

Bytex Maestro Intelligent Switching Hub

New Product Announcement

Analysis

Vendor

Bytex Corp.
Southborough Office Park
120 Turnpike Road
Southborough, MA 01772-1886
(508) 480-0840

Technology

Bytex incorporated its fault-tolerant and switching technologies into Maestro, which supports token-ring configurations.

Date Announced

May 6, 1991.

Scheduled Delivery

July 1991.

Pricing

A typically configured Maestro system ranges in price from \$250 to \$300 per port.

Company Background

Founded in 1980, Bytex designs, manufactures, markets, and supports fault-tolerant electronic matrix switching systems and related data communications products. With an

installed base of more than 4,000 switches, Bytex claims market leadership, an assertion supported by International Data Corp.'s assignment of 36 percent of the electronic matrix switch market in the U.S. to Bytex.

In 1990, Bytex entered the LAN market by acquiring Vance Systems of Chantilly, VA, the original developer and marketer of the ATS Series of LAN protocol analysis systems. The ATS 1000 LAN Analysis System, now marketed by Bytex, comes in an Ethernet and a token-ring version.

Relationship to Current Product Line
Bytex views Maestro as a logical extension of its fault tolerance and switching expertise. The company announced its intention of entering the LAN marketplace in July 1990 and followed through with the Vance acquisition and the assumption of Vance's ATS 1000 LAN Analysis System. ATS 1000 was also marketed under an OEM agreement with Atlantic Research Corp. as the Interview 1000 Series. Like the ATS 1000, Maestro supports token-ring.

—By Barbara Callahan
Associate Editor

Market Position

Bytex has captured a good portion of the electronic matrix switch market but is a newcomer to the highly active LAN market. To establish a niche, Bytex is targeting the physical-layer components of LANs, which, according to the company, cause more than 60 percent of LAN failures.

redundant power supplies and fans, and reports all events to the Maestro Network Management System. All components are hot swappable and can be serviced from the front of the unit.

Maestro Network Management System: Based on X Windows, OSF/Motif, and object-oriented software residing on a Sun SPARCstation 2, Maestro NMS features a graphical user interface to facilitate training and use. The system controls and monitors multiple Maestro Intelligent Switching Hubs and logs all LAN events reported by them.

Maestro Control Network: The Maestro Control Network provides dedicated, redundant, out-of-band serial communications links between the Maestro hubs and the Maestro NMS workstation. The redundant links ensure the continuation of communications between the Maestro hubs and Maestro NMS during LAN failures.

Maestro Remote Monitor: Based on the technology of the Bytex ATS 1000 LAN Analyzer, the Maestro Remote Monitor monitors LAN events from the Maestro NMS. ■

Characteristics

Maestro is an intelligent switching hub, dedicated to promoting LAN reliability by enabling network administrators to control and manage the physical layer of their LANs. Maestro implements and maintains token-ring LAN configurations from a centrally located management console, which eliminates the problem of manually repatching cable connections in the wiring closet. Maestro supports up to 144 token-ring stations, connects any token-ring port to any of 32 rings (in any order), features

Crescendo Communications CDDI Network

New Product Announcement

Analysis

Vendor

Crescendo Communications, Inc.
710 Lakeview Drive
Sunnyvale, CA 94086
(408) 732-5942

Technology

Copper Distributed Data Interface (CDDI)—Fiber Distributed Data Interface (FDDI) on unshielded twisted-pair copper wiring.

Date Announced

October 7, 1991.

Scheduled Delivery

December 1991.

Pricing

8-port CDDI concentrator: \$7,995; 8-port CDDI concentrator with A/B fiber optic ports for backbone ring connection: \$10,990; 10-port CDDI concentrator: \$8,990; SBus CDDI adapter: \$1,495.

Company Background

Crescendo Communications was founded in October 1990 by Mario Mazzola and Luca Cafiero, with the express purpose of bringing to market 100M bps networking on copper media. Mazzola and Cafiero were also the cofounders of David Systems, a quite successful manufacturer of 10BASE-T Ethernet hardware. Crescendo's initial round of financing netted \$2.4 million from Mayfield Fund and U.S. Venture Partners for development of CDDI technology and construction of prototype hardware.

—By John Krick
Associate Editor

Relationship to Current Product Line

These CDDI products are the initial offerings from Crescendo Communications.

Market Position

Crescendo is the first company to announce an FDDI on unshielded twisted-pair product and could be the first to market as well. Crescendo has dubbed its offering CDDI—Copper Distributed Data Interface—and expects to begin shipping the product sometime early in the first quarter of 1992. It should be noted that the ANSI committee that sets the FDDI standard has not yet reached a decision on a major issue bearing on FDDI transmission over unshielded twisted-pair (UTP) copper wire—FDDI packets must be broken up and encapsulated in smaller packets for successful transmission over UTP. Both AT&T and British Telecom have submitted their own schemes for accomplishing this repacketizing task. While Crescendo spokespersons claim that their method is the most efficient, AT&T and BT are both large and formidable opponents in any standards fight.

In addition to the true FDDI on copper side of the market, there are also alternative methods of achieving 100M bps speeds on UTP. Thomas-Conrad Corp., for one, has introduced a UTP version of its TCNS 100M bps fiber optic network system. While the Thomas-Conrad system is a proprietary technology, it carries low prices compared to both FDDI and Crescendo's CDDI network.

At this time, Crescendo has only released an adapter card for the Sun Microsystems SBus, with the expectation that users of engineering workstations will be the most likely potential customers initially.

Characteristics

Crescendo's CDDI offers 100M bps speeds on unshielded twisted-pair wire. Distances of up to 50 meters from the CDDI concentrator are supported on standard UTP telephone wire. Distances of 100 meters can be achieved using either data grade unshielded twisted-pair wire or shielded twisted pair. The Crescendo product line consists of three basic products—a CDDI concentrator, a CDDI adapter for the Sun Microsystems SBus, and a CDDI-to-FDDI Media Access Unit (MAU).

Crescendo 1000 CDDI Workgroup Concentrator

The Crescendo 1000 is an eight-port concentrator that can attach shielded or unshielded twisted-pair wiring. It can also be equipped with two additional ports that can be configured for FDDI or CDDI, depending on the selection of an optional plug-in interface card. Using the FDDI card, these two ports can be used to attach the concentrator to a dual fiber optic backbone ring. As CDDI ports, they can add an additional two copper ports to a standalone workstation, allowing the unit to support a total of 10 stations.

In-band network management reporting is supported by a Simple Network Management Protocol agent in the unit. An RS-232 port is included so that local, out-of-band management can be performed using an ASCII terminal.

Crescendo SBus CDDI Adapter

The Crescendo SBus adapter allows Sun SPARCstations to be connected to a CDDI network. The SBus adapter uses two direct virtual memory access (DVMA) channels and 128K of onboard RAM to off-load network-associated processing from the CPU. Data is transferred over a 32-bit data path, and bursts of up to 64 bytes in length are supported. FDDI SMT 6.2 station management is supported by the adapter, and it incorporates an SNMP agent as well, meaning that it can work with the SunNet Manager or other SNMP-based network management systems. Network attachment is through an RJ-45 connector.

Crescendo FDDI Media Access Unit (MAU)

The FDDI MAU is an FDDI-to-CDDI converter that allows any CDDI port on the Crescendo 1000 Concentrator to connect to existing fiber optic wiring. A version that allows the connection of shielded twisted-pair wiring to the Crescendo 1000 is also available. ■

Datability VCP 200 and VCP 300 Terminal Servers

New Product Announcement

Analysis

Vendor

Datability
322 Eighth Avenue, 11th Floor
New York, NY 10001
(212) 807-7800

In addition to its headquarters in New York City, the company maintains offices in Atlanta, Boston, San Francisco, Chicago, and London.

Technology

Gate-array logic; cable ready for standard or ThinWire Ethernet connections.

Relationship to Current Product Line
The VCP 200 and VCP 300 terminal servers are part of Datability's VISTA Series modular communications platform. Included in the VISTA Series are the VCP-1000 Communications Server; VCP/NIC-LAT, TCP/IP, and Dual Protocol Network Interface Card; VCP/LC-8-2400B Modem Line Card; VCP/LC-RS232-8 Eight Port Asynchronous Line Card; VCP/LC-RS423 Sixteen or Thirty-Two Port Asynchronous Line Card; VCP X.25 Line Card; VISTA Network Protocol Translator; VISTA Serial/Parallel Converter; and VISTAWARE Server Software.

Date Announced

April 26, 1991.

Scheduled Delivery

Immediate.

Pricing

VCP 200: single protocol—\$1,999; dual protocol—\$2,299; VCP 300: single protocol—\$2,599; dual protocol—\$2,999.

Market Position

Datability shows steady growth in the internetworking market. Specializing in products for the Digital and UNIX markets, the company ran a promotion for the VCP-200 and VCP-300 with very attractive pricing until June 30, 1991. This type of marketing should increase the company's visibility in the industry and attract new accounts.

—By Barbara Callahan
Associate Editor

Characteristics

The 8-port VCP-200 and 16-port VCP-300 terminal servers incorporate twin 16MHz Intel 80186 processors, combined with an 82586 network co-processor. The units feature custom gate-array logic and support standard or ThinWire Ethernet

connections. The VCP servers include TCP/IP support for Telnet, Rlogin, Slip, ARP, BOOTP, and TFTP. The units also feature a remote SNMP management capability. The VCP Series is completely LAT compatible, supporting all end-user, management, and printing capabilities through a command interface that is 100 percent Digital Equipment Corp. compatible. The servers support upgrades through the use of industry-standard ROM cards. Recently, Datability added support for data rates up to 57.6K bps to its complete line of single- and dual-protocol LAT and TCP/IP servers. ■

Everex Systems STEPserver and SpeedLink/12 Concentrator

New Product Announcement

Analysis

Vendor

Everex Systems, Inc.
48431 Milmont Drive
Fremont, CA 94538
(415) 498-1111

Technology

Server platform based on Intel 486
and EISA bus architecture; 12-port
10BASE-T concentrator.

Date Announced

February 6, 1991.

Scheduled Delivery

March 1991.

Pricing

STEPserver prices range from \$9,000
to \$14,000 depending on configura-
tion. SpeedLink/12 Twisted Pair
Concentrator sells for \$1,099.

Company Background

Everex, founded in 1983, produces a
line of network interface cards and
other hardware for all major LAN
topologies—Ethernet, token-ring,
and Arcnet. The company also pro-
duces modems and IBM-compatible
PCs, many of which are offered in
versions that have been optimized as
servers.

Market Position

Everex' STEPserver occupies a
unique place in the server market. It
is clearly more than a high-end PC
optimized for server use, yet, with-
out multiple processors or large-scale
I/O capacity, it does not fit into the
category of a "superserver." The
Speedlink/12 concentrator is some-
what less unique, since the market it
enters is already crowded with new
entries. 10BASE-T concentrators
have been proliferating fast lately,
with seemingly every network hard-
ware vendor offering one.

—By John Krick
Associate Editor

Characteristics

STEPserver 486/33E

The STEPserver 486/33E is a high-performance network server based on the Intel i486 microprocessor and the Extended Industry Standard Architecture (EISA) bus. The EISA bus was designed by a consortium of manufacturers in an effort to extend the useful life of the IBM PC AT or "Industry Standard Architecture" (ISA) 16-bit bus and the thousands of expansion cards designed for it. A second tier of contacts on the expansion board connectors allows the EISA bus to accept 32-bit expansion boards designed specifically for it, as well as existing 8- and 16-bit boards designed for the earlier ISA bus.

The STEPserver 486/33E has 10 EISA expansion slots, of which 6 are 32-bit slots. An 8-bit slot

and a high-performance 64-bit memory slot are also included. The machine can address up to 64M bytes of 32-bit memory on its 64-bit memory bus. Four half-height drive bays are provided, and SCSI disk storage options are offered in four sizes—150M, 320M, 650M, and 1.2G bytes.

The STEPserver 486/33E is packaged in a unique cube-shaped enclosure that allows stacking of units for the most efficient use of available space. A front-mounted door provides easy access to adapter cards and other hardware. The Everex Thermal Management System, composed of two high-capacity SmartFans, thermistors, and air baffles, directs cooling air over the warmest system components.

SpeedLink/12 Twisted Pair Concentrator

The SpeedLink/12 Twisted Pair Concentrator is a 12-port Ethernet concentrator that connects unshielded twisted-pair wiring segments in a star topology. The unit comes with 12 RJ45 connectors, and also includes one BNC and one AUI connector for attachment to thin coaxial and thick coaxial Ethernet segments, respectively. ■

Intel Local Area Networking Products

New Product Announcement

Analysis

Vendor

Intel Corp.
3065 Bowers Avenue, P.O. Box 58065
Santa Clara, CA 95052-8121
(408) 765-8080

Technology

Intel has announced several products for local area networks including network interface cards for Ethernet and token-ring, print and fax spooling software for Novell NetWare and Microsoft LAN Manager, and a suite of network management products that range from a software-only monitor to a full featured hardware and software protocol analyzer.

Date Announced

September 1991.

Scheduled Delivery

October 1991.

Pricing

EtherExpress16—\$199; EtherExpress16 TP—\$225; EtherExpress32 (EISA)—\$795; TokenExpress ISA—\$695; TokenExpress MCA—\$695; TokenExpress EISA—\$895; NetSight Analyst—\$995; NetSight Sentry Ethernet—\$1,995; NetSight Sentry Token-Ring—\$2,995; NetSight Professional enhancement for NetSight Sentry—\$6,495; NetSight Professional Ethernet—\$7,995; NetSight Professional Token-Ring—\$8,995.

Company Background

Intel is the major manufacturer of microprocessor chips. Even before IBM chose the Intel 8088 processor to build its initial PC offering around, Intel had secured a large portion of the market with its 8080 and 8085 eight-bit processors. IBM's choice of the Intel-based architecture assured the company a sizable and steady income for years to come. Today's 32-bit 80386 and 80486 remain the most widely used microprocessors in the industry.

Relationship to Current Product Line

Intel's release of local area networking and network management products represents a completely new area for this vendor. Intel's Personal Computer Enhancement Division (PCED), which is responsible for the network products, has previously offered add-in cards products of various types, including memory and modem cards.

Market Position

Intel has chosen to enter several very competitive markets at once. All of the products feature aggressive pricing, but some, particularly the high-end network management products, offer prices that severely undercut the competition. The Ethernet adapter card arena is full of low-priced offerings from dozens of manufacturers, so Intel must hope to compete on the basis of features, and in fact these cards are loaded with features. The token-ring cards are among the lowest-priced token-ring adapters on the market.

—By John Krick
Associate Editor

Characteristics

Ethernet Adapter Cards

Intel's Ethernet cards feature automation configuration capabilities that set up the cards for memory and I/O addressing, interrupts, bus timing, and Novell IPX configuration. Network management software called LANSight Express, included with the cards, allows reporting of workstation configuration data and driver statistics.

EtherExpress16: The EtherExpress16 for the AT bus supports both thick and thin Ethernet and is equipped with an Attachment Unit Interface (AUI) connector and a BNC connector.

EtherExpress16 TP: The EtherExpress16 TP for the AT bus has an AUI interface and an RJ45 connector for unshielded twisted-pair attachment.

EtherExpress32: The EtherExpress32 for the EISA bus is a 32-bit card designed for use in EISA-based servers. It works with thick or thin coaxial cable and is equipped with AUI and BNC connectors.

Token-Ring Adapter Cards

All of the Intel token-ring adapters are OEM'ed from Olicom A/S of Denmark and share certain common characteristics. They are all based on the Texas Instruments token-ring chipset, are all capable of bus master control of network I/O, and all include 128K of on-board RAM. All three cards can be used with either shielded or unshielded twisted-pair wiring, and all three support both 4M and 16M bps transmission speeds on either medium.

TokenExpress ISA 16/4: The TokenExpress ISA card is a 16-bit card for the IBM PC AT (ISA) bus.

TokenExpress MCA 16/4: TokenExpress MCA 16/4 is a 16-bit card for the IBM Micro Channel Architecture (MCA) used in the PS/2 Model 50 and higher.

TokenExpress EISA 16/4: TokenExpress EISA 16/4 is a 32-bit card for use in machines based on the EISA bus.

Network Management Products

NetSight Analyst: NetSight Analyst is software that can capture and decode IPX/SPX, AppleTalk, and TCP/IP packets for protocol analysis. The program can also filter packets, generate traffic for test purposes, and gather performance statistics.

NetSight Sentry: NetSight Sentry is a combination hardware and software product that is available in either Ethernet or token-ring versions. It can collect network statistics and display them, report on network traffic and workstation activity, and assist in the troubleshooting process by providing fault indications.

NetSight Professional: NetSight Professional, like NetSight Sentry, is a hardware and software product, but the software included allows more sophisticated monitoring and analysis of networks. The menu-driven user interface allows administrators to capture and decode packets in realtime on NetWare, Banyan, AppleTalk, TCP/IP, DECnet, OSI, and XNS networks. In addition, the token-ring version supports SNA and Microsoft LAN Manager.

LAN Fax Products

Intel has also announced a number of new products for LAN Fax applications, including a fax board dubbed SatisFAXtion, fax server software that works with the SatisFAXtion card, and an add-in software module that enables FAX capabilities with Intel's LANSpool print server software. LANSpool FAX requires a SatisFAXtion card in the print server. New versions of the LANSpool software itself, Version 3.0, as well as upgrades to Version 3.0 were also announced. ■

McDATA LinkMaster Interoperability Products

New Product Announcement

Analysis

Vendor

McDATA Corp.
310 Interlocken Parkway
Broomfield, CO 80021
(303) 460-9200

Technology

The LinkMaster 6100E is a network processor that attaches to an IBM mainframe and an Ethernet LAN; LinkMaster 4174 is an establishment controller that supports a 16M bps token-ring LAN.

Date Announced

6100E tn3270 server and 4174 Token-Ring feature—January 29, 1991.

Scheduled Delivery

Both products are available second-quarter 1991.

Pricing

4174 Token-Ring feature—\$3,500 or \$4,900, depending on the controller model; 6100E tn3270 software—no charge.

Company Background

McDATA Corp. designs, manufactures, and markets network communications systems. Major product families include wide area and local area channel extenders, host-to-host and host-to-Ethernet network processors, and a family of 3270-compatible establishment controllers and multiplexers. The company also markets custom solutions for manufacturers, systems integrators, and end users to unify multivendor environments.

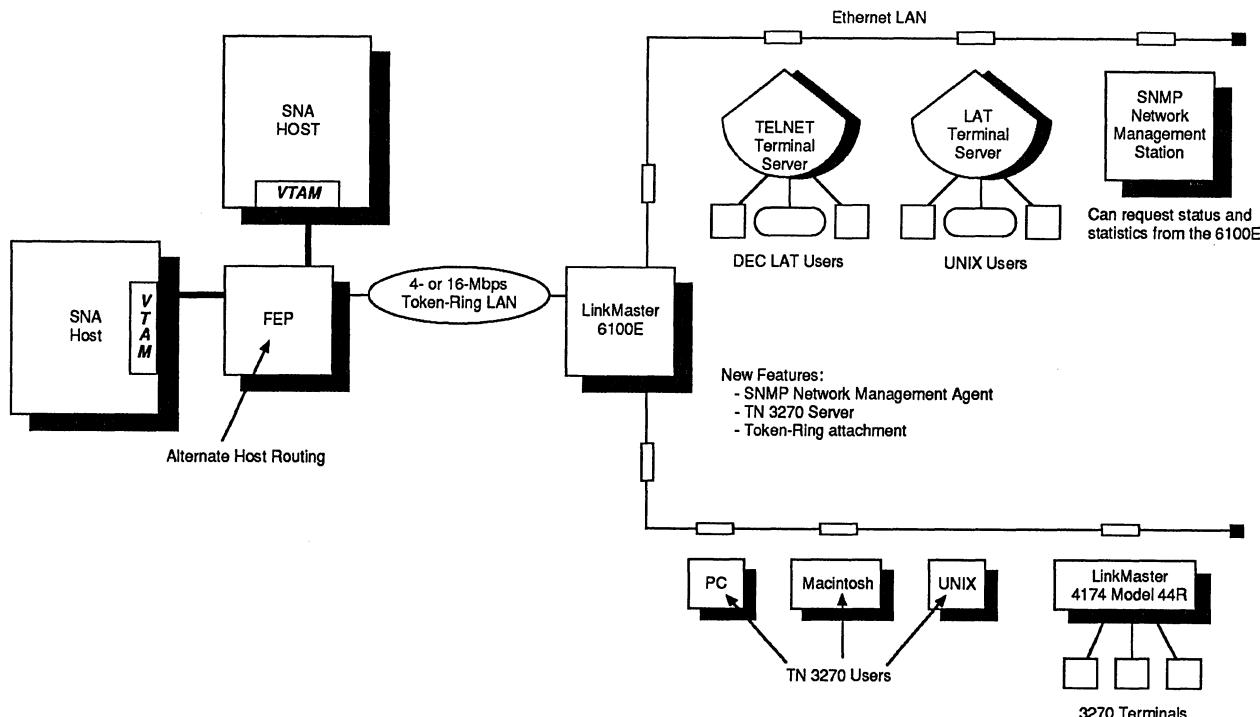
Founded in 1982, McDATA now employs more than 300 people worldwide. Headquartered in Broomfield, CO, 15 miles northwest of Denver, the company also supports international sales offices in London, Munich, Calgary, Montreal, and Vancouver. U.S. offices are located in Atlanta; Boston; Chicago; Dallas; Los Angeles; Orlando; Pittsburgh; San Francisco; St. Louis; New York; Seattle; and Washington, DC.

Relationship to Current Product Line

The LinkMaster 6100E supports communications between SNA, TCP/IP, and Digital Equipment environments. By adding the capability of acting as a tn3270 server to the

—By Barbara Callahan
Associate Editor

Figure 1.
Software for LinkMaster 6100E



McDATA announced software features for the LinkMaster 6100E that increase its interoperability set.

6100E, McDATA expands the product's interoperability set to include Macintosh, UNIX, and PC workstations in the list of devices for which it provides SNA host access.

The LinkMaster 4174 series includes 15 models that offer local and remote data communications for small, medium, and large device clusters. The series includes IBM-compatible token-ring local area network gateway and downstream controller models. The Model 44R, introduced in 1990, attaches to an Ethernet LAN. With the addition of the new feature for the 4174, McDATA expands the controller's capabilities to support of 16M bps token-ring LANs.

Market Position

McDATA ranks second to IBM in the communications controller market. In the interoperability market, the vendor has carved out a unique niche with its expertise in IBM channel communications. Its products also access IBM's NetView applications.

Characteristics

LinkMaster 6100E tn3270 server—The LinkMaster 6100E network processor links different systems by connecting Digital Equipment Corporation and UNIX devices on Ethernet LANs to additional resources located on an IBM mainframe. The 6100E attaches to the IBM channel and the Ethernet network cable. The product supplies Ethernet connectivity for host-based applications and also functions as a channel application server to support terminal emulation and file transfers. When acting as a tn3270 server, the 6100E provides SNA host access to Macintosh, UNIX, and PC workstations running tn3270.

LinkMaster 4174 Establishment Controller

16M bps Token-Ring Feature—LinkMaster 4174s are modularly constructed and offer industry-standard interfaces that are IBM 3174 compatible at network and device levels. LinkMaster 4174 controllers support Category A coax devices from a

variety of vendors. The Token-Ring feature for the 4174 consists of new software and a switchable 4/16M bps LAN interface card based on Texas Instruments' new chipset. McDATA plans to incorporate Remote Group Polling into the 4174 in the third quarter of 1991. ■

Multi-Tech Systems QuickLAN

New Product Announcement

Vendor

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, MN 55112
(612) 785-3500

Technology

QuickLAN is a zero-slot LAN—an affordable local area networking solution that allows file and printer sharing among small numbers of PCs. As the name implies, a zero-slot LAN does not require the installation of traditional LAN interface cards into the internal slots of the PCs that form the network. The PCs communicate with each other using their standard RS-232-C serial interface ports.

Pricing

QuickLAN sells for \$899 for a five-workstation system, and \$1,199 for a nine-workstation system.

Company Background

Founded in July 1970 by Raghu Sharma, Multi-Tech began as a manufacturer of acoustic couplers. Since then, the company's product line has expanded to include low, medium, and high speed modems; statistical

multiplexers; 3270 emulation systems; X.25 PADs; micro-to-mainframe products; and local area networking solutions.

Market Position

Zero-slot LANs are only one of many low-cost PC networking solutions on the market today. Other solutions (which are more sophisticated and more expensive) include data switches and multiuser operating systems. As with a zero-slot LAN, a data switch uses RS-232-C wiring and does not require that LAN interface cards be installed into the LAN PCs. Since the data switch is physically separate from the PCs it serves, however, it manages communications without loading down the processing power of PCs on the network. In a multiuser operating system, a high-end 386-based personal computer serves from two to seven display terminals simultaneously.

Zero-slot LANs and data switches are also referred to as sub-LANs, or RS-232-C asynchronous network and printer sharing products. Vendors competing with Multi-Tech in this market include Avatar, Buffalo Products, Digital Products, and Rose Electronics.

—By Martin Dintzis
Assistant Editor

Characteristics

Description

QuickLAN is a serial port LAN that provides file and peripheral sharing, including remote PC access using modems; E-Mail; and basic Novell NetWare connectivity for up to nine personal computers.

The product is intended for companies that have already made an investment in PC software for small numbers of personal computers, and, therefore, cannot cost justify migration to a server-based LAN environment.

System Components

Hardware

QuickLAN can be used with IBM PC/XT/ATs or compatibles equipped with at least one UART 8250 (RS-232-C serial) COM port and a hard disk drive. IBM PS/2s are also supported. A Multi-Tech multiport serial interface card (RS-504 or RS-508) is inserted into one IBM PC/AT, allowing it to function as both a workstation and a control server (hub) simultaneously. Each additional PC is then cabled to the control server using RS-232-C null-modem or RJ-45 cabling (not included), forming a star-type network.

Software

QuickLAN operates with MS-DOS or PC-DOS Versions 2.0 through 3.3. Each personal computer must use the same DOS version.

Special control software running on the control server coordinates operations on the network, establishing individual sessions between source nodes and destination nodes. QuickLAN, however, is a peer-to-peer type of LAN; attached nodes can send or receive data at any time without permission from the control server.

The control server software has three components: installation, network services, and E-Mail. The installation program configures the network and sets up passwords and user access rights. The

network services program provides users with access to the network resources. The E-Mail program provides the exchange of paperless messages with other networked users.

QuickLAN Features

Functions Supported

Users carry out tasks using a system menu, with context-sensitive help available at all times. Functions and services supported by the network services program include the following:

- Dialing in from remote sites;
- Logging on and off;
- Viewing network status information;
- File locking/unlocking;
- Printer redirection and spooling; and
- Setting the priorities of spooled files;

QuickLAN also provides the following E-Mail services:

- Sending, receiving, glancing at, or deleting mail;
- Reading selected mail messages;
- Sorting received mail;
- Editing mail messages;
- Printing mail;
- Assigning mail codes; and
- Managing mail distribution lists.

System Security

Each user is assigned a unique password to log on to the network from a specific node, along with access privileges to network resources (e.g., disk access privileges can be read-only or read-write).

QuickLAN provides three types of data integrity protection:

- File locking: allows a user to update a file at any given time;
- Record locking: allows more than one user to access the same file, but not the same record within that file; and
- Resource locking: allows users to lock a printer connected to the node.

Novell LAN Access

The control server can be configured as a node on a Novell network using an additional network interface card. Each QuickLAN node can be assigned access rights, allowing users to log on to the Novell network and access directory and file services. Enabled users can display, make, and remove directories and list, send, receive, delete, and rename files on the Novell file server.

Transmission Specifications

QuickLAN operates at speeds up to 38.4K bps, over standard RS-232-C cabling and/or RJ-45-type twisted-pair cabling. Distances up to 100 feet are acceptable, as remote connections via modems. ■

Netronix Remote TokenMaster 400 Bridge

New Product Announcement

Vendor

Netronix
1372 N. McDowell Boulevard
Petaluma, CA 94954
(707) 762-2703

Technology

Through the use of an IBM Token-Ring adapter, Remote TokenMaster 400 bridge is compatible with IBM Source Routing and IBM LAN Manager for interoperability in complex IBM environments.

Date Announced

January 14, 1991.

Scheduled Delivery

Immediate.

Pricing

\$6,790.

Company Background

Founded in 1983, the Netronix product line includes internetworking products for Ethernet, token-ring,

and broadband bridges, as well as board-level products sold on an OEM basis to routing manufacturers. The company is privately held and funded by a major corporate investor and individual investors.

Relationship to Current Product Line

Remote TokenMaster 400 is the latest in a series of bridges offered by Netronix, which markets TokenMaster 100, a MAC-layer local bridge, and TokenMaster 200, a token-ring bridge that connects multiple token-ring networks via a broadband backbone.

Market Position

Netronix is an active participant in the internetworking market, providing products that are compatible with system software from IBM, Novell, Digital Equipment, and Apple.

*By Barbara Callahan
Associate Editor*

Table 1. Performance

Filtering at 4M bps	20,000 packets per second
Filtering at 16M bps	77,000 packets per second
Forwarding	1,650 packets per second
Remote Link Utilization	100% of any speed link up to 2.048M bps
Compression	Typically 3-4 to 1
Filtering	Menu-selectable filtering options
Maximum Network Hops	7 subnets

Table 2. WAN Link

Network Types	Public, private
Link Types	Analog, DDS, Fractional T1, T1, E1
Speeds	9.6K bps to 2.048M bps
Link Protocol	LAP B
DCE Interface	V.35, RS-232, RS-422/RS-449, RS-530

Characteristics

Operating at 4M bps and 16M bps, the Remote TokenMaster 400 is fully compatible through the IBM Token-Ring adapter with IBM Source Routing and IBM LAN Manager. A 4:1 data compression ratio improves WAN link performance and lowers communications cost. The device resides in a single rack-mountable enclosure. It operates on analog, DDS, fractional T1, T1, and E1 (2.048M bps) circuits. Menu-selectable filtering options provide users with control of packet forwarding across the WAN link.

Bridge management occurs through NetView via IBM LAN Manager, the Netronix Support Program, LED status indicators/audible alarm, and extensive self-test diagnostics.

Tables 1 and 2 provide technical specifications. ■

Network Equipment Technologies (N.E.T.) LAN/WAN Exchange

New Product Announcement

Analysis

Vendor

Network Equipment Technologies (N.E.T.)
800 Saginaw Drive
Redwood City, CA 94063-4740
(415) 366-4400

Technology

N.E.T. based LAN/WAN Exchange on the packet-circuit architecture of the vendor's IDNX Integrated Digital Network Exchange, which multiplexes voice, data, and video signals onto multiple T1 backbone trunks. IBM has licensed its Token-Ring Network Bridge Program technology to N.E.T. for use in future versions of the LAN/WAN exchange and in other internetworking products.

Date Announced

June 19, 1991.

Scheduled Delivery

August 1991.

Pricing

LAN/WAN Exchange starts at \$7,995.

Company Background

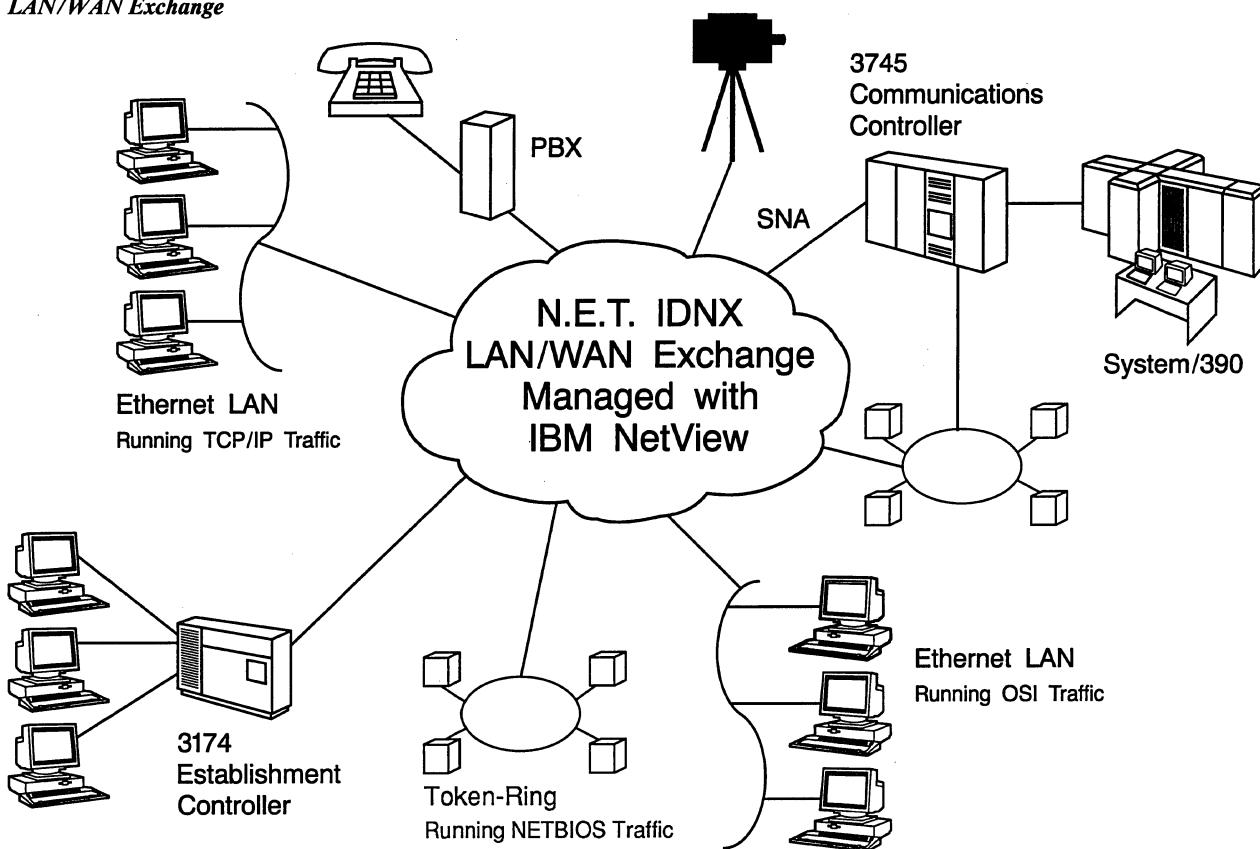
Since its origin in 1983, N.E.T. has ranked as one of the multiplexer industry's leading corporations. The company develops, manufactures, markets, and services advanced communications products that enable information-intensive organizations worldwide to interconnect and deploy wide area networked applications over public and private transmission facilities.

Relationship to Current Product Line

With this product, N.E.T. is leveraging the circuit-switching capabilities of the IDNX Integrated Digital Network Exchange to integrate LAN internetworking communications with circuit-mode communications, such as voice or video. Daniel J. Warmenhoven, N.E.T.'s chairman and CEO, explained his company's venture into the LAN/WAN market by commenting, "While standalone LAN routers and bridges can help link multiple local networks, they do not offer the integrated bandwidth management with other wide area communications, the network availability, or the consolidated network management capabilities necessary to deploy mission-critical applications cost efficiently across company sites around the world. The

—By Barbara Callahan
Associate Editor

Figure 1.
LAN/WAN Exchange



LAN/WAN Exchange enables users connected on LANs to exchange information across short or long distances.

new LAN/WAN Exchange and frame relay inter-networking products will use the leading packet-circuit architecture of N.E.T.'s IDNX enterprise solutions to provide these expanded benefits."

Market Position

Along with Newbridge Networks and Timeplex, N.E.T. is a leading vendor in the T1 multiplexer market. For several years, the T1 market averaged growth rates in the 30 to 40 percent range. Recently, however, the market has slowed to a 15 percent growth rate.

Recent financial news from N.E.T. has not been good. For the fiscal year ending March 1991, the company announced revenues of \$135 million and a net loss of approximately \$49.5 million, as compared to revenues of \$180.8 million and net loss of \$13.473 million last year. To regain profitability, N.E.T. has enhanced its IDNX multiplexer line and extended the packet-circuit architecture of the IDNX into wide area internetworking products.

A foresighted distribution and product development agreement with IBM, entered into in 1987, is serving as a long-term catalyst for restoring the company's good health. The agreement allows IBM to market N.E.T. products in the U.S. and worldwide. In addition to contributing funding and technology toward additional N.E.T. product development, IBM can implement portions of N.E.T.'s technology in future products. IBM also licensed its Token-Ring technology to N.E.T. to enable LAN/WAN Exchange to play an important part in IBM and multivendor networks. IBM and N.E.T. are also collaborating on interoperability testing between the two companies' implementations of frame relay and Token-Ring technologies.

N.E.T. has signed an agreement with Datability that calls for the two companies to jointly develop network-based communications products, including N.E.T.'s SPX/400 series of LAN-to-WAN gateways and servers. As yet, N.E.T. has not made a significant impact on the internetworking market, but LAN/WAN Exchange—the first product to integrate multivendor LAN communications

with voice, video, data, image, and facsimile communications using an intelligent WAN solution—is certainly going to generate considerable attention. LAN/WAN Exchange could be the product that helps pull N.E.T. out of its tailspin.

Characteristics

Overview

LAN/WAN Exchange performs concurrent, multi-protocol routing and bridging for N.E.T.'s IDNX product line. When integrated into an IDNX, the LAN/WAN Exchange module provides a packet-switching transport that handles bursty LAN traffic. An Ethernet or token-ring port on the LAN/WAN Exchange connects to a LAN backbone and provides a direct path to the wide area network. Eight high-speed serial ports on the LAN/WAN Exchange support connections to remote LAN/WAN Exchanges or to standalone routers. For additional network integration, the LAN/WAN Exchange Token Ring interface uses the 4/16M bps Token-Ring interface from IBM.

LAN/WAN Exchange makes use of the IDNX architecture to provide enterprise backbone functionality. The product leverages the bandwidth management capabilities of the IDNX to achieve efficient bandwidth allocation. Consolidated network management of the LAN and WAN backbones supports centralized software distribution, configuration control, and integrated fault and performance management of IDNX and LAN/WAN Exchange. An embedded standard SNMP agent enables LAN/WAN Exchange to be managed by any standard SNMP network manager.

The following network protocols are supported by LAN/WAN Exchange:

- TCP/IP
- DECnet
- IPX
- ISO/CLNS
- XNS
- AppleTalk
- Apollo Domain
- Chaosnet
- PUP

Other protocols supported include SNMP, TELNET, BOOTP, and TFTP. ■

Newport Systems Solutions LAN²LAN/768 Router

New Product Announcement

Analysis

Vendor

Newport Systems Solutions
4019 Westerly Place
Suite 103
Newport Beach, CA 92660
(714) 752-1511

Technology

High-speed routing of Ethernet,
token-ring, or Arcnet LAN traffic
over wide area network links.

Date Announced

February 12, 1991.

Scheduled Delivery

March 1991.

Pricing

LAN²LAN/768 is sold for \$2,695. A
data compression option is offered at
\$1,595, and the two additional ports
option costs from \$334 to \$394, de-
pending on the type of interface se-
lected.

Company Background

Newport Systems Solutions special-
izes in the design, manufacture, and
marketing of high-speed internet-
working equipment. Founded in
March 1988, the privately held firm
produces a line of multiport routers
called LAN²LAN.

Market Position

The interconnectivity market in
which Newport Systems Solutions
competes is an extremely dynamic
one. Several well-regarded firms, in-
cluding Cisco Systems, Wellfleet, and
Vitalink, offer products in the same
category.

—By John Krick
Associate Editor

Characteristics

Hardware

The LAN²LAN/768 is a high-speed router that operates at transmission rates from 9600 bps to 768K bps, the highest speed possible with fractional T1 links. An optional data compression device can be added to the LAN²LAN/768 to achieve compression ratios of at least four-to-one. Four-to-one compression means that the throughput of the router will be effectively quadrupled, so that the cost-effectiveness of expensive wide area links is greatly enhanced.

The LAN²LAN/768 is supplied with two ports that can support RS-232, RS-422, V.35, and X.21 interfaces. An additional two ports can be added.

Software

The LAN²LAN/768 includes software for both single, point-to-point connections and multiplexed X.25 links. Connected via a dial-up or a dedicated line, the point-to-point software allows full use of the maximum bandwidth obtainable. The X.25 version of the software is appropriate where expensive leased lines demand shared usage of the line. Both types of software are provided in versions for Novell NetWare 286 and NetWare 386 v3.1. Network management and diagnostic software are also included. ■

RAD Network Devices OpenGate Hub

New Product Announcement

Vendor

RAD Network Devices, Inc.
7711 Center Avenue, Suite 600
Huntington Beach, CA 92647
(714) 891-1964

Technology

A high-performance internetworking hub, OpenGate is based on parallel RISC architecture.

Date Announced

January 29, 1991.

Scheduled Delivery

June 1991.

Pricing

Chassis prices start at \$7,450; Ethernet modules cost \$1,800; dual-channel, high-speed WAN link modules cost \$2,750.

Company Background

RAD Network Devices (RND) competes in the local and wide area networking markets. Founded in 1987, the company introduced a combination bridge/router that provides enterprise-wide networking solutions for the global market. The company's

family of bridge/router products enables users to interconnect local and remote LANs into a single, integrated network for a wide range of applications and vertical market sectors.

RND is a member of the RAD Group of companies, which includes RAD Data Communications, Bynet, and Lannet Data Communications. The RAD Group originated in 1981 and currently employs 275 people. RND maintains an east coast center in Rochelle Park, NJ. International headquarters for the RAD Group are located in Tel Aviv, Israel.

Relationship to Current Product Line

The OpenGate series expands the RND bridge/router family by supporting any mix of local and wide area bridge/router modules in a single chassis. RND's Ethernet bridge/routers include RND REB, RND REB-SX, RND CEB, and RND XEB. RND's token-ring bridge router is the RND RTB. The company also offers the RND Remote Internetwork Management (RIM) Station.

Market Position

RND participates in both Ethernet and token-ring markets. In the Ethernet sector, RND offers a range of

—By Barbara Callahan
Associate Editor

products for low-end and high-end applications, notably in the bridge/router area. In the token-ring segment, RND offers global interconnection solutions. RND has penetrated the international market by supporting a network of distributors, resellers, and OEMs as well as a direct sales force.

Characteristics

RND designed the OpenGate series for use in large-scale, multiprotocol backbone networks. OpenGate expands the RND bridge/router family by supporting any mix of local and wide area router/bridge modules in a single chassis. Based on parallel RISC architecture to support high-speed packet filtering and forwarding, OpenGate functions in Ethernet, token-ring, and FDDI environments, supporting up to 12 LAN and WAN modules.

When acting as a local, multiport bridge, OpenGate's high-bandwidth bus enhances speed. For WAN applications, OpenGate features dynamic shortest path first routing based on Open Shortest Path First (OSPF) for any protocol including TCP/IP, IPX, DECnet, and LAT. Source Routing Transparent (SRT) bridging delivers a token-ring solution with full IBM compatibility.

To accommodate network growth, each module contains its own RISC processor. A bus arbitration method enables OpenGate to simultaneously

transfer data for any combination of LAN and WAN modules without limiting performance. Users can mix and match modules such as Ethernet, token-ring, FDDI, T1/CEPT, and X.25. In future releases, RND plans to support frame relay, fractional T1, and ISDN.

For efficient internetwork performance, OpenGate features optimal bandwidth utilization, alternate routing, broadcast message control, and user-selectable multilayer filters and security. Each module has its own SNMP agent, and RND offers MultiMan, an advanced SNMP multilayer management system.

Users with performance needs, rather than distance needs, can take advantage of OpenGate's high-bandwidth bus to configure an inverted backbone supporting up to 12 LANs. In campus environments, OpenGate can serve as a centralized connection to an FDDI backbone. In WAN environments, a single OpenGate can interconnect up to 22 geographically dispersed LANs in combination with RND bridge/routers at remote sites. Users of OpenGate can construct a multiprotocol backbone that can potentially support several hundred interconnected LANs.

OpenGate's parallel RISC architecture provides redundancy. An optional second Central Controller Module serves as a standby device. Multiple power supply modules protect against any single point of failure. If a communications line failure occurs, OpenGate features a fast switchover to an alternate route. ■

Raylan Fiber Optic Networking Products

New Product Announcement

Analysis

Vendor

Raylan Corp.
120 Independence Drive
Menlo Park, CA 94025
(415) 324-5013

Technology

Fiber optic network hardware for
Ethernet and token-ring networks.

Date Announced

January 29, 1991.

Scheduled Delivery

March 1991.

Pricing

Raylan components for Ethernet and
token-ring are priced identically.
Concentrators sell for \$595. Fiber
and copper drop cards cost \$220,
and transceivers cost \$230.

Company Background

Raylan was founded in 1989 as a
subsidiary of Raychem Corp., a \$1.5
billion materials science company
serving the aerospace, construction,
electronics, and telecommunications
industries. Raylan was a natural out-
growth of another Raychem branch,

Raynet Corp., which has been a supplier of fiber optic cabling for the telephone and video local loop service since its founding in 1987. Raynet was the first company to provide fiber cabling "to the curb" with costs comparable to copper.

Market Position

It is hard to dispute Raylan Corp.'s claims that its fiber optic networking products are the first to match copper-based networks on cost. Most fiber optic networking products offered so far, whether they conform to the FDDI standard or are proprietary solutions, have been extremely expensive compared to copper-based systems, and have offered much higher bandwidth than Raylan's Ethernet and token-ring offerings. The Raylan system, however, incorporates design features, such as a dual-ring architecture, that makes the hardware easily upgradable to 100M bps FDDI networking.

—By John Krick
Associate Editor

Characteristics

Hardware

Raylan's two initial product offerings, the Ethernet Series and the Token-Ring Series, are each composed of several components. Each is based on a 16-slot concentrator chassis that houses a different backplane depending on whether the chassis is for Ethernet or token-ring.

Two types of pluggable cards fit into the concentrator backplane. Up to sixteen drop cards that connect fiber cabling to the workstation can be installed in an Ethernet concentrator. In a token-ring concentrator, at least one ring card must reside in the leftmost slot of the concentrator. If the optional dual-ring architecture is employed, two ring cards are necessary.

Fiber drop cards are offered in both token-ring and Ethernet models, and copper drop cards are also available in both configurations for attachment to existing copper-based networks. Fiber drop cards attach to transceivers at the workstation that connect to any standard Ethernet adapter card with an AUI connector. Copper drop cards for Ethernet also use the 15-pin AUI connection. ■

Retix

4941 Remote Bridge/Router

New Product Announcement

Vendor

Retix
2644 30th Street
Santa Monica, CA 90405-3009
(213) 399-2200

Technology

The 4941 performs both bridging and routing functions in complex network configurations and applications.

Date Announced

February 11, 1991.

Pricing

From \$6,250.

Company Background

Founded in 1985, Retix designs, manufactures, and markets software and systems based on OSI networking standards. The company's markets include multivendor networking environments in commercial, governmental, and institutional sectors. Retix products are sold through a network of direct sales personnel, distributors, and value-added resellers in the U.S. and internationally.

Relationship to Current Product Line

The 4941 belongs to the internet-working product family of Retix, which includes a full line of local and remote Ethernet bridges, as well as bridge/routers. Retix has introduced the 4941 bridge/router to enhance price/performance in the internet-working industry.

Market Position

Servicing over 160 OEM clients, Retix claims a market share of over 75 percent in Open Systems Interconnection (OSI) source technology products. In January 1991, Retix announced that it was ranked number 45 on *INC. Magazine's* annual list of the 500 fastest-growing, privately held companies in the U.S. *INC.* recognized Retix for its rapid growth in revenue over the past four years, having grown from under \$1 million in 1985 to over \$50 million in 1990.

—By Barbara Callahan
Associate Editor

Characteristics

The 4941 can serve as a point-to-point bridge/router or a high-speed feeder into a complex network topology that incorporates Retix 4942 bridge/routers. The product features traffic control for applications such as network partitioning and broadcast traffic isolation. The 4941's IP routing functions allow users to isolate IP broadcast traffic to each LAN segment to preserve WAN bandwidth. For example, networks with a large number of UNIX workstations can produce a level of background TCP/IP broadcasts that can be isolated to each LAN segment with the 4941, thereby preserving more WAN bandwidth for critical data.

The 4941 can partition networks by IP address for almost unlimited scalability, particularly when it operates in conjunction with bridging. The 4941 can interconnect domains of local and remote bridges. For additional security and traffic control, the product incorporates special filters for MAC source and destination addresses, packet types, and IP addresses.

For handling other protocols, the 4941 provides high throughput, supports routable or non-routable protocols, supports the IEEE Spanning Tree Protocol, and accommodates plug-and-play operation. The 4941's throughput remains the same even when other protocols are added. It also implements Simple Network Management Protocol (SNMP). The Retix 5025 Network Management Center manages the 4941.

The 4941 supports standard 802.3/Ethernet and Thin Ethernet. Users can select from V.35, X.21, RS-449, RS-232-C, T1, and G.703 interfaces. The bridge/router's WAN port can support data rates of up to 2.048M bps. ■

Timeplex TIME/LAN 100 Products

New Product Announcement

Analysis

Vendor

Timeplex, Inc.
400 Chestnut Ridge Road
Woodcliff Lake, NJ 07675
(201) 930-4600

Technology

Internetworking products conforming to the Fiber Distributed Data Interface (FDDI) standard.

Date Announced

April 22, 1991.

Scheduled Delivery

Immediate.

Pricing

TIME/LAN 100 Router*Bridge—from \$7,995 to \$26,800; TIME/LAN 100 FDDI Concentrator*32—from \$24,700 to \$73,200; TIME/LAN 100 EMS—from \$10,000 to \$16,000.

Company Background

Now a subsidiary of Unisys Corp., Timeplex originated in 1969 and gained recognition through its time-division multiplexers. In the 1970s, the company successfully launched

its MICROPLEXER line of statistical multiplexers. In 1982, the company introduced LINK integrated connectivity systems, the first commercially available T1/E1 networking systems that provided multilink, multinodal capabilities at the 1.544M bps DS1 rate. Timeplex recently signed a three-year agreement with AT&T International Communications Services, which authorizes the sales forces of both companies to offer products and network services to their international customers.

Relationship to Current Product Line

Since Timeplex specializes in developing products for the high end of the WAN connectivity market, its decision to enter the FDDI internetworking arena can be viewed as a logical extension of its core business.

Market Position

In the T1/E1 market, Timeplex ranks as a leader. In the FDDI internetworking market, however, many vendors are currently jockeying for prominence, and Timeplex' ascendancy will be difficult. The main deterrent to the widespread use of FDDI has always been its price, but the crowded market is forcing down price-per-connection ratios. When

—By Barbara Callahan
Associate Editor

FDDI products reach an acceptable cost level, Timeplex' experience in the fast lane of data communications will be a considerable asset. Activity in the hub market is opening up, making room for Timeplex to enter with its new TIME/LAN 100 FDDI Concentrator*32.

Characteristics

Within its TIME/LAN 100 Series, Timeplex is marketing the TIME/LAN 100 Router*Bridge, TIME/LAN 100 FDDI Concentrator*32, and TIME/LAN 100 Element Management System.

TIME/LAN 100 Router*Bridge

Users can configure TIME/LAN 100

Router*Bridges to connect LANs locally via LAN interfaces and/or remotely via X.25 or high-speed serial links. Network interface modules for the product provide connections to FDDI (one DAS port); IEEE 802.3/Ethernet (up to 4 ports per module—maximum of 12 ports per unit); IEEE 802.5/Token Ring (one port); and Wide Area (up to 4 ports per module—maximum of 12 ports per unit). Users can combine up to three of these interface modules into a single router bridge.

Routing: Routing schemes in the product are user selectable from dynamic, static, and default settings. The device can route datagram traffic in an Internet Protocol (IP), Xerox Network Systems (XNS), or Novell IPX internetwork. A point-to-point protocol (PPP) governs the transmission of multiprotocol datagrams over serial links. The PPP multiplexes various network-level protocols and supports IP, XNS, and Novell NetWare applications.

Network Protocols supported by TIME/LAN 100 Bridge*Router include Internet Control Message Protocol (ICMP), Exterior Gateway Protocol (EGP), Open Shortest Path First (OSPF), Routing Information Protocol (RIP), Address Resolution

Protocol (ARP), Internet Packet Exchange (IPX), and XNS Routing Information Protocol.

Bridging: TIME/LAN 100 Router*Bridges support transparent and source route bridging between local or remote FDDI, IEEE 802.3/Ethernet, or IEEE 802.5 token-ring LANs. The information in each data frame determines the type of bridging to be used.

Network Management: The Router*Bridges collect protocol and interface statistics and exchange information with the TIME/LAN 100 Element Management System (EMS). Each device maintains a database of device parameter values and statistics that conform to Management Information Base (MIB) requirements.

Security: The Router*Bridge software incorporates the Network Level Module (NLM) to provide security for IP datagram traffic. The NLM checks the network-level information contained in the Revised IP Security Option (RIPSO) of each datagram received or transmitted by the Router*Bridge.

Access Control Filtering (ACF) is supported for IP, XNS, and IPX datagram traffic, as well as for bridged frame traffic. For datagram traffic, the ACF software filters both source and destination addresses. For bridged frame traffic, the software filters on the basis of protocols used and on source and destination addresses.

TIME/LAN 100 FDDI Concentrator*32

Timeplex based the TIME/LAN 100 FDDI Concentrator*32 on 32-bit microprocessor technology with FDDI components and specialized software. The Concentrator*32 operates at the Data Link layer of the OSI reference model. Above this layer, the product is completely transparent to protocols.

MAC Implementations: The Concentrator*32 incorporates two Media Access Control (MAC) implementations. The first MAC supplies the network attachment and switches onto either the primary or secondary ring of the FDDI dual counterrotating ring network. The second (auxiliary) MAC is used for the addition of a Single Attachment Station to the network. For this operation, a separate ring is established between the Concentrator*32 and the single attachment station.

The Roving MAC function of the product detects MAC-level frame errors on the FDDI ring and sends an error alarm to an EMS. This secondary MAC handles the insertion and deletion of Single Attachment Station (SAS) modules. Users can add SAS modules to the FDDI LAN without disturbing the operation of the ring. Concentrator*32 automatically begins the insertion process when an attachment station is powered up or when an EMS directs it to do so.

Redundancy Options: As an option, Timeplex offers a redundant CPU, which is identical to the primary CPU module. Users activate monitoring by switching logic in the midplane of the Concentrator*32. The switchover to the redundant unit occurs when the primary CPU does not respond to a periodic system check. Timeplex also offers load-sharing power supplies as a redundancy option.

Network Management: The Concentrator*32 can be managed remotely by the TIME/LAN 100 EMS or another similar element management system. The product makes use of Simple Network Management Protocol (SNMP) to communicate with the EMS. Network management information is collected in the implementation of the protocol layers and the device drivers on the managed elements. The management information variables are organized in the form of a tree.

TIME/LAN 100 EMS

This software runs on Sun Microsystems' SPARC-stations, which are resold by Timeplex. Users can also buy EMS as a standalone network management software system. EMS uses SQL Server from Sybase/Microsoft, which enables users to generate reports on network management statistics and operations. EMS supports SNMP and MIB-II. A user interface can extend the MIB to manage individual devices. ■

