LAN Switch
Sales Guide

Third Edition, Spring 1997

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Comments
Comments about this guide should be directed to TJ Aspden. His internal address is RALVM29(TJASPDEN) and his Internet address is **TJASPDEN@vnet.ibm.com**.

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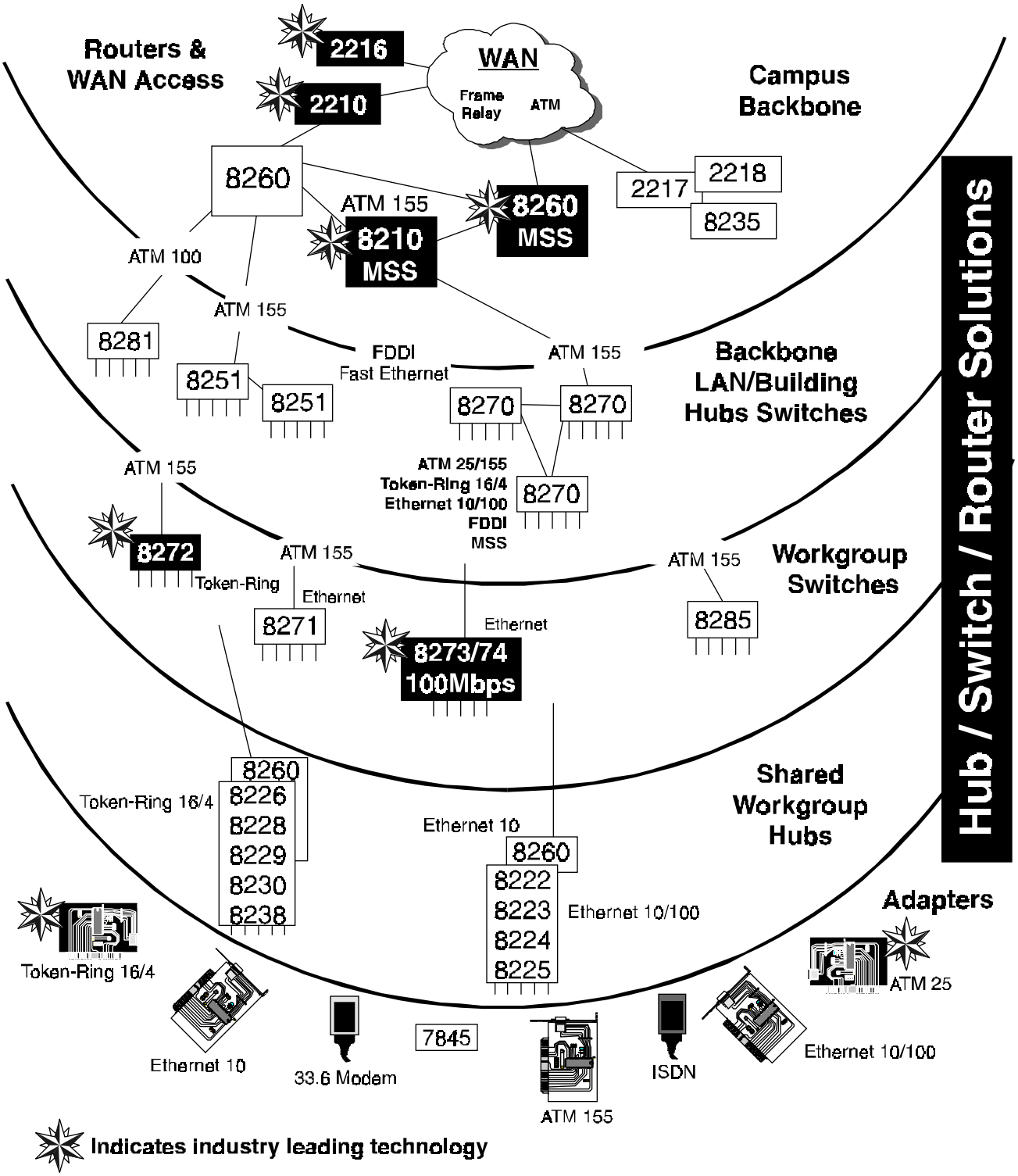
IBM Networking Portfolio Highlights



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Background

LAN Switches

Network congestion is rapidly becoming a serious problem for many customers today. One solution that customers have attempted is LAN segmentation (the separation of a group of LAN users into separate but interconnected LAN segments). Segmentation can improve LAN performance by reducing contention and LAN switches offer a high-performance, low-cost alternative method for interconnecting LAN segments. A switch can provide dedicated bandwidth for high traffic workstations or servers.

Technology Positioning

A switched LAN has several advantages over alternative solutions such as high-speed shared-LAN technologies (FDDI or 100-Mbps Ethernet). Switched LANs offer:

- **Easy Migration.** The customer retains the LAN technology which the I/S staff already knows and can support.
- **Less Investment.** No changes are required for cabling, adapters, software or training.
- **Full Duplex.** With the introduction of full-duplex switches, additional bandwidth is possible.
- **Evolutionary Step.** Switches enable a customer to move toward virtual LANs and the deployment of an ATM backbone.

Switch Market

As networks become larger and applications become more complex, bandwidth requirements are dramatically increasing. Customers are looking at switched LANs as an effective solution for the immediate future. The switch market is growing rapidly as customers search for a solution to increasing demands on network bandwidth. One way to segment the switch market is to divide it into workgroup and backbone switches.

- **LAN or workgroup switches** are the fastest growing segment of the switch market. They are optimized for 8 - 24 or more connections and add capacity and function to congested workgroup LANs. They connect either to individual workstations or to LAN segments and may have high-speed uplinks to backbone networks or servers. They typically use a cut-through switching mode for low latency, have embedded RMON agents, and are designed around high speed ASICs. However, LAN or workgroup switches typically have minimal fault tolerance (e.g. redundant power, resilient links.) Over time, more VLAN functionality as well as bridging and routing capabilities will be added.

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- **Larger switches** provide a high-speed switching fabric for the backbone of the enterprise network. These switches are likely to use store-and-forward technology and use more advanced networking to handle a larger number of connections and higher traffic volumes. These switches are likely to integrate ATM technology, more extensive filtering capabilities, and a higher level of redundancy.

IBM LAN Switches

IBM offers the following LAN or workgroup switches:

- IBM 8270 Nways™ LAN Switch Model 800
- IBM 8271 Nways Ethernet LAN Switch Module
- IBM 8271 Nways LAN Switch Module
- IBM 8271 Nways ATM/LAN Switch Module
- IBM 8272 Nways Token-Ring LAN Switch Module
- IBM 8272 Nways LAN Switch Module
- IBM 8272 Nways ATM/LAN Switch Module
- IBM 8273 Nways Ethernet RouteSwitch Module
- IBM 8276 Nways RoutePort (port switching concentrator)

These switches are the members of a new family of stand-alone LAN switches that are designed to increase the performance of a departmental LAN and distributed workgroups in a cost-effective manner.

IBM Backbone Switches

IBM offers the following backbone switches:

- IBM 8274 Nways LAN RouteSwitch
- IBM 8250 Multiprotocol Intelligent Hub
- IBM 8260 Nways Multiprotocol Switching Hub

For more information about the 8250 and 8260 switching hubs, please consult the *IBM LAN Hub Sales Guide.*

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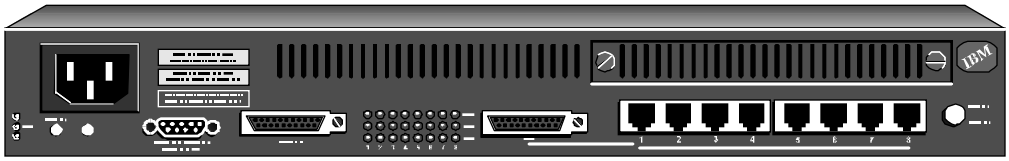
IBM 8271

Product Description The IBM 8271 Nways Ethernet LAN Switches are stackable, high-speed LAN switches that provide the ability to interconnect up to 24 shared or dedicated Ethernet LAN segments with Ethernet 10BASE-T media connections. A single Attachment Unit Interface (AUI) port is also provided for use in lieu of one of the 10BASE-T connections and can be used to connect the IBM 8271 to an Ethernet 10BASE2, 10BASE5 or fiber segment with an external transceiver. The Nways Ethernet LAN Switch can expand the total bandwidth of an Ethernet network up to 400%-800%.

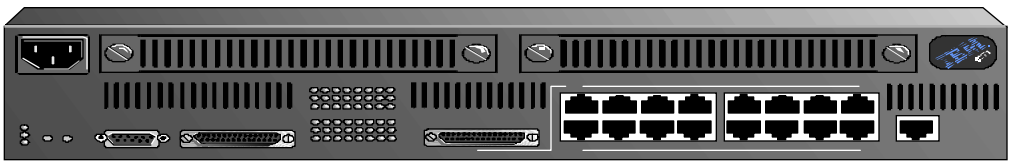
There are two models of the Nways Ethernet LAN Switch:

- **Model 108** features eight 10BASE-T ports and one AUI port. Full-duplex Ethernet is supported on a per-port basis plus additional capabilities that enhance configuration flexibility and ease of management. The most significant function is its Universal Feature Slot, which supports several different, optional Universal Feature Cards. These cards provide additional connections to augment the eight 10BASE-T Ethernet ports that are standard in the switch for port expansion or high-speed uplinks.



IBM 8271 Nways Ethernet LAN Switch Model 108

- **Model 216** features sixteen 10BASE-T ports and one AUI port, and has two Universal Feature Slots for optional Universal Feature Cards. The balance of the capabilities of Model 216 are identical to those of Model 108.



IBM 8271 Nways Ethernet LAN Switch Model 216

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Universal Feature Cards for the 8271 Models 108 and 216

One-Port 155 Mbps ATM	Provides the capability to connect Models 108 and 216 to an ATM switch, such as the IBM 8260 Nways Multiprotocol Switching Hub with its ATM Concentrator Module. Its 155 Mbps SONET interface fully supports ATM Forum-compliant LAN Emulation. This UFC is also supported in the 8271 LAN Switch Modules for the IBM 8260.
One-Port 100BASE-TX Ethernet	Allows the 8271s to be connected to a 100BASE-TX (Fast Ethernet) backbone segment with an external 100BASE-TX Ethernet repeater or for connection directly to a LAN station equipped with a 100BASE-TX Ethernet adapter.
Four-Port 10BASE-T Ethernet	Provides four additional 10BASE-T Ethernet ports for customers who want a small number of additional ports without having to interconnect multiple 8271 switches via a backbone network.
Three-Port 10BASE-FL Ethernet	Provides three 10BASE-FL ports to connect Ethernet segments to an IBM 8271 up to 2 km away.
FDDI - 3 cards •One DAS Multimode Fiber •One SAS Multimode Fiber •One SAS UTP	Provides additional 100 Mbps uplink alternatives. Allows interconnection of 8271s using an FDDI backbone. Provides bridge access from Ethernet ports to high-speed stations connected to the FDDI backbone. Supports IP fragmentation (RFC 1188). This UFC has been previewed by IBM.
One-Port 100BASE-FX Ethernet	Allows an 8271 Switch to be connected to a 100BASE-FX repeater or for direct connection to a LAN station equipped with a 100BASE-FX Ethernet adapter.

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Positioning

The IBM 8271 Nways Ethernet LAN Switches are a moderate-cost, high-performance LAN interconnect solution for small to medium sites that are currently experiencing Ethernet LAN congestion. It is best utilized as a Workgroup Switch, concentrating on 10M shared hubs. When interconnected using Universal Feature Cards that provide uplink connections to high speed backbone networks (such as ATM), the switch offers an attractive, scalable solution to networks of varying sizes from small to large.

Features/Functions

The IBM 8271 Nways Ethernet LAN Switches offer the following features:

Feature	Function
Full-Duplex	Supports full-duplex (bi-directional) communication with devices on dedicated segments, such as other switches, workstations or servers that are equipped with full-duplex Ethernet adapters.
Switching	Models 108/216 offers the customer the choice of switching mode: • **store-and-forward.** This mode completely checks the entire frame before the first bit is transmitted. This minimizes the likelihood of forwarding bad frames. • **cut-through.** With cut-through, the switch forwards a frame immediately upon detection of a valid address, without waiting for the end of the frame. This minimizes delay in forwarding. • **adaptive cut-through** (an IBM patented technology)**.** Models 108/216 will alternate between cut-through or store-and-forward switching depending on user-configurable, per-port, error rate thresholds. With this, the switch automatically adapts to changing network conditions.
Additional Connections	Model 108 provides one Universal Feature Slot that will support several optional field-upgradable cards. These cards can be for port expansion or to support high speed upstream links to a server, hub or backbone. Model 216 provides two Universal Feature Slots that support the same cards as the Model 108.
Management	• Supports remote management via SNMP, BOOTP and TFTP. • Out-of-band console management capabilities via the serial port. • In-band console management capabilities via Telnet.
EtherPipe	Scaling may be accomplished by connecting up to four (user-configurable) full-duplex Ethernet ports on one Model to those of another. Each of these links provides up to 20 Mbps of bandwidth between switches, for a maximum of 80 Mbps. This allows a customer to build configurations of many ports in a single switched domain.

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Feature	Function
EtherProbe	Models 108/216 offer a separate monitoring port. This EtherProbe port can be set to monitor the activity on any of the eight switch ports so that a LAN analyzer (like IBM DataLANce Network Analyzer) can be attached for diagnostics or tuning. Even full-duplex traffic can be monitored by looking at the transmit and receive paths separately.
Standards Support	Protects investment by interoperating with existing IEEE 802.3 Ethernet adapters, hubs and other components. Supports **Spanning Tree Protocol** (IEEE 802.1d) that allows alternate paths between interconnected devices.
Warranty	One year warranty.

8271 LAN Switch Module

The **IBM 8271 LAN Switch Module** in the IBM 8260 Nways Multiprotocol Switching Hub offers an integrated solution for interconnecting LAN segments in an easy, cost-effective manner. It inherits all of the functions of the standalone 8271 LAN Switch, and also inherits such 8260 features as intelligent cooling, redundant power supplies, comprehensive management and hot-pluggability.

The 8271 LAN Switch Module is available in 2 or 3-slot formats, and offers the following features:

- twelve 10BASE-T ports with RJ-45 UTP/STP connectors (UTP cabling category 3,4, and 5 is supported)
- supports up to two UFCs for the 2-slot module and up to four UFCs for the 3-slot module
- support for up to 28 Ethernet segments
- VLAN support, allowing a single physical LAN switch module to support up to 8 port-based VLANs
- support for a maximum of 1790 active LAN station addresses per port and 10,000 per module
- SNMP management via either the service port on the module, local or remote Telnet, or in-band from an SNMP management station
- microcode upgradable

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8271 ATM LAN Switch Module

The **8271 ATM LAN Switch Module** also is available in 2 or 3-slot formats, and offers the following features:

- connects directly to the ATM backplane
- twelve 10BASE-T ports with RJ-45 UTP/STP connectors (UTP cabling category 3,4, and 5 is supported)
- supports up to two UFCs for the 2-slot module and up to four UFCs for the 3-slot module
- support for up to 28 Ethernet segments
- VLAN support, allowing a single physical LAN switch module to support up to 8 port-based VLANs
- support for a maximum of 1790 active LAN station addresses per port and 10,000 per module
- SNMP management via either the service port on the module, local or remote Telnet, or in-band from an SNMP management station
- microcode upgradable

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 three management solutions:

- IBM Nways Manager for Windows™ V2.0
- IBM Nways Campus Manager LAN for AIX V3.0
- IBM Nways Campus Manager LAN for HP-UX V1.1

Nways Manager for Windows

This product is an integrated suite of network management applications (packaged with NetView for Windows Version 2.1 and NetManage Newt V4.6) that works seamlessly with the IBM NetView for Windows management platform to remotely control and monitor networking devices such as the IBM 8238; 8271 Models 001, 108 and 216; 8272 Models 108 and 216; 8224; 8230 Models 3/13, 213, 4A/4P; 8282; 8281; 8285; 6611; 2210; 8250; 8260; 8210; 8225; and 8235. It provides remote control and coordination of IBM networking products through:

- the ability to view and change subsystem configurations
- a 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

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- integrated trouble-ticketing to gather information about and track network problems to resolution
- a MIB browser to allow management of components not supported with a graphical interface
- inventory management
- collection and presentation of real-time and historical statistics
- drag and drop of ports and VLAN support provided
- telnet and FTP capabilities
- RMON coupling with Nways RMON for Windows V1.0 supporting the 8230 and 8238 Token-Ring LAN hubs.

Positioning

The Nways Manager for Windows V2.0 management product is for customers with small to medium networks up to 250 devices. These customers have one or more IBM Campus Networking Products and want a low cost management solution that provides complete device management.

Nways Campus Manager LAN for AIX

Nways Campus Manager LAN is an advanced package of integrated network management applications that enables complete management of Ethernet, Token-Ring or FDDI-based networks composed of IBM hubs, switches, bridges and concentrators. It also provides complete management of IBM (and selected OEM) routers. When installed on the IBM NetView for AIX platform, it allows customers to assess the status and configuration of the 8271 through a point-and-click interface. Comparable in function to that provided for by the 8271 in Nways Manager for Windows, switch performance can be monitored through user-defined, rate-of-change graphs that show the peak, mean, and actual number of frames per user-specified polling period. Drag and drop of ports and VLAN support is also provided. Other common features include:

- advanced graphical user interface
- SNMP support and capabilities
- Token-Ring media management
- NetView for AIX topology maps and expanded views
- OSF/MotifTM-based user interface
- X Window SystemTM support
- microcode updates
- remote login via Telnet
- multiple levels of alarms
- TCP/IP device faults are isolated to simplify problem determination and error correction
- object store database support for hub connected stations with user information accessible via import/export function

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- automatic discovery of IBM hub models and installed modules as well as IBM switches and routers
- compatibility with IBM 6611 and 2210 configuration tools
- access control by MAC address list
- context-sensitive help
- online documentation and help for better user efficiency
- NetView for AIX Client/Server support
- distributed management using Tivoli TME 10 distributed Router Monitoring capability along with Mid-Level Managers

Positioning

Nways Campus Manager LAN for AIX is positioned for large-scale LAN management. Management applications on NetView for AIX provide the most comprehensive set of applications for both device and network management and support the largest networks.

Nways Campus Manager LAN for HP-UX

This suite of Nways Campus management applications is functionally the same as Nways Campus Manager LAN for AIX, only ported to run on the HP 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. It also provides complete management of IBM routers. Comparable in function to Nways Manager for Windows, status and configuration of the 8271 can be performed through a point-and-click interface. Switch performance can also be monitored through user-defined, rate-of-change real-time graphics that show the peak, mean and actual number of frames per user-specified polling period.

Positioning

Nways Campus Manager LAN for HP-UX V1.1 is targeted at customers who run the HP OpenView management platform.

Management Software

Description
Nways Campus Manager LAN for AIX V3.0 (5697-B07)
8 mm tape
1/4 inch tape
4 mm tape
CD-ROM
Nways Campus Manager Suite for AIX V3.0 (5697-B06)
8 mm tape
1/4 inch tape
4 mm tape
CD-ROM
Nways Campus Manager for HP-UX (5801-AAR) (4 mm tape)
Nways Manager for Windows V2.0 (5801-AAR) (one-time license)

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8271 Products and Options

Description
8271 Nways Ethernet LAN Switch 8271 Nways Ethernet LAN Switch
Universal Feature Cards 8271 100BASE-TX (1 port) 8271 100BASE-FX (1 port) 8271 4-Port 10BASE-T 8271 3-Port 10BASE-FL 8271 1-port ATM 155 Mbps multimode fiber 8271 FDDI DAS MMF 8271 FDDI SAS MMF 8271 FDDI SAS UTP
8271 LAN Switch Modules 2-slot for Ethernet 3-slot for Ethernet
8271 ATM LAN Switch Modules 2-slot ATM for Ethernet 3-slot ATM for Ethernet

Target Market

The 8271 is targeted at customers who need a low cost, standalone Ethernet workgroup switch to improve bandwidth congestion. Customers who want some of the higher level networking functions such as filtering or routing of higher level protocols, or require a WAN connection, may want to consider the IBM 6611 Network Processor, the IBM 2210 Nways Multiprotocol Router or the IBM 8250/8260 Multiprotocol Intelligent Hubs. Customers with installed IBM 8250/8260s or customers that desire an Ethernet switching solution with more extensive network management capabilities may want to consider the IBM 8250/8260 hubs with its Ethernet 6-Port Switch module (see *IBM Hub Sales Guide*). For customers who need extensive VLAN support and integrated routing with any-to-any connectivity we suggest the 8273 Nways Ethernet RouteSwitch.

Q's and A's

Q) When do you sell the IBM 8271 versus the IBM 8250 hub?

A) The IBM 8250 Multiprotocol Intelligent Hub also provides Ethernet switching in the form of integrated modules. However, if a customer requires extremely low latency, full-duplex Ethernet support and more than 6 switched ports, then he/she should consider the IBM 8271. Additionally, for some customers, intelligent hub integration may not be appropriate. Refer to the following table for more information.

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	8271 Models 108 and 216 Switches	8250 Network Interconnect Module
Type	standalone Ethernet switch	Ethernet switch integrated into 8250/8260 hub
Switching	adaptive cut-through	store-and-forward
# Of Ports Per Switch	up to 16 - add more with Universal Feature Card	6 — use multiple modules to add more ports in a single hub
Upstream Links	10BASE-FL, 100BASE-TX, 10BASE-T, 155 Mbps ATM, FDDI, 100BASE-FX	Via other hub modules
Full Duplex	Yes	No
Management	In-band or out-of-band Nways Manager for Windows Nways Campus Manager LAN for AIX Nways Campus Manager LAN for HP-UX	In-band or out-of-band Intelligent Hub Management Program/DOS Nways Manager for Windows Nways Campus Manager LAN for AIX Nways Campus Manager LAN for HP-UX
Upgradable To Router Or Bridge	No	Yes - use upgrade kits to change to bridge or router
Fault Tolerance	No	Yes; from 8250/8260 host platform

Q) One hears a lot about IBM's Switched Virtual Networking (SVN) strategy. What is it?

A) Please see the Appendix, page 71, for a detailed description of SVN.

Sales Tools

The following sales tools are available for the IBM 8271.

IBM 8271 Nways Ethernet LAN Switch (spec sheet)	G224-4425-02
IBM 8271 Universal Feature Cards (spec sheet)	G224-4438-01
IBM 8260 Nways ATM Campus Solutions (spec sheet)	G221-4293-02
IBM 8260 LAN Switch Modules (spec sheet)	G224-4488-01

Information about the IBM 8271 is available on the Internet World-Wide Web Server at:

- URL: http://www.raleigh.ibm.com/nethome.html — IBM Networking home page
- URL: http://www.raleigh.ibm.com/nethard.html — IBM Networking hardware home page
- URL: http://www.raleigh.ibm.com/821/821prod.html — 8271-specific information

Information about the IBM 8271 is available from the IBM fax-back systems.

- IBM FAX (800-IBM-4FAX, product spec sheet document #s 3469, 2938, 4797)
- IBM PCC FAX (800-IBM-3395, product spec sheet document #s 11053, 11173)

A new LAN Switch Planning Tool will be available on CD-ROM, providing a suite of tools that allows customers to learn about and plan LAN switching solutions using the IBM 8271, IBM 8272, and IBM 8270 Model 800. This tool, suitable as a customer deliverable, consists of two parts: the first, "Why Switch?", is a multimedia demo that shows how LAN switches solve network congestion problems without upgrading the network infrastructure. The second, "Which Switch?", is an interactive planning tool that lets users build IBM 8271, IBM 8272, and IBM 8270 Model 800 solutions that are customized for their specific needs. This planning tool also contains an online information system to provide the user with more detailed product documentation. This tool will be orderable using form number SK2T-0403.

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Competition

The IBM 8271 competes against workgroup switches from such major vendors as Cisco, Bay Networks and 3Com. The following tables summarize the strengths and weaknesses of the IBM 8271's primary competitors and how to sell against them.

	Strengths	Weaknesses	Selling Against
Bay BayStack 301 Ethernet Switch	• Workgroup switch • 22 switched 10BT ports • 2 switched 10/100TX uplink ports • 10,240 MAC addr/switch • supports up to 24 port-based VLANS • redundant power in BayStack system	• no FDDI or ATM connectivity • no RMON	• stress adaptive cut-through • EtherPipe and EtherProbe • stress UFC capabilities • stress full-duplex • but a higher cost
Bay BayStack 302 Ethernet Switch	• Workgroup switch • 8 switched 10BT ports, half duplex • 1 switched 100TX (302T) or 100Base FX (302F) port full duplex configurable • 16,000 MAC addr/switch • store-and-forward • SNMP support **Note:** Replaces the BayStack Ethernet Workgroup Switch	• no FDDI or ATM connectivity • no RMON high cost for 100Base FX uplink ($800 more) • no VLAN support • no redundant power	• stress adaptive cut-through • EtherPipe and EtherProbe • stress UFC capabilities • stress full-duplex • but a higher cost • stress higher port density

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	Strengths	Weaknesses	Selling Against
Cisco Catalyst 1900	• Desktop or small workgroup • 24 switched 10BT ports • 2 switched 100BTX ports (one port can be 100BFX) • 1024 MAC addr/switch • SNMP, RMON (4 groups) • cut-through or store-and-forward • port-based VLAN's	• 1024 MAC addresses limits workgroup size • no FDDI or ATM uplink	• 8271 is better positioned as a workgroup switch which concentrates 10m shared hubs • 8271 offers more MAC address support, UFC's, adaptive cut-through, EtherPipe and EtherProbe, but a higher cost
Cisco Catalyst 2820	• Desktop or small/med. workgroup switch • 24 switched 10BT ports • 2 module slots for –100BTX port –100BFX port –8 port shared 100BTX –4 port shared 100BFX –FDDI UTP, DAS, SAS • 2048 or 8096 MAC addr/switch • SNMP, RMON (4 groups) • cut-through or store-and-forward • port-based VLAN's	• no ATM uplink (planned for `97)	• 8271 offers ATM uplink, adaptive cut-through, EtherPipe and EtherProbe, but at a higher cost

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	Strengths	Weaknesses	Selling Against
Cisco Catalyst 3000	• workgroup switch • 16 switched 10BT ports and one AUI port • 2 module slots for –4 port 10BT –3 port 10BFL –1 port 100 BTX –2 port 100BTX –1 port 100BFX –2 port 100BFX –1 port ATM • 10,000 MAC addr/switch • SNMP, RMON optional • adaptive cut-through • up to 64 VLAN's • redundant switch module with power supply **Note:** Kalpana technology similar to 8271.	• no FDDI uplink	• stress EtherPipe and EtherProbe • Cisco's adaptive cut-through is IBM technology
Cisco Catalyst 3100	• workgroup switch with WAN access • 24 switched 10BT ports • one flex slot for any one of the CAT 3000 expansion modules or a 3011 WAN/router module (based on Cisco 2503 router)		• stress EtherPipe and EtherProbe • Cisco's adaptive cut-through is IBM technology

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	Strengths	Weaknesses	Selling Against
3Com SuperStack II Desktop Switch	• Desktop switch • 24 switched 10BT ports • 1 switched 100BTX port and 1 module slot for additional 10BT, 100BTX, 100BFX • 4MAC addr/port, unlimited on uplink • SNMP, RMON • cut-through, store-and-forward, or intelligent switching modes • 3Com PACE support • resilient links • supports up to 16 VLANS • redundant power via SuperStack system	• 4 MAC addr/port limits switch to desktop connectivity • no FDDI uplink • ATM uplink not yet available (mid `97)	• 8271 is better positioned as a workgroup switch which concentrates 10m shared hubs • 8271 offers more MAC address support, UFC's, adaptive cut-trough, EtherPipe and EtherProbe, but at a higher cost
3Com SuperStack II Switch 1000	• Desktop or small workgroup switch • 12/24 switched 10BT ports • 1 switched 100BTX port • 500 MAC addr/switch • SNMP, RMON • cut-through, store-and-forward, or intelligent switching modes • 3Com PACE support • resilient links • supports up to 16 VLANS • redundant power via SuperStack system	• 500 MAC addresses limits workgroup size • no FDDI uplink	• 8271 is better positioned as a workgroup switch which concentrates 10m shared hubs • 8271 offers more MAC address support, UFC's, adaptive cut-through, EtherPipe and EtherProbe, but at a higher cost
3Com SuperStack II Switch 2200	• Desktop or workgroup switch with FDDI uplink • 16 switched 10BT ports • 1 FDDI DAS port • 8192 MAC addr • SNMP • store-and-forward • resilient links • supports up to 16 VLANS • redundant power via SuperStack system	• no 3Com PACE support • no RMON	• 8271 offers UFC's, adaptive cut-through, EtherpPipe and EtherProbe

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	Strengths	Weaknesses	Selling Against
3Com SuperStack II Switch 2700	• Desktop or small workgroup switch with ATM uplink • 12 switched 10BT ports • 1 ATM DS-3 or 155m port • 8192 MAC addresses per switch • SNMP • cell-based switching • LANE; SVC UNI 3.0, 3.1 • cut-through or store-and forward switching modes • rate-based flow control and congestion management • redundant power via SuperStack system	• no Fast Ethernet or FDDI uplink • no RMON	• 8271 offers UFC's for uplink flexibility, adaptive cut-through, EtherPipe and EtherProbe
3Com LANplex 2500	• Workgroup or small backbone switch • 8 or 16 switched 10BT ports • 1 or 2 uplinks –100 BTX –100BFX –FDDI UTP –FDDI DAS –ATM • 8192 MAC addr/switch • SNMP, RMON • VLAN	• no adaptive cut-through • no full duplex • expensive ATM uplink	• stress adaptive cut-through, full duplex, EtherPipe and EtherProbe, UFC's
Bay Model 2216T Ethernet Switch	• Desktop or small workgroup • 16 switched 10BT ports, half duplex • 1 switched 100TX port, full duplex • 1024 MAC addr/switch • store-and-forward • SNMP support	• no FDDI or ATM connectivity • no RMON • no VLAN support	• stress adaptive cut-through • EtherPipe and EtherProbe • stress UFC capabilities • stress full-duplex • but at a higher cost • stress more MAC address support

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Key Selling Points

When selling the IBM 8271 Nways Ethernet LAN Switches, the following points should be emphasized:

- 8271 is a high-speed Ethernet switching solution (adaptive cut-through further reduces latency)
- IBM's patented adaptive cut-through technology in Models 108/216 enables the switches to adapt to changing network conditions
- Full-duplex Ethernet support, enabling the doubling of network access bandwidth in a cost-effective manner
- The Universal Feature Slots provide flexible uplink and expansion options
- Network management capabilities of the 8271
- 8271's award-winning physical packaging which increases ease of use
- 8271's AUI port
- The 8271 is compatible with all current IBM Ethernet networking products
- IBM’s customer support and service
- IBM’s technology leadership and breadth of products

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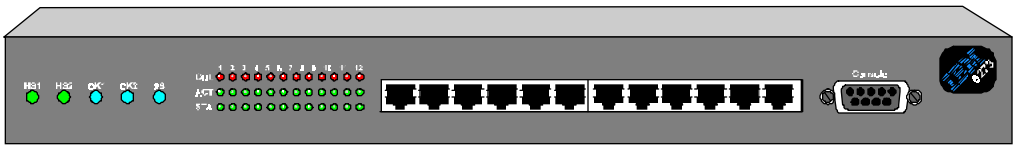
IBM 8273

Product Description The IBM 8273 Nways Ethernet RouteSwitch is a low cost, mid-range, Ethernet LAN switch. The 8273 is designed to:

- Provide wire speed switching between Ethernet segments and devices
- Accelerate server access through high speed server uplinks
- Provide access to ATM, FDDI or Fast Ethernet backbones for 10BASE-T clients

The 8273 is designed for customers who need extensive VLAN (Virtual Local Area Network) support as well as integrated routing with any-to-any switching that includes Ethernet-to-ATM, Ethernet-to-FDDI, Ethernet-to-Frame Relay and Ethernet-to-Fast Ethernet connectivity for workgroups. The 8273 offers customers significant functionality in a mid-range LAN switch for a moderate price.



IBM 8273 Nways Ethernet RouteSwitch

The 8273 is available in three models, and all offer the following features:

- Any-to-any transparent switching at wire speed for:
  - √ Ethernet-to-Ethernet
  - √ Ethernet-to-FDDI
  - √ Ethernet-to-CDDI
  - √ Ethernet-to-ATM (requires ATM switch)
  - √ Fast Ethernet-to-ATM (requires ATM switch)
  - √ Ethernet-to-Fast Ethernet
  - √ Fast Ethernet-to-FDDI
  - √ Ethernet-to-Frame Relay
- Flexible policy-based VLANs defined by:
  - √ Port
  - √ MAC Address
  - √ Protocol Type
  - √ Network Layer Address
  - √ Multicast Address
  - √ Custom Settings
- Standards-based 802.10 trunking
- Internal IP and IPX routing
- Comprehensive LAN-to-ATM internetworking (ATM PVCs, SVCs, LAN Emulation, Multiprotocol Encapsulation over ATM, Classic IP over ATM)

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- Any-to-any switching
- RMON support (Ethernet groups as defined in RFC 1757)
- SNMP management support via in-band and out-of-band support
- Port mirroring
- Graphical network management support on a broad range of management platforms.
- Three SPARC RISC processors and five ASICs that provide high-speed switching
- High-speed content addressable memory (CAM) stores 1024 MAC addresses per switch (2048 optional)
- Configuration and software are stored in non-volatile flash memory
- LED indicators provide network and port-level status at a glance
- Optimized Drive Switching mode is automatically enabled by the 8273 when it senses that only one device is attached to a port. This mode ensures that the device only receives the traffic it actually requires.

The **Model 100** has 12, RJ-45, 10BASE-T ports (accessed from the front) and two sub-module slots (accessed through the rear). Segments or directly-attached workstations can be connected to any of the 10BASE-T ports. The Model 100 ships with 8MB of DRAM and 2MB of flash memory. For most applications, the Model 100s installed memory is sufficient. The Model 100 can be configured with the following high speed, sub-module uplinks:

- One or two DAS FDDI uplink ports
- Four or eight CDDI uplink ports
- One or two 155 Mbps ATM (OC-3) uplink ports
- Four or eight 100 BASE-TX uplink/dedicated ports
- 2 and 4 WAN Frame Relay sub-module

(For mixed sub-module configurations, please see the following "Sub-Module Compatibility" chart)

The **Model 10E** has the same features, performance and throughput as the Model 100, with the exception that the Model 10E is shipped with 16MB of DRAM and 4MB of flash memory. The extra memory would be required when the 8273 is being used as a router in a very large routed network (over 100 route entries). The extra memory will also be used for future software and hardware options.

The **Model 10U** has the same features, performance and throughput as the Model 100. The Model 10U ships with 8MB of DRAM and 2MB of flash memory. There are eight universal slots on the front of the Model 10U and two sub-module slots on the back. User-specified adapter boards populate the eight universal slots in any combination from the following choices:

- Two port, 10BASE-T/AUI (occupies 2 adapter board positions)
- One port, multimode fiber, 10BASE-FL (ST Connector)
- One port, single mode fiber, 10BASE-FL (SC Connector)
- One port, BNC, 10BASE2
- One port, 10BASE-T

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All models of the 8273 are build-to-order including the high speed, sub-module uplinks, the adapter board for the 10U, and the 8273 RouteSwitch Software Program (microcode for the 8273). The IBM Nways RouteSwitch Users Guide (GA27-4166) documentation is NOT shipped unless the appropriate feature is ordered. One copy of the documentation is recommended. The documentation contains installation instructions.

Sub-Module Uplinks for the 8273

Feature	Function
FDDI - Two Sub-Modules • One Port DAS, Multimode Fiber • One Port DAS, Single Mode Fiber	Provides for 100 Mbps uplinks. Allows interconnection of 8273s using a FDDI backbone. Provides access from Ethernet ports to high speed stations connected to the FDDI backbone. Supports SMT 7.3
Four-Port CDDI	Allows the 8273 to be connected to high speed, CDDI attached servers for overall network performance improvement.
One-Port 155 Mbps ATM **4 Sub-Modules** • One port, Multimode Fiber, 500 KB SRAM • One port, Multimode Fiber, 2 MB SRAM • One port, Single Mode Fiber, 500 KB SRAM • One port, Single Mode Fiber, 2 MB SRAM	Provides the capability to connect the 8273 to an ATM switch, such as the IBM 8260 Nways Multiprotocol Switching Hub. The sub-module is a 155 Mbps SONET interface fully supporting ATM Forum Compliant LAN Emulation.
Four-Port 100BASE-TX	Allows the 8273 to be connected to a 100BASE-TX (Fast Ethernet) backbone segment or for connection directly to a LAN station equipped with a 100BASE-TX Ethernet adapter
WAN frame relay Sub-Modules • 2 Port, Universal Serial, No Compression • 4 Port, Universal Serial, Compression	Allows the 8273 to be connected to a frame relay network. These sub-modules reach T1 and E1 speeds.
ATM E3 Sub-Modules • DS3-1, One Port, Coax • E3-1, One Port, Coax	Provides the capability to connect an ATM E3 uplink module with any Fast Ethernet uplink module. These modules can be used to provide E3 connectivity between end points for government and Telco type environments.
Fast Ethernet Full-Duplex Modules • One Port 100BASE-FX Multimode Fiber • One Port 100BASE-FX Single Mode Fiber	Allows users to double the throughput for full capacity in each direction for double the bandwidth found of standard half-duplex operation. The 8273 can support up to two full-duplex Fast Ethernet uplinks modules and users may mix a full-duplex Fast Ethernet module with a 4-port shared 100BASE-TX, ATM or FDDI uplink module.

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8273 Sub-Module Compatibility

	ATM	FDDI	CDDI	100BASE-TX
ATM	Y	N	N	Y
FDDI	N	Y	Y	Y
CDDI	N	Y	Y	Y
100BASE-TX	Y	Y	Y	Y

Positioning

The IBM 8273 Nways Ethernet RouteSwitch is intended for customers who need extensive VLAN support, integrated routing with any-to-any connectivity that includes Ethernet-to-ATM, Ethernet-to-FDDI, Ethernet-to-Fast Ethernet, and Ethernet-to-Frame Relay. The 8273 provides significant functionality in a mid-range LAN Switch.

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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 two management solutions:

- IBM Nways RouteSwitch Network Manager V3
- IBM Nways Route Tracker Manager V3
- IBM Nways RouteMonitor V1
- IBM Nways RouteDirector

Nways Route Switch Network Manager

The RouteSwitch Network Manager provides complete configuration, monitoring, and diagnostic information for your entire 8273 network. With its use of detailed graphics for real time reporting of network performance, alarms and configurations, RouteSwitch Network Manager is a valuable tool for ensuring your network is operating efficiently. It provides remote control and coordination of an 8273 through:

- Graphical (GUI) representation of an 8273 in the network
- The ability to view and change subsystem configurations
- Monitoring of switch ports and connector status
- Collection and presentation of real time statistics down to the port level (Ethernet, Token-Ring, FDDI, and ATM)
- Real time event monitoring with a time stamped alarm log
- Basic VLAN configuration capability
- Configuration of the IP and IPX routing parameters
- Configuration of the source route bridging parameters
- Runs on most common platforms such as Microsoft Windows V3.1 (or later), Windows 95, Windows NT, Sun OS, HP-UX, and Sun Solaris

Nways Route Tracker Manager

Route Tracker Manager provides powerful graphical VLAN configuration and tracking capabilities. Route Tracker offers the following capabilities for your Ethernet, Fast Ethernet, FDDI, CDDI and ATM devices attached to the 8273:

- Automatic VLAN creation based upon policies established using Route Tracker. The policies can include:
  - √ Physical port on an 8273
  - √ MAC address of a device
  - √ Protocol type such as IP, IPX, AppleTalk, and DECNet
  - √ Layer three addressing such as IP sub-nets and IPX network numbers
  - √ User-defined such as a specific pattern in a frame
- Create VLANs that can span entire buildings or an entire campus. Members of the same VLAN can be connected to each other across a FDDI or ATM backbone.
- Configure a single switch port to support multiple VLANs.
- A device can move from one switch port to another. The combination of Route Tracker software and the 8273 hardware will maintain the VLAN policies on the new switch port.
- A database maintains the VLAN groups and policies as well as polls the switches to determine if any changes have occurred in the VLANs.

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- Changes to the VLANs can be made immediately or staged for later implementation and activation.
- Runs on most common platforms such as Microsoft Windows 95, Windows NT, Sun Solaris, and HP-UX.

Nways RouteMonitor V1

Nways RouteMonitor Manager provides another method for network managers to oversee their 8273 network through:

- Statistics as well as alarm and event monitoring.
- It allows the user to view statistical data from each switch at the virtual LAN level, the switch level, the module level and the port level.
- Reports provided in a variety of graphics displays, including history line graph, pie charts, bar charts, bar graphs and view meters.
- Event and alarm thresholds can be set at the same level that can be set for statistical data.
- Traps can be monitored and forwarded to other management stations or network management applications, such as HP OpenView. These traps can be sent via e-mail to the network manager's console.

Nways RouteDirector

Nways RouteDirector is very similar in appearance and function to RouteTracker, but instead of configuring and managing VLANs, RouteDirector allows the user to configure and monitor ATM connections. It draws a logical network map of an organization's ATM network using a GUI. Using a unique tree hierarchy, the RouteDirector provides users with an understanding of the physical and logical structure of the network. This gives network administrators a clear and thorough view of their networks. RouteDirector provides two comprehensive network views that allow administrators to sort and view all the elements in their networks. The tree hierarchy provides a listing of enterprise-wide elements, including:

- Interfaces by type (ATM, Ethernet, Fast Ethernet, FDDI, Frame Relay and Token-Ring)
- ATM PVC and SVC connections
- Configured switch services such as bridging, routing, LAN Emulation services and trunking
- A detailed view of physical switches, modules and ports.

The network map displays physical switch interconnectivity with media color-coding, along with device-specific elements such as ATM PVC and SVC connections, services and physical modules and ports. RouteDirector is available for Windows 95 and Windows NT operating systems.

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8273 Products and Options

Description
12-10BASE-T ports, 2 Sub-Module Slots, 8MB DRAM, 2MB Flash
12-10BASE-T Ports, 2 Sub-Module Slots, 16MB DRAM, 4MB Flash
8 Universal Slots (front), 2 Sub-Module Slots, 8MB DRAM, 2MB Flash
RouteSwitch Software Program V2.1 (5697-B69) (Pre-loaded)
RouteSwitch Software Program V2.1 Basic License (5697-B69)
IBM Nways RouteSwitch Users Guide (8273-GA27-4166)
Adapter Boards for Model 10U
AUI/10BASE-T (2 Ports)
10BASE-FL (1 Port Multimode)
10BASE-FL (1 Port Single Mode)
10BASE2 (1 Port BNC)
10BASE-T (1 Port RJ-45)
Sub-Modules for Models 100, 10E, 10U
FDDI Sub-Module (1 DAS Port Multimode)
FDDI Sub-Module (1 DAS Port Single Mode)
CDDI Sub-Module (4 Ports RJ-45)
ATM Sub-Module (1 Port 155 Mbps Multimode 500KB SRAM)
ATM Sub-Module (1 Port 155 Mbps Multimode 2MB SRAM)
ATM Sub-Module (1 Port 155 Mbps Single Mode 500KB SRAM)
ATM Sub-Module (1 Port 155 Mbps Single Mode 2MB SRAM)
ATM Sub-Module (1 Port DS3-1 Coax)
ATM Sub-Module (1 Port E3 Coax)
WAN Frame Relay Module (2 Ports No Compression)
WAN Frame Relay Module (4 Ports Compression)
100BASE-TX Sub-Module (4 Ports RJ-45)
100BASE-TX Sub-Module (1 Port RJ-45)
Fast Ethernet Full-Duplex Module (1 Port 100BASE-FX Single Mode)
Fast Ethernet Full-Duplex Module (1Port 100BASE-FX Multimode)
AUI Full-Duplex Adapter Board Module (100BASE-T Requires 2 port slots)
Management Software
Nways RouteSwitch Network Manager V2.1 Sun Solaris, 1/4 inch tape (5697-B67)
Nways RouteSwitch Network Manager V2.1 Sun OS, 1/4 inch tape (5697-B67)
Nways RouteSwitch Network Manager V2.1 HP-UX, 4 mm tape (5697-B67)
Nways RouteSwitch Network Manager V2.1, 8 mm tape (5697-B67)
Nways RouteSwitch Network Manager V2.1 Windows 95 & NT, diskette (5697-B67)
Nways RouteSwitch Network Manager V2.1 Windows 3.1, diskette (5697-B67)
Nways RouteSwitch Network Manager Software User's Guide
Nways RouteSwitch Software Program V2.1 (5697-B70) (pre-loaded)
Nways RouteSwitch Software Program V2.1 Basic License (5697-B70)
Nways RouteSwitch Users Guide (8274-GA27-4166)
Nways Route Tracker Manager V2.1 Sun Solaris 1/4 inch tape (5697-B68)
Nways Route Tracker Manager V2.1 AIX 8 mm tape (5697-B68)
Nways Route Tracker Manager V2.1 HP-UX 4 mm tape (5697-B68)
Nways Route Tracker Manager V2.1 Windows 95 & NT, diskette (5697-B68)
Nways Route Tracker Manager User Guide

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Target Market

The 8273 is intended for customers who need extensive VLAN support, integrated routing with any-to-any connectivity that includes Ethernet-to-ATM, Ethernet-to-FDDI, Ethernet-to-Frame Relay, and Ethernet-to-Fast Ethernet for attached devices or segments.

Sales Tools

The following sales tools are available for the IBM 8273

- IBM 8273 Nways Ethernet RouteSwitch (spec sheet) G224-4524-00

Information about the IBM 8273 is available on the Internet World-Wide Web Server at:

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

Information about the IBM 8273 is available from the IBM fax-back systems.

- IBM FAX (800-IBM-4FAX) Product spec sheet document #6198
- IBM PCC FAX (800-IBM-3395) Product spec sheet document #10033

Competition

The IBM 8273 competes against workgroup switches from such major vendors as Cisco, Bay Networks and 3Com. The tables on the following pages summarize the strengths and weaknesses of the IBM 8271's primary competitors and how to sell against them.

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	Strengths	Weaknesses	Selling Against
3Com SuperStack II Desktop Switch	• Desktop switch • 24 switched 10BT ports • 1 switched 100BTX port and 1 module slot for additional 10BT, 100BTX, 100BFX • 4MAC addr/port, unlimited on uplink • SNMP, RMON • cut-through, store-and-forward, or intelligent switching modes • 3Com PACE support • resilient links • supports up to 16 VLANS • redundant power via SuperStack system	• 4 MAC addr/port limits switch to desktop connectivity • no FDDI uplink • ATM uplink not yet available (mid `97)	• 8273 is better positioned as a workgroup switch • 8273 offers more MAC address support, more uplink options, RMON, policy-based VLAN's, IP/IPX internal routing, but at a higher price
3Com SuperStack II Switch 1000	• Desktop or small workgroup switch • 12/24 switched 10BT ports • 1 switched 100BTX port • 500 MAC addr/switch • SNMP, RMON • cut-through, store-and-forward, or intelligent switching modes • 3Com PACE support • resilient links • supports up to 16 VLANS • redundant power via SuperStack system	• 500 MAC addresses limits workgroup size • no FDDI uplink	• 8273 is better positioned as a workgroup switch • 8273 offers more MAC address support, more uplink options, RMON, policy-based VLAN's, IP/IPX internal routing, but at a higher price
3Com SuperStack II Switch 2200	• Desktop or workgroup switch with FDDI uplink • 16 switched 10BT ports • 1 FDDI DAS port • 8192 MAC addr • SNMP • store-and-forward • resilient links • supports up to 16 VLANS • redundant power via SuperStack system	• no 3Com PACE support • no RMON	• 8273 offers RMON, policy-based VLAN's, IP/IPX internal routing

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	Strengths	Weaknesses	Selling Against
3Com SuperStack II Switch 2700	• Desktop or small workgroup switch with ATM uplink • 12 switched 10BT ports • 1 ATM DS-3 or 155m port • 8192 MAC addresses per switch • SNMP • cell-based switching • LANE; SVC UNI 3.0, 3.1 • cut-through or store-and forward switching modes • rate-based flow control and congestion management • redundant power via SuperStack system	• no Fast Ethernet or FDDI uplink • no RMON	• 8273 offers RMON, policy-based VLAN's, IP/IPX internal routing
3Com LANplex 2500	• Workgroup or small backbone switch • 8 or 16 switched 10BT ports • 1 or 2 uplinks –100 BTX –100BFX –FDDI UTP –FDDI DAS –ATM • 8192 MAC addr/switch • SNMP, RMON • VLAN	• no adaptive cut-through • no full duplex • expensive ATM uplink	• stress adaptive cut-through, full duplex, EtherPipe and EtherProbe, UFC's
Bay Networks Model 2216T Ethernet Switch	• Desktop or small workgroup • 16 switched 10BT ports, half duplex • 1 switched 100TX port, full duplex • 1024 MAC addr/switch • store-and-forward • SNMP support	• no FDDI or ATM connectivity • no RMON • no VLAN support	• 8273 is better positioned as a workgroup switch • 8273 offers more MAC address support, more uplink options, RMON, policy-based VLAN's, IP/IPX internal routing, but at a higher price

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	Strengths	Weaknesses	Selling Against
Bay Networks BayStack 301 Ethernet Switch	• Workgroup switch • 22 switched 10BT ports • 2 switched 10/100TX uplink ports • 10,240 MAC addr/switch • supports up to 24 port-based VLANS • redundant power in BayStack system	• no FDDI or ATM connectivity • no RMON	• 8273 is better positioned as a workgroup switch • 8273 offers more uplink options, RMON, policy-based VLAN's, IP/IPX internal routing, but at a higher price
Bay Networks BayStack 302 Ethernet Switch	• Workgroup switch • 8 switched 10BT ports, half duplex • 1 switched 100BASE-TX (302T) or 100BASE- FX (302F) port full duplex configurable • 16,000 MAC addr/switch • store-and-forward • SNMP support **Note:** Replaces the BayStack Ethernet Workgroup Switch	• no FDDI or ATM connectivity • no RMON • high cost for 100Base FX uplink ($800 more) • no VLAN support • no redundant power	• 8273 is better positioned as a workgroup switch • 8273 offers more uplink options, RMON, policy-based VLAN's, IP/IPX internal routing, but at a higher price

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	Strengths	Weaknesses	Selling Against
Cisco Catalyst 3000	• Workgroup switch • 16 switched 10BT ports and one AUI port • 2 module slots for –4 port 10BT –3 port 10BFL –1 port 100 BTX –2 port 100BTX –1 port 100BFX –2 port 100BFX –1 port ATM • 10,000 MAC addr/switch • SNMP, RMON optional • adaptive cut-through • up to 64 VLAN's • redundant switch module with power supply **Note:** Kalpana technology similar to 8271.	• no FDDI	• 8273 offers RMON, policy-based VLAN's, IP/IPX internal routing • Cisco's adaptive cut-through is IBM 8271 technology
Cisco Catalyst 3100	• Workgroup switch with WAN access • 24 switched 10BT ports • one flex slot for any one of the CAT 3000 expansion modules or a 3011 WAN/router module (based on Cisco 2503 router)		• 8273 offers RMON, policy-based VLAN's, IP/IPX internal routing • Cisco's adaptive cut-through is IBM 8271 technology

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	Strengths	Weaknesses	Selling Against
Cisco Catalyst 1900	• Desktop or small workgroup • 24 switched 10BT ports • 2 switched 100BTX ports (one port can be 100BFX) • 1024 MAC addr/switch • SNMP, RMON (4 groups) • cut-through or store-and-forward • port-based VLAN's	• 1024 MAC addresses limits workgroup size • no FDDI or ATM uplink	• 8273 is better positioned as a workgroup switch • 8271 offers more MAC address support, more uplink options, RMON, policy-based VLAN's, IP/IPX internal routing, but at a higher price
Cisco Catalyst 2820	• Desktop or small/med. workgroup switch • 24 switched 10BT ports • 2 module slots for –100BTX port –100BFX port –8 port shared 100BTX –4 port shared 100BFX –FDDI UTP, DAS, SAS • 2048 or 8096 MAC addr/switch • SNMP, RMON (4 groups) • cut-through or store-and-forward • port-based VLAN's	• no ATM uplink (planned for `97)	• 8273 offers ATM uplink, RMON, policy-based VLAN's, IP/IPX internal routing

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Key Selling Points

When selling the IBM 8273 Nways Ethernet RouteSwitch, the following points should be emphasized:

- Provides low cost, mid-range switching with a low price per port
- Offers wire speed switching between Ethernet segments and devices
- Supports any-to-any connectivity including Ethernet-to-ATM, Ethernet-to-FDDI, Ethernet-to-Frame Relay, and Ethernet-to-Fast Ethernet.
- Delivers all of the software capabilities found in a powerful backbone switch including IP and IPX internal routing
- Policy based VLANs
- Standards based 802.10 trunking
- RMON support
- Port mirroring
- Flexible sub-module uplinks for connectivity to high speed networks
- IBM's customer support and service
- IBM's technology leadership and breadth of products

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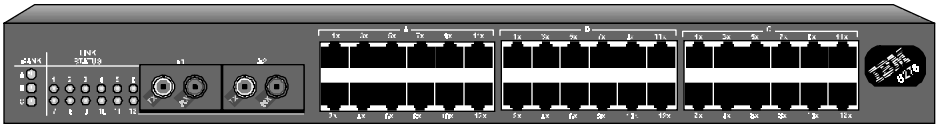
Edition 3

IBM 8276

Product Description The IBM 8276 Ethernet RoutePort complements IBM's powerful 8273 and 8274 RouteSwitch, and 8271 Ethernet Switch offerings. The IBM 8276 Ethernet RoutePort extends the benefits of switching to the desktop. Used in combination with IBM's powerful switches, the 8276 provides an excellent way to provide switching's benefits and extensive Virtual LAN support found in the 8273 and 8274 to users at a low per port price.

Customers who would like the advantages of switching, LAN segmentation, Virtual LANs, routing and increased bandwidth, but cannot justify 10 Mbps switching to every desktop will benefit greatly from the 8276's port switching capabilities.



IBM 8276 Ethernet RoutePort Concentrator

Features The 8276 Ethernet RoutePort is available in six models. This port switching concentrator provides:

- 36 10BASE-T ports
- Two optional (depending on model) fiber ports to extend connectivity up to 2000 meters
- Division of any ports into as many as four segments under software control
- Preloaded SNMP management
- Reduced network administration cost

The ability to subdivide the 8276 into four LAN segments provides the network administration greater flexibility. Through the use of VLANs, port assignments can be added, changed or moved from segment to segment with no disruption to users of the network. The network administrator can dynamically segment the LAN to achieve load balancing or provide workgroup security without recabling and with greatly reduced effort.

Depending on the model, IBM 8276 Ethernet RoutePort provides the configuration flexibility of optionally providing zero, one or two 10BASE-FL single-mode or multimode ports.

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Edition 3

The 10BASE-T cabling, which is provided by the customer and can be either shielded or unshielded twisted pair, allows connectivity to machines up to 100 meters from the RoutePort. 10BASE-FL allows connectivity up to 2000 meters. The multimode fiber connector is type ST, the single-mode is type SC.

The RoutePort also comes with an RS-232C, 9-pin "D" connector for attachment to a control console. LEDS provide indication of port link integrity.

Model	Number. of Multimode Ports	Number. of Single-Mode Ports	Available 10BASE-T Ports
360	0	0	36
361	1	0	35
362	2	0	34
363	0	1	35
364	0	2	34
365	1	1	34

The 8276 Ethernet RoutePort is intended to be rack-mounted and is shipped with the required brackets.

Management

The built-in SNMP agent allows management of the network through the use of a graphical network management package such as the IBM Nways RouteSwitch Network Manager, Nways RouteTracker, Nways RouteMonitor and Nways RouteDirector. (See page 24 for more information.) The built-in user interface also allows complete network management and control via a console management terminal.

8276 Products and Options

Description
Nways Ethernet RoutePort, zero ports
Nways Ethernet RoutePort, 1 MMF port
Nways Ethernet RoutePort, 2 MMF port
Nways Ethernet RoutePort, 1 SMF port
Nways Ethernet RoutePort, 2 SMF port
Nways Ethernet RoutePort, 1 MMF port, 1 SMF port
Nways RoutePort Machine Code, all models
Nways RouteSwitch/Port User's Guide

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Target Market

The 8276 Ethernet RoutePort is especially attractive to those who have growing Ethernet LANs in which segment size and security concerns dictate frequent changes in LAN segmentation. The flexibility of the segmentation under software control significantly reduces network administrative costs.

The 8276 should be presented as an option to customers who need:

- 8273 affinity
- RouteSwitch campus management
- 8273/8274 VLAN solution
- high port density with the ability to segment the LAN

Sales Tools

The following sales tools are available for the IBM 8276.

IBM Nways RouteSwitch/RoutePort Users Guide	GA27-4166-01
IBM Nways RouteSwitch User's Release Note	GC30-3874
IBM 8276 Nways Ethernet RoutePort (spec sheet)	G224-4449

Information on the IBM 8276 RoutePort is available on the World-Wide Web on the IBM Networking Home Page at:
URL: http:\\www.networking.ibm.com
Information about the IBM 8276 is available from the IBM fax-back system.
IBM FAX (800-IBM-4FAX) Document #7213

Competition

The IBM 8276 Nways Ethernet RoutePort does not have many competitors. The most direct competition comes from 3Com.

	Strengths	Weaknesses	Selling Against
3Com SuperStack II Port Switch Hub 40	• 12/24 10BASE-T ports • 2 slots for transceiver modules • stack up to 10 units; max 260 users • up to 4 segments • port switching through software • SNMP, RMON (9 groups) • VLAN support • redundant management • resilient links • redundant power via SuperStack system		• stress higher port density • complements 8273/4; extends benefits of VLAN's

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Key Selling Points

When selling the IBM 8276 Nways Ethernet RoutePort, the following points should be emphasized:

- Extends benefits of switching to desktop
- Cost-effective method to improve performance of growing LANs
- Delivers switching's benefits at low per-port cost
- Complements 8273 and 8274
- Provides smaller users with benefits of VLANs
- Reduced network administration costs
- Provides LAN segmentation for load balance or security
- IBM's customer support and service
- IBM's technology leadership and breadth of products

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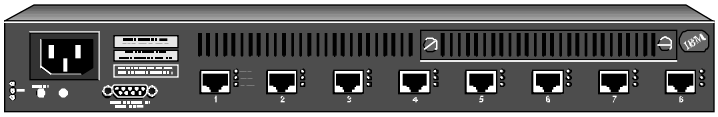
IBM 8272

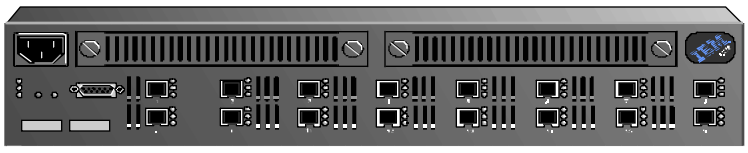
Product Description The IBM 8272 Nways Token-Ring LAN Switch Model 108 is a standalone, high-speed LAN switch that provides the ability to interconnect up to eight shared or dedicated Token-Ring LAN segments. Depending on traffic patterns, total bandwidth of Token-Ring networks segmented using the Nways Token-Ring LAN Switch could be expanded up to 400%-800%.

Like other members of the IBM workgroup LAN switch family, the 8272 Model 108 switch includes a Universal Feature Slot that will support several optional Universal Feature Cards. These cards could augment the eight Token-Ring ports provided by the switch or could provide a high-speed uplink connection to a backbone network.



IBM 8272 Nways Token-Ring LAN Switch Model 108

The 8272 Model 216 features sixteen Token-Ring ports, and has two Universal Feature Slots for optional Universal Feature Cards and can support up to 24 Token-Ring ports. The balance of the capabilities of the Model 216 are identical to those of Model 108.



IBM 8272 Nways Token-Ring LAN Switch Model 216

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Universal Feature Cards for the IBM 8272 Models 108 and 216

One-Port 155 Mbps ATM	Provides the capability to connect the 8272 switches to an ATM switch such as the IBM 8260 Nways Multiprotocol Switching Hub with its ATM Concentrator Module. Its 155 Mbps SONET interface fully supports ATM Forum-compliant LAN Emulation. This UFC is also supported in the 8272 LAN Switch Modules for the IBM 8260.
Four-Port TR Enhanced Twisted Pair (UTP/STP)	Provides four additional twisted pair ports (RJ-45) for customers who want a small number of additional ports without having to interconnect multiple 8272 switches via a backbone network.
Two-Port TR Enhanced Fiber	Provides two connections to an optical fiber ring for LAN segments up to 2 km apart
FDDI - 3 cards •One DAS Multimode Fiber •One SAS Multimode Fiber •One SAS UTP	Provides additional 100 Mbps uplink alternatives. Allows interconnection of 8272s using an FDDI backbone. Provides bridge access from Token-Ring ports to high-speed stations connected to the FDDI backbone. Supports either transparent or source-routing modes. This UFC has been previewed by IBM.
RMON	Provides RMON support for the 8272-216, 8270-800, and the 8272 ATM/LAN modules for the 8260. This UFC supports all 13 RMON groups.

Positioning

The IBM 8272 Nways Token-Ring LAN Switches are a low-cost, high-performance LAN interconnect solution for small-to-medium size sites that are currently experiencing Token-Ring LAN congestion. When interconnected using Universal Feature Cards that provide uplink connections to high-speed backbone networks (such as ATM), the 8272 offers an attractive, scalable solution to networks of varying sizes from small to large.

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Features/Functions The IBM 8272 Nways Token-Ring LAN Switches offer the following features:

Feature	Function
Full-Duplex	Supports full-duplex (bi-directional) communication with devices on dedicated segments such as other switches, workstations or servers that are equipped with full-duplex Token-Ring adapters.
Source-Route Switching	The switch and the Token-Ring segments connected to the switch share the same ring number ID. Administrators do not have to assign each port a separate ring number, reducing the configuration burden for administrators. Another benefit is the network span of 8272s is not limited to a maximum of seven hops.
Switching	Offers the customer the choice of switching mode: • **store-and-forward.** This mode completely checks the entire frame before the first bit is transmitted. This minimizes the likelihood of forwarding bad frames. • **cut-through.** With cut-through, the switch forwards a frame immediately upon detection of a valid address, without waiting for the end of the frame. This minimizes delay in forwarding. • **adaptive cut-through** (IBM patented technology). The 8272s will alternate between cut-through or store-and-forward switching depending on user-configurable, per-port, error rate thresholds. With this, the switches automatically adapt to changing network conditions.
Source-Route Bridging	Has an internal bridge function that adds one hop to source-routed frames. Each switch port may be a separate ring, with a unique ring number (configured in the switch), or ports may be grouped to be on the same logical ring number. This eliminates the need for external bridges (saving money), but still provides the benefits of source-routing (i.e., parallel paths). The source-route bridging microcode is an upgrade from current releases.
Auto-Sense/Auto Configure	Automatically senses what type of Token-Ring connection is being used on each port and whether this is: • to a shared media segment via a Token-Ring concentrator • to a dedicated media segment (to a Token-Ring LAN station) • operating in half-duplex or full-duplex mode • operating at 4 Mbps or at 16 Mbps • to another 8272 Nways Token-Ring LAN Switch Each port is automatically configured to operate at the highest level of capability possible minimizing the administrative burden associated with installation and moves/changes.
Additional Connections	Provides up to two Universal Feature Slots that will support several optional field-upgradable cards. These cards can be for port expansion or to support high-speed upstream links to a server, hub

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Feature	Function
Management	• Supports remote management with SNMP, BOOTP and TFTP. • Out-of-band console management capabilities using the serial port. • In-band console management capabilities with Telnet. • Supports RMON with the addition of the RMON UFC.
TokenPipe	Allows two 8272s to communicate by connecting up to four (user-configurable), parallel, full-duplex Token-Ring ports on one 8272 to those of another. Each of these links provides up to 32 Mbps of bandwidth between switches. This allows a customer to scale their switched network.
TokenProbe	TokenProbe is a monitoring port (any of the eight ports can be designated as TokenProbe) that can be set to monitor the activity on any one (at a time) of the eight switch ports so that a LAN analyzer can be attached for diagnostics or tuning. Even full-duplex traffic can be monitored by looking at the transmit and receive paths separately.
Standards Support	Protects investment by interoperating with existing IEEE 802.5 Token-Ring adapters, hubs and other components. Supports **Spanning Tree Protocol** that allows alternate paths between interconnected devices.
Warranty	One year warranty.

8272 LAN Switch Module

The **IBM 8272 LAN Switch Module** in the IBM 8260 Nways Multiprotocol Switching Hub offers an integrated solution for interconnecting LAN segments in an easy, cost-effective manner. It inherits all of the functions of the stand-alone 8272 LAN Switch, and also inherits such 8260 features as intelligent cooling, redundant power supplies, comprehensive management and hot-pluggability.

The 8272 LAN Switch Module is available in 2 or 3-slot formats, and offers the following features:

- eight Token-Ring ports with RJ-45 UTP/STP connectors (UTP cabling category 3,4, and 5 is supported)
- supports up to two UFCs for the 2-slot module and up to four UFCs for the 3-slot module
- support for up to 24 Token-Ring segments
- VLAN support, allowing a single physical LAN switch module to support up to 8 port-based VLANs
- support for a maximum of 1,790 active LAN station addresses per port and 10,000 per module
- SNMP management via either the service port on the module, local or remote Telnet, or in-band from an SNMP management station
- microcode upgradable

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8272 ATM LAN Switch Module

The **IBM 8272 ATM LAN Switch Module** in the IBM 8260 Nways Multiprotocol Switching Hub also offers an integrated solution for interconnecting ATM LAN segments in an easy, cost-effective manner. It inherits all of the functions of the standalone 8272 LAN Switch, and also inherits such 8260 features as intelligent cooling, redundant power supplies, comprehensive management and hot-pluggability.

The 8272 ATM LAN Switch Module is available in 2 or 3-slot formats, and offers the following features:

- connects directly to the ATM backplane
- eight Token-Ring ports with RJ-45 UTP/STP connectors (UTP cabling category 3,4, and 5 is supported)
- supports up to two UFCs for the 2-slot module and up to four UFCs for the 3-slot module
- support for up to 24 Token-Ring segments
- VLAN support, allowing a single physical LAN switch module to support up to 8 port-based VLANs
- support for a maximum of 1,790 active LAN station addresses per port and 10,000 per module
- SNMP management via either the service port on the module, local or remote Telnet, or in-band from an SNMP management station
- microcode upgradable

Management Software

Customers have several management options including out-of-band management from an ASCII terminal, remote logon via Telnet, and SNMP management. The IBM Nways Token-Ring LAN Switch contains an SNMP (MIB-II compliant) management agent that will allow a customer-supplied SNMP management station to interrogate and modify management data to obtain status on or control the operations of the switch. IBM offers three management solutions:

- IBM Nways Manager for Windows V2.0
- IBM Nways Campus Manager LAN for AIX V3.0
- IBM Nways Campus Manager LAN for HP-UX V1.1

Nways Manager for Windows

This product is an integrated suite of network management applications (packaged with NetView for Windows Version 2.1 and NetManage Newt V4.6) that works seamlessly with the IBM NetView for Windows management platform to remotely control and monitor networking devices such as the IBM 8238; 8272 Models 108 and 216; 8271 Models 001, 108, and 216; 8224; 8230 Models 3/13, 213, 4A/4P; 8282; 8281; 8285; 6611; 2210; 8250; 8260; 8210; 8225; and 8235. It provides remote control and coordination of IBM networking products through:

- the ability to view and change subsystem configurations
- a color-coded system status at a glance, with real-time problem detection and the ability to set thresholds for error notification

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- realistic, graphical depictions of products to assist with component selection
- graphical network topologies with a library of elements for easy creation of customized configurations
- real-time event monitoring, with a time-stamped alarm log
- tools to select, display and analyze information in the event log
- microcode download for the supported products
- integrated trouble-ticketing to gather information about and track network problems to resolution
- a MIB browser to allow management of components not supported with a graphical interface
- inventory management
- collection and presentation of real-time and historical statistics
- drag and drop of ports and VLAN support provided
- telnet and FTP capabilities
- RMON coupling with Nways RMON for Windows V1.0 supporting the 8230 and 8238 Token-Ring LAN hubs

Positioning

The Nways Manager for Windows V2.0 management product is for customers with small to medium networks up to 250 devices. These customers have one or more IBM Campus Networking Products and want a low cost management solution that provides complete device management.

Nways Campus Manager LAN for AIX

Nways Campus Manager LAN is an advanced package of integrated network management applications that enables complete management of Ethernet, Token-Ring or FDDI-based networks composed of IBM hubs, switches, bridges and concentrators. It also provides complete management of IBM (and selected OEM) routers. When installed on the IBM NetView for AIX platform, it allows customers to assess the status and configuration of the 8272 through a point-and-click interface. Comparable in function to that provided for the 8272 in Nways Manager for Windows, switch performance can be monitored through user-defined, rate-of-change graphs that show the peak, mean, and actual number of frames per user-specified polling period. Drag and drop of ports and VLAN support are also provided. Other common features include:

- advanced graphical user interface
- SNMP support and capabilities
- Token-Ring media management
- NetView for AIX topology maps and expanded views
- OSF/MotifTM-based user interface
- X Window SystemTM support
- microcode updates
- remote login via Telnet
- multiple levels of alarms
- TCP/IP device faults are isolated to simplify problem determination and error correction

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- object store database support for hub connected stations with user information accessible via import/export function
- automatic discovery of IBM hub models and installed modules as well as IBM switches and routers
- compatibility with IBM 6611 and 2210 configuration tools
- access control by MAC address list
- context-sensitive help
- online documentation and help for better user efficiency
- NetView for AIX Client/Server support
- distributed management using Tivoli TME 10 distributed Router Monitoring capability along with Mid-Level Managers

Positioning

Nways Campus Manager LAN for AIX is positioned for large-scale LAN management. Management applications on NetView for AIX provide the most comprehensive set of applications for both device and network management and support the largest networks.

Nways Campus Manager LAN for HP-UX

This suite of Nways Campus management applications is functionally the same as Nways Campus Manager LAN for AIX, only ported to run on the HP 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. It also provides complete management of IBM routers. Comparable in function to Nways Manager for Windows, status and configuration of the 8272 can be performed through a point-and-click interface. Switch performance can also be monitored through user-defined, rate-of-change real-time graphics that show the peak, mean and actual number of frames per user-specified polling period.

Positioning

Nways Campus Manager LAN for HP-UX V1.1 is targeted at customers who run the HP OpenView management platform.

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8272 Products and Options

Description
8272 Nways Token-Ring LAN Switch
8272 Nways Token-Ring LAN Switch
Universal Feature Cards
8272 4-Port TR Enhanced UTP/STP
8272 2-Port TR Enhanced Fiber
8272 1-Port ATM 155 Mbps MMF
8272 FDDI DAS MMF
8272 FDDI SAS MMF
8272 FDDI SAS UTP
8272 FDDI RMON UFC
LAN Switch Modules
2-slot for Token-Ring
2-slot ATM for Token-Ring
3-slot for Token-Ring
3-slot ATM for Token-Ring
4-Port Token-Ring/Enhanced UTP/STP (UFC) (For use in Modules and 8270-800)
2-Port Token-Ring/Enhanced Fiber (UFC)(For use in Modules and 8270-800)
Management Software
Nways Campus Manager LAN for AIX V3.0 (5697-B07)
8 mm tape
1/4 inch tape
4 mm tape
CD-ROM
Nways Campus Manager Suite for AIX V3.0 (5697-B06)
8 mm tape
1/4 inch tape
4 mm tape
CD-ROM
Nways Campus Manager for HP-UX (5801-AAR) (4 mm tape)
Nways Manager for Windows V2.0 (5801-AAR) (one-time license)

Target Market The 8272 is intended to be used by customers who need a low-cost, standalone Token-Ring workgroup switch to improve available bandwidth congestion. Customers who want some of the higher level networking functions, such as filtering or routing of higher level protocols, or require a WAN connection, may want to consider the IBM 8229 Bridge, IBM 2210 Nways Multiprotocol Router or IBM 8250 Multiprotocol Intelligent Hub.

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Q's and A's

Q) Can the IBM 8272 Models 108/216 switches be managed by IBM's LAN Network Manager?

A) No. IBM's strategic direction for the IBM 8272s are SNMP-based management. Since the IBM LAN Network Manager is a CMIP protocol-based management application, it cannot be used to manage the IBM 8272s. The switches, however, will provide many of the same functions available with CMIP management. An example is the TokenProbe function that allows the customer to do port mirroring with a selected port on the IBM 8272 switches. Also, IBM does offer the LAN Network Manager for AIX on the NetView for AIX platform, so customers can consolidate LAN media switch management on NetView for AIX.

Q) One hears a lot about IBM's Switched Virtual Networking (SVN) strategy. What is it?

A) Please see the Appendix, page 71, for a detailed description of SVN.

Sales Tools

The following brochures are available for the IBM 8272.

IBM 8272 Nways Token-Ring LAN Switch (spec sheet)	G224-4418-04
IBM 8272 Universal Feature Cards (spec sheet)	G224-4439-02
IBM 8260 LAN Switch Modules (spec sheet)	G224-4488-02
IBM 8260 Nways ATM Campus Solutions (spec sheet)	G221-4293-02

Information about the IBM 8272 is available on the Internet World-Wide Web Server at:

- URL: http://www.raleigh.ibm.com/nethome.html — IBM Networking home page
- URL: http://www.raleigh.ibm.com/nethard.html — IBM Networking hardware home page
- URL: http://www.raleigh.ibm.com/822/822prod.html — 8272-specific information

Information about the IBM 8272 is available from the IBM fax-back systems.

- IBM FAX (800-IBM-4FAX, product spec sheets document #s 3470, 4798)
- IBM PCC FAX (800-IBM-3395, product spec sheets document #s 10824, 11174)

A new LAN Switch Planning Tool will be available on CD-ROM, providing a suite of tools that allows customers to learn about and plan LAN switching solutions using the IBM 8271, IBM 8272, IBM 8273, IBM 8274 and the IBM 8270 Model 800. This tool, suitable as a customer deliverable, consists of two parts: the first, "Why Switch?", is a multimedia demo that shows how LAN switches solve network congestion problems without upgrading the network infrastructure. The second, "Which Switch?", is an interactive planning tool that lets users build IBM 8271, IBM 8272, IBM 8273, IBM 8274 and IBM 8270 Model 800 solutions that are customized for their specific needs. This planning tool also contains an online information system to provide the user with more detailed product documentation. This tool will be orderable using form number SK2T-0403.

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Competition The IBM 8272 competes against workgroup switches from such major vendors as Cisco, 3Com and Madge. The tables on the following pages summarize the strengths and weaknesses of the IBM 8272's primary competitors and how to sell against them.

	Strengths	Weaknesses	Selling Against
3Com SuperStack II Switch 2000 TR	• 12 ports • stackable, up to 6 for 72 ports • FDDI and ATM uplinks (available early `97) • adaptive cut-through • source route, transparent, source route transparent bridging • SNMP, RMON (5 groups) • VLAN support	• no full-duplex • no probe port • no autosense for station or concentrator connection • no autosense for ring speed • clunky, external MAU • FDDI and ATM uplinks not yet available	• stress autosense and autoconfigure • UFC capability • stress full-duplex • stress TokenPipe and TokenProbe • lower cost
Madge Smart RingSwitch	• 8/12 ports • modular, 3 slots • full-duplex • cut-through switching • FDDI, ATM uplinks • UTP/STP and fiber expansion planned • SNMP, RMON option	• no translational bridging or source-route switching • no adaptive cut-through • no autosense ring speed or full-duplex • no TR probe • no autosense for station or concentrator connection • expensive	• stress autosense and autoconfigure • stress adaptive cut-through and forwarding modes • stress UFC uplinks • stress management options • stress diagnostic port • lower cost
Cisco Catalyst 1800 (Nashoba) **Cabletron[1] TSX-1620** (Nashoba/Cisco)	• 8/12/16 ports • modular, 2 slots • store-and-forward • 8000 MAC addresses • FDDI uplink (ATM planned) • UTP/STP expansion • source-route, source-route transparent bridging • source-route switching • SNMP, RMON, (8 groups) • TR probe on any port • autosensing ring speed • autoconfiguring ring speed and UTP/STP • redundant power	• no full-duplex • no adaptive cut-through • no ATM uplink • no autosense for station or concentrator connection • expensive • new product from Nashoba acquisition, withdrawing the Catalyst 1600 (OEM from Madge) and the Catalyst 2600 (OEM from IBM)	• stress full-duplex • stress adaptive cut-through • stress UFC uplinks • stress management options • lower cost

1. Cabletron OEM's their TSX-1620 Token-Ring switch from Nashoba. Nashoba was recently aquired by Cisco.

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Key Selling Points

When selling the IBM 8272 Nways Token-Ring LAN Switch, the following points should be emphasized:

- Industry-leading lowest price/port
- 8272 is a high speed Token-Ring switching solution (adaptive cut-through further reduces latency)
- 8272's autosense and autoconfiguration capabilities
- IBM's patented adaptive cut-through switching technology enables the switch to adapt to changing network conditions
- Source-Route Switching eases the configuration burden for administrators
- Source-Route Bridging allows external bridges to be replaced, thereby reducing costs
- The investment protection offered by the 8272 which requires a minimum of disruption to existing networks and a minimum of investment to achieve a significant increase in bandwidth
- Full-duplex Token-Ring support enables the doubling of available network bandwidth in a cost-effective manner
- Network management capabilities of the 8272
- Flexible expansion and uplink capabilities of the Universal Feature Cards
- The 8272 is compatible with all current IBM Token-Ring networking products
- IBM’s customer support and service
- IBM’s technology leadership in Token-Ring
- IBM's breadth of products

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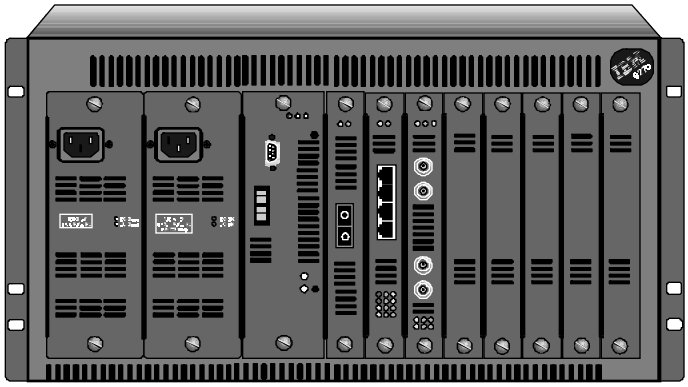
IBM 8270

Product Description The IBM 8270 Nways LAN Switch Model 800 is a configurable Token-Ring switch. Unlike other members of IBM's LAN switch family (the 8271 and the 8272), the 8270 Model 800 has no fixed LAN ports but has eight Universal Feature Slots. The Model 800 can be configured with a set of UFCs comparable to those supported on the 8272.



IBM 8270 Nways LAN Switch Model 800

The IBM 8270 Model 800 is an empty chassis (it ships with one power supply) that must be configured for Token-Ring operation by ordering a co-requisite IBM 8270 Token-Ring Processor Card. The Model 800 cannot be configured for Ethernet operation.

To help ensure continuous operation, a single optional, redundant power supply may be ordered. Only one power supply is required to support the entire Model 800; the second power supply is fully redundant. Both power supplies are completely load-sharing and hot-pluggable. The Model 800 chassis also includes two fans, one of which is totally redundant.

The 8270 Model 800's shipping carton has been specifically designed for hot staging in the carton to allow the switch to be configured and tested in a staging location, before shipment to a final location for installation.

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Universal Feature Cards for the IBM 8270 Model 800

One-Port 155 Mbps ATM	Provides the capability to connect the Model 800 to an ATM switch such as the IBM 8260 Nways Multiprotocol Switching Hub with its ATM Concentrator Module. Its 155 Mbps SONET interface fully supports ATM Forum-compliant LAN Emulation. This UFC is also supported in the 8272 LAN Switch Modules for the IBM 8260.
Four-Port TR Enhanced Twisted Pair (UTP/STP)	Provides four additional twisted pair ports (RJ-45) for customers who want a small number of additional ports without having to interconnect multiple 8270 switches via a backbone network.
Two-Port TR Enhanced Fiber	Provides two connections to an optical fiber ring for LAN segments up to 2 km apart.
FDDI - 3 cards • One DAS Multimode fiber • One SAS Multimode fiber • One SAS UTP	Provides additional 100 Mbps uplink alternatives. Allows interconnection of 8272s using an FDDI backbone. Provides bridge access from Token-Ring ports to high-speed stations connected to the FDDI backbone. Supports either transparent or source-routing modes. This UFC has been previewed by IBM.
RMON UFC	Provides RMON support for the 8272-216, 8270-800, and the 8272 ATM LAN Switch modules for the 8260. This UFC supports all 13 RMON groups.

Positioning

The IBM 8270 Model 800 should be considered preferable over the IBM 8272 when more than two Universal Feature Slots are required for uplinks or fiber port connections. Additionally, a Model 800 will allow users to build switched Token-Ring networks starting with fewer ports and building to a greater number of ports than possible with the 8272. An 8272 should be considered preferable over a Model 800 when configuration simplicity is preferred over flexibility.

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Features/Functions The IBM 8270 Nways LAN Switch Model 800 offers the following features:

Feature	Function
Switching	Offers the customer the choice of switching mode: • **store-and-forward.** This mode completely checks the entire frame before the first bit is transmitted. This minimizes the likelihood of forwarding bad frames. • **cut-through.** With cut-through, the switch forwards a frame immediately upon detection of a valid address, without waiting for the end of the frame. This minimizes delay in forwarding. • **adaptive cut-through** (IBM patented technology). The 8270s will alternate between cut-through or store-and-forward switching depending on user-configurable, per-port, error rate thresholds. With this, a switch will automatically adapt to changing network conditions.
Source-Route Bridging	Has an internal bridge function that adds one hop to source-routed frames. Each switch port may be a separate ring, with a unique ring number (configured in the switch), or ports may be grouped to be on the same logical ring number. This eliminates the need for external bridges (saving money), but still provides the benefits of source-routing (i.e., parallel paths). Source-route bridging microcode requires an upgrade.
AutoSense/ AutoConfigure	Automatically senses what type of Token-Ring connection is being used on each port and whether each is a connection: • to a shared media segment via a Token-Ring concentrator • to a dedicated media segment (to a Token-Ring LAN station) • operating in half-duplex or full-duplex mode • operating at 4 Mbps or at 16 Mbps • to another 8270 Model 800 Each port is automatically configured to operate at the highest level of capability possible minimizing the administrative burden associated with installation and moves/changes.
Additional Connections	Provides up to eight Universal Feature Slots that will support several optional field-upgradable cards. These cards can be for port expansion or to support high-speed upstream links to a server, hub or backbone.
Management	• Supports remote management via SNMP, BOOTP and TFTP. • Out-of-band console management capabilities via the serial port. • In-band console management capabilities via Telnet. • RMON support with RMON UFC.
TokenPipe	Allows two 8270s to communicate by connecting up to four (user-configurable), parallel, full-duplex Token-Ring ports on one 8270 to those of another. Each of these links provides up to 32 Mbps of bandwidth between switches. This allows a customer to build configurations of more than 8 ports.

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Feature	Function
Full Duplex	Supports full-duplex (bi-directional) communication with devices on dedicated segments such as other switches, workstations or servers that are equipped with full-duplex Token-Ring adapters.
Source-Route Switching	The switch and the Token-Ring segments connected to the switch share the same ring number ID. Administrators do not have to assign each port a separate ring number, reducing the configuration burden for administrators. Another benefit is the network span of 8270s is not limited to a maximum of seven hops.
TokenProbe	TokenProbe is a monitoring port (any of the copper ports can be designated as TokenProbe) that can be set to monitor the activity on any one (at a time) of the copper switch ports so that a LAN analyzer can be attached for diagnostics or tuning. Even full-duplex traffic can be monitored by looking at the transmit and receive paths separately.
Standards Support	Protects investment by interoperating with existing IEEE 802.5 Token-Ring adapters, hubs and other components. Supports **Spanning Tree Protocol** that allows alternate paths between interconnected devices.
Redundant Power Supplies	An optional, hot-swappable, second power supply to provide high availability
Space Saving	Fits on a shelf, table top, or rack
Warranty	One year warranty

8270 Products and Options

Description
8270 Nways LAN Switch 8270 Token-Ring Processor Card (only 1 can/must be ordered) 8270 Redundant Power Supply
Universal Feature Cards
8270 4-port Token-Ring/Enhanced UTP/STP
8270 2-port Token-Ring/Enhanced Fiber
8270 1-port ATM 155 Mbps MMF Token-Ring
8272 FDDI DAS MMF
8272 FDDI SAS MMF
8272 FDDI SAS UTP
8272 RMON UFC

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Target Market

The IBM 8270 is targeted at customers who need a low-cost, standalone Token-Ring workgroup switch to improve bandwidth congestion.

Sales Tools

The following brochures are available for the IBM 8270.

IBM 8270 Nways LAN Switch Model 800 (spec sheet)	G224-4510-00
IBM 8272 and 8270 Universal Feature Cards (spec sheet)	G224-4439-02

Information about the IBM 8270 is available from the IBM fax-back systems:

- IBM FAX (800-IBM-4FAX)
  product spec sheet document #s 4798, 6195
- IBM PCC FAX (800-IBM-3395)
  product spec sheet document #s 10042, 11174

Information about the IBM 8270 is available on the Internet World-Wide Web Server at:

- URL: http://www.raleigh.ibm.com/nethome.html
  IBM Networking home page
- URL: http://www.raleigh.ibm.com/nethard.html
  IBM Networking hardware home page
- URL: http://www.raleigh.ibm.com/822/822prod.html
  8270-specific information

A new LAN Switch Planning Tool will be available on CD-ROM, providing a suite of tools that allows customers to learn about and plan LAN switching solutions using the IBM 8271, IBM 8272, IBM 8273, IBM 8274 and the IBM 8270 Model 800. This tool, suitable as a customer deliverable, consists of two parts: the first, "Why Switch?", is a multimedia demo that shows how LAN switches solve network congestion problems without upgrading the network infrastructure. The second, "Which Switch?", is an interactive planning tool that lets users build IBM 8271, IBM 8272, IBM 8273, IBM 8274 and IBM 8270 Model 800 solutions that are customized for their specific needs. This planning tool also contains an online information system to provide the user with more detailed product documentation. This tool will be orderable using form number SK2T-0403.

Competition

The IBM 8270 Token-Ring LAN Switch competes against products from 3Com, Madge and Cisco. For information on these products and how to position the 8270 against them, see the table on the following page.

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	Strengths	Weaknesses	Selling Against
3Com SuperStack II Switch 2000 TR	• 12 ports • stackable, up to 6 for 72 ports • FDDI and ATM uplinks (available early `97) • adaptive cut-through • source route, transparent, source-route transparent bridging • SNMP, RMON (5 groups) • VLAN support	• no full-duplex • no probe port • no autosense for station or concentrator connection • no autosense for ring speed • clunky, external MAU • FDDI and ATM uplinks not yet available	• greater flexibility with 8 universal feature slots • higher port density; more uplink options • stress autosense and autoconfigure • stress TokenPipe and TokenProbe • stress redundant power
Madge Smart RingSwitch	• 8/12 ports • modular, 3 slots • full-duplex • cut-through switching • FDDI, ATM uplinks • UTP/STP and fiber expansion planned • SNMP, RMON option	• no translational bridging or source-route switching • no adaptive cut-through • no autosense ring speed or full-duplex • no TR probe • no autosense for station or concentrator connection • expensive	• greater flexibility with 8 universal feature slots • higher port density; more uplink options • stress autosense and autoconfigure • stress TokenPipe and TokenProbe • stress redundant power • stress adaptive cut-through • lower cost
Cisco Catalyst 1800	• 8/12/16 ports • modular, 2 slots • store-and-forward • 8000 MAC addresses • FDDI uplink (ATM planned) • UTP/STP expansion • source-route, source-route transparent bridging • source-route switching • SNMP, RMON, (8 groups) • TR probe on any port • autosensing ring speed • autoconfiguring ring speed and UTP/STP • redundant power	• no full-duplex • no adaptive cut-through • no ATM uplink • no autosense for station or concentrator connection • expensive • new product from Nashoba acquisition, withdrawing the Catalyst 1600 (OEM from Madge) and the Catalyst 2600 (OEM from IBM)	• greater flexibility with 8 universal feature slots • higher port density; more uplink options • stress TokenPipe and TokenProbe • stress adaptive cut-through • lower cost

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Key Selling Points When selling the IBM 8270 Nways Token-Ring LAN Switch, the following points should be emphasized:

- 8270 is a high speed Token-Ring switching solution (adaptive cut-through further reduces latency)
- 8270's autosense and autoconfiguration capabilities
- IBM's patented adaptive cut-through switching technology enables the switch to adapt to changing network conditions
- Source-Route Switching eases the configuration burden for administrators
- Source-Route Bridging allows external bridges to be replaced, thereby reducing costs
- The value offered by an 8270 which requires a minimum of disruption to existing networks and a minimum of investment to achieve a significant increase in bandwidth
- Full-duplex Token-Ring support, enabling the doubling of network access bandwidth in a cost-effective manner
- Network management capabilities of the 8270
- Flexible expansion and uplink capabilities of the Universal Feature Cards
- The 8270's redundant power supplies and cooling fans
- The 8270 is compatible with all current IBM Token-Ring networking products
- IBM's customer support and service
- IBM's technology leadership in Token-Ring
- IBM's breadth of products

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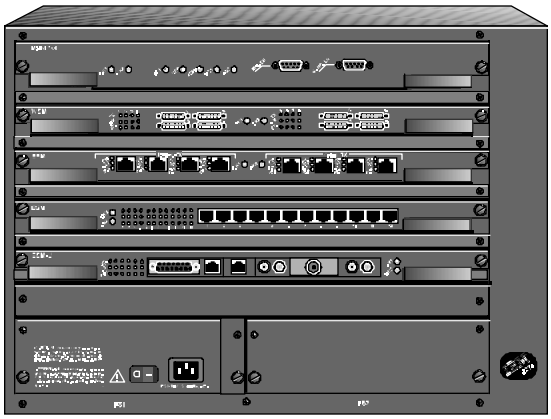
IBM 8274

Product Description The IBM 8274 Nways LAN RouteSwitch is a flexible, powerful, highly reliable switching platform. It combines an innovative hardware architecture with a sophisticated feature set, yet it's so inexpensive it can serve as a basic network building block. The 8274 is uniquely versatile; supporting any combination of Ethernet, Fast Ethernet, Token-Ring, FDDI, CDDI, and ATM at wire speeds with automatic any-to-any translation. It routes IP and IPX over twisted pair, coaxial or fiber optic cable. It connects to network segments, file servers, or individual workstations.



IBM 8274 Nways LAN RouteSwitch

The 8274 is a chassis-based switch available in two sizes. The five slot 8274 (Models 5xx) contains a Management Processor Module (MPM) and up to four open slots for switching modules. The nine slot 8274 (Models 9xx) contains a MPM and up to eight open slots for switching modules. All models of the 8274 offer the following features:

- Multiple SPARC RISC processor architecture. Each switching module as well as the Management Processor Module (MPM) has one or two fast SPARC RISC processors. Processor power is added every time a module is added. Switching tasks are distributed over all processors.
- Hot-Swappable modules. Modules can be removed and inserted into the 8274 while the system is operational.
- Redundant power supplies. The 8274 supports an AC power supply in models 5xx and 9xx. A single power supply supports a fully configured chassis. A second redundant power supply can be added and will switch-over from the main to redundant power supply without any loss of data. All power supplies are hot-swappable and can be replaced while the 8274 is operational. Each power supply has its own power cord, therefore the 8274 can be fed from different power sources.

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- Redundant cooling fans. There are two fan units in the 8274. If one should fail, the other is capable of keeping the switch within operating temperatures.
- Temperature alarm. The 8274 has a broad temperature operating range, yet if the temperature in a wiring closet gets too high, the 8274 will detect this condition and immediately generate an alert to notify the network manager.
- Flash memory. All operating software and configuration information are stored in nonvolatile flash memory. New software revisions can be downloaded to the 8274. There is no mechanical disk drive to provide a potential source of failure.
- Small profile. The 8274 is smaller than many units of similar design. The 8274 can be rack mounted in a standard 19-inch rack or placed on a table top.

- Transparent switching at wire speed with any-to-any translation
- Policy-based VLANs defined by:
  - √ Port
  - √ MAC Address
  - √ Protocol Type
  - √ Network Layer Address
  - √ Multicast Address
  - √ Custom Settings
  - √ Standards-based 802.10 trunking
  - √ Internal IP and IPX routing
  - √ Comprehensive LAN-to-ATM internetworking (ATM, PVCs, SVCs, LAN Emulation, Multiprotocol Encapsulation over ATM, Classic IP over ATM)
- Any-to-any switching
- RMON support (5 Ethernet groups as defined in RFC 1757)
- SNMP management support using in-band and out-of-band access
- Port mirroring
- Graphical network management support on a broad range of management platforms
- High speed content addressable memory (CAM) stores up to 2,048 MAC addresses per switching module
- LED indicators provide network and port level status at a glance
- Optimized Drive Switching mode is automatically enabled by the 8274 when it senses that only one device is attached to a port. This mode ensures that the device only receives traffic it actually requires

Models 500 and 900 include all features and functions as described above while shipping with a 960 Mbps frame-based backplane.

Models 513 and 913 include all of the features and functions as described above while shipping with a 960 Mbps frame-based backbone and an additional 13.2 Gbps cell-based backplane.

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All models of the 8274 are build-to-order including the redundant power supplies, the Management Processor Module (MPM), all switching modules, and the 8274 RouteSwitch Software Program (microcode for the 8274). The IBM Nways RouteSwitch Users Guide (GA27-4166) documentation is NOT shipped unless the appropriate feature is ordered. One copy of the documentation is recommended. The documentation contains installation instructions. The ship group for each model is as follows:

8274 Model 500 has five slots (one slot is occupied by the Management Processor Module), a 250-watt power supply, power line cord, and rack mounting hardware. At least one MPM MUST be ordered using feature code 7112 or 7113.

8274 Model 513 has five slots (one slot is occupied by the Management Processor Module), a 250-watt power supply, power line cord, and rack mounting hardware. At least one MPM MUST be ordered using feature code 7112.

8274 Model 900 has nine slots (one slot is occupied by the Management Processor Module), a 350-watt power supply, power line cord, and rack mounting hardware. At least one MPM MUST be ordered using feature code 7112 or 7113.

8274 Model 913 has nine slots (one slot is occupied by the Management Processor Module), a 500-watt power supply, power line cord, and rack mounting hardware. At least one MPM MUST be ordered using feature code 7112.

Positioning

The IBM 8274 Nways LAN RouteSwitch is intended for customers who need extensive VLAN support, integrated routing with any-to-any connectivity that includes Ethernet, Fast Ethernet, FDDI, CDDI, Token-Ring and ATM. The 8274 has a high port density coupled with the ability to do switching to the desktop or provide a backbone switch.

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8274 Modules

Module Type	Connector Type	Number of Ports	Max Number of Ports Per Chassis
10 Mbps Ethernet	RJ-45 (UTP CAT x)	12	48 (5 slot) 96 (9 slot)
10 Mbps Ethernet	RJ-45 (UTP CAT x)	8	32 (5 slot) 64 (9 slot)
10 Mbps Ethernet Universal[1]	AUI and RJ-45 (Transceiver & UTP CAT x)	1 AUI and 1 RJ-45	12 (5 slot) 24 (9 slot)
10 Mbps Ethernet Universal[1]	ST (10BASE-FL) (Multimode Fiber)	1	24 (5 slot) 48 (9 slot)
10 Mbps Ethernet Universal[1]	ST (10BASE-FL) (Single Mode Fiber)	1	24 (5 slot) 48 (9 slot)
10 Mbps Ethernet Universal[1]	BNC (10BASE2) (Thin coax)	1	24 (5 slot) 48 (9 slot)
10 Mbps Ethernet Universal[1]	RJ-45 (10BASE-T) (UTP CAT x)	1	24 (5 slot) 48 (9 slot)
FDDI	MIC (Multimode Fiber)	1 (DAS)	4 (5 slot) 8 (9 slot)
FDDI	MIC (Single Mode Fiber)	1 (DAS)	4 (5 slot) 8 (9 slot)
FDDI	MIC (Multimode Fiber)	2 (DAS)	8 (5 slot) 16 (9 slot)
FDDI	MIC (Single Mode Fiber)	2 (DAS)	8 (5 slot) 16 (9 slot)
CDDI	RJ-45 (UTP CAT x)	4	16 (5 slot) 32 (9 slot)
CDDI	RJ-45 (UTP CAT x)	8	32 (5 slot) 64 (9 slot)
FDDI/CDDI Combo	MIC/RJ-45 (Multimode Fiber/UTP CAT x)	1 (DAS)/4 Copper	4/16 (5 slot)2 8/32 (9 slot)
100BASE-TX	RJ-45 (UTP CAT 5)	4	16 (5 slot) 32 (9 slot)
100BASE-TX	RJ-45 (UTP CAT 5)	8	32 (5 slot) 64 (9 slot)
ATM	SC (Multimode Fiber)	1/2	4/8 (5 slot) 8/16 (9 slot)
ATM	SC (Single Mode Fiber)	1/2	4/8 (5 slot) 8/16 (9 slot)
Token-Ring	RJ-45	6	24 (5 slot)

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Management Software

Customers have several management options, including out of band management from an ASCII terminal, remote logon using Telnet and SNMP management. For SNMP management with a graphical user interface, IBM offers two management solutions:

- IBM Nways RouteSwitch Network Manager V2.1
- IBM Nways Route Tracker Manager V2.1
- IBM Nways Route Monitor V1
- IBM Nways Route Director

Nways RouteSwitch Network Manager

The RouteSwitch Network Manager provides complete configuration, monitoring, and diagnostic information for your entire 8274 network. With its use of detailed graphics for real time reporting of network performance, alarms and configurations, RouteSwitch Network Manager is a valuable tool for ensuring your network is operating efficiently. It provides remote control and coordination of the 8274s through:

- Graphical (GUI) representation of the 8274s in the network
- The ability to view and change subsystem configurations
- Monitoring of switch ports and connector status
- Collection and presentation of real time statistics down to the port level (Ethernet, Token-Ring, FDDI, and ATM)
- Real time event monitoring with a time stamped alarm log
- Basic VLAN configuration capability
- Configuration of the IP and IPX routing parameters
- Configuration of the source route bridging parameters
- Runs on most common platforms such as Microsoft Windows V3.1 (or later), Windows 95, Windows NT, Sun OS, HP-UX, and Sun Solaris

Nways Route Tracker Manager

Route Tracker Manager provides powerful graphical VLAN configuration and tracking capabilities. Route Tracker offers the following capabilities for your Ethernet, Fast Ethernet, FDDI, CDDI and ATM devices attached to the 8274:

- Automatic VLAN creation based upon policies established via Route Tracker. The policies can include:
  - √ Physical port on an 8274
  - √ MAC address of a device
  - √ Protocol type such as IP, IPX, AppleTalk, and DECNet
  - √ Layer three addressing such as IP sub-nets and IPX network numbers
  - √ User defined such as a specific pattern in a frame
- Create VLANs that can span entire buildings or an entire campus. Members of the same VLAN can be connected to each other across a Fast Ethernet, FDDI, or ATM backbone
- Configure a single switch port to support multiple VLANs
- A device that can move from one switch port to another. The combination of Route Tracker and the 8274 will keep the VLAN policies in place on the new switch port
- A database maintains the VLAN groups and policies as well as polls the switches to determine if any changes have occurred in the VLANs

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- Changes to the VLANs can be made immediately or staged for later implementation and activation
- Runs on most common platforms such as Microsoft Windows 95, Windows NT, Sun Solaris, HP-UX, and AIX

Nways RouteMonitor V1

Nways RouteMonitor Manager provides another method for network managers to oversee their 8273 network through:

- Statistics as well as alarm and event monitoring.
- It allows the user to view statistical data from each switch at the virtual LAN level, the switch level, the module level and the port level.
- Reports provided in a variety of graphics displays, including history line graph, pie charts, bar charts, bar graphs and view meters.
- Event and alarm thresholds can be set at the same level that can be set for statistical data.
- Traps can be monitored and forwarded to other management stations or network management applications, such as HP OpenView. These traps can be sent via e-mail to the network manager's console.

Nways RouteDirector

Nways RouteDirector is very similar in appearance and function to RouteTracker, but instead of configuring and managing VLANs, RouteDirector allows the user to configure and monitor ATM connections. It draws a logical network map of an organization's ATM network using a GUI. Using a unique tree hierarchy, the RouteDirector provides users with an understanding of the physical and logical structure of the network. This gives network administrators a clear and thorough view of their networks. RouteDirector provides two comprehensive network views that allow administrators to sort and view all the elements in their networks. The tree hierarchy provides a listing of enterprise-wide elements, including:

- Interfaces by type (ATM, Ethernet, Fast Ethernet, FDDI, Frame Relay and Token-Ring)
- ATM, PVC, and SVC connections
- Configured switch services such as bridging, routing, LAN Emulation services and trunking
- A detailed view of physical switches, modules and port

The network map displays physical switch interconnectivity with media color-coding, along with device-specific elements such as ATM, PVC, and SVC connections, services and physical modules and ports. RouteDirector is available for Windows 95 and Windows NT operating system.

Management Software

Management Software	Operating System
Nways RouteSwitch Network Manager V2.1	Sun Solaris, SunOS, HP-UX, AIX, Windows 95, Windows NT, Windows 3.1
Nways RouteSwitch Network Manger V3.0	Sun Solaris, HP-UX, AIX, Windows 95, Windows NT
Nways RouteTracker Manager V2.1	Sun Solaris, HP-UX, AIX, Windows 95, Windows NT
Nways RouteTracker Manager V3.0	Sun Solaris, HP-UX, AIX, Windows 95, Windows NT
Nways RouteMonitorManager V3.0	Windows 95, Windows NT
Nways RouteDirector Manager V3.0	Windows 95, Windows NT

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8274 Products and Options

Description
8274 Model 500 5 slot, 960 Mbps backplane
8274 Model 513 5 slot, 13.2 Gbps backplane
8274 Model 900 9 slot, 960 Mbps backplane
8274 Model 913 9 slot, 13.2 Gbps backplane
10 Mb Ethernet Switching Modules
ESM-C-12 12 port 10BASE-T (1024 MACs)
ESM-C-12-C 12 port 10BASE-T (2048 MACs)
ESM-T-12 12 port 10BASE-T Telco (1024 MACs)
ESM-T-12-C 12 port 10BASE-T Telco (2048 MACs)
ESM-F-8 8 port 10BASE-FL (1024 MACs)
ESM-F-8-C 8 port 10BASE-FL (2048 MACs)
Universal Switching Modules
ESM-U-6 6 slot Universal Adapter Board (1024 MACs)
ESM-U-6-C 6 slot Universal Adapter Board (2048 MACs)
ESM-AB-AT 1 port each, 10BASE-T/AUI
ESM-AB-FL 1 port 10BASE-FL (ST Connector)
ESM-AB-FL-S 1port 10BASE-FL (ST Connector)
ESM-AB-T 1port 10BASE-T
ESM-AB-B 1port 10BASE2
100 Mb Ethernet Switching Modules
ESM-100C-4 4 port 100BASE-TX (1024 MACs)
ESM-100C-4-C 4 port 100BASE-TX (2048 MACs)
ESM-100C-8 8 port 100BASE-TX (1024 MACs)
ESM-100C-8-C 8 port 100BASE-TX (2048 MACs)
ATM Switching Modules
ASM-155FM-1 1 port Multimode Fiber (500KB SRAM)
ASM-155FM-1C 1 port Multimode Fiber (2048 MACs)
ASM-155FM-1E 1 port Multimode Fiber (2MB SRAM)
ASM-155FM-1EC 1 port Multimode Fiber (2MB SRAM, 2048 MACs)
ASM-155FM-2 2 port Multimode Fiber (500KB SRAM)
ASM-155FM-2C 2 port Multimode Fiber (2048 MACs)
ASM-155FM-2E 2 port Multimode Fiber (2MB SRAM)
ASM-155FM-2EC 2 port Multimode Fiber (2MB SRAM, 2048 MACs)
ASM-155FS-1 1 port Single Mode Fiber (500KB SRAM)
ASM-155FS-1C 1 port Single Mode Fiber (2048 MACs)
ASM-155FS-1E 1 port Single Mode Fiber (2MB SRAM)
ASM-155FS-1EC 1 port Single Mode Fiber (2MB SRAM, 2048 MACs)
ASM-155FS-2 2 port Single Mode Fiber (500KB SRAM)
ASM-155FS-2C 2 port Single Mode Fiber (2048 MACs)
ASM-155FS-2E 2 port Single Mode Fiber (2MB SRAM)
ASM-155FS-2E-C 2 port Single Mode Fiber (2MB SRAM, 2048 MACs)
ASM-155C-1 Copper, 1 port (500KB SRAM)
ASM-155C-1C Copper, 1 port (2048 MACs)
ASM-155C-1E Copper, 1 port (2MB SRAM)
ASM-155C-1EC Copper, 1 port (2MB SRAM, 2048 MACs)

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Description
Token-Ring Switching Modules
TSM-CD-6, 6 port TR RJ-45 (1024 MACs)
TSM-CD-6c, 6 port TR RJ-45 (2048 MACs)
TSM-F-6, 6 port, TR Fiber (ST) (1024 MACs)
TSM-F-6c, 6 port, TR Fiber (ST) (2048 MACs)
FDDI/CDDI Switching Modules
FSM-M-1 DAS, 1 port FDDI Multimode Fiber (1024 MACs)
FSM-M-1C DAS, 1 port FDDI Multimode Fiber (2048 MACs)
FSM-M-2 DAS, 2 port FDDI Multimode Fiber (1024 MACs)
FSM-M-2C DAS, 2 port FDDI Multimode Fiber (2048 MACs)
FSM-C-4 RJ-45, 4 port CDDI (1024 MACs)
FSM-C-4C RJ-45, 4 port CDDI (2048 MACs)
FSM-C-8 RJ-45, 8 port CDDI (1024 MACs)
FSM-C-8C RJ-45, 8 port CDDI (2048 MACs)
FSM-M-C 1 port DAS, 4 port FDDI (1024 MACs)
FSM-M-CC 1 port DAS, 4 port FDDI (2048 MACs)
FSM-S-1 1 port DAS Single Mode Fiber (1024 MACs)
FSM-S-1C 1 port DAS Single Mode Fiber (2048 MACs)
FSM-S-2 2 port DAS Single Mode Fiber (1024 MACs)
FSM-S-2C 2 port DAS Single Mode Fiber (2048 MACs)
Management Processor Modules (MPM)
MPM-II, 8 MB (For models 500, 548, 900)
MPM-II, 16MB proc (For models 500, 513, 548, 900, 913)
MPM upgrade to 16MB (For models 500, 548, 900)
Memory and Flash Upgrades
2MB flash upgrade (For models 500, 513, 900, 913)
1KB CAM upgrade (For models 500, 513, 900, 913)
Optional Power Supplies
8274-PS5 (150W for model 500)
8274-PS5-250 (250W for models 500 and 513)
8274-PS9 (350W for model 900)
8274-PS9-500 (500W for model 913)
Accessories
8274-5-Wall (Wall mount bracket for models 500, 513, 548)
8274-9-Wall (Wall mount bracket for models 900, 913)
8274-BLNK (Blank panel for all models)
8274-5-CAB (Cable organizer for models 500, 513, 548)
8274-9-CAB (Cable organizer for models 900, 913)
Management Software
Nways Route Switch Network Mgr. V2.1 Sun Solaris 1/4 inch tape (5697-B67)
Nways Route Switch Network Mgr. V2.1 Sun OS 1/4 inch tape (5697-B67)
Nways Route Switch Network Mgr. V2.1 HP-UX 4 mm tape (5697-B67)
Nways Route Switch Network Mgr. V2.1 AIX 8 mm tape (5697-B67)
Nways Route Switch Network Mgr. V2.1 Win 95 & NT diskette (5697-B67)
Nways Route Switch Network Mgr. V2.1 Win 3.1 diskette (5697-B67)
Nways Route Switch Network Manager Software User's Guide
Nways Route Tracker Mgr. V2.1 Sun Solaris 1/4 inch tape (5697-B68)
Nways Route Tracker Mgr. V2.1 AIX 8 mm tape (5697-B68)
Nways Route Tracker Mgr. V2.1 HP-UX 4 mm tape (5697-B68)
Nways Route Tracker Mgr. V2.1 Windows 95 & NT diskette (5697-B68)
Nways Route Tracker Manager User's Guide

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Target Market

The 8274 provides best of breed solutions for customers requiring switching to the desktop, workgroup switching or backbone switching. The common chassis integrates switching for any media: Ethernet, Fast Ethernet, Token-Ring, FDDI, CDDI or ATM.

Overall cost of network ownership is dramatically reduced with the 8274. Customers requiring switching for multiple media types (for example, Ethernet, Fast Ethernet and Token-Ring) in the same chassis no longer need to purchase expensive routers to translate the different media.

With the integrated routing for IP and IPX traffic, customers will no longer need to enhance or make forklift upgrades to their existing routers. The 8274 routing capabilities will easily communicate with existing routers over common routing protocols, like OSPF or RIP.

In addition to reducing or eliminating router upgrades, the 8274 reduces network administration efforts. Customers need only manage the 8274's intelligent switching fabric, and not suffer the additional hassle of managing a router infrastructure.

The best VLAN implementation in the industry means customer mobility is simplified. VERY versatile policies are defined using the RouteTracker software. These policies for VLAN membership are then loaded to all 8274s (and 8273s) in the customer network. When an end user moves across the campus, the policies move with them!

The 8274 provides investment protection to customers by supporting any media type today. If a customer is interested in ATM backbones in their future, but only able to migrate to a Fast Ethernet backbone TODAY, the 8274 is a perfect solution. It provides the Fast Ethernet backbone today. When the customer is ready to migrate to ATM, an addition of an ATM blade will complete the migration. Hassle free migration when the customer is ready, means investment protection.

Sales Tools

The following sales tools are available for the IBM 8274

- *IBM 8274 Nways LAN RouteSwitch (spec sheet)* G224-4525-00

Information about the IBM 8274 is available on the Internet World Wide Web server at:

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

Information about the IBM 8274 is available from the IBM fax-back system:

- IBM PCC FAX (800-IBM-3395,
  product spec sheet document #10043)

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Competition The following tables provide information on how to best position the IBM Nways 8274 LAN RouteSwitch against Cisco.

	Strengths	Weaknesses	Selling Against
Cisco Catalyst 5000	• 5 slot chassis; one slot used for the supervisor engine • 1.2 Gbps passive backplane; frame based • store-and-forward • 16,000 MAC addresses • redundant power • 10/100 autosensing module • good port density and pricing for switched 10BASE-T	• no Token-Ring, Frame Relay • no redundant supervisor engine (single point of failure) • VLAN's port-based only; each port can belong to only a single VLAN • 256 VLAN's/switch; 1024 VLAN's for entire switched network • depends on external routers for multicast registration and broadcast control • expensive FDDI and ATM ports • potential blocking backplane limitation • to be replaced by Catalyst 5500 in `97	• stress high port densities and more options • stress higher capacity backplane and redundancy • no single point of failure • stress more robust VLAN capability, policy-based VLAN's, multiple VLAN membership • flexible, easy migration path

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	Strengths	Weaknesses	Selling Against
Cisco LightStream 1010	• 5 slot chassis; one slot for ATM switch processor (ASP) • CAM (carrier module, 4 per slot) • PAM (port module, 2 per slot) • 5 Gbps backplane, cell based • UNI 3.0 (3.1 soon), ILMI, PNNI Phase 1, IISP • 622M ATM support	• ATM only switch; no TR, EN, FDDI, Frame Relay • no ATM 25 module • no redundant ASP (single point of failure) • no integrated routing; requires external router for LES/BUS • no integrated policy-based VLAN manager or broadcast manager	• supports both LAN and ATM • stress Token-Ring, Ethernet, CDDI/FDDI, Frame Relay connectivity • stress high port densities and more options • stress higher capacity backplane and redundancy • no single point of failure • stress dynamic buffer management to avoid cell loss and maximize throughput • stress more robust VLAN capability, policy-based VLANs, multiple VLAN membership • flexible, easy migration path

	Strengths	Weaknesses	Selling Against
Bay Centillion 100	• 6 slot chassis • redundant, hot-swap power and switching modules • 3.2 Gbps backplane • Master Control Processor (MCP) single switching supervisor • internal ATM switching, 1.2 Gbps performance, LES/BUS, SAR ASIC on each ATM module, balanced traffic load sharing • flexible Token-Ring autosense	• no CDDI/FDDI ports, Frame Relay or ATM 25 ports • no RMON • MCP single point of failure • no internal routing • only port-based VLANs; requires router to connect groups • forced frame-to-cell translation for all backplane traffic • no Ethernet to Token-Ring translation • TR MCP does not support LANE	• stress port densities and more connectivity options • stress higher capacity backplane • no single point of failure • stress dynamic buffer management to avoid cell loss and maximize throughput • stress more robust VLAN capability, policy-based Vlans, multiple VLAN membership • flexible, easy migration path

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	Strengths	Weaknesses	Selling Against
3Com LANplex 6000	• 4 or 12 slot • requires one management module • redundant power • hot-swappable switch modules • store-and-forward • high Ethernet port density • IP, IPX, IP Multicast routing • RMON (Ethernet 4 groups), optional roving • TR module supports source-route, transparent, and source-route transparent bridging	• no ATM connectivity • shared backplane (3 FDDI rings), blocking, non-scaling, not interconnected • performance limitations across backplane due to dual FDDI translation • no Ethernet to Token-Ring translation • only port-based VLANs; 384 VLANs for entire switched network	• stress more connectivity options • stress ATM connectivity and migration path • no single point of failure • stress more robust VLAN capability, policy-based VLANs, multiple VLAN membership

	Strengths	Weaknesses	Selling Against
3Com CELLplex 7000	• 4 slot chassis • 2.5 Gbps backplane; cell based (7000 HD has 5.0 Gbps backplane; available in `97) • redundant power and switching engine • cut-through and store-and-forward • ATM SVC (UNI 3.0, 3.1), LANE 1.0, IISP	• no Token-Ring or FDDI ports • no ATM 155M UTP • port-based VLANs; requires router to connect groups • only 16 VLANs/switch • only 48 Ethernet ports with 12 ATM ports • no RMON • no integrated policy-based VLAN manager or broadcast manager • no redundant LES/BUS • no CBR or VBR support • small cell buffers and low call set-up rate • single processor handles both switching and LES/BUS functions	• stress high port densities and more options • stress higher capacity backplane, redundancy • no single point of failure • stress more robust VLAN capability, policy-based VLANs multiple VLAN membership • stress dynamic buffer management to avoid cell loss and maximize throughput

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Key Selling Points

When selling the IBM 8274 Nways LAN RouteSwitch, the following points should be emphasized:

- Support for any-to-any connectivity
- Built in any-to-any translation -- no need for expensive external router
- Built in IP and IPX routing -- no need for expensive external router
- BEST policy-based VLAN implementation in the industry provides
- dramatic network simplification
- reduction to cost of network administration
- Redundant power supplies, hot-pluggable modules
- RMON support
- Hybrid switch - wire speed switching with layer 3 capabilities where the customer needs them
- IBM customer support and service
- IBM's complete end-to-end switching solutions

Customers must buy into VLANs, or at least Switch/Routing (SVN), otherwise the switch will not be viewed favorably in a price battle.

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Appendix 1

Switched Virtual Networking

Market Information

Network Computing

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

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

Existing Networks

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

- **Host-based networks** are characterized by the traditional corporate computing structure built around the use of large centralized processors. Traditionally, they use connection-oriented protocols and can, therefore, guarantee some service level for their applications. Their traffic patterns are relatively easy to predict and the networks are efficient and manageable. This comes at a price — a lack of flexibility.

- **Router-based networks** emerged to support the growing use of personal productivity tools and the resultant need to share the data they created. Router-based networks typically use connectionless protocols (e.g., TCP/IP). In a connectionless network, each packet is routed to its destination based on the conditions of the traffic at the time. Consequently, it is a very flexible environment which can adapt very easily to the changes in the network. In addition, the traffic patterns of the router-based network are not easily predictable. All of this makes the management of these networks a real challenge.

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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

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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

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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 and WAN backbone

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

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

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

Network Management

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

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

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IBM's SVN Implementation

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

Current products that support SVN are:

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

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

Networking BroadBand Services (NBBS)
IBM 2220 Nways BroadBand Switch
IBM 8260 Nways Multiprotocol Switching Hub Models A10, A17 and G17

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

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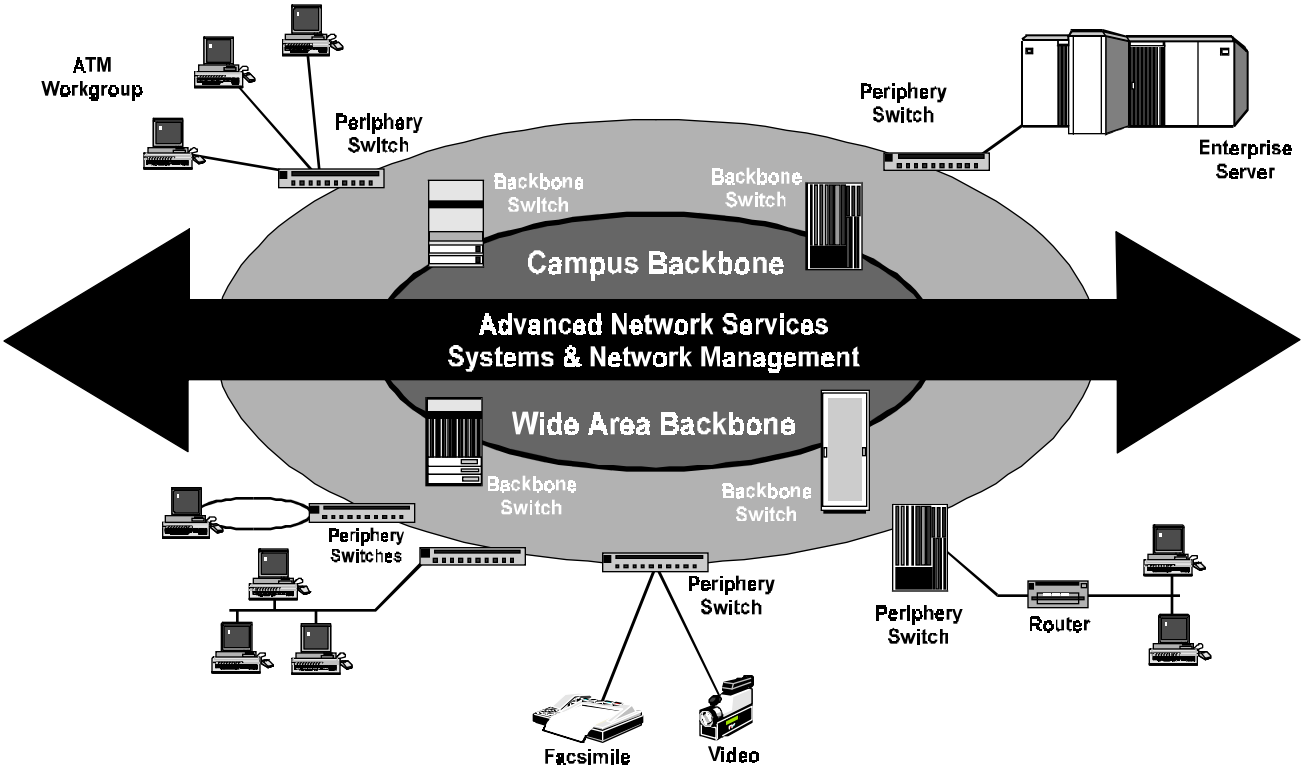

IBM's Switched Virtual Networking

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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
- ATM Sales Guide

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Glossary

Adaptive Cut-Through — Mode of operation for the IBM 8271 and 8272 switches in which they will automatically alternate between cut-through switching and store-and-forward switching depending on user-configurable, per port, error rate thresholds.

ATM — Asynchronous Transfer Mode. An international standard for cell relay that defines a fixed length 53-byte packet or cell. Common network speeds range from 25 Mbps to 622 Mbps.

AUI — Also known as thickwire or 10BASE5. This type of Ethernet connector has a 15 pin D shell connector.

BNC — A commonly-used connector for coaxial cable.

CDDI — Copper Distributed Data Interface. A proposed ANSI standard that defines a dual counter-rotating ring which operates at a rate of 100 Mbps over Category 5 copper wire.

CMIP — Common Management Information Protocol. Network management protocol from ISO.

Cut-Through — Mode of operation for LAN switches in which frames are forwarded immediately upon detection of a valid address, without waiting for the end of the frame. Reduces delay without increasing the likelihood of forwarding a bad packet.

EtherPipe — A capability of the IBM 8271 Nways Ethernet LAN Switch Model 108 that allows two 8271s to communicate by connecting 4 full-duplex Ethernet ports.

EtherProbe — A monitoring port on the IBM 8271 Nways Ethernet LAN Switch Model 108.

Full-Duplex — Full-duplex means that stations on a LAN (equipped with full-duplex adapters) can transmit and receive at the same time doubling their bandwidth potential.

FDDI — Fiber Distributed Data Interface. An ANSI standard that defines a dual counter-rotating ring which operates at a rate of 100 Mbps over fiber.

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.

Shared LAN — The total bandwidth is shared among all nodes attached to the LAN segment.

SNMP — Simple Network Management Protocol. Widely-used network monitoring and control protocol. Data is passed from SNMP agents which are hardware and/or software processes reporting activity in each network device to the workstation console used to oversee the network. The agents return information contained in a MIB.

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Spanning Tree Protocol	A protocol that inactivates links between networks so that information packets are channeled along one route and will not search endlessly for a destination.
Source-Route Bridging	A new IBM technology that provides an internal bridge function in the switch. Each port may have a separate ring number. External bridges can be replaced.
Source-Route Switching	A new IBM technology that takes advantage of the inherent benefits of source-routing without forcing the customer to configure ring and bridge numbers manually for every port on the Token-Ring switch. A source-routing switch does not require any ring and bridge numbering.
Store-and-Forward	A mode of operation for a LAN switch in which it completely checks every frame before forwarding, so customers can use the switch to isolate erroneous frames generated on one segment so they do not traverse the switch onto another segment.
STP	Shielded Twisted Pair. Telephone wire wrapped in a metal sheath to eliminate external interference.
Switched LAN	A dedicated connection for each user whereby the full bandwidth is available to the workstation.
Telnet	A TCP/IP protocol that governs the exchange of character-based terminal data.
TokenPipe	A capability of the IBM 8272 Nways Token-Ring LAN Switch that allows two 8272s to communicate by connecting up to four full-duplex Token-Ring ports.
TokenProbe	A monitoring port on the IBM 8272 Nways Token-Ring LAN Switch.
UTP	Unshielded Twisted Pair. A cable medium with one or more pairs of twisted insulated copper conductors bound in a single plastic sheath.
VLAN	Virtual Local Area Network. A logical association of switch ports based upon a set of rules or criteria such as MAC addresses, protocols, network address, or multicast address. This permits resegmentation of the LAN without requiring physical rearrangement.
WAN	Wide Area Network.
10BASE-FL	This type of Ethernet uses a bus topology with fiber optic cable.
10BASE-T	This type of Ethernet network uses a star topology with two pairs of unshielded twisted pair cable. It is used for a single, point-to-point connection between a computer and a hub or switch.

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10BASE2 This type of Ethernet uses a bus topology with a thin coaxial cable. It is generally used for small networks, departmental networks or wiring a number of nodes together in the same room.

10BASE5 This type of Ethernet uses the bus topology with thick coaxial cable.

100BASE-FX Fast Ethernet running at 100 Mbps over one pair of multimode fiber.

100BASE-TX This type of Ethernet network transmits at 100 Mbps over 2-pairs of category 5 UTP cable.

100BASE-T4 (Fast Ethernet). This type of Ethernet network transmits at 100 Mbps over 4-pairs of category 3 UTP cable.

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