN technologies and yet includes features like Quality of Service, flow control, LAN-WAN integration, scalable speeds, and multimedia support available only with ATM. The price of the adapters ($295) or adapters in conjunction with the 8285 Workgroup Switch ($495 per user) makes 25-Mbps ATM extremely attractive. In this announcement, IBM provides ATM Forum-compliant LAN Emulation and Classical IP support for TURBOWAYS 25 ISA and PCI adapters in Windows NT or OS/2 environments and Forum-compliant LAN Emulation for TURBOWAYS MC adapters in OS/2 environments. This standards-compatible support comes with the adapters at no extra charge and allows existing applications to operate over an ATM network.

High-bandwidth applications or servers can benefit from even faster speeds. IBM announced ATM Forum-compliant LAN Emulation for its currently available TURBOWAYS 155 Micro Channel adapters in an OS/2 environment. Also, IBM will sell 155-Mbps Interphase ATM adapters for PCI, EISA, and Silicon Graphics GIO busses. These adapters support Symmetric Multiprocessing

(SMP), NetWare 3.x, NetWare 4.x, Windows NT 3.5, and IRIX 5.3. The adapters provide ATM Forum-compliant LAN Emulation and Classical IP support. These adapters can be used to connect to any ATM Switch that supports ATM Forum UNI Specifications V3.0 or 3.1, but are particularly well suited for servers connected to the 155-Mbps port of an 8285 Workgroup Switch or 155-Mbps ATM Concentration Modules in an IBM 8260 Nways Hub.

In related announcements, IBM also announced:

- Connections from ATM campus backbones using 8260 hubs through an ATM wide area network using the IBM 2220 Nways BroadBand Switch
- Integrated, direct connectivity from S/390 Parallel Enterprise Servers to an ATM campus network
- New adapters for the IBM 8260 that connect an 8260 to wide area ATM networks using T3/E3, STM-1/SDH, and OC3/SONET connections

Figure 8. IBM 8223 100BASE-TX Workgroup Hub



Fast Ethernet

IBM has Fast Ethernet adapters and LAN switch UFCs. IBM previously announced a low-cost 8223 Fast Ethernet Workgroup Hub with eight, 100BASE-TX ports. The 8223 is compatible with all IBM 100BASE-TX products and all non-IBM, 100BASE-TX products that comply with IEEE 802.3u. The 8223 is designed for small, simple, unmanaged Fast Ethernet LANs with up to eight connected devices. Because it meets the more stringent CLASS II Repeater provisions of the IEEE 802.3u standard, it can be linked to another 8223 to form a larger workgroup. To simplify installation and operation, the 8223 is a ”plug and go” hub, with no configuration required, and includes easy-to-use, error-avoiding features like:

- LEDs that show network utilization and collision status
- MDI and MDI-X ports for cascading using cables with or without crossover
- Automatic jabber protection and port partitioning and restoration

The RJ-45 ports on the 8223 support STP or UTP category 5 cables at distances up to 205 m (672 ft) total end-to-end distance or 5 m (16 ft) between hubs.

Figure 9. IBM 8225 100BASE-TX Workgroup Hub



IBM also announced a Fast Ethernet stackable hub, the 8225. IBM 8225 stack units each have twelve, 100BASE-TX ports. There can be up to six 8225 units in a stack. Stack units can be connected to other units or isolated from other stack units yet still managed as part of the stack. With multi-segment configuration options, management and fault tolerant features, and expansion modules, the IBM 8225 provides unusual flexibility for network managers who wants to add Fast Ethernet to all or part of their Ethernet networks.

There are three 8225 models. The 8225 Model 001 is an unmanaged unit. The 8225 Model 002 has an SNMP agent, and can manage other 8225 Model 001 units in the stack. More than one 8225 Model 002 can be used to provide management redundancy. The 8225 Model 003 is similar to the 8225 Model 002, but adds RMON support for all nine Ethernet RMON groups.

The 8225 Stackable Ethernet Hub is designed for workgroups with up to 72 connected devices on up to 3 independent segments. It has extensive, fault-tolerant support including a redundant power supply, redundant ports (up to 18) and hot-pluggable stack expansion. Unlike the 8223, it has extensive SNMP and RMON management. Like the IBM 8223, it has error-avoiding features like:

- Status LEDs
- MDI and MDI-X ports
- Port partitioning
- Jabber protection

Expansion cards, called Fast Expansion Modules, are available for all models of the 8225. There are three different cards:

- A 10BASE-T/100BASE-TX card that connects to existing 10BASE-T networks or provides an additional 100BASE-TX connection. This card automatically determines whether the connection is 10BASE-T or 100BASE-TX.
- A 100BASE-T4 card for connections to 100BASE-T4 networks.
- A 100BASE-FX card for connections to 100BASE-FX networks.

Each of these expansion cards presents a switched interface to the network and thus creates a new collision domain. This feature greatly expands the number of topology options. Customers can expand the radius of their Fast Ethernet network to 100 m (328 ft) using 100BASE-TX Fast Expansion Modules or to 2 km (6562 ft) using 100BASE-FX Fast Expansion Modules in full duplex mode.

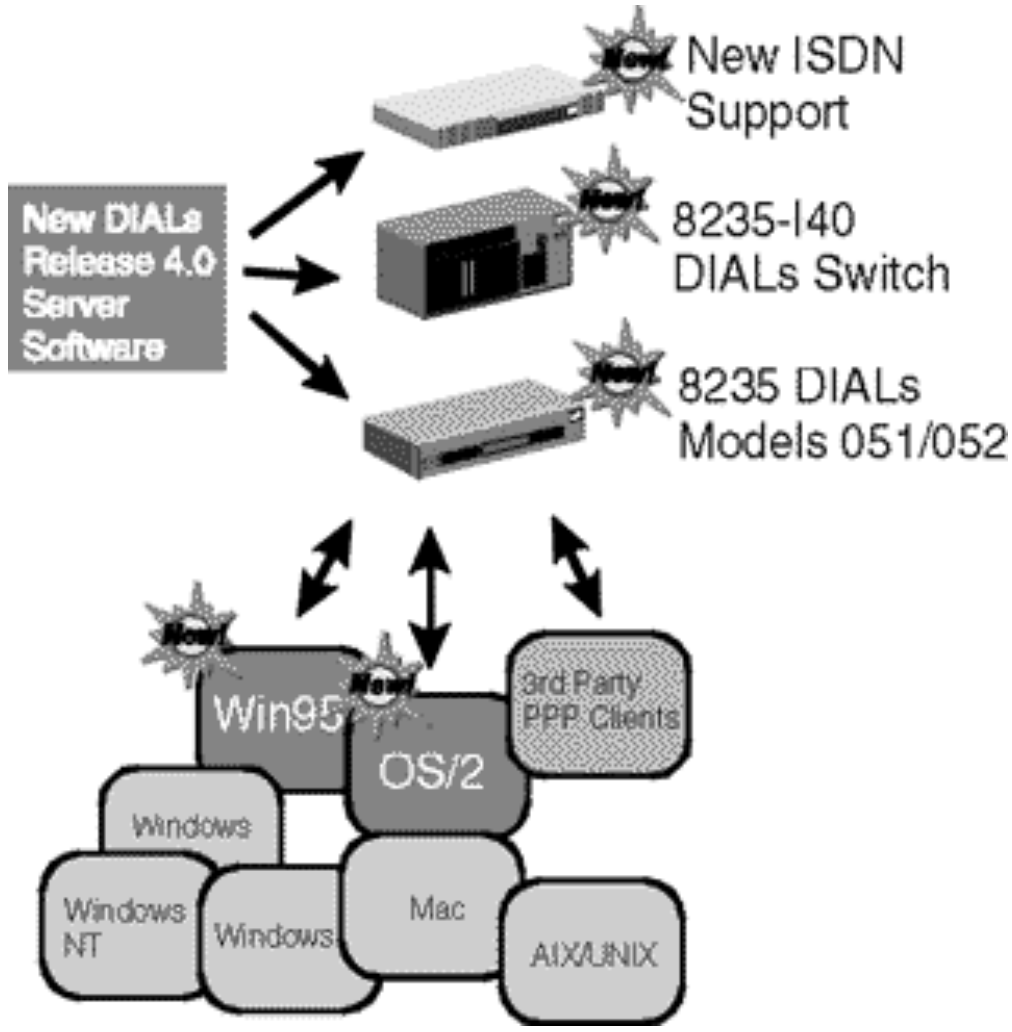
LAN Adapters

IBM announced a new token-ring adapter and reduced its adapter prices since the last Campus Networking Announcement Fact Sheet. IBM announced an Auto Wake Token-Ring ISA Adapter in February, 1996. This new adapter is compatible with IBM's other shared-RAM token-ring adapters and supports remote power-on in systems like the IBM PC 700 that support Wake-on-LAN signalling. The adapter package includes a Wake-on-LAN cable, through which it signals the host PC when the adapter senses an industry-standard LAN wake-up frame. Customers can use this adapter to remotely upload and download data to and from the system during off-peak hours, without operator intervention, facilitating money-saving and automated, remote, unattended maintenance. Similar to IBM's other token-ring adapters, this new adapter:

- Provides automatic ring-speed detection, which prevents wrong speed insertion and supports automatic ring-speed selection
- Automatically supports either UTP or STP media with no user specification required
- Has externally visible adapter and ring status LEDs
- Includes Remote Program Load at no additional cost
- Includes device drivers for a wide range of operating and network operating systems such as DOS, Windows, OS/2, and NetWare
- Is full-duplex capable
- Comes with a lifetime warranty

In addition, IBM announced price reductions ranging from 10% to 30% on its Ethernet and token-ring adapters in March, 1996. These price reductions complement high reliability, high performance, continuously available service and support, and price reductions and continual updates to keep IBM driver support the most extensive in the industry. Together, they justify the customer confidence that has made IBM a LAN adapter market leader. Price, performance, features, reliability, service, and support continue to make IBM LAN adapters excellent choices for either Ethernet or token-ring.

Figure 10. Wide range of remote LAN access

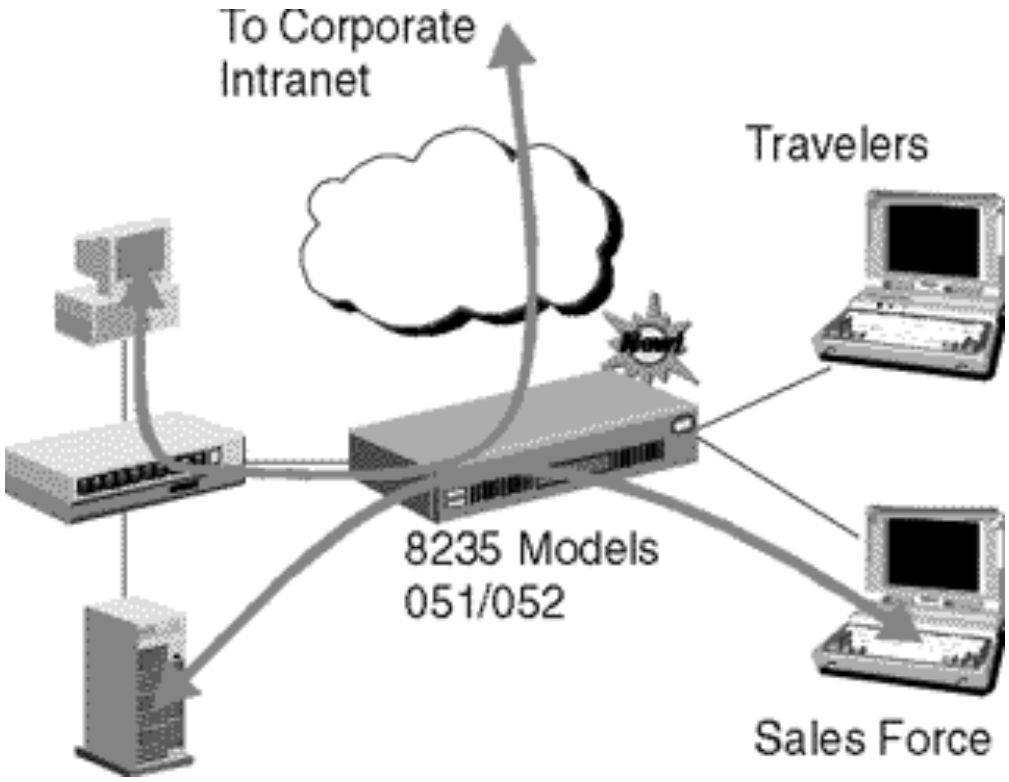


Remote LAN Access

More than 80% of organizations with LANs now use remote access to improve productivity and speed project completion. With the IBM 8235 Dial In Access to LANs (DIALs) remote access servers and switches, customers can use standard dial-up telephone lines or digital networks to remotely access LAN resources. In this announcement, IBM broadened its remote access server line to cover small and very large access sites and directly attacked the two largest components of recurring remote access costs.

IBM enhanced its existing 8235 Ethernet or token-ring remote LAN access server in this announcement, and added three new models for small and very large access sites. IBM now offers 8235 DIALs servers or switches that can support 2 connections, 8 connections, and more than 71 connections simultaneously. The new, small, IBM 8235 Models 051 and 052 have two ports for modems or ISDN attachments. The new, large, IBM 8235 Model I40 DIALs Switch supports both individual modems and aggregated connections like channelized T1/E1 and primary rate ISDN to accommodate the largest number of users with the smallest number of network connections.

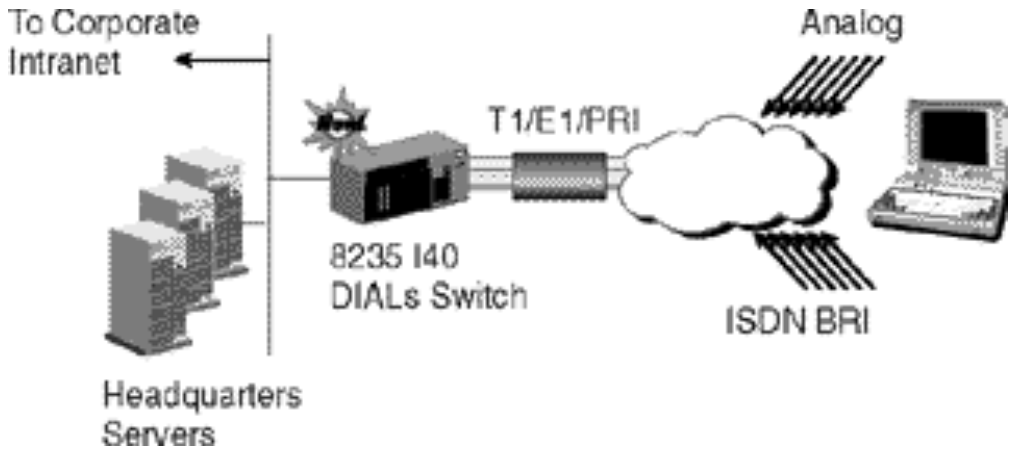
Figure 11. New IBM 8235 Model 051 and 052



The new 8235 Models 051 and 052 are for small offices that need no more than two simultaneous connections. Models 051 and 052 are based on the existing 8235 models and have the same functions, with the exception that they have two ports instead of eight. The new 8235 Model I40 DIALs Switch is for central sites with hundreds of dial-in users. This integrated solution for large offices integrates ISDN and analog remote access, communications server, and remote routing functions in a single box, reducing complexity and cost of providing remote access to large numbers of users.

The two largest component or recurring remote access costs are line charges and user support. Together, these account for over 84% of recurring costs, according to the Real Cost of Remote Access, a recent study by Infonetics Inc. IBM directly attacked these costs with virtual connections and automated installation. Virtual connections that allow users to be charged only for productive communications can save as much as 80% of the line charges compared with systems that require the line to stay connected for the entire session. Automated installation aids lower support costs by automatically detecting the client configuration, and by allowing network managers to build a sample configuration and rapidly replicate that configuration to large numbers of similar clients.

Figure 12. New IBM 8235 Model I40 Switch



All 8235 models support dial-in connections, dial-out and fax-out connections, and LAN-to-LAN routing for IP and IPX protocols. All models:

- Support analog and digital connections including ISDN
- Support IP, IPX, NetBIOS, and LLC protocols
- Come with advanced function client software for OS/2, DOS, and Windows at no additional charge
- Have money saving communications and management functions designed to lower the two largest remote access costs: line charges and user support
- Offer a rich set of security options

In March 1996, IBM announced integrated basic rate ISDN support, a new dial-out client for OS/2 and Warp users, IP support for Windows dial-out clients, enhanced security, and DIALs client enhancements including IBM WaveRunner ISDN adapter support, intelligent setup and express installation, and support for non-standard port drivers. The ISDN support includes pluggable adapters for 8235 models with integrated modems and DIALs Server Release 4.0 software with enhancements like static channel aggregation and virtual connection support for high throughput and the lowest-possible line costs.

Network Management

Network management reduces the cost of operating and administering campus networks and increases their effectiveness. IBM offers integrated Nways Managers for campus networks to save money compared with other, less integrated managers. Nways Managers reduce training requirements and alleviate personnel shortages with easy to use managers that increase operator productivity. Nways Managers also reduce the time to identify, find, and fix performance and operational problems by offering a suite of integrated management applications that run on industry-leading platforms like NetView for Windows, NetView for AIX, and OpenView.

IBM announced enhancements to existing Nways Managers and a new version of the Nways Campus Manager LAN for AIX. The enhancements further improve Nways Manager integration by adding additional hardware support, drag and drop interfaces for Virtual LAN management, critical resource monitoring, and virtual switch definition. The new Nways Campus Manager LAN for AIX

also integrates the previously separate LAN Network Manager (LNM) for AIX and adds major topology enhancements including automatic discovery using the IP map and improved statistics.

Summary

Together, these announcements demonstrate IBM's commitment to meet the continuing challenges of campus networks, with:

- New switches, hubs, and hub models that increase network capacity and add flexibility
- New ATM adapters that support a broader range of systems and bus types with ATM Forum-compliant support
- New, wide area ATM support including 8260 modules and new internetworking with the IBM 2220 and S/390
- New remote access support for faster and less expensive connections with a new, wider range of DIALs servers
- A new token-ring adapter that enables money saving, remote, unattended maintenance
- Continual enhancements to IBM's leading-edge line of integrated Campus Managers

These products continue the delivery of functions within the Switched Virtual Networking framework. Now more than ever before, it's a good time for network managers to look at IBM Campus Networking products, as the customers shown earlier did.

Benefit	**Features**
Twice the capacity of current LAN switches	New Nways LAN switches add configuration flexibility and provide single-box solutions for more configurations by doubling the capacity of previously available IBM LAN switches.
Increased availability in a simpler, higher capacity	New LAN switch modules for the 8260 not only increase LAN switching solution configuration flexibility, they bring outstanding multiprotocol, fault-tolerant, and remote management features to IBM LAN switches.
Interoperable ATM networks for almost any desktop, workgroup, backbone, or wide area configuration	New support for ATM Forum-compliant LAN Emulation, new capabilities to connect 8260 and 8285 campus backbones over a 2220 Nways BroadBand Switch network, and new, high-speed, direct ATM attachment to IBM S/390 processors allow network managers to build almost any configuration they need for interoperable desktop, workgroup, backbone, or wide area ATM networks.
Easy, inexpensive increased capacity for Ethernet LANs	Fast Ethernet support allows network managers to incrementally add capacity to Ethernet networks. IBM's adapters, hubs, and switches allow mangers to build workgroups, provide high-speed links to servers, or build Fast Ethernet backbones for switched Ethernet workgroups.
Less expensive administration during off-shift periods	Wake-Up-on-LAN support for token ring can be used to significantly reduce the largest part of the life-cycle cost of a LAN, its operating and support costs, by allowing remote, unattended maintenance and data transfer.

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Benefit	Features
More flexible remote LAN access with lower operating costs	Over 80% of organizations with LANs have remote access somewhere in their organization, and they depend on it for improved customer support, speedier project completion, and improved employee flexibility and morale. With its newly broadened 8235 product line, IBM offers managers the most flexibility and supports the widest range of communication protocols, operating systems, and dial-in clients.
Lower network operating costs	Media management, critical resource monitoring, drag-and-drop virtual LAN configuration, and other functions in integrated Nways Managers with uniform graphical interfaces make it easier and less expensive for network managers to configure and operate their networks. These functions, coupled with applications like trouble ticketing and proactive RMON network analysis make network operators more productive and more effective compared with other, less integrated packages.

Positioning	Features
LAN Switches	The 8271 and 8272 are workgroup switches, providing immediate increases in effective capacity for LAN segments or for dedicated connections to servers or power users. UFCs can be used to expand the number of ports or accommodate fiber media, Fast Ethernet, FDDI, or ATM. There are two models of each with capacities of 8 and 16 ports not using UFCs for expansion and 12 ports and 24 ports using UFCs. These switches can be used by themselves or connected to a backbone. Used by themselves, they can form a collapsed backbone for up to 24 segments. They can connect to a backbone by connecting switches together (with EtherPipe or TokenPipe connections) or by connecting the switches to Fast Ethernet, FDDI, or ATM using UFCs. Switch modules for the 8260 provide both workgroup and backbone switching capabilities with fault-tolerant features enjoyed by all 8260 modules. Total capacity of an 8260 filled with switch modules is 160 Ethernet ports or 128 token-ring ports for Model 017 and 100 Ethernet ports or 80 token-ring ports on Model 010. The Fast Ethernet UFCs on the Ethernet switch module also allow the 8260 to connect to UTP/STP or fiber Fast Ethernet backbones.
ATM	ATM has inherent advantages over other LAN technologies due to its support for Quality of Service, scalable range of speeds, LAN-WAN integration, and support for multimedia applications. Although ATM is often evaluated for campus backbones, IBM's support for 25-Mbps ATM at the lowest price in the industry, coupled with ATM's advantages, make it a worthwhile desktop alternative to Fast Ethernet and FDDI. Network managers who are going to replace adapters and infrastructure products like hubs to support another LAN technology may be pleasantly surprised by the comparable or lower cost of 25-Mbps ATM.

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Positioning	Features
Fast Ethernet Hubs	Fast Ethernet is best suited either for small workgroups requiring high-speed transfer of large files or for backbones connecting a small number of switched 10BASE-T Ethernet segments. Fast Ethernet is an extension of 10-Mbps Ethernet. Many organizations view Fast Ethernet as a natural extension of their existing Ethernet networks—though ATM may be more effective and cost less in both the short term and long term. Wiring, the need for upgraded hub and router connections, the need to replace PC Adapters and the capability of the desktop PCs to sustain Fast Ethernet communications should be carefully considered. In most organizations, the number of users requiring Fast Ethernet is small. The 8223 Fast Ethernet Hub can be used to build workgroups for these users (up to 16 users). The 8225 Fast Ethernet hub can be used for larger workgroups or, by connecting 8271 switches to the 8225, to build backbones for switched 10BASE-T segments.
Token-Ring Adapters	Network managers with ISA machines who have Wake-Up-on-LAN-capable PCs, like the IBM PC-700, and who plan to do remote, unattended maintenance should choose the AutoWake ISA adapter. Otherwise, they should choose the existing IBM Auto 16/4 ISA adapter.
Remote LAN Access	In this announcement, IBM dramatically broadened its remote access product line to support both smaller and larger remote access sites. Customers who don't need more than two dial-in, dial-out, or LAN-to-LAN ports can save money compared with the current 8235 models by choosing either the 8235 Model 051 for token ring or the 8235 Model 052 for Ethernet. Customers with central sites can also save money by using the new high-capacity 8235 Model I40 DIALs Switch. In all cases, customers will have the same rich connectivity and client support offered uniformly across the entire line of 8235 remote access servers.
Nways Managers	This announcement enhances the suport for most of the products managed by the Nways Campus Manager, and should be evaluated by all current users. In addition, new token-ring media management, support for graphical configuration of virtual LANs, and support for critical resource management further increase the likelihood that network managers can use the Nways Campus Managers to increase the efficiency of their operations and save money.

Table 2. Part Numbers, Prices, Availability

Item	Machine Type	Model	Price	Availability
Nways LAN Switches				
16-port 8272 Nways Token Ring LAN Switch	55H7160	216	$9995	Available

Continued on next page

Item	Machine Type	Model	Price	Availability
4-port Token-Ring UTP/STP UFC	13H9196	9196	$1600	Available
2-port Token-Ring Fiber UFC	41H6985	6985	$1600	Available
8272 Microcode Upgrade	41H7026		NC	Available
16-port 8271 Nways Ethernet LAN Switch	55H7131	216	$7200	7/96
4-port 10BASE-T UFC	13H9195	9195	$1000	Available
3-port 10BASE-FL UFC	41H7020	7020	$1700	Available
1-port 100BASE-TX UFC	41H6995	6995	$1300	Available
1-port 100BASE-FX UFC	41H7000	7000	$1695	Available
8271 Microcode Upgrade	72H3425		NC	6/96
8260 Nways Intelligent Switching Hub				
2-slot 8272 LAN Switch Module	51H4589	6208	$8650	10/96
3- slot 8272 LAN Switch Module	51H4591	6308	$9650	10/96
4-port Token-Ring UTP/STP UFC	13H9196	9196	$1600	Available
2-port Token-Ring Fiber UFC	41H6985	6985	$1600	Available
2-slot 8271 LAN Switch Module	51H4593	6212	$7950	10/96
3- slot 8271 LAN Switch Module	51H4595	6312	$8950	10/96
4-port 10BASE-T UFC	13H9195	9195	$1000	Available
3-port 10BASE-FL UFC	41H7020	8603	$1700	Available
1-port 100BASE-TX UFC	41H6995	6995	$1300	Available
1-port 100BASE-FX UFC	41H7000	7000	$1695	Available
Advanced DMM/Controller Module	80G3375	1700	$6495	6/96
ATM Control Point Code V2.2 (AUS)			NC	6/96
WAN/ATM Module	51H4328	5302	$4495	7/96
1-port E3 I/O Card for WAN/ATM Module*	51H4335	8501	$3995	7/96*
1-port DS3 I/O Card for WAN/ATM Module	51H4338	8502	$3995	7/96
1-port STM1 I/O Card for WAN/ATM Module (SMF)*	51H4557	8505	$10995	9/96*
1-port STM1 I/O Card for WAN/ATM Module (MMF)*	51H4674	8506	$6080	9/96*
1-port OC3 I/O Card for WAN/ATM Module (SMF)	51H4558	8503	$10995	9/96
1-port OC3 I/O Card for WAN/ATM Module (MMF)	51H4673	8504	$6080	9/96

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Item	Machine Type	Model	Price	Availability
ATM Adapters				
TURBOWAYS 25 MC Adapter (Single)	25H3546	4746	$595	6/96-8/96**
TURBOWAYS 25 MC Adapter (5-pack)	25H3547	4748	$2885	6/96-8/96**
TURBOWAYS 25 ISA Adapter (Single)	42H0525	0287	$295	6/96-8/96**
TURBOWAYS 25 ISA Adapter (5-pack)	42H0526	0288	$1430	6/96-8/96**
TURBOWAYS 25 PCI Adapter (Single)	25H3562	2844	$295	6/96-8/96**
TURBOWAYS 25 PCI Adapter (5-pack)	25H3563	2845	$1430	6/96-8/96**
TURBOWAYS 25 PCI Adapter (30-pack)	42H0554	1797	$8580	6/96-8/96**
TURBOWAYS 100 MC MMF Adapter (Single)	04H7521	4757	$1995	9/96 **
TURBOWAYS 100 MC MMF Adapter (5-pack)	04H7522	4758	$8975	9/96 **
TURBOWAYS 155 MC MMF Adapter (Single)	38H6388	4754	$1995	9/96 **
TURBOWAYS 155 MC UTP Adapter (Single)	55H9366	1775	$1995	9/96 **
Interphase 155 PCI UTP5	85H4041	2383	$650	6/96-8/96**
Interphase 155 PCI MMF	85H4042	2384	$850	6/96-8/96**
Interphase 155 EISA UTP5	85H4045	2387	$895	6/96-8/96**
Interphase 155 EISA MMF	85H4046	2388	$1095	6/96-8/96**
Interphase 155 GIO UTP5	85H4043	2385	$995	6/96-8/96**
Interphase 155 GIO MMF	85H4044	2386	$1050	6/96-8/96**
Fast Ethernet Hubs				
8223 Fast Ethernet Work-group Hub	42H4545	008	$1595	Available
8225 Fast Ethernet Stackable Hub Manageable Unit	42H3727	001	$2895	9/96
8225 Fast Ethernet Stackable Hub Basic Managed Unit	42H3739	002	$3995	9/96
8225 Fast Ethernet Stackable Hub Advanced Managed Unit	42H4522	003	$4495	9/96
8225 Base Management Upgrade Card (Upgrade to Model 002)	42H4530	4530	$1150	9/96
8225 Advanced Management Upgrade Card (Upgrade to Model 003)	42H4534	4534	$1650	9/96

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Item	Machine Type	Model	Price	Availability
8225 2-port TX Extender Module	42H3744	3744	$725	9/96
8225 2-port FX Extender Module	42H3748	3748	$1000	9/96
8225 2-port T4 Extender Module	42H4527	4527	$700	9/96
8225 Pluggable Redundant Power Module	42H3751	3751	$255	9/96
8225 Hub Interconnect Cable	42H3754	3754	$95	9/96
Token Ring Adapters				
IBM Auto Wake Token-Ring ISA Adapter (Single)	55H6760		$305	Available
IBM Auto Wake Token-Ring ISA Adapter (Card Pack)	55H6815		$300	Available
IBM Auto Wake Token-Ring ISA Adapter (Bulk Pack)	55H6807		$10800	Available
Remote LAN Access				
8-port 8235 DIALs Server w/Rel 4 (token ring)	42H4560	021	$5890	Available
8-port 8235 DIALs Server w/Rel 4 (Ethernet)	42H4570	022	$4760	Available
8-port 8235 DIALs Server w/Rel 4 (token ring with Integrated modems)	42H4590	031	$5739	Available
8-port 8235 DIALs Server w/Rel 4 (Ethernet with integrated modems)	42H4600	032	$4599	Available
2-port 8235 DIALs Server w/Rel 4 (token ring)	55H8540	051	$2399	6/96
2-port 8235 DIALs Server w/Rel 4 (Ethernet)	55H8570	052	$1899	6/96
8235 DIALs Switch w/Rel 4 (Ethernet)	85H4532	I40	$20700	8/96
8235 ISDN Basic Rate S/T Adapter	42H4580	4580	$850	Available
8235 DIALs Switch Single T1/P1 Adapter with CSU/DSU	85H4525	4525	$6000	8/96
8235 DIALs Switch Single T1/P1 Adapter without CSU/DSU	85H4027	4027	$5520	8/96
8235 DIALs Switch Dual T1/P1 Adapter with CSU/DSU	85H4034	4034	$9650	8/96

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Item	Machine Type	Model	Price	Availability
8235 DIALs Switch Dual T1/P1 Adapter without CSU/DSU	85H4029	4029	$8740	8/96
8235 DIALs Switch Analog Adapter(12 modems)	85H4031	4031	$9775	8/96
Nways Managers				
Nways Campus Manager LAN for AIX V2.1 (8 mm)	84H0032		$10999	5/96
Nways Campus Manager LAN for AIX V2.1 (1/4 inch)	84H0033		$10999	5/96
Nways Campus Manager Suite for AIX V2.1(8 mm)	84H0030		$17999	5/96
Nways Campus Manager Suite for AIX V2.1 (1/4 inch)	84H0031		$17999	5/96

* Actual dates dependent upon homologation
** Dates are for new drivers announced on 28 May, 1996. TURBOWAYS 25 ISA, PCI, and MC adapters with other drivers are available now.

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This fact sheet is an overview of IBM Campus Networking products announced on 28 May 1996.

The part numbers and availability dates shown here are valid in the U.S. They will vary from country to country. Some products may not be announced in your country. Refer to product announcements for your country or contact your local IBM representative or IBM Business Partner.