Today's building block for tomorrow's networks

IBM 2216 Nways Multiaccess Connector

Highlights

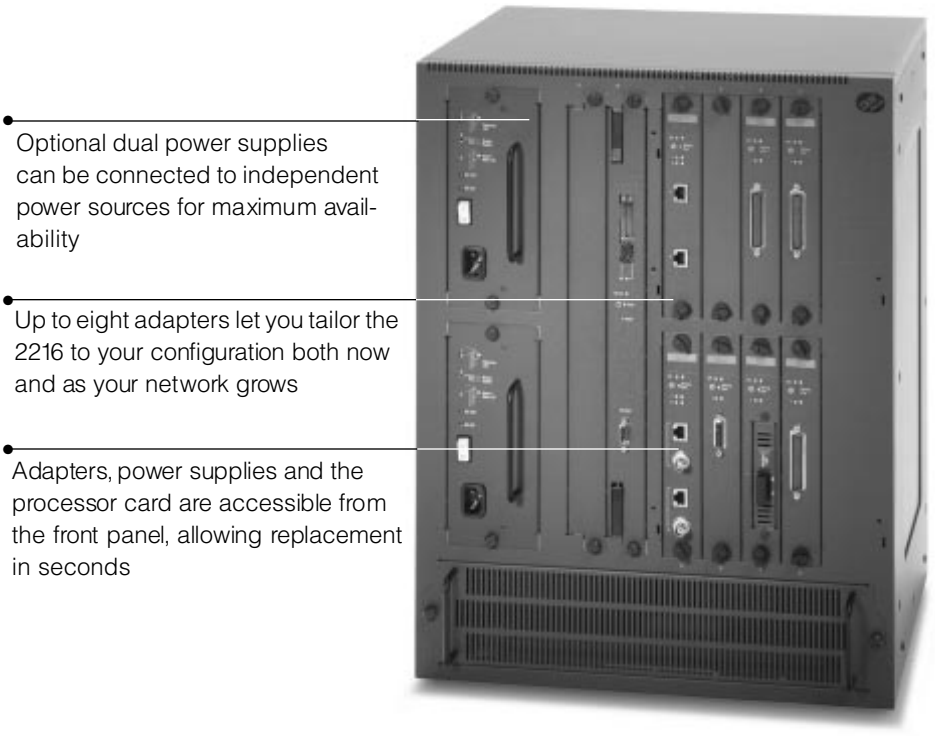
- ***Multiple-site interconnection***
- ***Flexible intranet and Internet connection***
- ***Branch-office traffic consolidation and network optimization using Frame-Relay connections from multiple FRADs or APPN® High Performance Routing (HPR) traffic from remote SNA controllers***
- ***New SNA technologies like Frame-Relay BAN, Data Link Switching (DLSw) or APPN HPR***
- ***Efficient SNA and IP network consolidation and support***
- ***Business-critical SNA and IP host-applications access over a high-performance ESCON® channel***

You need to get the most from your network

You are straining the capabilities of your networks to provide information to field organizations, product development teams, customer service personnel, your customers and suppliers. You want to exploit intranets to improve access to internal information. You want to use the Internet to transact business electronically with your customers and suppliers. You want to optimize your networks and maximize their potential.

Use the multifaceted, multiprotocol, multiaccess 2216

IBM offers network access solutions, based on the 2216 Nways™ Multiaccess Connector and Multiprotocol Access Services software, for regional router concentration, remote SNA concentration and high-performance campus and data-center access. With the 2216, IBM can meet your needs and help you get the most from your network.



IBM 2216 Nways Multiaccess Connector

Get started easily and quickly
The 2216 hardware takes less than 2 hours on average to install. Initial configuration to connect the 2216 to a network is then done using either a local ASCII terminal or an ASCII terminal connected via a modem. Subsequent configuration can be done using a graphical configuration program running on AIX®, OS/2® or Windows®.

Once configured, the 2216 can be managed by an SNMP manager. IBM provides comprehensive, easy-to-use graphical administration, management, problem analysis and reporting software as a component of its Nways Managers, which are available for AIX and HP OpenView.

Adapters, power supplies and the processor card are accessible from the front panel, allowing replacement in seconds without having to remove the 2216 from a rack or remove its covers. The 2216 maintains its configuration and operating history in nonvolatile storage, speeding problem identification and diagnostics. An integrated modem is available in most countries for remote diagnostics. These features are combined with globally available, on-site support and field replacement of failed components 24 hours a day, 7 days a week.

Get S/390® server access
An ESCON channel feature on the 2216 provides cost-effective access to host applications. Those applications can be either SNA-based (such as CICS® and DB2®) or TCP/IP-based (such as the World Wide Web and FTP). The devices accessing the host can be connected with any of a variety of different media, including leased lines, Frame Relay, ISDN, ATM, X.25 or LANs. ESCON channel support provides you with the following features:

- Access to SNA and TCP/IP host applications from LANs, WANs and ATM
- Industry-leading price-performance for IP and SNA host-application access, featuring Multi-Path Channel+ (MPC+) support for high-throughput APPN HPR to VTAM® 4.4 SNA applications
- APPN Intermediate Session Routing (ISR) to VTAM 3.4 (or higher) SNA applications



A wide range of adapters tailors the 2216 to your configuration

- APPN and IP routing over any other 2216 interface
- Dependent LU Requester (DLUR) in APPN to provide connectivity between dependent downstream SNA devices and VTAM SNA applications
- Boundary Access Node (BAN) support in APPN to provide connectivity between downstream BAN Frame-Relay access devices (FRADs) and VTAM SNA applications
- IP route selection based on static, RIP, OSPF and Border Gateway Protocol-4 (BGP-4) routes and filtering of IP frames coming from or destined for the channel
- DLSw support for VTAM 3.4 (or higher) SNA applications

  DLSw allows for local (single 2216) conversion from SDLC to the channel and remote (via DLSw partners) connectivity to SNA devices on SDLC, LANs and ATM Forum-compliant LAN Emulation (LANE).

- ESCON channel-to-LAN connectivity for Token-Ring, Ethernet and ATM LANE
- Support for up to 4 ESCON channels
- Support for 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 Logically Partitioned Mode (LPAR) hosts in a processor capable of running the ESCON Multiple Image Facility (EMIF)

Get the most from your network with the 2216
Take advantage of the 2216 to optimize your network by using it as a concentrator or high-capacity access point. The 2216 plays a vital role by interconnecting sites to exploit network computing. The 2216 provides WAN access, network optimization, device attachment and concentration. The 2216 fits naturally between IBM's workgroup and campus routers and switches and its high-capacity broadband switches as an exciting, new network-computing building block.

The 2216 uses the same routing, bridging and SNA capabilities proven in the popular, award-winning IBM 8210 Nways MSS Server and 2210 Nways Router. These functions, called *Multiprotocol Access Services*, include standards-based, interoperable support for routing and bridging, with security and re-routing, on leased and switched networks. Multiprotocol Access Services includes the following functions:

- All common routing protocols, including IP, IPX, AppleTalk 2, Banyan VINES, DECnet IV and DECnet V/OSI
- IP routing including ICMP, TCP, UDP, RIP, OSPF V2, BGP-4, static routes, Multicast Extensions to OSPF (MOSPF), ARP, InARP and IP Access Controls
- Advanced SNA Data Transport, with APPN Network Node (NN), HPR, DLUR, DLSw including NetBIOS support, BAN and support for LAN Network Manager protocols
- All common bridging techniques, including transparent, source-route, source-route transparent, source-route-to-transparent translational bridging and IP bridging tunnels

- The two primary forms of handling data traffic over ATM links, ATM Forum-compliant LANE client and Classical IP
- Frame Relay (RFC 1490 including BAN support), PPP, X.25 and SDLC (both primary and secondary)
- Access to SNA and TCP/IP host applications for LANs, WANs and ATM
- V.25bis and ISDN PRI switched network access with worldwide ISDN software options for dial backup and dial on demand
- Dial backup using either WAN re-route support for recovery from Frame-Relay, PPP and X.25 link failures or WAN restoral for recovery from PPP link failures
- Bandwidth reservation to assign traffic priority over Frame-Relay and PPP

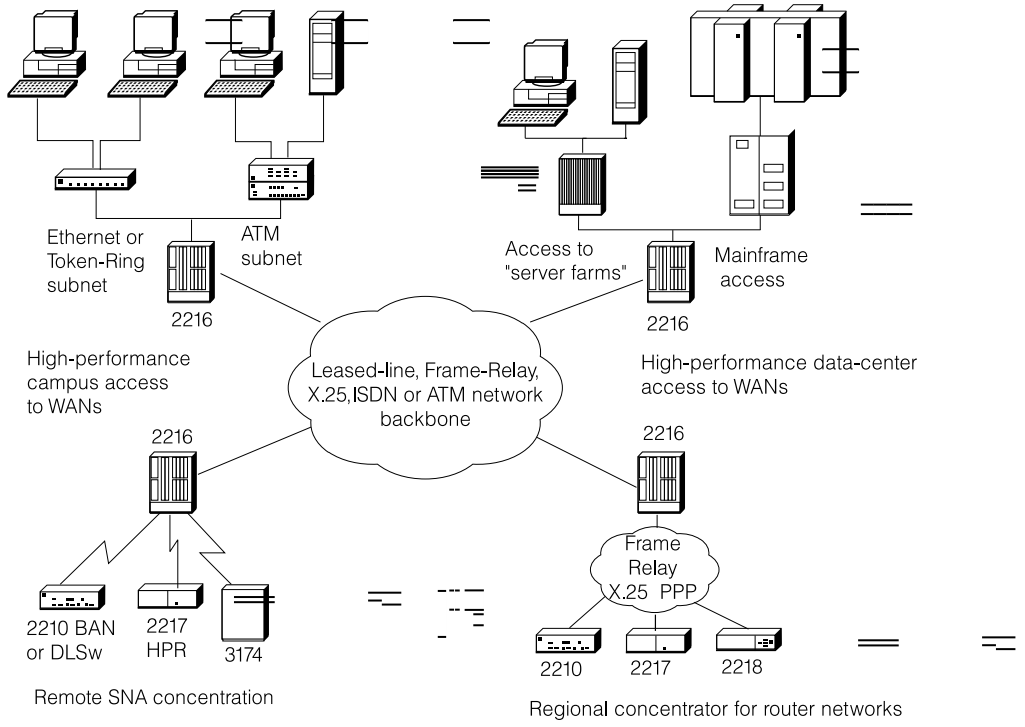
The 2216 can support up to 64 attachments for device access or network consolidation. The 2216 has eight adapter slots with up to eight interfaces per adapter, giving it more than five times the WAN capacity of the largest 2210 Nways Router and making it an excellent choice for data-center access or regional concentration of remote branch offices.

Customers can choose from among the following attachments:

- 2-port Token Ring
- 2-port Ethernet
- 8-port EIA 232/V.24
- 6-port V.35 or V.3
- 8-port X.21
- 1-port ISDN PRI for E1 (30 B+D) or T1/J1 (23 B+D)
- 1-port 155-Mbps ATM (single-mode or multimode fiber)
- 1-port ESCON channel

Adapters can be positioned in any slot, with four exceptions:

- Token-Ring or Ethernet adapters in slots 3 or 7 require adjacent slots (4 or 8) to be kept free. And, Token-Ring or Ethernet adapters in slots 4 or 8 require the adjacent slots (3 or 7) to be kept free.
- Up to 2 ATM adapters can be used.
- Up to 4 ISDN adapters can be used.
- Up to 4 ESCON adapters can be used.



The versatile 2216 helps optimize your network in four key areas

The 2216 can grow with you as your networks grow

Need dependable networks? You can depend on the 2216!

The 2216 has a number of design features that maximize network availability. The hardware supports a high degree of redundancy and nondisruptive operation, with:

- Optional, dual power supplies that share the 2216 power load. Each has its own power cord for connection to independent power sources. The 2216 will continue operating with a single power supply if one of the dual power supplies fails .
- Individually powered adapters that can be inserted or removed while the 2216 is operational. Failed adapters can be replaced without taking down the system or rebooting the software. Replaced adapters assume the configuration of the adapter they replace. New adapters can be added, and activated at a convenient time using fast reboot.
- System-cooling with multiple fans that can maintain safe operating temperatures if a fan fails.
- Extensive environmental monitoring that tracks system operation and allows operators to correct potentially critical situations before they cause outages.

The 2216 software increases system and network availability, with:

- Dial backup to bypass failed connections using either V.25bis or ISDN PRI
- Routing around failed Frame-Relay, PPP or X.25 links

IBM 2216 Nways Multiaccess Connector at a glance

Models	Model 400 with 8 adapter slots and a system card with a PowerPC® 604 133-MHz processor 512 KB of L2 cache and 64 MB of RAM
Software	IBM Nways Multiprotocol Access Services (5765-B87) • Routing protocols: - TCP/IP - IPX - AppleTalk 2 - Banyan VINES - DECnet IV - DECnet V/OSI • SNA Data Transport: - APPN NN/HPR/DLUR - DLSw (RFC 1795) including NetBIOS support - Frame-Relay BAN - LAN Network Manager support • Bridging: - Source-Route Bridging - Transparent Bridging - Source-Route Transparent Bridging - SR-TB Translational Bridging - IP Bridging tunnel • ATM: - ATM UNI 3.0/3.1 - ATM Forum-compliant LANE Client (LEC) - Classical IP • Switched network access: - V.25bis - Worldwide ISDN PRI - WAN re-route 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 - PPP - X.25 - SDLC primary and secondary • IP and SNA over ESCON channel • Bandwidth Reservation System (BRS) over Frame Relay and PPP
Adapters	2-port Token-Ring adapter 2-port Ethernet adapter 8-port EIA 232/V.24 adapter 1-port ISDN PRI adapter for T1/J1 1-port ISDN PRI adapter for E1 1-port, 155-Mbps Multimode Fiber ATM adapter 1-port, 155-Mbps Single-Mode Fiber ATM adapter 6-port V.35/V.36 adapter 8-port X.21 adapter 1-port ESCON channel adapter

IBM 2216 Nways Multiaccess Connector at a glance, continued

Capacity	Up to 8 slots available for communications adapters Up to 2 power supplies 1 standard service port conforming to EIA 232. The port has a 9-pin, D-shell connector. 1 system card
Management	• SNMP V1 with configurable MIB information access and support for the following standard and enterprise-specific MIBs: - WAN interfaces including ISDN - LAN interfaces - ATM interfaces - Bridging and routing - DLSw - APPN - LANE LEC - System specific - Enterprise specific • The following IBM Nways Managers, with 2216-specific support: - Nways Campus Manager LAN for AIX and HP-UX - Nways Campus Manager Suite for AIX and HP-UX - Nways Enterprise Manager • LAN Network Manager support
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 1 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 100–240 V ac at 50–60 Hz.
ISO 9000	The 2216 Nways Multiaccess Connector has been developed and is manufactured in IBM facilities that are fully compliant, and have been registered, with ISO 9000 standards.



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IBM Corporation
Department TYCA
PO Box 12195
RTP, NC 27709

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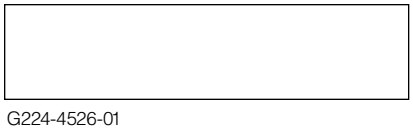
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