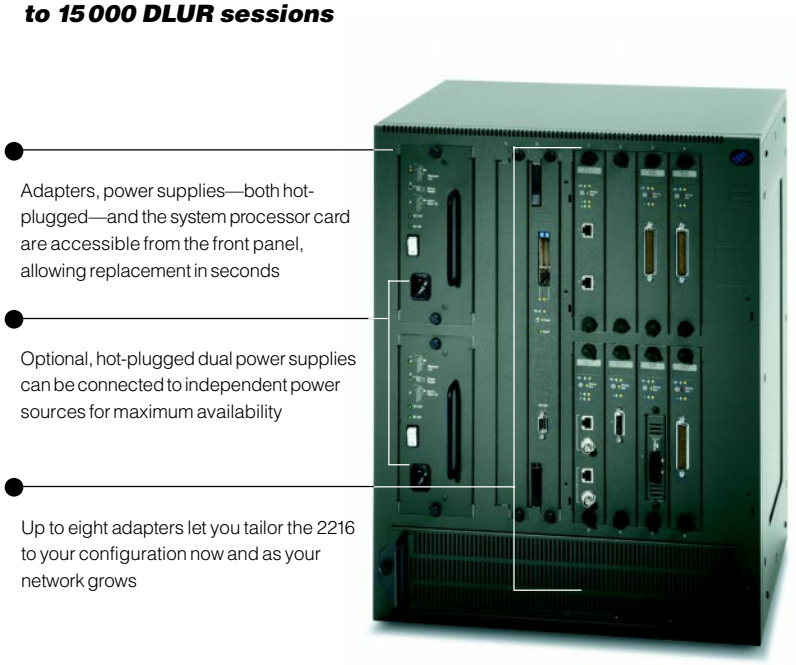
IBM 2216 Nways Multiaccess Connector Model 400

- ***Leader in IP and SNA integration***
- ***ESCON® and parallel channel support for server access to System/370™ and System/390® hosts***
- ***TCP/IP passthru provides function similar to 3172 IP gateway***
- ***Enhanced TN3270E server support for over 15000 sessions***
- ***Enhanced Network Dispatcher for load-balanced traffic to IP Web servers, file transfer, mail news, Telnet and TN3270 servers***
- ***Web Server cache for high-speed access to Web pages***
- ***Virtual private network security features for secure exchanges over insecure networks***
- ***Latest IP enhancements include IPv6, RSVP, and policy-based routing with Type of Service (TOS) bits***
- ***Boot Server support for network computers***
- ***Virtual Router Redundancy Protocol support for backup and redundant router gateways***
- ***Data Link Switching to support SNA protocol traffic over IP backbones***
- ***Enterprise Extender technologies for APPN/HPR quality and dependability for SNA traffic over IP backbones***
- ***Full APPN® support includes up to 15000 DLUR sessions***



IBM 2216 Nways Multiaccess Connector

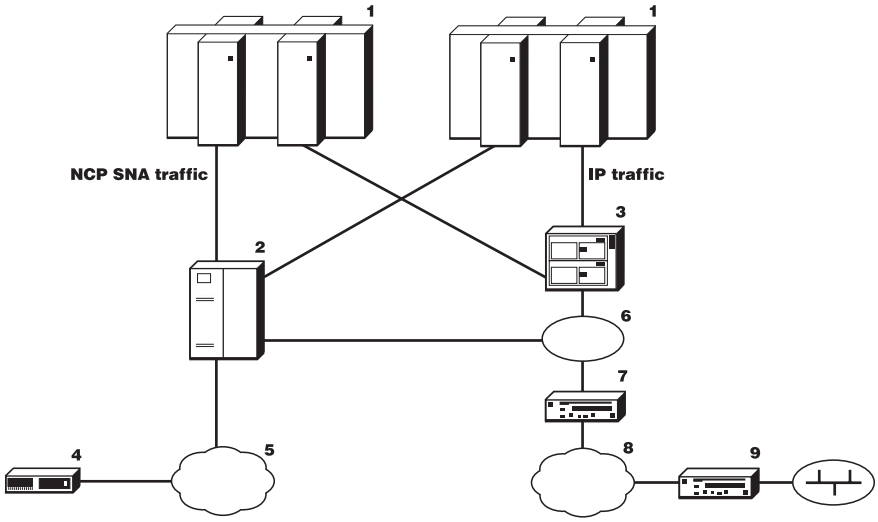
Overburdened networks can (and sometimes do) fail, preventing mission-critical information from reaching field organizations, product development teams, customer service personnel, suppliers, and, most important, customers. To prevent catastrophic network outages and fully exploit the enhanced access to the internal information that intranets provide, deploy the IBM 2216 Nways® Multiaccess Connector Model 400.

Positioning and Benefits

Problem: An enterprise with two separate networks for SNA and TCP/IP wants to consolidate the networks for host access.

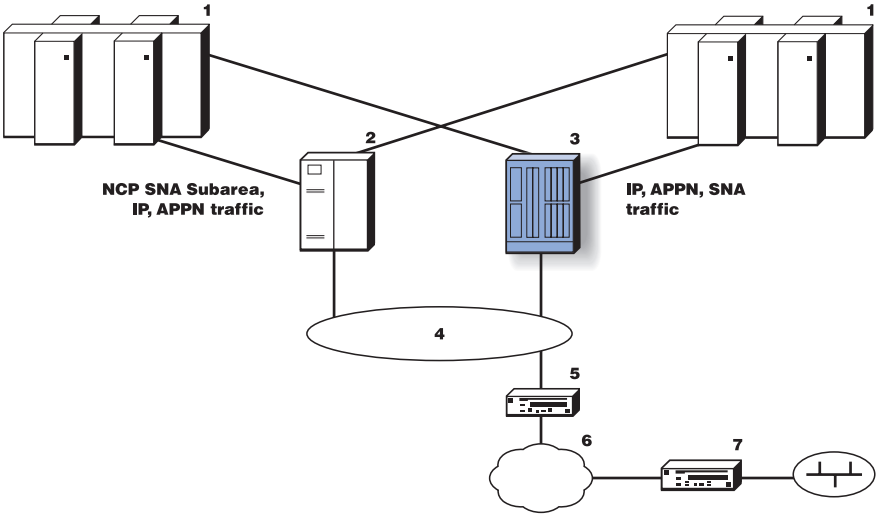
Environment: This customer has two S/390® enterprise servers. They interconnect to the network through an IBM 3745 Communication Controller for SNA and 3172 for TCP/IP using a router network to transport IP, and some SNA traffic using DLSw. The network protocols are SNA and IP. Although the customer relies on SNA for mission-critical data, IP traffic is growing rapidly. The customer wants to consolidate the separate SNA and IP networks into a single network. IBM provides two alternatives: the 3746 Expansion Unit with Multiaccess Enclosure (MAE) or the 2216.

1. *IBM S/390*
2. *IBM 3745*
3. *3172*
4. *Remote SNA Controller*
5. *SNA*
6. *LAN*
7. *Router*
8. *IP*
9. *Remote Branch Router*



Solution: The customer can combine these two networks using either the 2216 or the 3746 MAE. The decision between the two products is a function of the size of the networks, and of the number of connections.

1. *IBM S/390*
2. *IBM 3745*
3. *2216*
4. *LAN*
5. *Router*
6. *IP or APPN*
7. *Branch Routers*

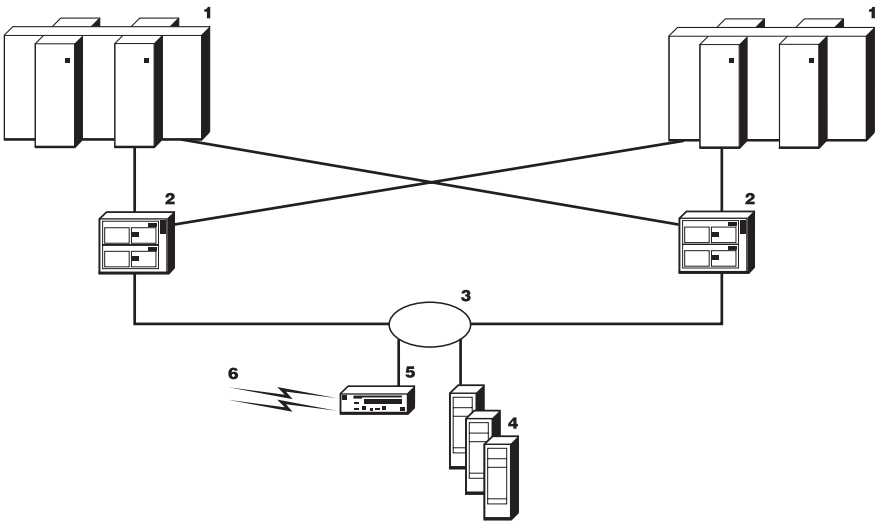


Benefits

- Higher channel throughput—best in the industry
- Significant cost-savings over the Cisco 7513 in both the 3746 MAE and the 2216
- Simplified network management
- Lower training costs with one platform
- Lower maintenance costs

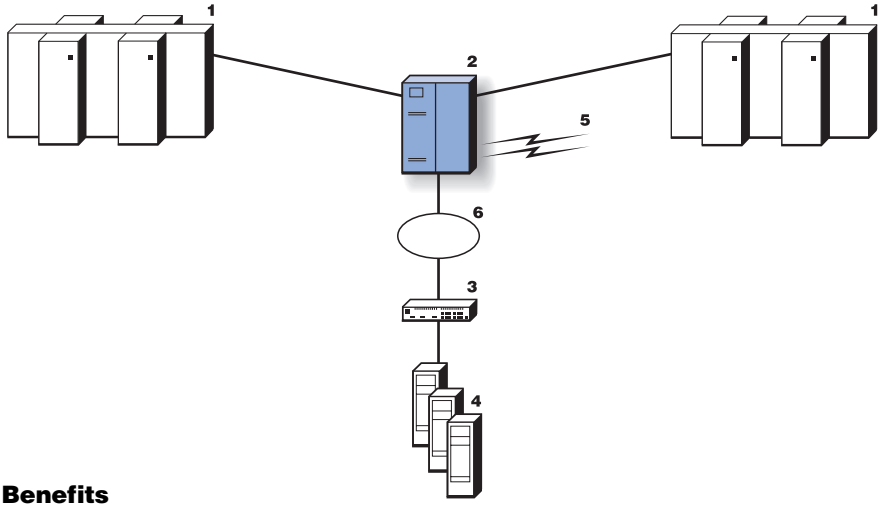
Problem: The customer has two enterprise servers with ESCON adapters connected to two 3172s. The customer is looking for higher gateway throughput as well as connection to higher speed campus.

Environment: The customer uses the 3172s to provide access to host TCP/IP applications from multiple branch offices that are connected via a router network. There are also several large PC file servers in the enterprise. These are backed up to the hosts on a nightly basis. The customer is looking for maximum channel throughput for these servers to be backed up more quickly.



1. *IBM S/390*
2. *IBM 3172*
3. *Backbone Token Rings*
4. *Servers*
5. *Router*
6. *To branch offices*

Solution: The customer replaces the two 3172s with one 2216 containing two ESCON adapters. This can provide the throughput of up to a pair of 3172s dependent on LAN media type and transaction sizes. The wide area connections are brought straight into the 2216. The PC servers are connected via dedicated Token-Ring segments to a LAN switch with ATM 155 upstream. Note that for a larger number of WAN links, bringing them into a separate 2216 might be appropriate.



1. *IBM S/390*
2. *IBM 2216*
3. *LAN switch*
4. *Servers*
5. *To branch offices*
6. *LAN*

Benefits

- Higher channel throughput
- Flexible connectivity
- Faster server access via switching and ATM

Product Overview

Demand the most from your network—its users do

At home as a scalable, dependable WAN concentrator or providing access to System/370 or System/390 hosts, the IBM 2216 Nways Multiaccess Connector Model 400 is a versatile addition to your network infrastructure. Use it for directing access to the company intranet or for concentrating access to the Internet for electronic commerce. No matter how you choose to deploy the 2216 Nways Multiaccess Connector, you can rely on advanced security features—including the ability to configure a virtual private network—to ensure that only authorized users are granted access.

With integrated Network Dispatcher, you can load-balance Web, file transfer, news and mail servers more effectively by supporting protocol advisors for HTTP, FTP, Network News Transfer Protocol (NNTP), Post Office Protocol (POP3), Simple Mail Transfer Protocol (SMTP) and Telnet. With the Network Dispatcher, the advisers query the servers and analyze the results to help determine the best distribution of incoming requests. Users always get the least- busy available server.

No matter where you install the 2216, you'll know that your networks will keep pace with future demands and also provide the dependability today's users require.

Deploy the highly rated, multiprotocol 2216

Optimize your network and address multiple network design challenges with the IBM 2216 Nways Multiaccess Connector Model 400. Rated more than twice as fast as the competition by the Tolly Group*, an independent testing lab, the 2216 delivers both Systems Network Architecture (SNA) and Transmission Control Protocol/Internet Protocol (TCP/IP) traffic to S/390 hosts with tremendous throughput. Whether deployed as a wide area network (WAN) concentrator or to provide S/370 or S/390 server access, the high-capacity 2216 fits naturally with IBM's campus switches, broadband switches, and branch office routers, presenting a new and exciting network-computing building block for a variety of network infrastructures.

A mid-priced solution engineered for S/390 and S/370 server access and concentrating multiple WAN remote locations into regional and data-center campus backbones, the 2216 can be tailored to meet a broad range of challenges. Its eight adapter slots are capable of ESCON® and parallel connections, WAN speeds of 9.6 Kbps to T1/E1/J1, High-Speed Serial Interface (HSSI) for T3/E3, 155-Mbps asynchronous transfer mode (ATM), 10- and 100-Mbps Ethernet, Token-Ring, Fiber Distributed Data Interface (FDDI), andIntegrated Services Digital Network (ISDN) Primary Rate Interface (PRI) network connections including support for channelized T1/E1/J1. And the 2216 also supports all common networking protocols.

ESCON channel for TCP/IP and SNA connectivity

The ESCON channel manages data movement between the 2216 and S/390 servers, making use of innovative technologies to transfer data across the channel independent of the 2216's processing load. The ESCON Channel Adapter offers up to 32 ESCON logical addresses (subchannels) per adapter for access to up to 16 hosts, when used with an ESCON Director, or access to up to 16 logical partitions (LPs) in a host capable of running the ESCON Multiple Image Facility (EMIF). It can be extended up to 3 km (1.86 miles) with optical fiber, using either the 9034 ESCON Converter or the 3044 Fiber Optic Channel Extender Link Model D02.

The 2216 Multiaccess Connector Model 400 will be enhanced in 1999, with additional Channel adapter capabilities:

- The ability to add a new LP or change an existing LP without disrupting the operation of other LPs.
- Support for up to 64 LPs per adapter.
- The ability to use the same logical CU address for multiple LPs, reducing system definition complexity.

With the ESCON Channel Adapter, the 2216 can be attached to the following hardware:

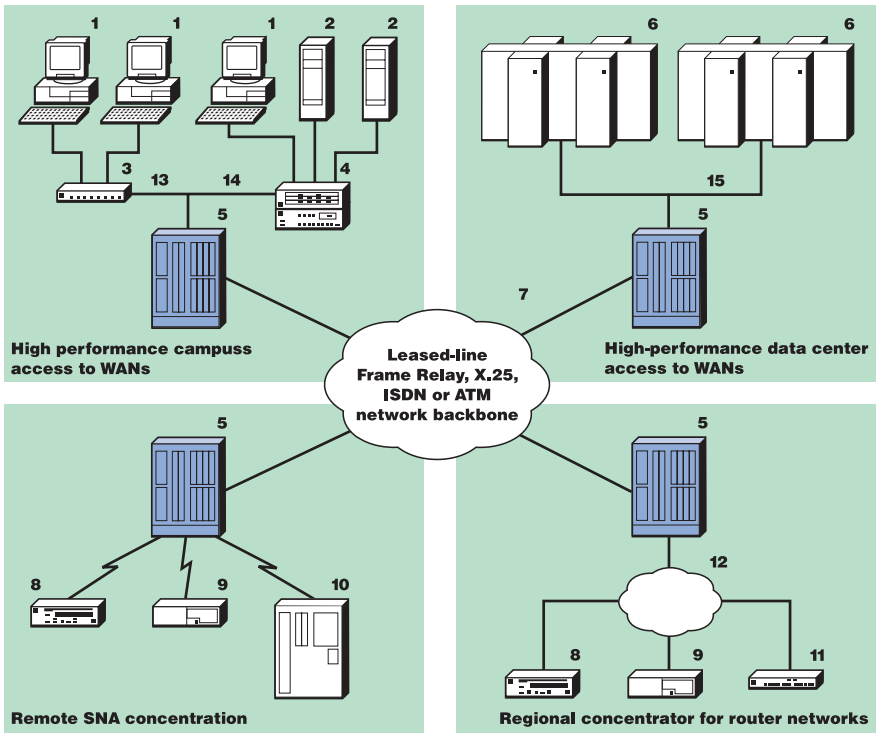
- ES/3090 Models 180J, 200J, 280J or other J-series models with System EC 227574 installed
- All models of the ES/9000 processors
- All ES/3090-9000T models
- All S/390 Parallel Transaction Servers
- All S/390 Parallel Enterprise Servers
- All S/390 Multiprise 2000 Servers

Parallel Channel Adapter for S/370 and S/390 connectivity

The 2216 Parallel Channel Adapter provides a great upgrade path for IBM 3172 users looking to boost capacity and add new, high-speed media attachments, technology upgrades, and more functions. It also includes IP Passthru support that enables the channel to bypass the IP routing code. This offers you a simplified configuration like the 3172 supports for easier migration when replacing the 3172s with the 2216s.

**Source: The Tolly Group, publication 7192, September 1997, www.tolly.com*

The versatile 2216 helps optimize your network in four key areas



1. *Mainframe access (S/390, S/370); Server load balancing and Web Server caching*
2. *2216 with IP, APPN, Enterprise Extender, DLSw and Network Dispatcher; or Server caching*
3. *Campus data center backbone (Token Ring, FasTR, 10-/100-Mbps Ethernet, ATM, Fiber Distributed Data Interface (FDDI))*
4. *Client servers*
5. *AS/400® system*
6. *Leased-line, Frame Relay, X.25 or ISDN network backbone*
7. *FDDI*
8. *Ethernet architecture*
9. *Token-Ring architecture*
10. *ATM architecture*
11. *3174*
12. *2210 BAN or DLSw*
13. *2218 (Frame Relay)*
14. *2216 with IP, APPN, Enterprise Extender, DLSw*

With the Parallel Channel Adapter installed, the 2216 can be connected to the following hardware:

- ES/3090™
- ES/9021
- ES/9121
- ES/9221
- ES/9370™
- 308x and 309x Processor series
- S/390 Parallel Transaction Server
- S/390 Parallel Enterprise Server™
- 3044 Fiber Optic Channel Extender Link, Models C02 and D02
- 9034 ESCON Converter Model 1
- Non-IBM hosts that support the OEMI interface standard
- Data transfer using Direct-Coupled Interlock (DCI) or at data-streaming speeds of 3.0 and 4.5 Mbps

Get high-speed System/390 and System/370 server access

For TCP/IP traffic, the 2216 uses LAN Channel Station (LCS) protocol. For SNA traffic, the 2216 channel uses Link Services Architecture (LSA) protocol for subarea SNA, Advanced Peer-to-Peer Networking (APPN and IBM High-Performance Routing protocol (HPR).

In addition, the 2216 channels support Multi-Path Channel+ (MPC+), also known as High-Performance Data Transfer (HPDT) MPC, for both VTAM® and TCP/IP high-performance data transfer. MPC+ support reduces S/390 VTAM cycles and storage requirements. HPDT MPC connections provide a more efficient transfer of data and decrease consumption of CPU cycles, leaving more processing power for other demands. Additional S/370 and S/390 support features include:

- Support for up to 10 000 link stations per SAP using the LSA channel protocol.
- Multicast support over the channel allowing the use of multicast IP addresses over the ESCON and Parallel Channel
- On-board processing to reduce main CPU workload for efficient data transfers with S/370 and S/390 hosts
- APPN and High-Performance Routing (HPR) networking with VTAM Version 4.4 for MVS/ESA™ or Communications Server for OS/390® Version 1.3 or higher
- HPDT UDP for applications using OS/390 UNIX® System Services UDP interface with OS/390 Version 2.4, or higher (ESCON only)
- Dependent LU Requester (DLUR) in APPN to provide connectivity between dependent downstream SNA devices and VTAM SNA applications
- Boundary Access Node (BAN) support for connectivity between downstream BAN Frame Relay Access Devices (FRADs) and VTAM SNA applications
- Data Link Switching (DLSw) Version 2 support for VTAM Version 3.4, or higher, SNA applications
- DLSw Version 2 for local (single 2216) conversion from SDLC to the channel and remote (using DLSw partners) connectivity to SNA devices on SDLC, LANs, and ATM Forum-compliant LANE.

  Devices accessing the host can be connected with leased lines, Frame Relay, ISDN, ATM, X.25 or LANs. The 2216 can accept any combination of up to four Parallel Channel and ESCON Adapters. Up to six Parallel Channel Adapters can be attached per parallel channel.

- APPN Extended Border Node (EBN) support for subdividing large APPN networks for improved manageability and performance; or to interconnect APPN networks
- APPN EBN Session Services Extensions (SSE) support to allow VTAM end nodes to establish CP-CP sessions across border node boundaries

ISDN and channelized connectivity

The 2216 Nways Multiaccess Connector can provide up to eight ISDN Primary Rate or channelized attachments by installing optional adapter cards. The 4-port PRI ISDN/Channelized T1/E/J1 mother card can be augmented with a 4-port daughter card (feature number 2251) to maximize available connections. In addition to PRI connections, the 2216 can also be configured as a channelized T1/E1/J1 interface to offer as many as 248 DS0 connections. These 2216 adapter cards can support a combination of PRI and DS0 connections. The IBM 2216 Nways Multiaccess Connector adapter cards provide the following features:

- Support for T1/J1 data transfer rates up to 1.544 Mbps; E1 support for 2.048 Mbps transfers
- T1/J1: Twenty-three 64-Kbps B-channels for data and one 64-Kbps D-channel for signaling for ISDN or twenty-four 64-Kbps DS0s when used as a channelized T1/J1
- E1: Thirty 64-Kbps B-channels and one 64-Kbps D-channel or up to thirty-one DS0s when used as a channelized E1
- Support for a combination of ISDN PRI interfaces and channelized interfaces to provide leased-line connectivity and dial backup on a single adapter

TN3270E connectivity between IP desktops and SNA servers

TN3270E support provides desktop users with access to SNA applications through the 2216. This allows network managers to take advantage of the growth in IP desktops and link them to SNA applications to maximize the efficiency of SNA-to-IP connections.

TN3270 improvements include:

- Up to 15 000 sessions with 512 MB of system memory
- LU pooling to balance the traffic, increase reliability, availability and improve scalability of the TN3270 LUs
- IP Address to LU name mapping that enables administrators to control client access to particular LUs or LU pools
- Self-defining Dependent LUs (SDDLU)/ Dynamically Defined Dependent LUs (DDDLU) that allows VTAM to create its own LU definitions
- Multiple TCP ports to support older clients

The 2216's preloaded code provides support for subarea SNA connections from TN3270E servers to SNA hosts along with improved management. Multiprotocol Access Services also supports IBM APPN/HPR technologies that significantly improve network reliability and data transmission rates. Management Information Base (MIB) capabilities for TN3270 servers–including Response Time Monitor (RTM) features–ensure that the 2216 remains an efficient network building block.

The 2216's TN3270E Server capacity can be incremented with the addition of the IBM Network Utility to the campus backbone. User connections will be balanced among the 2216 and Network Utility TN3270E Servers, providing users access to the least busy, available server.

New Web Server Cache capabilities

The 2216 has added a code image that allows it to function as a cache support of a Web server, especially S/390 Web servers. The Server cache provides high-speed access to Web pages while reducing the communications overhead on the server. With the new 233-MHz processor system card, the 2216 provides approximately 400 MB of memory cache for Web objects. The cache supports:

- Caching of static Web pages
- HTTP 1.0 and 1.1 servers and clients
- Flexible caching policies for the objects to be cached, object size, cache partitions and objects to include or exclude based on URL masks
- Up to 16 independent cache partitions in support of multiple server clusters
- Full TCP/IP support

  Load balancing of servers via Network Dispatcher for Web pages not found in the cache

  Active or passive backup cache for high availability

Take advantage of IBM reliability

The 2216 Multiaccess Connector is designed for maximum availability. With hot-plugged, load-sharing power supplies and current-limiting circuitry to prevent a single adapter failure from corrupting other adapters and the power supply, the 2216 is a network stalwart. Front panel access to the adapters, power supplies, and system card allow for quick replacement without removing the 2216 from a rack.

The 2216 maintains its configuration and operating history in nonvolatile storage to reduce offline diagnostics and servicing. Additionally, an integrated modem is available in most countries for remote diagnostics.

Each of the 2216's power supplies has its own power cord for connection to independent power sources; and its hot-plugged, multi-fan cooling system can prevent catastrophic network failures. An optional second power supply is available. Individually powered, hot-plugged adapters can be inserted or removed while the 2216 is operational and without rebooting the software.

Most adapters can be installed without taking the network down. This dynamic reconfiguration capability coupled with globally available on-site support and field replacement of failed components 24 hours a day, 7 days a week, will keep information flowing.

Use virtual private networks to prevent unauthorized network access

Multiprotocol Access Services features IP Security (IPSec) for authentication, encryption, and IP packet tunneling over insecure IP backbones–including the Internet–that pose security hazards. Using IPSec to secure IP connections over insecure networks can eliminate the need for leased lines between sites and allow the use of virtual private networks to reduce networking capital expenses.

A virtual private network can be deployed as an extension of your corporate intranet across a public network (the Internet or service provider networks) to create a secure connection through an encrypted "tunnel." With three broad applications, virtual private networks are proving to be powerful enterprise solutions.

- The first application is dedicated to the remote user who needs access to the corporate intranet using the Internet.
- The second application is for branch office connection to the central corporate intranet without leasing or installing Frame Relay, leased lines, X.25, or similar telecommunications connections.
- The third application is intended for corporate business partners or suppliers who need access to internal corporate data but are not privileged with a dedicated connection.

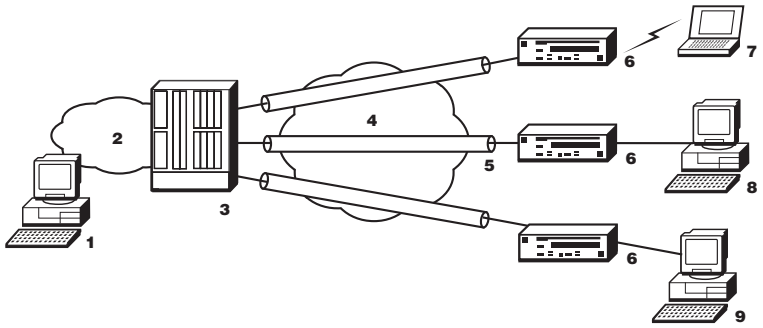
With these applications, virtual private networks use the Internet for data transfer through secure connections. Encryption is used for packet transmission, and hosts use firewall technologies to prevent unauthorized access. Most important, based upon research completed by Infonetics Research, Inc., virtual private networks can save 20 to 47% in WAN costs and can reduce remote access costs by as much as 60 to 80%.

Multiprotocol Access Services also provides Network Address Translation (NAT) to prevent unauthorized users from determining the IP address of any of the servers or nodes on your private network. And for additional security, Multiprotocol Access Services supports Layer 2 Tunneling Protocol (L2TP) for secure tunneling of multiprotocol data from remote users. The Layer 2 Tunneling Protocol has been enhanced so that the 2216 can initiate an outgoing call from the L2TP Access Concentrator (LAC), like the 2210 or 2212, when its traffic has been designated for a remote user. The code also allows external TACACS+ or RADIUS servers to authenticate, authorize, and account for logon requests either for operations access to the 2216 or for Point-to-Point Protocol (PPP) connections to ensure that potential users are authorized to access network resources.

Latest 2216 IP enhancements include:

- IPv6, the successor to the current Internet Protocol, IPv4
- RSVP to reserve network resources to achieve a desired quality of service for packet delivery.
- IP Precedence/TOS bits to classify, filter and route packets.
- IPv4 type of service (TOS) Precedence Setting/Filtering Support for APPN/HPR, SNA/DLSw and TN3270E servers to extend SNA priority queing over IPSec virtual private network connections.

Virtual private networks allow secure transfers using TCP/IP networks



1. *Enterprise workstation*
2. *Enterprise intranet*
3. *2216 Nways Multiaccess Connector*
4. *TCP/IP network*
5. *Encrypted transmission tunnels*
6. *2210 Nways Multiprotocol Router or 2212*
7. *Remote end user*
8. *Branch-office desktop user*
9. *Supplier/vendor desktop user*

A range of WAN support

The 2216 offers a range of WAN adapters to connect downstream 2210 multiprotocol routers, 2212 and 2218 FRADs.

The IBM 2216 Nways Multiaccess Connector WAN adapter cards provide the following features:

- Support for T1/J1 data transfer rates up to 1.544 Mbps; E1 support for 2.048 Mbps transfers
- T1/J1: Twenty-three 64-Kbps B-channels for data and one 64-Kbps D-channel for signaling for ISDN or twenty-four 64-Kbps DS0s when used as a channelized T1/J1
- E1: Thirty 64-Kbps B-channels and one 64-Kbps D-channel or up to thirty-one DS0s when used as a channelized E1
- Up to eight ISDN Primary Rate or channelized attachments by installing optional adapter daughter cards. In addition to PRI connections, the 2216 can also be configured as a channelized T1/E1/J1 interface to offer as many as 248 DS0 connections. These 2216 adapter cards can support a combination of PRI and DS0 connections.
- Frame Relay encryption
- Dial-backup support for up to 240 active ISDN B-channels with proper configuration and storage for 1000 remote sites
- Termination of hundreds of L2TP tunnels
- The software uses the award-winning Bandwidth Reservation System (BRS) to assign traffic priority and maintain throughput.

Nways 2216 attachments support diverse network architectures

IBM offers several attachments designed to make the 2216 your network's cornerstone. The 2216 Multiaccess Connector features the following adapters:

- 1-port Parallel Channel
- 1-port ESCON Channel
- 1-port ISDN PRI/Channelized T1/J1
- 1-port ISDN PRI/Channelized E1
- 4-port ISDN PRI/ Channelized T1/J1 (with an optional 4-port daughter card)
- 4-port ISDN PRI/Channelized E1 (with an optional 4-port daughter card)
- 8-port EIA 232/V.24
- 6-port V.35 or V.36
- 8-port X.21
- 1-port High-Performance ATM MMF
- 1-port High-Performance ATM SMF
- 2-port 10-Mbps Ethernet
- 2-port Token Ring
- 1-port 10-/100-Mbps Fast Ethernet
- 1-port FDDI
- 1-port HSSI

Flexible adapter configuration

Adapters can be positioned in any slot, with the following exceptions:

- Token-Ring or two-port Ethernet adapters in slots 3 or 7 require the adjacent slots (4 or 8) to be kept free. Token-Ring or two-port Ethernet adapters in slots 4 or 8 require the adjacent slots (3 or 7) to be kept free.
- Up to two ATM adapters can be used.
- Up to four one-port ISDN adapters can be used.
- Up to four channel adapters, any combination of ESCON or Parallel, can be used.
- Only one Multiport ISDN PRI/ Channelized T1/J1/E1 adapter can be used.
- Maximum of eight of any combination of ISDN PRI/Channelized interfaces can be used.

  Note: You can configure the 2216 with up to eight high-speed adapters (HSSI, FDDI and Fast Ethernet). However, you may not be able to achieve full media throughput concurrently on all the adapters. When planning the installation of such adapters, review system performance expectations with an IBM representative.

Easy to install and administer

Get the most from your 2216 with IBM Nways Multiprotocol Access Services code. To route information to its destination, your network relies on hardware and code to make sure that information is delivered efficiently. IBM Nways Multiprotocol Access Services was engineered to support the 2216's hardware and ensure optimum network operation, while offering reliable security and significantly improved network availability and scalability.

A typical 2216 hardware installation requires less than two hours. Following the hardware installation, the 2216 can be configured to a network with a local ASCII terminal or an ASCII terminal connected by modem. GUI configuration programs running on IBM AIX®, OS/2® or Microsoft® Windows® 95 or Windows NT® can then tailor the 2216 to meet enterprise-specific demands.

Once configured, a Simple Network Management Protocol (SNMP) manager can direct the 2216 over a TCP/IP network. IBM provides comprehensive, easy-to-use GUI software to support the 2216 Nways administration, management, problem analysis, and reporting capabilities. Current management applications include Nways Manager for AIX Version 1.2, Nways Workgroup Manager for Windows NT Version 1.1, and Nways Manager for HP-UX Version 1.2.

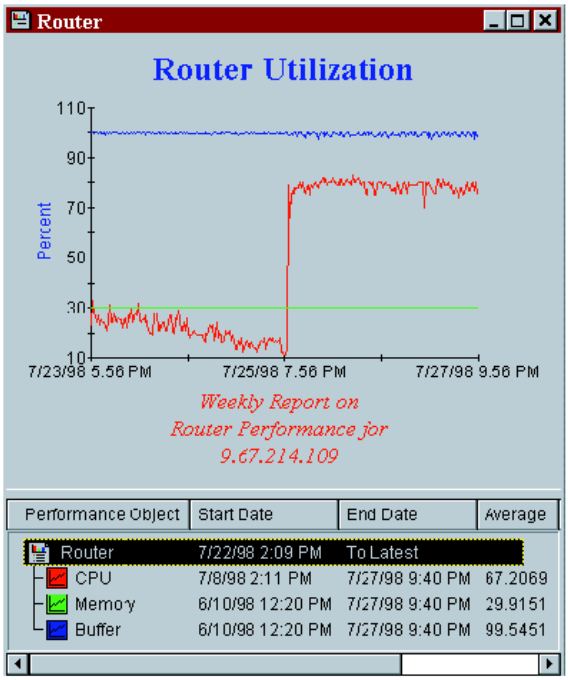
These manager products take advantage of Java™ technologies to deliver real-time network performance characteristics to network administrators when a Java-enabled browser is used to access management features.

You can monitor the 2216's CPU and memory either from the command-line interface or SNMP. This information can be used to determine network bottlenecks and daily load trends and also to map future capacity needs.

Increase network availability

Multiprotocol Access Services allows you the freedom to add or remove adapters without taking the 2216 down, diminishing the disruptions caused by configuration changes. Dynamic reconfiguration enhancements allow new adapters and protocols to be configured and activated without powering down or disabling the 2216.

Availability is augmented by the Virtual Router Redundancy Protocol (VRRP). VRRP specifies a standards-based protocol that provides backup among LAN-attached routers. This technology provides a higher availability default path without requiring dynamic routing or router discovery protocols on every end host..



Monitor the CPU and memory utilization of the 2216 using Java-based Nways management applications

Additional Multiprotocol Access Services features

Multiprotocol Access Services allows a single network infrastructure to carry all common protocols: IP, IPX, AppleTalk 2, Banyan VINES, DECnet IV, SNA, APPN, and DECnet V/OSI traffic can share common resources, helping to abate network expenses.

Multiprotocol Access Services offers innovative Enterprise Extender technology to bring APPN/HPR benefits to IP backbones. The code also features Network Dispatcher for high-capacity load balancing and high availability for IP client access to servers. Multiprotocol Access Services V3.2 and Network Dispatch can balance traffic to the TN3270E server in the same 2216 as well as extend TN3270E servers, like the IBM Network Utility.

Multiprotocol Access Services code supports multiple forms of data traffic over ATM links: ATM Forum-compliant LANE client, Classical IP, IPX bridging, and native APPN/HPR routing.

Multiprotocol Access Services can also integrate high-speed networking protocols, such as Fast Ethernet and FDDI for high-bandwidth, high-capacity access to campus backbones or servers from attached LANs, WANs, ATM networks, or ESCON and Parallel channels.

The 2216 with Multiprotocol Access Services also supports high-speed T3/E3 connections for connectivity between two sites using PPP or for cost-effective consolidation of many connections into a campus or data center.

A wide range of adapters tailors the 2216 to your configuration

2216 Nways Multiaccess Connector Specifications

Models	Model 400 with 8 adapter slots
System Card	• PowerPC 604E 200-MHz processor, and 64, 128 or 256 MB of RAM • Optional PowerPC 233-MHz processor supporting 64, 128, 256, 512 MB Note: Both processors offer comparable performance
Software	IBM Nways Multiprotocol Access Services V3.2 • Routing protocols: TCP/IP including IPSec IPX AppleTalk 2 Banyan VINES DECnet IV DECnet V/OSI • SNA Data Transport: APPN NN/HPR/ISR/DLUR/Branch Extender/Enterprise Extender DLSw (RFC 1795 and 2166) including NetBIOS support Frame Relay BAN LAN Network Manager support • Bridging: Source-route, Transparent, Source-route transparent, SR-TB translational, and IP bridging tunnel • ATM: ATM UNI 3.0/3.1 ATM Forum-compliant LANE Client (LEC) Classical IP and NHRP 1483 encapsulation for IP, IPX, and bridging Native HPR routing • Switched network access: V.25bis Worldwide ISDN PRI WAN reroute for Frame Relay, PPP or X.25 link failures WAN restoral for PPP Dial on demand • WAN data link controls: Frame Relay (RFC 1490) including BAN support, compression, encryption, congestion control, and SVCs PPP including compression and encryption, and multilink support L2TP X.25 including QLLC and X.25 over TCP/IP SDLC primary and secondary • IP and SNA over ESCON and Parallel channels including HPDT MPC (MPC+) • TN3270E server support for both SNA subarea and APPN (optimal image) • Network Dispatcher for balanced traffic among IP servers • Bandwidth Reservation System (BRS) over Frame Relay and PPP • Web server cache (optimal image)
Adapters	1- port Parallel Channel 1-port ESCON Channel 2-port Token Ring 2-port 10-Mbps Ethernet 1-port 10/100-Mbps Ethernet 8-port EIA 232/V.24 6-port V.35 or V.36 8-port X.21 1-port ISDN PRI/Channelized T1/J1 1-port ISDN PRI/Channelized E1 4-port ISDN PRI/Channelized T1/J1 (with an optional 4-port daughter card) 4-port ISDN PRI/Channelized E1 (with an optional 4-port daughter card) 1-port High Performance ATM MMF

IBM 2216 Multiaccess Connector (continued)	
Adapters, continued	1-port, High-Performance ATM SMF 1-port FDDI 1-port HSSI
Capacity	• Up to 8 slots available for communication adapters • Up to 2 power supplies
Management	• SNMP Version 1 with configurable MIB information access and support for standard and enterprise-specific MIBs including: WAN interfaces including ISDN LAN interfaces ATM interfaces Bridging and routing DLSw APPN TN3270E server and Response Time Monitor ATM Lan Emulation Client System specific (CPU usage, memory usage, thermal sensing) Enterprise specific • LAN Network Manager support • The following IBM Nways Managers, with 2216-specific support: Nways Manager for AIX Version 1.2 Nways Workgroup Manager for Windows NT Version1.1 Nways Manager for HP-UX Version1.2
Physical characteristics	Width: 440 mm (17.3 in.) without rack-mounting flange 480 mm (19 in.) with rack-mounting flange Depth: 358 mm (14.1 in.) Height: 572 mm (22.5 in.) (13 U) without rubber footpads 576.1 mm (22.7 in.) (13 U) with rubber footpads Weight: 31.6 kg (69.6 lb) base box with one power supply and power-supply filler plate 1 kg (2.2 lb) each adapter 0.1 kg (0.2 lb) each filler plate for unoccupied adapter slots 3.5 kg (7.8 lb) second power supply 0.2 kg (0.4 lb) power-supply filler plate
Operating environment	Temperature: 10° to 40°C (50° to 104°F) Relative humidity: 8% to 80% Maximum wet-bulb temperature: 27°C (80°F) Calorific value: 547 kcal/hr (2171 BTU/hr) Electrical power: 0.65 kVA Capacity of exhaust: 2.0 m^3/min Noise level: 50 dB Leakage current : 1.5 mA maximum per power supply Starting current: 70 A per power supply
Electrical requirements	Automatically senses line voltage within a nominal input range from 100 to 240 V ac at 50 to 60 Hz.
ISO 9000	The IBM 2216 Nways Multiaccess Connector was developed and is manufactured by IBM under a registered ISO 9000 quality management system.
Hardware warranty	The IBM 2216 Nways Multiaccess Connector is backed by a 1-year warranty. The hardware warranty and subsequent IBM Maintenance Agreements include IBM Onsite Repair. Installation code fixes and upgrades from the 2216 Web page is a customer responsibility.
Year 2000 ready	The IBM 2216 Nways Multiaccess Connector and Multiprotocol Access Services Version 3 are Year 2000 ready when used in accordance with their associated documentation and are capable of correctly processing, providing, and receiving data within and between the 20th and 21st centuries, provided that all other hardware, software, and/or firmware used with the products properly exchange accurate data with them.

Key Customer Benefits

- Provides local and remote users with easy access to mission-critical host applications, the corporate intranet, partner extranet and e-business Internet
- Deployable in wide area (WAN) concentrator and S/390 channel attach roles
- Fits naturally with campus switches, broad-band switches, and remote branch routers
- IP and SNA integration technologies include:
  - Data Link Switching transporting SNA traffic over IP
  - Enterprise Extender for non-disruptive SNA sessions over IP
  - TN3270E Server for IP access to SNA applications
  - VPNs for connection over insecure networks
  - Server caching for high-speed Web access

Supplementary Information

The following sales tools are available for the 2216:

- Specification sheet:
  IBM 2216 Multiaccess Connector Model 400, G224-4526-05
- Information on the 2216 is available at:
  www.networking.ibm.com
  www.networking.ibm.com/216/216prod.html