# IBM Multiprotocol Solutions for the Expanding Enterprise Network Fact Sheet

Flexible connectivity from desktop to mainframe

*25 June 1996*

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## Announcement Summary

**Network Computing is all about creating a universally connected world that puts people in touch with each other and businesses, as well as other organizations, in touch with all of their constituencies.**

**Although network managers are increasingly utilizing the open standards of the Internet and its underlying TCP/IP communications to enable the universally connected world, economic reality requires network owners to leverage existing applications that rely on SNA communications to access critical corporate databases located in S/390 and AS/400 servers.**

**Thus, today's expanding enterprise network is typically a mix of router-based and controller-based technologies. And, above all else, network managers need network solutions to manage the complexity of today's diverse users, locations, and protocols, while retaining the freedom and flexibility to implement new, cost-effective technologies as they become available.**

**As the world leader in the implementation of critical, multiprotocol internetworking solutions, IBM is pleased to present the following key enhancements to a selection of enterprise network products:**

- **Reliable, channel-attached TCP/IP routing on the 3746 platform, providing a complete set of TCP/IP functions, including OSPF-2, BGP-4, and RIP, as well as a rich set of access filters**
- **High-Performance Routing (HPR) on the 3746 platform to enable customers to implement high-availability solutions for both the data center and the network**
- **Frame Relay support on the 3746 platform, independent of NCP, based on RFC 1490 or boundary access node (BAN) and boundary network node (BNN)**
- **ISDN support, including new Euro-ISDN primary rate interface (PRI) support of dial access for SNA on the 3746 Model 900 and a new ISDN basic rate interface (BRI) adapter for the 2210 that extends existing ISDN support to additional models**
- **General functional enhancements of the 2210 to provide enhanced connectivity and availability, additional SNA support, new security features, and more efficient use of network bandwidth**
- **An additional model of the 2218 Nways Frame Relay Access Device (FRAD) to expand on the recently announced family of low-cost Frame Relay devices**

**The products and features included in today's announcement provide high reliability, predictability, and performance, in addition to appropriate security, backup, and recovery features. These characteristics are some of the most important elements necessary to operate a successful intranet, which is a private network that uses the infrastructure and standards of the Internet and the World Wide Web with firewalls to prevent access from the public Internet. Customers are using intranets to create a business environment in which applications, tools, and information are created, accessed, and shared among different departments, business units, and worldwide offices of a company or organization.**

**This announcement, coupled with IBM's recent announcement titled "S/390 Network Computing Vision,' and other IBM enterprise networking announcements from earlier in the year, consolidates IBM's commitment to help customers leverage their existing networking, application, and database investments as they migrate to collaborative computing based on Internet technologies. IBM's Network Computing announcements provide solutions that span the enterprise from the desktop to the largest S/390 server, support secure intranet and Internet access from any desktop, and enable new applications to be easily implemented.**

**Customer needs are driving this new computing model at the same time that technology is making it possible. Customers want to extend their reach globally, improve quality, cut costs, get to market faster, and serve their customers better. For example, one customer who will benefit from today's announcement is a large, heavy-equipment manufacturing firm that uses SNA and NetBIOS as LAN protocols. The hardware configuration consists of IBM mainframes running MVS with CICS and IMS transaction monitors that are connected to PCs running DOS, OS/2, Windows, and Windows NT.**

**As the customer stated:**

> **"Our challenge was to provide a flexible alternative that would allow the various business units to access the mainframe data stores and combine that data with whatever types of data and processors they wished to use."**

## Announcement Highlights

*3746 Nways Controller Model 900 and Model 950 Enhancements*

Almost all of the following enhancements will be available in September 1996 and December 1996. The enhancements include the following features:

- Robust, channel-attached TCP/IP routing that includes a complete set of TCP/IP functions as well as a rich set of access filters, positioning the 3746 as a key gateway into an intranet.
- HPR connectivity between Parallel Sysplex and the 3746 enables very high SNA application availability, even if there is a host failure. HPR connectivity between the network and the 3746 provides non-disruptive path switching to re-reroute HPR traffic around network outages.
- Frame Relay support that is independent of NCP on the Model 950, and a Euro-ISDN PRI adapter on the Model 900.

- An evolutionary path that allows the 3745/3746 and associated SNA network to evolve and grow in capacity, function, and performance. The 3746 Model 900 is field-upgradeable to a Model 950, and SNA/Subarea applications can evolve to APPN/HPR networking.

*New ACF/NCP Version 7 Release 5*

The new ACF/NCP software will be available in November 1996. It provides the following functions:

- Support for a native ISDN E1 Adapter
- State-of-the-art subarea router solutions
- Excellent APPN capabilities
- High-speed X.25 SNA transmission capabilities
- Comprehensive Frame Relay switching

*New ACF/SSP Version 4 Release 5*

The new ACF/SSP software will be available in November 1996. It includes the following enhancements:

- Full support of ACF/NCP including:
  - ISDN support
  - Duplicate TIC
  - Frame Relay error count

*New NTuneMON Version 2 Release 3*

The new NTuneMON software will be available in November 1996. It features:

- Real-time monitoring and analysis of ACF/NCP including:
  - Interactive tuning feature
  - Support of ACB-Channel detail
  - Logical stations attached to B-Channels
  - Details about ISDN logical stations
  - Information about Frame Relay links

*New ISDN Adapter for 2210 Nways Multiprotocol Router*

The ISDN Adapter will be available in August 1996. It performs the following functions:

- Supports basic rate interface (BRI) ISDN
- Allows greater network design flexibility
- Can be used for either primary network connection or switched backup capability
- Supports a wide variety of signaling specifications

*New Functions for Nways Multiprotocol Routing Network Services (2210 Software)*

The functions for the 2210 Router, available in June 1996 (ISDN August 1996), include the following enhancements:

- WAN re-reroute extensions
- Frame Relay over BRI ISDN dial circuits
- Synchronous Data Link Control (SDLC) secondary support
- Additional IPX capabilities
- X.25 DTE transport
- Point-to-Point Protocol (PPP) data compression
- Data Link Switching (DLSw) support for LAN Network Manager (LNM)
- User Datagram Protocol (UDP) broadcast forwarding
- DECnetV/OSI Echo support (RFC 1139)
- IPX filter enhancements
- Software support for the new 2210 BRI ISDN Adapter
- OSI Echo
- Support for the Australian ISDN switch standard
- PAP/CHAP password security for PPP links
- ISDN Cause Code Management

*New 2218 Nways Model 12X Frame Relay Access Device*

The 2218 Nways Model 12X Frame Relay Access Device (FRAD) will be available in June 1996. It supports the following functions:

- Introduces low-cost entry-level solution for linking branch offices to a centralized data center.
- Supports two communication ports with no LANs.
- Provides device/host interconnection across a Frame Relay network.
- Channels SNA, BSC, asynchronous, and multiprotocol LAN traffic onto a single Frame Relay permanent virtual circuit, eliminating the need to have separate WAN links.
- Is fully compatible with other IBM products that support RFC 1490.

## Additional Technical Details

*3746 Nways Controller Models 900 and 950 Enhancements*

With the addition of the IP support included in this announcement, the 3746 now is a key gateway into the growing intranet environment.

The availability of HPR brings significant performance and availability improvements. Combined with use of a dual Network Node Processor (NNP) and higher connectivity, this qualifies the IBM 3746 Models 900 and 950 as the prime network access equipment for S/390 servers in Parallel Sysplex environments. Multiprotocol capabilities of the 3746 Models 900 and 950 are widely extended by the support of APPN/HPR and IP routing, the attachment of Ethernet LANs, and the support of Frame Relay RFC 1490, including boundary access node (BAN) and boundary network node (BNN). The 3746 Model 900 is provided with a PRI Euro-ISDN adapter that operates under the control of ACF/NCP. SNA traffic flowing on Frame Relay links can be routed over up to 30 separate ISDN B-Channels at 64 Kbps.

HPR is the next generation, high-speed networking solution for multiprotocol customers who have SNA. Developed for high-speed environments, HPR positions customer networks for a smooth transition to ATM. HPR provides an excellent transport for the integration of all your network protocols. It improves performance, increases availability, and reduces costs in SNA networks. HPR is an open, proven standard in the APPN Implementer's Workshop, and is a key component of IBM's high-availability Sysplex strategy.

The IBM 3746 network management is extended to the new protocols and functions via NetView/390 with APPN Topology Manager for the 3746 network node, and NetView for AIX for the 3746 IP router. For users of NetView Performance Monitor (NPM), the 3746 Models 900 and 950 now report the configuration and activity data of the resources used in APPN/DLUR and HPR traffic. This data includes processor load and storage utilization of the adapters and counter reporting for Token-Ring couplers, lines, Frame Relay DLCIs, and stations.

*ACF/NCP Version 7 Release 5*

Designed to enhance enterprise-wide connectivity, this release supports the latest enhancements of the 3745 Models 900 and 950. It operates on any IBM 3745 Communication Controller channel-attached to a host processor or remotely connected via an SDLC link, IBM Token Ring, X.25, or Frame Relay through another controller to a host processor.

*ACF/SSP Version 4 Release 5*

- This release incorporates new and changed keywords and statement structure required for ISDN parameters including:
  - Optional cyclical redundancy checks (CRCs) included in frames.
  - Unrestricted or restricted information transfer
  - ISDN address and subaddress for physical interfaces.
- ACF/TAP is updated to support ISDN as follows:
  - Outboard data link control (ODLC) line traces dynamic parameter status areas (DSPAs) as NCP sees them.

– ACF/TAP adds an option so that you can segregate data for a specific B-Channel from a line trace of the physical line. This physical line trace includes data for the D-Channel and one or more B-Channels.

*NTuneMON Version 2 Release 3*

- Is designed to run in a virtual storage environment in any IBM system configuration that supports MVS/ESA, MVS/XA, or VM/ESA.
- With the NTuneNCP Tuning Feature, operates with the IBM 3720, 3725, 3745, or 3745 with 3746 Model 900 controllers.

*2210 BRI ISDN Adapter*

The 2210 BRI ISDN Adapter provides a four-wire, twisted-pair S/T interface with an RJ-45 connector. The ISDN port provides two 64-Kbps B-Channels for data and one 16-Kbps D-Channel for signaling.

The BRI ISDN adapter supports:

- Euro-ISDN
- INS-64
- National ISDN-1 and -2
- AT&T 5ESS
- Nortel DMS-100
- TS 013

*2210 MRNS Software Enhancements*

Nways Multiprotocol Routing Network Services Release 3 Extended includes a range of functional enhancements. Enhancements to the current WAN re-reroute function detect PPP and X.25 link failures (in addition to Frame Relay) and re-reroute traffic over any data link control, including PPP, X.25, and Frame Relay (in addition to ISDN and V.25bis dial circuits).

WAN re-reroute extensions over PPP-, X.25-, and Frame Relay-configured interfaces are enabled through enhanced MRNS WAN support for modems and ISDN terminal adapters that store dial digits.

Additional new functions include Frame Relay over BRI ISDN dial circuits to enable BAN traffic to be transported over ISDN, secondary link stations support for SDLC devices, and software data compression on PPP links.

Additional IPX capabilities include new filtering function and enhancements to the IPX protocol to allow IPX to operate more efficiently over dial-on-demand circuits. Four new IPX filters operate on IPX packets at the interface level rather than at a global level associated with all interfaces.

The X.25 DTE transport function enables the transport of data packets over a TCP/IP network between 2210 routers with attached X.25 DTE devices. Extensions to the DLSw function enable DLSw to transport LNM packets. New UDP support enables the forwarding of UDP broadcasts.

DECnetV/OSI support has been added for Echo support (RFC 1139) to enable Echo requests and replies to be used for the determination of OSI protocol connectivity. The addition of PAP/CHAP password security includes the establishment of passwords at each end of a PPP link and a procedure to check those passwords before bringing up the link.

ISDN cause code management allows user changes to the behavior of the router if a given cause code is generated by the switch.

*2218 Nways Model 12X Frame Relay Access Device*

Fully compliant with RFC 1490, the 2218 Model 12X is designed to ensure interoperability with enterprise network technology today and tomorrow. The 2218 Model 12X:

- Adds another model to the family of 2218 Nways FRADs announced in April 1996.
- Interoperates with IBM 3745 and 3746 controllers, and 3172 software.
- Integrates and supports serial protocols including SDLC, X.25 QLLC, BSC, asynchronous, and SNA downstream physical units.
- Attaches to the host via SLDC, BSC, Token-Ring, or Frame Relay circuit.
- Is fully manageable by NetView and SNMP managers.

## Benefits

- HPR provides increased productivity resulting from very short response times and 100% network availability. HPR provides powerful solutions for consolidation of large networks, with reduced operational costs, thanks to maximized line utilization.
- The rich IP support turns the 3746 into a gateway device for a company's intranet.
- Multiprotocol benefits include native routing of IP, APPN/HPR, and SNA protocols over the same media, allowing for link consolidation and reduction of operational costs. Communication with downstream NCPs over Frame Relay BAN connections is enabled, as well as support of IP applications at marginal cost. The PRI ISDN adapter supports the Euro-ISDN standard and operates in conjunction with ACF/NCP, allowing SNA equipment to communicate with ACF/NCP over ISDN connections.
- Management enhancement benefits include support of the IBM 3746 IP router in an SNMP environment, resource monitoring allowing for timely capacity planning, configuration management ensuring the Network Computing availability, and graphical display for IP and APPN/HPR network topologies.
- Advanced Communication Functions and management functions include ACF/NCP Version 7 Release 5, ACF/SSP Version 4 Release 5, and NTuneMON Version 2 Release 3. These software updates provide state-of-the-art subarea router solutions and solid IP support. They are compatible with all ACF/NCP and associated product releases supported by ACF/SSP Version 4 Release 2 still in service. NTuneMON Version 2 Release 3 provides faster resolution of potential and existing internetwork problems, increased network and NCP availability through interactive online tuning, and enhanced management of controllers and networks.

- Today's announcement of additional 2210 software function and expanded ISDN availability provides enhanced connectivity, improved network availability, expanded SNA support, additional security features, and improved bandwidth utilization. The IBM 2210 family of routers provides an extensive range of connectivity, protocol, and price that can be tailored to link remote offices and regional and central host sites into a cohesive, cost-effective multiprotocol network.

- The 2218 Nways FRAD Model 12X provides multiple protocols over relay transmission links, with priority queuing and bandwidth allocation. Benefits include efficient bandwidth utilization, consistent response times, enhanced session reliability, and simplified network topologies. These allow customers to consolidate networks without mandating change at the network protocol level, and eliminate expensive serial links between the host and the branch office.

- Another benefit to the enterprise network is the ability to combine the Enterprise Network products with the Personal Communications family of products to create total enterprise networking solutions, providing desktop communication across all of the major desktop operating systems.

  These solutions provide customers with 3270 and 5250 emulation, SNA client support, and applications for OS/2 and DOS/Windows workstations. They also provide a variety of ways to connect to S/390, AS/400, and S/36 systems, including Token Ring and Ethernet, NetWare for SAA 3270, TCP/IP TN3270 and TN5250, SDLC, dial-in asynchronous communication, Twinax, APPC 5250, console support for AS/400, S/3x, 3270 passthrough via AS/400, coaxial DFT and CUT, APPC 3270, and with the addition of the ATM S/390 Open Systems Adapter 2 (OSA-2).

  The ATM OSA-2 brings to the enterprise LAN environment the security, backup and recovery, availability, and centralized access to data that comes from the S/390 server. When combined with ATM Forum-compliant LAN Emulation (LE) for Ethernet and Token Ring that is also provided by the ATM OSA-2, customers have a powerful addition to their network that allows them to migrate to ATM without losing their current investment in Token Ring or Ethernet LANs.

## Positioning

- These are key products for customers planning to implement IBM's networking strategy for Network Computing (NC) and Switched Virtual Networking (SVN). The IBM 3746, along with the S/390 Open Systems Adapter (OSA), the IBM 3172 Interconnect Controller, and the RISC System/6000, are IBM solutions to support network peripheral access and routing to S/390 servers in LAN and WAN environments.

- The Nways controllers are the prime server-attached products for high-availability Network Computing in a multiprotocol environment. With HPR support, they enhance Parallel Sysplex environments, allowing fast routing techniques and automatic recovery. Concurrent support of HPR and SNA with APPN/DLUR allows users to evolve at their own pace from SNA to HPR, taking full advantage of and security from the product platform's evolution. Future product evolution includes support of 155-Mbps ATM for LAN and WAN attachment.

- Advanced Communication Functions and management function benefits will suit customers considering migration to a higher level of NCP, customers seeking ISDN primary rate interface, customers seeking to expand HPR routes to span multiple APPN subnetworks, and internetwork managers implementing ISDN features of the IBM 3746.
- The 2210 with ISDN can be used at remote locations that require dial-on-demand or dial backup capabilities in addition to the broad array of multiprotocol routing support in the 2210. At a data center location, the 2210 with ISDN provides a very cost-effective, central-site router for ISDN termination.
- The 2218 Model 12X provides a low-cost solution for migrating to networks of the future, including SNA customers who are migrating their branch office networks, customers seeking more cost-effective, faster connections than are currently utilized over multipoint, leased-line networks, and customers seeking to connect smaller sites to corporate Frame Relay networks.

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