Communications Processors: Comparison Columns

In this report:

Synopsis

Editor's Note
For information on the communications processor market, see "Communications Processors: Market Overview"; for information on communications processor technology, see "Communications Processors: Technology Overview." To assist readers in researching the communications processor market, this report contains comparison columns listing the principal characteristics of 65 products offered by 28 vendors.

In the Comparison Column Entry Descriptions, we have briefly described and defined the characteristics featured in the columns. We suggest that the reader become familiar with the descriptions of the entries before reading the columns.

The vendors furnished information for the columns during January and February 1991. When a vendor did not provide information for a specific entry, and we could not locate that information in our files, we have listed "Vendor did not specify" on the appropriate line. Datapro wishes to thank the vendors for their cooperation.

In addition to the lines allocated for vendors to indicate specified information for their models, we have added space at the bottom of the columns for vendor notations about options or special features of their products.

The absence of any company or product from these columns means that the company either failed to respond to our repeated requests for information or declined to be part of the survey.

Vendors

Amdahl Communications
1250 E. Arques Avenue, MS: 276
Sunnyvale, CA 94088 (408) 746-6000, (800) 233-8489

Apertus Technologies
7275 Flying Cloud Drive
Eden Prairie, MN 55344 (612) 828-0300

Bull HN Information Systems, Inc.
Technology Park, 2 Wall Street
Billerica, MA 01821-4199 (508) 294-7000

Carse, Woodworth and Associates Int'l.
15750 Winchester Boulevard, Suite 104
Los Gatos, CA 95030 (408) 395-2000

Commtex Inc.
1655 Crofton Boulevard
Crofton, MD 21114-1341 (301) 721-3666

Computer Communications, Inc.
2610 Columbia Street
Torrance, CA 90503 (213) 320-9101, (800) 421-1178

Computer Designed Systems
14050 21st Avenue N.
Minneapolis, MN 55447 (612) 553-2042

Computer Logics Ltd.
31200 Carter Street
Solon, OH 44139 (216) 349-8600, (800) 354-059

Computer Network Technology Corp.
6655 Wedgwood Road
Maple Grove, MN 55369 (612) 420-4466, (800) 638-8324

Computerm Corp.
100 Wood Street
Pittsburgh, PA 15222 (412) 391-7804, (800) 873-0303

Concurrent Computer Corp.
106 Apple Street
Tinton Falls, NJ 07724 (908) 758-7000, (800) 631-2154

Control Data Corp.
Computer Products Div.
8100 34th Avenue S., P.O. Box 0
Minneapolis, MN 55440 (612) 853-8100

Emulex Corp.
3545 Harbor Boulevard, P.O. Box 6725
Costa Mesa, CA 92626 (714) 662-5600, (800) 854-7112

Encore Computer
6901 W. Sunrise Boulevard
Fort Lauderdale, FL 33340-9148 (305) 587-2900

International Business Machines Corp. (IBM.)
Old Orchard Road
Armonk, NY 10504
Contact your local IBM representative.

Lemcom Systems, Inc.
2104 W. Peoria Avenue
Phoenix, AZ 85029 (602) 944-1543

Micom Communications Corp.
4100 Los Angeles Avenue
Simi Valley, CA 93063-8100 (805) 583-8600

Morning Star Technologies
1760 Zollinger Road
Columbus, OH 43221 (614) 451-1883, (800) 558-7827

NCR
2700 Snelling Avenue N.
St. Paul, MN 55113 (612) 638-7777

Netlink, Inc.
3214 Spring Forest Road
Raleigh, NC 27604 (919) 878-8612, (800) 638-5465

Periphonics Corp.
4000 Veterans Highway
Bohemia, NY 11716 (516) 467-0500

Simpact Associates, Inc.
9210 Sky Park Court
San Diego, CA 92123-4302 (619) 565-1865, (800) 448-4188

Systech Corp.
6465 Nancy Ridge Drive
San Diego, CA 92121 (619) 453-8970

Thomas Engineering Co.
2440 Stanwell Drive
Concord, CA 94520 (415) 680-8640, (800) 832-8649

TIL Systems, Inc.
225 Stedman Street, Suite 27
Lowell, MA 01851 (508) 970-1189, (800) 752-1736

Tri-Data Corp.
3270 Scott Boulevard
Santa Clara, CA 95054 (408) 727-3270, (800) 874-3282

Unisys Corp.
P.O. Box 500
Blue Bell, PA 19424 (215) 986-4011

Communications Processors
Comparison Column Entry Descriptions

Computer Systems Interfaced
Manufacturer/Models. If processors serve IBM and plug-compatible mainframes, the vendor indicated that information here. Vendors of processors operating in open network architectures also listed the computers interfaced here.

Direct Attachment of Host. This entry distinguishes between a front-end processor and a network processor, which does not connect directly to the host.

Functional Characteristics
Front-End Processor. The front-end processor (FEP) intercepts and handles communications activities for the host.

Max. Hosts Attachable to FEP. In this space, the vendor noted the highest number of hosts that can be channel attached to the system.

Max. Hosts Supported Simultaneously. This entry notes the highest number of hosts that can be active at the same time.

PU Type within Network. This entry indicates the physical unit (PU) type within the network. These devices are also known as Node Types (NTs). The most common types are PU Type 1, PU Type 2, PU Type 4, and PU Type 5.

Remote Line Concentrator. A "yes" response indicates that the processor can serve as a line concentrator located remotely from any host processor in its network.

Max. Hosts Served by One Concentrator. Since many concentrators can serve more than one host, vendors noted the maximum number here.

Host-Independent Network Processor. Some models can control a network based on open architecture without the direction of a host computer.

Host Channel Extender. The architectures of some processors enable them to function as host channel extenders.

Terminal Controller. The architectures of some processors enable them to function as terminal controllers.

Store-and-Forward Switching. Some processors can function as standalone, store-and-forward message switching.

Distributed Processing Node. In addition to their principal networking functions, some processors can support distributed applications.

Network Architecture Compliance. Some communications processors function exclusively within their vendors' network architectures; others support open architectures such as X.25. If a processor supports no network architecture, it may be a transparent device.

Native T1 Support. A "yes" response indicates that the T1 was purchased from a carrier and is used on an "as is" basis.

Number of T1 Lines Supported. Indicates the maximum number of T1 lines supported as well as the number of T1 interface modules.

Communications Line Capacity
No. Half-Duplex Lines Attachable. In half-duplex operation, transmission occurs alternately in either direction, but not in both directions simultaneously. This entry lists the number of half-duplex lines attachable to the processor.

Highest Line Speed Supported (bps). Vendors filled in line speeds in bits per second (bps).

Communications Features/Functions
Multiplexing/ Demultiplexing. Multiplexing refers to the division of a transmission facility into two or more channels, either by splitting the frequency band into narrower bands or by allotting a common channel to several different information channels. Demultiplexing restores the datastream to its original number of channels.

Terminal-Initiated Application Switching. This entry indicates that the processor, at the terminal's request, supports the selection of applications within a session between an attached terminal and an attached host.

Dynamic Line Reconfiguration. Vendors noted if the processor can switch a session, without operator intervention, from a connection with a failed line or component to a healthy connection when it senses the failure.

LAN Connectivity. This entry indicates which local area networks (LANs) can be connected to the processor.

Interface to Ethernet LAN. If the processor can connect to an Ethernet Local Area Network (LAN), it is noted here.

Protocol Conversion. Some of the popular forms of protocol conversion are async to 3270 BSC, async to Uniscope, SDLC to X.25, and async to X.25.

Error Control. Some types of error control techniques are parity checking with retransmit, parity checking, longitudinal redundancy check (LRC) and cyclic redundancy check (CRC), and automatic repeat request (ARQ)-cyclic redundancy check (CRC).

System Characteristics

Processor Type. Some of the processors are proprietary. Other widely used processors are Tymnet; Motorola 6800, Z80B, MC68010, MC68020; LSI 11/23, LSI 11/73; and Intel 286, 386, and 486.

Main Memory Word Size (bits). In most cases, the main memory word size is also the width of the processor's internal transmission path along its bus.

Main Memory Storage Capacity (bytes). This entry lists the capacity of main memory in bytes. Large main memory capacity is useful for transmission with high-speed protocols in which large blocks of data must be stored for retransmission in case of error.

Hard Disk Storage Capacity (M bytes). This entry indicates the largest disk capacity available, usually represented in megabytes (MB). The hard disk provides rapid restart and recovery capabilities and allows users to store multiple copies of software.

Data Transferred across I/O Lines. Communications processors configured as front ends transfer data to and from the host through an I/O channel (line). The width, in bits, of the I/O channel, along with the communications processor's main memory word size, yields the level of data transferred (e.g., byte or block).

Type of Data Transfer Supported between Memory and Communication Lines, Mass Storage, and Other Peripherals. In some communications processors, only the CPU has access to main memory, and other components must interrupt the CPU to read from or write information to main memory. In others, microprocessors in the subsidiary components share control of main memory with the CPU and can read and write memory on their own. The latter process is called direct memory access (DMA).

I/O, Backup, and Diagnostic Peripherals. Most communications processors interact only with their attached hosts and terminals, relying on host disk systems for storage and on host software for detailed diagnostics. Some newer models, however, support local disk storage for control software, traffic, and support information and feature diagnostic consoles for direct operator intervention.

Support for Remote Console. Some processors that support local operators' consoles can also support an operator's console attached over communications lines.

Support for X.25 Level 3 Capabilities. X.25 is a CCITT recommendation that specifies the interface between user data terminal equipment (DTE) and packet-switching data circuit-terminating equipment (DCE). X.25 Level 3 defines procedures for call initiation, data transfer, interrupts, reset, restart, and clearing.

Communications Operating Software

Operating System Implemented in. This entry explains how the processor stores its control program: wired directly into the hardware, in software that must be loaded into memory from the outside, in firmware (local read-only memory) on-board the processor, or in some combination.

IPL Method. This entry indicates how the processor receives its initial program load (IPL): from its host processor, from a locally attached diskette activated by an operator, or from on-board read-only memory.

User Programmability. This entry indicates the programming method used.

Network Management/Control

Diagnostic Tests Supported. Examples of diagnostic tests are remote and local loopback, port/link status, and internal diagnostics.

Data Collected. The processor can collect data relating to traffic loading, line outages, line hits, link loading, node/link/software status, port statistics, error rates, accounting, trace, and events.

Pricing and Availability

Purchase Price ($). Vendors provided the price of the unit, excluding any options; monthly maintenance and monthly lease/rental prices may also be listed.

Date of First Commercial Delivery. The date on which the product reached the marketplace.

Serviced by. Usually the vendor offers service on an on-site or factory repair/return basis. In some cases, a third party provides the service.

Comments. This space affords vendors the opportunity to describe significant or unusual features, capabilities, or applications that are not reflected in the standard entries.

	Amdahl Communications	Amdahl Communications	Apertus Technologies	Bull HN Information Systems, Inc.
	4745-110	**4745-210**	**Data Star 5000**	**DATANET 8/05 DPS 7000**
Computer Systems Interfaced				
Manufacturer/Models	370 class mainframes	370 class mainframes	IBM E various unix	Bull DPS 7000
Direct Attachment of Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Vendor did not specify	Yes
Max. Hosts Attachable to FEP	4	8	Vendor did not specify	1
Max. Hosts Supported Simultaneously	2	6	Vendor did not specify	1
PU Type within Network	4	4	2	5, DSA node/FE to host
Remote Line Concentrator	Yes	Vendor did not specify	Yes	No
Max. Hosts Served by One Concentrator	SNA/NCP	SNA/NCP defined	6 or more	1,000
Host-Independent Network Processor	No	No	Yes	No
Host Channel Extender	No	No	No	No
Terminal Controller	No	No	Yes	Yes
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	No	No	Yes	No
Network Architecture Compliance	SNA, BSC, X.25	SNA, BSC, X.25	SNA, BSC, TCP/IP	BSC, OSI, X.25, DSA
Native T1 Support	No	No	Yes	Vendor did not specify
Number of T1 Lines Supported	Not applicable	Vendor did not specify	4	Not applicable
Communications Line Capacity				
No. Half-duplex Lines Attachable	64	256	12 or more	15
Highest Line Speed Supported (bps)	256K	256K	T-1	64K
Communications Features/Functions				
Multiplexing/Demultiplexing	No	No	No	Yes
Terminal-Initiated Application Switching	No	No	Yes	Yes
Dynamic Line Reconfiguration	No	No	Yes	Yes
LAN Connectivity	Token-ring	4 MB	Token-ring, Ethernet	Ethernet
Interface to Ethernet LAN	No	No	Yes	No
Protocol Conversion	SDLS to X.25, async to X.25	SDLS to X.25, async to X.25	Async to 3270 BSC, async to X.25, 3270 to Async	Async, VIP, DSC, RCI
Error Control	Parity check w/retransmit on error, LRC & CRC detection/correction, parity, ARQ-CRC	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction, parity
System Characteristics				
Processor Type	Proprietary	Proprietary	Intel 286, Asyncmetric Multiprocessing	Proprietary
Main Memory Word Size (bits)	16	16	16, 2M/module	16
Main Memory Storage Capacity (bytes)	8M	8M	2M	2M
Hard Disk Storage Capacity (Mbytes)	67 formatted	67 formatted	40	Not applicable
Data Transferred Across I/O Lines	Byte, block	Byte, block	Byte	Word, 36 bit
Data Transferred Between:				
Memory and Communications Lines	DMA and interrupt	DMA and interrupt	DMA, DMA and interrupt	DMA and interrupt
Memory and Mass Storage	DMA and interrupt	DMA and interrupt	DMA and interrupt	Vendor did not specify
Memory and Other Peripherals	Interrupt	Interrupt	DMA and interrupt	DMA
I/O, Backup, and Diagnostic Peripherals	FEP console, diskette, patch panel, disk	FEP console, diskette, patch panel, disk	Diskette, disk	FEP console, diskette, host/mainframe
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	No	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software	Software	Software, firmware
IPL Method	Download from host, internal self-load	Download from host, internal self-load	Manual load, internal self-load, IPL diskette	Download from host, IPL diskette, tele-load
User Programmability	No	No	No	No
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status, network management
Data Collected	NPA NetView statistics	NetView/NPA	Node/link/software status, line outages, port statistics, trace, events, link loading	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, error rates, events, link loading
Pricing and Availability				
Purchase Price ($)	100,650.00	132,000.00	5K-50K	12,000.00
Monthly Purchase ($)	303.00	319.00	Vendor did not specify	150.00
Monthly Lease/Rental ($)	Not applicable	Not applicable	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	June 1988	June 1988	June 1989	September 1987
Serviced by	Amdahl	Amdahl	Apertus Technology	Bull Worldwide Info Sys
Comments	Runs both NCP-3 or NCP-4 and NCP-5; runs in 3725 mode or 3745 mode	Runs NCP-3 or NCP-4 and NCP-5; runs in 3725 mode or 3745 mode	Communications server provides various host access by terminals (3270 async)	

	Bull HN Information Systems, Inc.	Bull HN Information Systems, Inc.	Bull HN Information Systems, Inc.	Carse, Woodworth and Associates Int'l.
	DATANET 8/10	DATANET 8/20	DATANET 8/30	COM/3X Communication Gateway All TCP\IP UNIX Hosts
Computer Systems Interfaced				
Manufacturer/Models	Bull DPS7, DPS7000, DPS8, DPS8000, DPS88, DPS90, DPS9000	DPS7, DPS7000, DPS8, DPS88, DPS90, DPS8000, DPS9000	Bull DPS7, DPS7000, DPS8, DPS8000, DPS88, DPS90, DPS9000	Vendor did not specify
Direct Attachment of Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	1 or 2	4	4	1
Max. Hosts Supported Simultaneously	1 or 2	4	4	Unlimited
PU Type within Network	DSA node	2, 4, DSA node	2, 4, DSA node	PU Type 2.1, LU 6.2
Remote Line Concentrator	Yes	Yes	Yes	No
Max. Hosts Served by One Concentrator	1,000	1,000	1,000	Vendor did not specify
Host-Independent Network Processor	Yes	Yes	Yes	No
Host Channel Extender	No	No	No	No
Terminal Controller	Yes	Yes	Yes	Yes
Store-and-Forward Switching	No	No	No	Yes
Distributed Processing Node	No	No	No	No
Network Architecture Compliance	BSC, OSI, DSA	SNA, BSC, OSI, X.25, DSA	SNA, BSC, OSI, X.25, DSA	SNA, X.25, TCP/IP
Native T1 Support	Vendor did not specify	Yes	Yes	No
Number of T1 Lines Supported	Not applicable	Vendor did not specify	Vendor did not specify	Vendor did not specify
Communications Line Capacity				
No. Half-duplex Lines Attachable	31	127	127	24
Highest Line Speed Supported (bps)	64K	2.5M	2.50M	64K
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	No
Terminal-Initiated Application Switching	Yes	Yes	Yes	Yes
Dynamic Line Reconfiguration	Yes	Yes	Yes	Yes
LAN Connectivity	Ethernet	Ethernet	Ethernet	Token-ring, Ethernet
Interface to Ethernet LAN	No	No	No	Yes
Protocol Conversion	Async, VIP, DSC, RSI	SDLS to X.25	SDLS to X.25, async, VIP, BSC, RCI	SDLS to X.25, async to X.25, SNA to TCP/IP
Error Control	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Parity check w/retransmit on error
System Characteristics				
Processor Type	Proprietary	Proprietary	Proprietary	Intel 186, Intel 286, 186, 386, 486 family
Main Memory Word Size (bits)	16	16	16	16
Main Memory Storage Capacity (bytes)	2M	2M	2M	16M
Hard Disk Storage Capacity (Mbytes)	Not applicable	None	None	120M
Data Transferred Across I/O Lines	Word (36 bit)	Word (36 bit)	Word (36 bit)	Block
Data Transferred Between:				
Memory and Communications Lines	DMA, interrupt	DMA and interrupt	DMA, interrupt	Vendor did not specify
Memory and Mass Storage	Vendor did not specify	Not applicable	Vendor did not specify	Vendor did not specify
Memory and Other Peripherals	DMA	DMA	DMA	Vendor did not specify
I/O, Backup, and Diagnostic Peripherals	FEP console, host/mainframe	FEP console, diskette, Host/mainframe	FEP console, diskette, host/mainframe	FEP console, diskette, magnetic tape, printer
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software, firmware	Software, firmware	Software, firmware	Software, OS/2, Com/3X
IPL Method	Download from host, tele-load	Download from host, IPL diskette, Tele-load	Download from host, IPL diskette, tele-load	IPL diskette
User Programmability	No	No	No	No
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status, network management	Local/remote loopback, internal diagnostics, problem determination, port/line status, Network management	Local/remote loopback, internal diagnostics, problem determination, port/line status, network management	Local/remote loopback, internal diagnostics, port/line status
Data Collected	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, error rates, events, link loading	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, error rates, events, link loading	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, error rates, events, link loading	Line outages, port statistics, line hits, error rates
Pricing and Availability				
Purchase Price ($)	33,890.00	47,990.00	47,990.00	25,000.00
Monthly Purchase ($)	244.00	329.00	329.00	250.00
Monthly Lease/Rental ($)	1,160.00	1,640.00	1,640.00	Not applicable
Date of First Commercial Delivery	September 1985	September 1985	September 1985	September 1987
Serviced by	Bull Worldwide Info Sys	Bull Worldwide Info Sys	Bull Worldwide Info Sys	CWA
Comments				SNA to TCP/IP Gateway supports seven layer protocol translation between user applications

	Commtex Inc.	Computer Communications, Inc.	Computer Designed Systems	Computer Logics Ltd.
	CX-80 Data Exchange	**Data Express**	**Adviser 2390/XX**	**CCP 3205**
Computer Systems Interfaced				
Manufacturer/Models	Two IBM 3270 mainframes (4 opt.) and/or any async hosts (5)	IBM 370 class	IBM, MIPS, Pyramid, Motorola	Unisys
Direct Attachment of Host	No	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	No	Yes	Yes	Yes
Max. Hosts Attachable to FEP	Not applicable	13	4	2
Max. Hosts Supported Simultaneously	4	13	4	2
PU Type within Network	2	2, 2.1-6.2	Optional 1 thru 5	2
Remote Line Concentrator	No	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	Not applicable	128	4	Unlimited
Host-Independent Network Processor	No	Yes	Yes	Yes
Host Channel Extender	No	Yes	Yes	No
Terminal Controller	Yes	Yes	Yes	Yes
Store-and-Forward Switching	No	Yes	Yes	No
Distributed Processing Node	No	Yes	Yes	No
Network Architecture Compliance	SNA, BSC	SNA, DECnet, BSC, OSI, X.25, ALC, SLC, & TCP/IP	SNA, BSC, OSI, X.25	OSI, X.25, TCP/IP
Native T1 Support	No	Yes	Yes	Vendor did not specify
Number of T1 Lines Supported	Vendor did not specify	4	24	Vendor did not specify
Communications Line Capacity				
No. Half-duplex Lines Attachable	4	256	32	16-line expansion
Highest Line Speed Supported (bps)	64K	T1 (1.544M)	56K	64K
Communications Features/Functions				
Multiplexing/Demultiplexing	No	Yes	Yes	Yes
Terminal-Initiated Application Switching	Yes	Yes	Yes	Yes
Dynamic Line Reconfiguration	No	Yes	Yes	Yes
LAN Connectivity	Not applicable	Token-ring, Ethernet	Token-ring, Ethernet	Vendor did not specify
Interface to Ethernet LAN	No	Yes	Yes	Yes
Protocol Conversion	Async to 3270 BSC, SDLS to X.25, async to X.25, async to SNA/SDLC	Async to 3270 BSC, SDLS to X.25	Async to 3270 BSC, SDLS to X.25, async to X.25	Asynch to uniscope
Error Control	Parity	Parity check w/retransmit on error, LRC & CRC detection/correction, parity, ARQ-CRC	Parity check w/retransmit on error, LRC & CRC detection/correction	LRC & CRC detection/correction
System Characteristics				
Processor Type	Z80B, MC68010, HD 64180	Proprietary, Motorola 6800	MC68020, Intel 286, 386	Concurrent Computer 3205
Main Memory Word Size (bits)	16	16, 32	32	32
Main Memory Storage Capacity (bytes)	128K, 256K, 512K, 1M	No pract. limit	4M	8M
Hard Disk Storage Capacity (Mbytes)	Not applicable	No practical limit	2.4GB Max.	Vendor did not specify
Data Transferred Across I/O Lines	Block	Byte, file, block	Byte, file, block	Byte
Data Transferred Between:				
Memory and Communications Lines	Interrupt	DMA and interrupt	DMA, DMA and interrupt	DMA, interrupt
Memory and Mass Storage	Not applicable	DMA and interrupt	DMA and interrupt	DMA, or ESI channel
Memory and Other Peripherals	Interrupt	DMA and interrupt	DMA and interrupt	DMA, interrupt
I/O, Backup, and Diagnostic Peripherals	Diskette	FEP console, diskette, patch panel, disk, mag.tape	FEP console, diskette, patch panel, disk, mag.tape	FEP console
Support for Remote Console	Yes	Yes	Yes	Vendor did not specify
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Hardware, software	Firmware	Software
IPL Method	Internal self-load	Download from host, manual load, int.self-load, disk.	Download from host, internal self-load	Host download
User Programmability	Via user-selected parameters	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination	Local/remote loopback, internal diagnostics, problem determination, port/line status, extensive	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, port/line status
Data Collected	Line outages, line hits, error rates	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, line hits, error rates, events, link loading	Node/link/software status, port statistics
Pricing and Availability				
Purchase Price ($)	4,950.00	50,000.00	8,500.00	500,000.00
Monthly Purchase ($)	Vendor did not specify	3,500.00	96.00	300.00
Monthly Lease/Rental ($)	Vendor did not specify	Contact vendor	Not applicable	Vendor did not specify
Date of First Commercial Delivery	1982	Vendor did not specify	January 1990	1986
Serviced by	Intelogic Trace	Computer Communications	Various	Computer Logics
Comments	Unrestricted mix up to 50 async ASCII, & Type-A coax terminals & PCs to access two (four opt.) IBM 3270 mainframe hosts, async			Fully compliant TCP/IP and Ethernet support; allows for PC LAN interface to 1100s with full UTS emulation at each PC

	Computer Network Technology Corp.	**Computerm Corp.**	**Concurrent Computer Corp.**	**Concurrent Computer Corp.**
	CHANNELlink	**3800/3890 Channel extension system**	**Procom-2**	**Procom-8**
Computer Systems Interfaced				
Manufacturer/Models	IBM S/370 & compat., Cray Supercomputers, DEC/VAX-B1Bus	IBM S/370, and compatibles	Concurrent Computer Series 3200	Concurrent Computer Series 3200
Direct Attachment of Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	No	Yes	Yes	Yes
Max. Hosts Attachable to FEP	8	7	1	1
Max. Hosts Supported Simultaneously	8	7	1	1
PU Type within Network	All PU types	Not applicable	Not applicable	Not applicable
Remote Line Concentrator	Yes	Yes	No	No
Max. Hosts Served by One Concentrator	Vendor did not specify	28	Vendor did not specify	N
Host-Independent Network Processor	Yes	Yes	No	No
Host Channel Extender	Yes	Yes	No	No
Terminal Controller	No	No	No	No
Store-and-Forward Switching	Yes	No	No	No
Distributed Processing Node	No	No	Yes	Yes
Network Architecture Compliance	SNA, DECnet, BSC, OSI, X.25, TCP/IP	Transparent	OSI, X.25	OSI, X.25
Native T1 Support	Yes	Yes	No	No
Number of T1 Lines Supported	12	4	No	No
Communications Line Capacity				
No. Half-duplex Lines Attachable	16	8	2	8
Highest Line Speed Supported (bps)	100M	1.544M	64K	64K
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	No	Yes	Yes
Terminal-Initiated Application Switching	No	Yes	No	No
Dynamic Line Reconfiguration	Yes	No	No	Vendor did not specify
LAN Connectivity	Ethernet, Proprietary	Token-ring, through gateway	None	None
Interface to Ethernet LAN	Yes	No	No	No
Protocol Conversion	Vendor did not specify	No	No	No
Error Control	Parity check w/retransmit on error, ARQ-CRC	LRC & CRC detection/correction	LRC & CRC detection/correction	LRC & CRC detection/correction
System Characteristics				
Processor Type	MC68020	IBM Series/1 and Z80	Motorola 68000	Motorola 68000
Main Memory Word Size (bits)	32	16	32	32
Main Memory Storage Capacity (bytes)	Up to 10MB	2M	512K	512K
Hard Disk Storage Capacity (Mbytes)	Vendor did not specify	Not applicable	Not applicable	Not applicable
Data Transferred Across I/O Lines	Block	Byte, block	Byte	Byte
Data Transferred Between:				
Memory and Communications Lines	DMA	DMA	DMA, interrupt	DMA, interrupt
Memory and Mass Storage	DMA	None	Not applicable	Not applicable
Memory and Other Peripherals	Vendor did not specify	DMA	None	None
I/O, Backup, and Diagnostic Peripherals	Battery, Back-up, RAM	FEP console, diskette	None	None
Support for Remote Console	Yes	Yes	No	No
Support for X.25 Level 3 Capabilities	No	No	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software, firmware	Firmware	Firmware
IPL Method	Internal self-load	Internal self-load, IPL diskette, optional	Download from host	Download from host
User Programmability	Via console	User configurable	Via user-created programs	Via user-created programs
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Internal diagnostics	Internal diagnostics	Internal diagnostics
Data Collected	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, line outages, trace, error rates, realtime monitor	Node/link/software status, accounting, line outages, trace	Node/link/software status, accounting, line outages, trace
Pricing and Availability				
Purchase Price ($)	Contact vendor	73,000.00	4,000.00	6,000.00
Monthly Purchase ($)	Vendor did not specify	613.00	37.00	58.00
Monthly Lease/Rental ($)	Vendor did not specify	1,621.00	Not applicable	Not applicable
Date of First Commercial Delivery	1987	December 1982	Not available	Not available
Serviced by	StorageTek, IBM	Computerm and IBM	Concurrent Computer Corp.	Concurrent Computer Corp.
Comments	CHANNELink delivers networking solutions for data center consolidation, disaster recovery, multiple data centers	Chan.extension suppt. for print., CRTs, check sorters, Mag tape, and FEPs with satellite-efficient protocols.	Software environment utilizes OS/32 Rev 8.1.3 or higher. Procom board is provided with OS/32 driver support	Software environment utilizes OS/32 Rev 8.1.3 or higher. Procom board is provided with OS/32 driver support

	Concurrent Computer Corp.	Control Data Corp.	Emulex Corp.	Encore Computer
	SCP Serial Communications Processor	**CDCNET 2600 Series**	**DCP-286**	**QSSC (Quad Sync Serial Controller) 8521**
Computer Systems Interfaced				
Manufacturer/Models	Concurrent Computer Series 3200	Control Data Corporation/ CDCNET 2600 Series	ISA, Micro Channel PCs	Concept 32/67, Concept 2040, Concept 32/97
Direct Attachment of Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	1	3	1	1
Max. Hosts Supported Simultaneously	1	3	8	1
PU Type within Network	Not applicable	Not available	Not applicable	Vendor did not specify
Remote Line Concentrator	No	Yes	Yes	No
Max. Hosts Served by One Concentrator	Vendor did not specify	Unlimited	8	Vendor did not specify
Host-Independent Network Processor	No	Yes	No	No
Host Channel Extender	No	No	No	Yes
Terminal Controller	No	Yes	Yes	Yes
Store-and-Forward Switching	No	No	Yes	No
Distributed Processing Node	Yes	Yes	Yes	No
Network Architecture Compliance	X.25	BSC, OSI, X.25, TCP/IP	SNA, BSC, X.25	OSI, X.25
Native T1 Support	No	No	No	Yes
Number of T1 Lines Supported	No	Vendor did not specify	Vendor did not specify	4
Communications Line Capacity				
No. Half-duplex Lines Attachable	4	64	8	4
Highest Line Speed Supported (bps)	56K	256K	1M	2.048M
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Application Switching	No	Yes	Yes	Yes
Dynamic Line Reconfiguration	No	Yes	Yes	Yes
LAN Connectivity	None	Ethernet	None	Not applicable
Interface to Ethernet LAN	No	Yes	No	Vendor did not specify
Protocol Conversion	No	Async to X.25	Async to 3270 BSC, SDLS to X.25, async to X.25	Not applicable
Error Control	LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction, parity, ARQ-CRC	LRC & CRC detection/correction
System Characteristics				
Processor Type	Motorola 68000	MC 68030	Intel 286	Thompson 5025
Main Memory Word Size (bits)	32	16	16	32
Main Memory Storage Capacity (bytes)	512K	1M-16M	1M	128K
Hard Disk Storage Capacity (Mbytes)	Not applicable	No disk	Not applicable	Not applicable
Data Transferred Across I/O Lines	Byte	Block	Byte	Block
Data Transferred Between:				
Memory and Communications Lines	DMA, interrupt	DMA, interrupt	DMA and interrupt	DMA and interrupt
Memory and Mass Storage	Not applicable	Not available	Not applicable	DMA
Memory and Other Peripherals	None	Interrupt	Shared memory	Not applicable
I/O, Backup, and Diagnostic Peripherals	None	FEP console	Not applicable	Disk, magnetic tape
Support for Remote Console	No	Yes	Yes	No
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Firmware	Software, firmware	Software	Software
IPL Method	Download from host	Download from host	Download from host	Internal self-load
User Programmability	Via user-created programs	No	Via user-created programs	Via user-selected parameters
Network Management Control				
Diagnostic Tests Supported	Internal diagnostics	Local/remote loopback, internal diagnostics, problem determination, port/line status	None	Local/remote loopback, problem determination, port/line status
Data Collected	Node/link/software status, accounting, line outages, trace	Traffic loading, node/link/software status, accounting, line outages, port statistics, line hits, error rates, events, link loading	Vendor did not specify	Node/link/software status, accounting, line outages, port statistics, events
Pricing and Availability				
Purchase Price ($)	6,500.00	12,000.00	1,695.00	15,000.00
Monthly Purchase ($)	12.00	100.00	Not applicable	67.00
Monthly Lease/Rental ($)	Not applicable	Vendor did not specify	Not applicable	Not applicable
Date of First Commercial Delivery	1987	December 1985	1986	December 1989
Serviced by	Concurrent Computer Corp.	Control Data Corp.	Emulex Corp.	Encore Computer Corp.
Comments	Purchase price is $6,500 without software; $7,500 with software	A modular multinode local area network product with extended features including front-end funct., router, full X.25		

	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)
	IBM 3745 130	**IBM 3745 150**	**IBM 3745 170**	**IBM 3745 210**
Computer Systems Interfaced				
Manufacturer/Models	IBM 43XX, 937X, 308X, 3090	IBM 43XX, 937X, 308X, 3090	IBM 43XX, 937X, 308X, 3090	IBM S/370, 43XX, 937X, 3033, 308X, 3080
Direct Attachment of Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	4	4	4	16
Max. Hosts Supported Simultaneously	256 with token ring	256 with token ring	256 with token ring	256 with token-ring
PU Type within Network	4	4	4	4
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	256	256	256	256
Host-Independent Network Processor	No	No	No	No
Host Channel Extender	No	No	No	No
Terminal Controller	No	No	No	No
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	No	No	No	No
Network Architecture Compliance	SNA	SNA	SNA	SNA, X.25
Native T1 Support	Yes	Yes	Yes	Yes
Number of T1 Lines Supported	2	1	2	16
Communications Line Capacity				
No. Half-duplex Lines Attachable	Not applicable	32	112	896
Highest Line Speed Supported (bps)	1.544M	1.544MB	1.544Mb	1.544M
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Application Switching	No	No	No	No
Dynamic Line Reconfiguration	Yes	Yes	Yes	Yes
LAN Connectivity	Token-ring	Token-ring	Token-ring	Token-ring
Interface to Ethernet LAN	No	No	No	No
Protocol Conversion	Yes	Yes	Yes	Yes
Error Control	LRC & CRC detection/correction	LRC & CRC detection/correction	LRC & CRC detection/correction	LRC & CRC detection/correction
System Characteristics				
Processor Type	Proprietary	Proprietary	Proprietary	Proprietary
Main Memory Word Size (bits)	8	18	8	8
Main Memory Storage Capacity (bytes)	8M	8M	Vendor did not specify	8M, (per CCU)
Hard Disk Storage Capacity (Mbytes)	67 formatted	67 formatted	67 formatted	67 formatted
Data Transferred Across I/O Lines	Block	Block	Block	Block
Data Transferred Between:				
Memory and Communications Lines	DMA	DMA	DMA	DMA
Memory and Mass Storage	DMA	DMA	DMA	DMA
Memory and Other Peripherals	DMA	DMA	DMA	DMA
I/O, Backup, and Diagnostic Peripherals	FEP console	FEP console	FEP console	Vendor did not specify
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software	Software	Software
IPL Method	Internal self-load	Internal self-load	Internal self-load	Internal self-load
User Programmability	Yes	Yes	Yes	Yes
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Yes	Yes
Data Collected	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, line hits, error rates, events	Yes	Yes
Pricing and Availability				
Purchase Price ($)	21,420.00	31,590.00	26,780.00	147,050.00
Monthly Purchase ($)	220.00	232.00	220.00	350.00
Monthly Lease/Rental ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	1989	1989	1989	March 1988
Serviced by	IBM	IBM	IBM	IBM
Comments	Contact local IBM rep.	Contact local IBM rep.	Contact local IBM rep.	Max. hosts supported simultaneously using token ring is 256

	International Business Machines Corp. (IBM)	Lemcom Systems, Inc.	Lemcom Systems, Inc.	Micom Communications
	IBM 3745 410	**Distributed Network Processor**	**DNP 9000**	**Micom/MBE**
Computer Systems Interfaced				
Manufacturer/Models	IBM S/370, 43XX, 937X, 3033, 308X, 3080	IBM 43XX, 30XX, 937X	IBM 43XX, 30XX, 937X	370 class mainframes
Direct Attachment of Host	Yes	Yes	Yes	No
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	No
Max. Hosts Attachable to FEP	16	32	16	33
Max. Hosts Supported Simultaneously	256 with token-ring	32	16	33
PU Type within Network	4	2, 4	2, 4	1 and 2
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	Up to 256	32	16	33
Host-Independent Network Processor	No	Yes	Yes	Yes
Host Channel Extender	No	No	No	No
Terminal Controller	No	No	Yes	Yes
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	No	Yes	Yes	Yes
Network Architecture Compliance	SNA, X.25	SNA, BSC	SNA, BSC	SNA, BSC, OSI, X.25 HDLC, TCP/IP
Native T1 Support	Yes	No	Yes	No
Number of T1 Lines Supported	16	Vendor did not specify	Vendor did not specify	Vendor did not specify
Communications Line Capacity				Vendor did not specify
No. Half-duplex Lines Attachable	896	1,024	1,000	Vendor did not specify
Highest Line Speed Supported (bps)	1.544M	64K	2.0486M	128K
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Application Switching	No	Yes	Yes	Yes
Dynamic Line Reconfiguration	Yes	Vendor did not specify	Yes	Yes
LAN Connectivity	Token-ring	Vendor did not specify	Token-ring	Ethernet
Interface to Ethernet LAN	No	No	No	Yes
Protocol Conversion	Yes	Async to 3270 BSC, async to 3270 SDLC	Async to 3270 BSC, BSC to SDLC	SDLC to X.25, async to X.25 async to 3270, BSC, HDLC to X.25
Error Control	LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction, parity, ARQ-CRC	LRC & CRC detection/correction, parity, ARQ-CRC	LRC and CRC detection/correction
System Characteristics				
Processor Type	Proprietary	MC6809	MC68020	Motorola 6800
Main Memory Word Size (bits)	Vendor did not specify	32	32	16
Main Memory Storage Capacity (bytes)	8M, (per CCU)	4M	2M, per MC68020	2M
Hard Disk Storage Capacity (Mbytes)	67 formatted	Vendor did not specify	Non-volatile RAM	Vendor did not specify
Data Transferred Across I/O Lines	Block	Byte, block	Byte, block	Block
Data Transferred Between:				
Memory and Communications Lines	DMA	DMA and interrupt	DMA and interrupt	DMA
Memory and Mass Storage	DMA	DMA and interrupt	DMA	Interrupt
Memory and Other Peripherals	DMA	Not applicable	Not available	DMA
I/O, Backup, and Diagnostic Peripherals	Vendor did not specify	FEP console, diskette	FEP console, diskette	PC-based network management system
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	No	No	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software	Software	Firmware
IPL Method	Internal self-load	Internal self-load	Internal self-load	Internal self-load
User Programmability	Yes	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console	Yes, via console
Network Management Control				
Diagnostic Tests Supported	Yes	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, port/line status, internal diagnostics, problem determination
Data Collected	Yes	Traffic loading, node/link/software status, line outages, trace, line hits, error rates, link loading	Traffic loading, node/link/software status, line outages, trace, line hits, error rates, events, link loading	Traffic loading, line outages, line hits, link loading, node/link/ software status port statistics, error rates, accounting, trace, events
Pricing and Availability				
Purchase Price ($)	221,450.00	18,450.00	20,000.00	9,700
Monthly Purchase ($)	538.00	Vendor did not specify	150.00	200
Monthly Lease/Rental ($)	Vendor did not specify	632.00	685.00	Vendor did not specify
Date of First Commercial Delivery	March 1988	1980	1991	1988
Serviced by	IBM	HDS)Hitachi Data Systems	Hitachi Data Systems	Micom
Comments	Max. hosts supported simultaneously using token-ring is 256	Appears to host as locally attached IBM 3274-1A, IBM 3274-1D, or IBM 3737. Upgraded version 1986	Concurrently used as IBM-compatible FEP and RCTCA, as concentrator for networking IBM compatible DES Encryption	Runs NCP-3 or NCP-4 and NCP-5; runs in 3725 mode or 3745 mode

	Morning Star Technologies	Morning Star Technologies	Morning Star Technologies	NCR
	Horizon 240V	**Horizon 482V**	**Horizon 840**	**NCR 5620-XP**
Computer Systems Interfaced				
Manufacturer/Models	Board-level that installs in VMEbus UNIX computers	Board-level that installs in VMEbus UNIX computers	Board-level that installs in Multibus UNIX computers	IBM 360/370, 303X, 308X, 3090, 43XX, plus compatible Amdahl & Hitachi (NAS)
Direct Attachment of Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	Not applicable	Not available	Not available	2
Max. Hosts Supported Simultaneously	Not applicable	Not available	Not available	2
PU Type within Network	2, SNA or BSC 3270	2, SNA or BSC 3270	2, SNA or BSC 3270	4, 5
Remote Line Concentrator	No	No	No	Yes
Max. Hosts Served by One Concentrator	Vendor did not specify	Vendor did not specify	Vendor did not specify	Throughput dependent
Host-Independent Network Processor	Yes	Yes	Yes	No
Host Channel Extender	No	No	No	Yes
Terminal Controller	No	No	No	Yes
Store-and-Forward Switching	No	No	No	Yes
Distributed Processing Node	No	No	No	Yes
Network Architecture Compliance	SNA, BSC, X.25	SNA, BSC, X.25	SNA, BSC, X.25	SNA, BSC, OSI, X.25
Native T1 Support	No	No	No	No
Number of T1 Lines Supported	0	Vendor did not specify	0	Vendor did not specify
Communications Line Capacity				
No. Half-duplex Lines Attachable	2 full-duplex lines	4 full-duplex	8 full-duplex	64
Highest Line Speed Supported (bps)	64K each line	64K	64K	56/64K
Communications Features/Functions				
Multiplexing/Demultiplexing	No	No	No	Yes
Terminal-Initiated Application Switching	No	No	No	Yes
Dynamic Line Reconfiguration	Yes	Yes	Yes	Yes
LAN Connectivity	Not applicable	Not available	Not available	Token-ring, Ethernet, 4Mb
Interface to Ethernet LAN	Yes	Yes	Yes	Yes
Protocol Conversion	Not applicable	Not available	Vendor did not specify	Async to 3270 BSC, SDLS to X.25, async to X.25
Error Control	Vendor did not specify	Vendor did not specify	Vendor did not specify	LRC & CRC detection/correction
System Characteristics				
Processor Type	10M Hz 68000	MC68020, 20M Hz	10M Hz 68000	Proprietary
Main Memory Word Size (bits)	Vendor did not specify	Vendor did not specify	3M optional	32
Main Memory Storage Capacity (bytes)	1M, 2M optional	1M, 4M, optional	1M, standard	4M
Hard Disk Storage Capacity (Mbytes)	Not available	Vendor did not specify	Vendor did not specify	10M
Data Transferred Across I/O Lines	Frame	Frame	Frame	Byte
Data Transferred Between:				
Memory and Communications Lines	DMA	DMA	DMA	DMA and interrupt
Memory and Mass Storage	Not available	Not available	Not available	DMA
Memory and Other Peripherals	Not available	Not available	Not available	DMA
I/O, Backup, and Diagnostic Peripherals	Vendor did not specify	Not available	Vendor did not specify	FEP console, diskette, disk, printer
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software	Software	Software
IPL Method	Set with jumpers	Configured via software	Set by wire-wrap	Download from host, manual load, internal self-load,
User Programmability	Via user-selected parameters, via user-created programs, via console,	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics	Local/remote loopback, internal diagnostics	Local/remote loopback, internal diagnostics	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Traffic loading, accounting, port statistics, trace, error rates	Traffic loading, accounting, port statistics, trace, error rates	Traffic loading, accounting, trace, error rates	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, line hits, error rates, events, link loading
Pricing and Availability				
Purchase Price ($)	2,690.00	3,817.00	2,748.00	Vendor did not specify
Monthly Purchase ($)	Not applicable	Not applicable	Not applicable	Vendor did not specify
Monthly Lease/Rental ($)	Not applicable	Not applicable	Not applicable	Vendor did not specify
Date of First Commercial Delivery	1986	1990	1985	1987
Serviced by	Morning Star Technologies	Morning Star Technologies	Morning Star Technologies	NCR
Comments	Both serial sync ports support RS-232 signal & a 2 port ribbon cable with DB25 female connectors. Runs MST X.25, SNA, or BSC prot.sft.	Four serial sync ports can be individually set up for either RS-232, RS-422/449 or V.35 signals. Runs MST X.25, SNA, or BSC prot.sft.	Serial sync ports can be individually setup for either RS-232, RS-422/449 or V.35 signals. Runs MST X.25, SNA or BSC prot.sft.	NCR 8500/8600 and 9800 are other computer systems interfaced

	NCR	NCR	NCR	NCR
	NCR 5645-B	**NCR 5655-B**	**NCR 5685-B**	**NCR 5675-B**
Computer Systems Interfaced				
Manufacturer/Models	IBM 360/370, 303X, 308X, 3090, 43XX, plus compatible Amdahl & Hitachi (NAS)	IBM 360/370, 303X, 308X, 3090, 43XX, plus compatible Amdahl & Hitachi (NAS)	IBM 360/370, 303X, 308X, 3090, 43XX, plus compatible Amdahl & Hitachi (NAS)	IBM 360/370, 303X, 308X, 3090, 43XX, plus compatible Amdahl & Hitachi (NAS)
Direct Attachment of Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	4	8	8	16
Max. Hosts Supported Simultaneously	4	8	8	16
PU Type within Network	4, 5	4, 5	4, 5	4, 5
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	Throughput dependent	Throughput dependent	Throughput dependent	Throughput dependent
Host-Independent Network Processor	No	No	No	No
Host Channel Extender	Yes	Yes	Yes	Yes
Terminal Controller	Yes	Yes	Yes	Yes
Store-and-Forward Switching	Yes	Yes	Yes	Yes
Distributed Processing Node	Yes	Yes	Yes	Yes
Network Architecture Compliance	SNA, BSC, OSI, X.25	SNA, BSC, OSI, X.25	SNA, BSC, OSI, X.25	SNA, BSC, OSI, X.25
Native T1 Support	Yes	Yes	Yes	Yes
Number of T1 Lines Supported	4	16	16	24
Communications Line Capacity				
No. Half-duplex Lines Attachable	1284 - 9.6K FDX line	512 - 9.6K FDX lines	512	1,024
Highest Line Speed Supported (bps)	T-1 (1.544/2.048M)	T-1 (1.544/2.048M)	T-1 (1.544/2.048M)	T-1 (1.544/2.048M)
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Application Switching	Yes	Yes	Yes	Yes
Dynamic Line Reconfiguration	Yes	Yes	Yes	Yes
LAN Connectivity	Token-ring, Ethernet	Token-ring, Ethernet	Token-ring, Ethernet	Token-ring, Ethernet
Interface to Ethernet LAN	Yes	Yes	Yes	Yes
Protocol Conversion	Async to 3270 BSC, SDLS to X.25, async to X.25	Async to 3270 BSC, SDLS to X.25, async to X.25	Async to 3270 BSC, SDLS to X.25, async to X.25	Async to 3270 BSC, SDLS to X.25, async to X.25
Error Control	LRC & CRC detection/correction	LRC & CRC detection/correction	LRC & CRC detection/correction	LRC & CRC detection/correction
System Characteristics				
Processor Type	Proprietary	Proprietary	Proprietary	Proprietary
Main Memory Word Size (bits)	32	32	32	32
Main Memory Storage Capacity (bytes)	16M	16M	16M	16M
Hard Disk Storage Capacity (Mbytes)	80	80	80	80
Data Transferred Across I/O Lines	Byte, file, block	Byte, file, block	Byte, file, block	Byte, file, block
Data Transferred Between:				
Memory and Communications Lines	DMA and interrupt	DMA, interrupt, both	DMA, interrupt,	DMA, interrupt
Memory and Mass Storage	DMA	DMA	DMA	DMA
Memory and Other Peripherals	DMA	DMA	DMA	DMA
I/O, Backup, and Diagnostic Peripherals	FEP console, disk, printer	FEP console, disk, printer, universal comm. adapter	FEP console, disk, printer, universal comm. adapter	FEP console, disk, printer, universal comm. adapter
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software	Software	Software
IPL Method	Download from host, manual load, internal self-load,	Download from host, manual load, internal self-load	Download from host, manual load, internal self-load,	Download from host, manual load, internal self-load,
User Programmability	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, line hits, error rates, events, link loading
Pricing and Availability				
Purchase Price ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Monthly Purchase ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Monthly Lease/Rental ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	September 1990	September 1990	April 1991	April 1991
Serviced by	NCR	NCR	NCR	NCR
Comments	NCR 8500/8600 and 9800 are other computer systems interfaced	NCR 8500/8600 and 9800 are other computer systems interfaced	NCR 8500/8600 and 9800 are other computer systems interfaced	NCR 8500/8600 and 9800 are other computer systems interfaced

	Netlink, Inc.	**Netlink, Inc.**	**Periphonics Corp.**	**Periphonics Corp.**
	SNA Link	**SNA-Hub**	**VPS 7000**	**VPS 7500**
Computer Systems Interfaced				
Manufacturer/Models	IBM (and compatible) SNA hosts	IBM (and compatible) SNA hosts	IBM 3274 SNA/SDLC/Bisync, IBM 5251 SDLC, Async	IBM 3274 SNA/SDLC/Bisync, IBM 5251 SDLC, Async
Direct Attachment of Host	No	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	No	No	Yes	Yes
Max. Hosts Attachable to FEP	Vendor did not specify	Vendor did not specify	4	4
Max. Hosts Supported Simultaneously	Vendor did not specify	Vendor did not specify	4	4
PU Type within Network	2, PU 5	2, PU 5	2	2
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	2	Up to 8	4	4
Host-Independent Network Processor	No	No	Yes	Yes
Host Channel Extender	No	No	Yes	Yes
Terminal Controller	No	No	Yes	Yes
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	No	No	Yes	Yes
Network Architecture Compliance	SNA	SNA	SNA, BSC, async	SNA, BSC, async
Native T1 Support	No	No	No	No
Number of T1 Lines Supported	Vendor did not specify	Vendor did not specify	Can be upgraded	Can be upgraded
Communications Line Capacity				
No. Half-duplex Lines Attachable	8	16	64	64
Highest Line Speed Supported (bps)	64K	64K	19.2K	19.2K
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Application Switching	Yes	Yes	Yes	Yes
Dynamic Line Reconfiguration	No	No	Yes	Yes
LAN Connectivity	Vendor did not specify	Token-ring	Token-ring	Token-ring
Interface to Ethernet LAN	No	No	No	No
Protocol Conversion	No	IBRO 30/40 to SNA, async to SNA	Async to 3270 BSC	Async to 3270 BSC
Error Control	Parity check w/retransmit on error, LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Vendor did not specify	Vendor did not specify
System Characteristics				
Processor Type	Intel 186, Intel 286, 8086	8086	Motorola 68000/68030	Motorola 68000/68030
Main Memory Word Size (bits)	16	16	32	32
Main Memory Storage Capacity (bytes)	1M	1M	8M, 32MB voice	8M, 32MB voice
Hard Disk Storage Capacity (Mbytes)	20	Vendor did not specify	43MB min.; 600MB max.	43MB min.; 600MB max.
Data Transferred Across I/O Lines	Block	Block	Byte	Byte
Data Transferred Between:				
Memory and Communications Lines	DMA and interrupt	DMA and interrupt	Interrupt	Interrupt
Memory and Mass Storage	DMA and interrupt	Interrupt	Interrupt	Interrupt
Memory and Other Peripherals	Interrupt	Vendor did not specify	Interrupt	Interrupt
I/O, Backup, and Diagnostic Peripherals	Disk	ROM	Diskette, magnetic tape	Diskette, disk, magnetic tape
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	No	No	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software, firmware	Proprietary software	Proprietary software
IPL Method	Download from host, internal self-load	Download from host	Internal self-load	Internal self-load
User Programmability	Via user-selected parameters	Via user-selected parameters	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, port/line status	Local/remote loopback, internal diagnostics, port/line status
Data Collected	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, line hits, error rates, events	Traffic loading, node/link/software status, line outages, port statistics, line hits, error rates, events; link loading
Pricing and Availability				
Purchase Price ($)	4,500.00	6,000.00	35K to 150K	35K to 150K
Monthly Purchase ($)	Vendor did not specify	Vendor did not specify	Of purchase price	Vendor did not specify
Monthly Lease/Rental ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	Vendor did not specify	August 1987	1987	1987
Serviced by	Dictaphone	Dictaphone	Periphonics Corp.	Periphonics Corp.
Comments	SNA PU and Line Concent.; Multiple host access; supp.for SNA dial-in devices; LU priority scheduling.	SNA PU and Line Concentration; Host-based confg.mang;. LU priority sched.	Supports analog telephone conn. & can be expanded to 64 lines per unit, vocab.& appl.develop. tools	Supports analog telephone conn. & can be expanded to 64 lines per unit, vocab. & appl. development

	Periphonics Corp.	Periphonics Corp.	Simpact Associates, Inc.	Simpact Associates, Inc.
	VPS 9000	**VPS 9500**	**CNS 6000 Programmable Communications Network Serve**	**ICP1622 Q-bus Systems**
Computer Systems Interfaced				
Manufacturer/Models	IBM 3274 SNA/SDLC/Bisync, IBM 5251 SDLC, Async	IBM 3274 SNA/SDLC/Bisync, IBM 5251 SDLC, Async	All models of IBM	Q-bus systems
Direct Attachment of Host	Yes	Yes	No	Yes
Functional Characteristics				
Front-end Processor	No	No	Yes	Yes
Max. Hosts Attachable to FEP	4	4	256	Not applicable
Max. Hosts Supported Simultaneously	4	4	256	1 unit is board level
PU Type within Network	2	2	Vendor did not specify	2, Software dependent
Remote Line Concentrator	Yes	Yes	Vendor did not specify	No
Max. Hosts Served by One Concentrator	4	4	Vendor did not specify	Not applicable
Host-Independent Network Processor	Yes	Yes	Yes	No
Host Channel Extender	Yes	Yes	Vendor did not specify	No
Terminal Controller	Yes	Yes	Vendor did not specify	No
Store-and-Forward Switching	No	No	Vendor did not specify	No
Distributed Processing Node	Yes	Yes	Yes	No
Network Architecture Compliance	SNA, BSC, async	SNA, BSC, async	BSC, X.25, TCP/IP	BSC, X.25
Native T1 Support	Yes	Yes	Yes	No
Number of T1 Lines Supported	2	2	1	None
Communications Line Capacity				
No. Half-duplex Lines Attachable	2 T-1 SPANS	2 T-1 SPANS	8	4 or 16 w/expander
Highest Line Speed Supported (bps)	19.2K	19.2K	1.544M	1M
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Vendor did not specify	No
Terminal-Initiated Application Switching	Yes	Yes	Vendor did not specify	Vendor did not specify
Dynamic Line Reconfiguration	Yes	Yes	Yes	Vendor did not specify
LAN Connectivity	Token-ring	Token-ring	Ethernet	None
Interface to Ethernet LAN	No	No	Yes	No
Protocol Conversion	Async to 3270 BSC	Async to 3270 BSC	X.25 to TCP/IP	No
Error Control	Vendor did not specify	Vendor did not specify	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Parity check w/retransmit on error, LRC & CRC detection/correction, parity
System Characteristics				
Processor Type	Motorola 68030/68000	Motorola 68030/68000	MC68010	DEC MICRO/T-11
Main Memory Word Size (bits)	Vendor did not specify	Vendor did not specify	16	16
Main Memory Storage Capacity (bytes)	8M, 32 voice	8M, 32M voice	1M, 2M, 8M	512K
Hard Disk Storage Capacity (Mbytes)	4.3MB min.; 600 MB max.	4.3MB min.; 600 MB max.	Not applicable	Not applicable
Data Transferred Across I/O Lines	Byte	Byte	Byte, block	Software dependent
Data Transferred Between:				
Memory and Communications Lines	Interrupt	Interrupt	Interrupt	DMA, interrupt,
Memory and Mass Storage	Interrupt	Interrupt	Vendor did not specify	Not applicable
Memory and Other Peripherals	Interrupt	Interrupt	DMA, interrupt	Not applicable
I/O, Backup, and Diagnostic Peripherals	Diskette, magnetic tape	Diskette, magnetic tape	FEP console	FEP console
Support for Remote Console	Yes	Yes	Yes	No
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Proprietary	Proprietary	Software	Hardware, RAM
IPL Method	Internal self-load	Download from host, internal self-load	Download from host	Download from host
User Programmability	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console	Via user-created programs	Via user-selected parameters, via user-created programs
Network Management Control				
Diagnostic Tests Supported	Internal diagnostics, port/line status	Internal diagnostics	Local/remote loopback, internal diagnostics, port/line status	Local/remote loopback, internal diagnostics, port/line status
Data Collected	Traffic loading, node/link/software status, line outages, port statistics, line hits, error rates, events	Traffic loading, node/link/software status, line outages, port statistics, line hits, error rates, events	Traffic loading, port statistics, link loading	Node/link/software status, port statistics, trace, line hits, error rates, events
Pricing and Availability				
Purchase Price ($)	150,000.00	35K to 150K	Vendor did not specify	Vendor did not specify
Monthly Purchase ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	295.00
Monthly Lease/Rental ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Not applicable
Date of First Commercial Delivery	1987	1987	September 1990	Vendor did not specify
Serviced by	Periphonics	Periphonics	Simpact	Simpact & Digital Equip.
Comments	Connects directly to digital speech netwk. or digital PBX unit.	Connects directly to digital speech netwk. or digital PBX unit, Main memory storage 32 MB voice		Hardware includes board, distribution panel, and cables

	Simpact Associates, Inc.	**Simpact Associates, Inc.**	**Simpact Associates, Inc.**	**Simpact Associates, Inc.**
	ICP1632 VAXBI Systems	**ICP3222**	**ICP3232 VAXBI Systems**	**ICP6000/9000 VMEbus**
Computer Systems Interfaced				
Manufacturer/Models	VAXBI Systems	Vendor did not specify	Vendor did not specify	Vendor did not specify
Direct Attachment of Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	Not applicable	Not applicable	Not applicable	1
Max. Hosts Supported Simultaneously	1	1	1	1
PU Type within Network	2, Software dependent	2, Software dependent	2, 4, software dependent	Not applicable
Remote Line Concentrator	No	No	No	Vendor did not specify
Max. Hosts Served by One Concentrator	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Host-Independent Network Processor	No	No	No	No
Host Channel Extender	No	No	No	Yes
Terminal Controller	No	No	No	No
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	No	No	No	No
Network Architecture Compliance	BSC, X.25	BSC, X.25	BSC, X.25	BSC, OSI, X.25
Native T1 Support	No	No	No	Yes
Number of T1 Lines Supported	Not applicable	Not applicable	Not applicable	1
Communications Line Capacity				
No. Half-duplex Lines Attachable	4	4	4	16
Highest Line Speed Supported (bps)	1M	1M	1M	1.8M
Communications Features/Functions				
Multiplexing/Demultiplexing	No	No	No	No
Terminal-Initiated Application Switching	No	No	No	No
Dynamic Line Reconfiguration	Vendor did not specify	Yes	No	Yes
LAN Connectivity	Not applicable	None	None	Vendor did not specify
Interface to Ethernet LAN	No	No	No	Vendor did not specify
Protocol Conversion	No	No	No	Vendor did not specify
Error Control	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Parity check w/retransmit on error, LRC & CRC detection/correction, parity
System Characteristics				
Processor Type	DEC MICRO/T-11	MC68020	MC68020	MC68020
Main Memory Word Size (bits)	16, 18, 32	32	32	32
Main Memory Storage Capacity (bytes)	512K	1M	1M	1M
Hard Disk Storage Capacity (Mbytes)	Not applicable	Not applicable	Vendor did not specify	Vendor did not specify
Data Transferred Across I/O Lines	Byte	Byte	Byte	Block
Data Transferred Between:				
Memory and Communications Lines	DMA, interrupt,	DMA, interrupt	DMA, interrupt	DMA
Memory and Mass Storage	Not applicable	Not applicable	Not applicable	Vendor did not specify
Memory and Other Peripherals	Not applicable	Not applicable	Not applicable	Vendor did not specify
I/O, Backup, and Diagnostic Peripherals	FEP console	FEP console	FEP console	Vendor did not specify
Support for Remote Console	No	No	No	Vendor did not specify
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Hardware, RAM	Hardware, RAM	Hardware, RAM	Software
IPL Method	Download from host	Download from host	Download from host	Download from host
User Programmability	Via user-selected parameters, via user-created programs	Via user-selected parameters, via user-created programs	Via user-selected parameters, via user-created programs	Via user-selected parameters, via user-created programs
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, port/line status	Local/remote loopback, internal diagnostics port/line status	Local/remote loopback, internal diagnostics, port/line status	Local/remote loopback, internal diagnostics
Data Collected	Node/link/software status, port statistics, trace, line hits, error rates, events	Node/link/software status, port statistics, trace, line hits, error rates, events	Node/link/software status, port statistics, trace, line hits, error rates, events	Port statistics, line hits, error rates, link loading
Pricing and Availability				
Purchase Price ($)	Contact vendor	Contact vendor	Contact vendor	Contact vendor
Monthly Purchase ($)	295.00	295.00	295.00	Vendor did not specify
Monthly Lease/Rental ($)	Not applicable	Not applicable	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	Vendor did not specify	Vendor did not specify	Vendor did not specify	November 1989
Serviced by	Digital Equip. & Simpact	Simpact	Simpact	Simpact
Comments				

	Systech Corp.	Thomas Engineering Co.	Thomas Engineering Co.	TIL Systems, Inc.
	DCP 8820	**LAN-TEC**	**UNI-TEC**	**PDX Plus**
Computer Systems Interfaced				
Manufacturer/Models	VME Bus compatible systems	LAN-Tec	Uni-Tec	TIL Systems with SNA HPAD, X.25, SDLC TPAD, Bisyn HPAD
Direct Attachment of Host	Yes	No	No	No
Functional Characteristics				
Front-end Processor	Yes	No	No	No
Max. Hosts Attachable to FEP	Vendor did not specify	None	None	None
Max. Hosts Supported Simultaneously	Vendor did not specify	8	4 with 32 users, 12 with 16	Vendor did not specify
PU Type within Network	Vendor did not specify	Vendor did not specify	2	2
Remote Line Concentrator	Vendor did not specify	No	Yes	Yes
Max. Hosts Served by One Concentrator	Vendor did not specify	Vendor did not specify	20 SNA or X.25	Vendor did not specify
Host-Independent Network Processor	No	Yes	Yes	Yes
Host Channel Extender	Yes	No	No	No
Terminal Controller	Yes	Yes	Yes	Yes
Store-and-Forward Switching	No	No	No	Yes
Distributed Processing Node	Yes	No	No	No
Network Architecture Compliance	SNA, BSC, X.25	BSC, VIP, Uniscope	SNA, BSC, X.25, VIP, Uniscope, IPARS	SNA, BSC, X.25
Native T1 Support	Vendor did not specify	No	No	No
Number of T1 Lines Supported	Vendor did not specify	Not applicable	Vendor did not specify	Vendor did not specify
Communications Line Capacity				
No. Half-duplex Lines Attachable	4	8	44	32
Highest Line Speed Supported (bps)	1.6Mb	19.2K	56K	64K
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	No
Terminal-Initiated Application Switching	No	Yes	Yes	No
Dynamic Line Reconfiguration	Yes	No	Yes	Vendor did not specify
LAN Connectivity	Vendor did not specify	Token-ring, Arcnet	Vendor did not specify	Vendor did not specify
Interface to Ethernet LAN	Vendor did not specify	Yes	No	No
Protocol Conversion	Async to 3270 BSC, SDLS to X.25, async to X.25	Async to TCP/IP	Async to 3270 BSC, asynch to uniscope, SDLS to X.25, async to X.25, Async to VIP	Async to 3270 BSC, SDLS to X.25, async to X.25
Error Control	Parity	LRC & CRC detection/correction, parity	Parity check w/retransmit on error, LRC & CRC detection/correction	Vendor did not specify
System Characteristics				
Processor Type	Intel 186	Z80B, Intel 286	Z80B, MC68010, MC68000	NS32532
Main Memory Word Size (bits)	8	Vendor did not specify	16	32
Main Memory Storage Capacity (bytes)	512K	2M	512K to 8M	16 max.
Hard Disk Storage Capacity (Mbytes)	Not applicable	20, 40, 80	No hard disk, 1.2M floppy	Vendor did not specify
Data Transferred Across I/O Lines	Byte	Byte, block	Byte	Byte
Data Transferred Between:				
Memory and Communications Lines	DMA, interrupt	Interrupt	Interrupt	Interrupt
Memory and Mass Storage	DMA, interrupt	DMA	Interrupt	Interrupt
Memory and Other Peripherals	DMA, interrupt	Interrupt	Not applicable	Interrupt
I/O, Backup, and Diagnostic Peripherals	Not applicable	Diskette	Diskette, printer	Diskette
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	No	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Firmware	Software	Software	Software
IPL Method	Download from host	IPL diskette	IPL diskette	IPL diskette
User Programmability	Via user-selected parameters, via user-created programs	Via user-created programs	Via user-selected parameters, via console	Via user-selected parameters, via console
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Internal diagnostics, problem determination, port/line status	Port/line status
Data Collected	Vendor did not specify	Traffic loading, accounting, port statistics, trace, events, link loading	Node/link/software status, trace, events	Accounting, port statistics, trace, line hits, error rates
Pricing and Availability				
Purchase Price ($)	Vendor did not specify	2,995.00	3,495.00	Vendor did not specify
Monthly Purchase ($)	Not applicable	25.00	90.00	Vendor did not specify
Monthly Lease/Rental ($)	Not applicable	Not applicable	Not applicable	Vendor did not specify
Date of First Commercial Delivery	January 1987	July 1990	1985	Vendor did not specify
Serviced by	Systech Corp.	Vendor did not specify	Thomas Engineering	Vendor did not specify
Comments	Flexible channel configurations: RS-232, RS-449/422, V.11, and V.35	Protocol conversion also includes to BSC, VIP, and Uniscope	Maximum number of hosts served by one concentrator 40 VIP, Protocol convers.are Uniscope VIP to X.25	

	Tri-Data Corp.	Tri-Data Corp.	Unisys Corp.	Unisys Corp.
	Netway 1000	**Netway 2000**	**CP2000**	**DCP/5**
Computer Systems Interfaced				
Manufacturer/Models	Most IBM systems	Most IBM systems	Unisys A & V series mainframes	All models of Unisys 1100/2200 and System 80
Direct Attachment of Host	Yes	Yes	Yes	No
Functional Characteristics				
Front-end Processor	No	No	Yes	No
Max. Hosts Attachable to FEP	Vendor did not specify	Vendor did not specify	99	No
Max. Hosts Supported Simultaneously	Vendor did not specify	Vendor did not specify	99	Vendor did not specify
PU Type within Network	2	2	2, 5	2, 4, 5
Remote Line Concentrator	No	No	Yes	Yes
Max. Hosts Served by One Concentrator	Vendor did not specify	Vendor did not specify	Unlimited	Any host in network
Host-Independent Network Processor	Yes	Yes	No	Yes
Host Channel Extender	No	No	No	No
Terminal Controller	No	No	Yes	No
Store-and-Forward Switching	No	No	No	Yes
Distributed Processing Node	Yes	Yes	No	No
Network Architecture Compliance	SNA	SNA	SNA, OSI, X.25, Unisys BNA, TCP/IP	SNA, BSC, OSI, X.25, DDN, X.21, Uni DCA
Native T1 Support	No	Vendor did not specify	Vendor did not specify	No
Number of T1 Lines Supported	Vendor did not specify	4	Vendor did not specify	11
Communications Line Capacity				
No. Half-duplex Lines Attachable	Vendor did not specify	4	56	11 (V.35)
Highest Line Speed Supported (bps)	19.2K	56/64K	64K	64K
Communications Features/Functions				
Multiplexing/Demultiplexing	No	No	Yes	Yes
Terminal-Initiated Application Switching	Yes	Yes	Yes	Yes
Dynamic Line Reconfiguration	Yes	Yes	Yes	Yes
LAN Connectivity	LocalTalk (AppleTalk)	Token-ring,LocalTalk	Vendor did not specify	Ethernet
Interface to Ethernet LAN	No	Yes	Yes	Yes
Protocol Conversion	SNA	SNA	SDLS to X.25, BDLC to ET X.25	Asynch to uniscope, SDLS to X.25, async to X.25, 3270/Uni, Uni/3270
Error Control	LRC & CRC detection/correction	LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC
System Characteristics				
Processor Type	Z80 clone, HD64180	SPARC	Intel 80386	Proprietary
Main Memory Word Size (bits)	32	32	16	16
Main Memory Storage Capacity (bytes)	4M	4M	5M	2M
Hard Disk Storage Capacity (Mbytes)	N/A	Vendor did not specify	Vendor did not specify	80
Data Transferred Across I/O Lines	Byte	Byte	Byte	Byte
Data Transferred Between:				
Memory and Communications Lines	DMA	DMA	DMA, DMA and interrupt	DMA
Memory and Mass Storage	N/A	N/A	DMA and interrupt	DMA
Memory and Other Peripherals	DMA and interrupt	DMA and interrupt	Not applicable	DMA
I/O, Backup, and Diagnostic Peripherals	MAC/PC	MAC/PC	Disk	FEP console, diskette, patch panel, disk, printer
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Vendor did not specify	No	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software	Software, firmware	Software
IPL Method	Across-LAN automatic	AcrossLAN; automatic	Download from host	Download from host, IPL diskette
User Programmability	Via console	Via console	No	Via user-created programs
Network Management Control				
Diagnostic Tests Supported	Internal diagnostics, problem determination, port/line status	Internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Node/link/software status, line outages, port statistics, trace, line hits, events	Node/link/software status, line outages, port statistics, trace, line hits, events	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, link loading
Pricing and Availability				
Purchase Price ($)	2,195.00 to 3,195.00	14,995.00	18,888.00	9,800.00
Monthly Purchase ($)	Vendor did not specify	Not applicable	141.50	172.00
Monthly Lease/Rental ($)	Vendor did not specify	Not applicable	705.00	Vendor did not specify
Date of First Commercial Delivery	May 1986	May 1989	1986	March 1989
Serviced by	DEC	DEC	Unisys	Unisys
Comments			When used as a front-end processor, multiple CP2000s are connected to the A & V series mainframes via 802.3 LAN	

	Unisys Corp.	Unisys Corp.	Unisys Corp.	Unisys Corp.
	DCP/15	**DCP/25**	**DCP/30**	**DCP/35**
Computer Systems Interfaced				
Manufacturer/Models	All models of Unisys 1100/2200 and System 80	All models of Unisys 1100/2200 and System 80	All models of Unisys 1100/2200 and System 80	All models of Unisys 1100/2200 and System 80
Direct Attachment of Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	2	6	21	21
Max. Hosts Supported Simultaneously	2	6	21	21
PU Type within Network	2, 4, 5	2, 4, 5	2, 4, 5	2, 4, 5
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	Any host in network	Any host in network	Vendor did not specify	Any host in network
Host-Independent Network Processor	Yes	Yes	Yes	Yes
Host Channel Extender	No	No	No	No
Terminal Controller	No	No	No	No
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	No	No	No	No
Network Architecture Compliance	SNA, BSC, OSI, TCP/IP, X.21 cir.sw.	SNA, BSC, OSI, X.25, TCP/IP, X.21 cir.sw.	SNA, BSC, OSI, X.25, TCP/IP, X.21 cir.sw.	SNA, BSC, OSI, X.25, ICP/IP, X.25 cir.sw.
Native T1 Support	Vendor did not specify	Yes	Yes	Yes
Number of T1 Lines Supported	Vendor did not specify	2	3	3
Communications Line Capacity				
No. Half-duplex Lines Attachable	52	184	680	672
Highest Line Speed Supported (bps)	64K WAN, 10M LAN	256K WAN, 10M LAN	1.544M/2.048M, T1/E1	1.544M/2.048M
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Application Switching	Yes	Yes	Yes	Yes
Dynamic Line Reconfiguration	Yes	Yes	Vendor did not specify	Yes
LAN Connectivity	Vendor did not specify	Vendor did not specify	Ethernet	Ethernet
Interface to Ethernet LAN	Yes	Yes	Yes	Yes
Protocol Conversion	Asynch to uniscope, SDLS to X.25, async to X.25, 3270/Uni, Uni/3270	Asynch to uniscope, SDLS to X.25, async to X.25, 3270/Uni, Uni/3270	Asynch to uniscope, SDLS to X.25, async to X.25, Uni/3270, 3270/Uni	Asynch to uniscope, SDLS to X.25, async to X.25, 3270/Uni, Uni/3270
Error Control	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC
System Characteristics				
Processor Type	Proprietary	Proprietary	Proprietary	Proprietary
Main Memory Word Size (bits)	16	32	32	32
Main Memory Storage Capacity (bytes)	4M	8M	8M	8M
Hard Disk Storage Capacity (Mbytes)	Vendor did not specify	2) 20MB per I/O module	20, 20MB per I/O module	2) 20 MB per I/O module
Data Transferred Across I/O Lines	Byte, block, word	Byte, block, word	Byte, block, word	Byte, block, word
Data Transferred Between:				
Memory and Communications Lines	DMA	DMA	DMA	DMA
Memory and Mass Storage	DMA	DMA	DMA	DMA
Memory and Other Peripherals	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
I/O, Backup, and Diagnostic Peripherals	FEP console, diskette, patch panel, disk, printer	FEP console, diskette, patch panel, disk, printer	FEP console, diskette, patch panel, disk, printer	FEP console, diskette, patch panel, printer
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software, firmware	Software, firmware	Software, firmware	Software, firmware
IPL Method	Download from host, IPL diskette	Download from host, IPL diskette	Download from host, IPL diskette	Download from host, IPL diskette
User Programmability	Via user-created programs	Via user-selected parameters	Via user-created programs	Via user-created programs
Network Management Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, problem determination, port/line status
Data Collected	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, line hits, error rates, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading
Pricing and Availability				
Purchase Price ($)	55,000.00	31,000.00	55,000.00	125,500.00
Monthly Purchase ($)	89.10	Vendor did not specify	175.00	Vendor did not specify
Monthly Lease/Rental ($)	600.00	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	April 1987	Vendor did not specify	October 1988	Vendor did not specify
Serviced by	Unisys	Vendor did not specify	Unisys	Vendor did not specify
Comments		Up to 31 line module slots	Up to 93 line module slots	Required software is DCP/OS plus Telcom 8R2 or higher release level. Up to 92 line module slots

	Unisys Corp. **DCP/50**	**Unisys Corp.** **DCP/55**
Computer Systems Interfaced		
Manufacturer/Models	All models of Unisys 1100/2200 and System 80	All models of Unisys 1100/2200 and System 80
Direct Attachment of Host	Yes	Yes
Functional Characteristics		
Front-end Processor	Yes	Yes
Max. Hosts Attachable to FEP	56	46
Max. Hosts Supported Simultaneously	56	Unlimited
PU Type within Network	2, 4, 5	2, 4, 5
Remote Line Concentrator	Yes	Yes
Max. Hosts Served by One Concentrator	Any host in network	Any host in network
Host-Independent Network Processor	Yes	Yes
Host Channel Extender	No	No
Terminal Controller	No	No
Store-and-Forward Switching	No	No
Distributed Processing Node	No	No
Network Architecture Compliance	SNA, BSC, OSI, X.25, X.21 circuit switch	SNA, BSC, OSI, X.25, ICP/IP, X.21 cir.sw.
Native T1 Support	Yes	Yes
Number of T1 Lines Supported	12	12
Communications Line Capacity		
No. Half-duplex Lines Attachable	1912	1536
Highest Line Speed Supported (bps)	1.544M/2.048M	1.544M/2.048M
Communications Features/Functions		
Multiplexing/Demultiplexing	Yes	Yes
Terminal-Initiated Application Switching	Yes	Yes
Dynamic Line Reconfiguration	Yes	Yes
LAN Connectivity	Ethernet	Ethernet
Interface to Ethernet LAN	Vendor did not specify	Yes
Protocol Conversion	Asynch to uniscope, SDLS to X.25, async to X.25, 3270/Uni, Uni/3270	Asynch to uniscope, SDLS to X.25, async to X.25, 3270/Uni, Uni/3270
Error Control	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC
System Characteristics		
Processor Type	Proprietary	Proprietary
Main Memory Word Size (bits)	32	32
Main Memory Storage Capacity (bytes)	8M	16
Hard Disk Storage Capacity (Mbytes)	2) 20M per I/O module	2)20M per I/O
Data Transferred Across I/O Lines	Byte, block, word	Byte, block, word
Data Transferred Between:		
Memory and Communications Lines	DMA	DMA
Memory and Mass Storage	DMA	DMA
Memory and Other Peripherals	DMA	Vendor did not specify
I/O, Backup, and Diagnostic Peripherals	FEP console, diskette, patch panel, disk, printer	FEP console, diskette, patch panel, mag.tape,
Support for Remote Console	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes
Communications Operating Software		
Operating System Implemented in	Software, firmware	Software, firmware
IPL Method	Download from host, IPL diskette	Download from host
User Programmability	Via user-created programs	Via user-created programs
Network Management Control		
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading
Pricing and Availability		
Purchase Price ($)	275,000.00	396.00
Monthly Purchase ($)	595.00	Vendor did not specify
Monthly Lease/Rental ($)	4,680.00	Vendor did not specify
Date of First Commercial Delivery	December 1987	Vendor did not specify
Serviced by	Unisys	Vendor did not specify
Comments	Up to 247 line module slots; three IOP in a single IOM	Required software is DCP/OS Telcom 9R/or highest release level. Three IOP in a single IOM

Communications Processors: Comparison Columns

In this report:

Synopsis

Editor's Note
For information on the communications processor market, see Report C13-010-101; for information on communications processor technology, see Report C13-010-201. To assist readers in researching the communications processor market, this report contains comparison columns listing the principal characteristics of 42 products offered by 16 vendors.

In the Comparison Column Entry Descriptions, we have briefly defined the comparison column entries used in the columns. We suggest that the reader consult the key to become familiar with the descriptions of the entries before reading the columns.

Vendors furnished information for the columns during January and February 1990. When a vendor did not provide information for a specific entry, and we could not locate that information in our files, we have listed "Vendor did not specify" on the appropriate line. Datapro wishes to thank the vendors for their cooperation.

In addition to the lines allocated for vendors to indicate specified information for their models, we have added space at the bottom of the columns for vendor notations about options or special features of their products.

The absence of any company or product from these columns means that the company either failed to respond to our repeated requests for information or declined to be part of the survey.

Vendors

Amdahl Communications
1250 E. Arques Avenue, MS 200
Sunnyvale, CA 94088 (408) 746-6000

Bull HN Worldwide Information Systems
Technology Park, 2 Wall Street
Billerica, MA 01821-4199 (617) 895-6000

Chi Corp.
31200 Carter Street
Solon, OH 44139 (216) 349-8600

Computer Communications, Inc.
2610 Columbia Street
Torrance, CA 90503 (213) 320-9101

Computer Network Technology Corp.
6655 Wedgwood Road
Maple Grove, MN 55369 (612) 420-4466

Computerm Corp.
100 Wood Street
Pittsburgh, PA 15222 (412) 391-7804

Control Data Corp.
Computer Products Div.
8100 34th Avenue S., P.O. Box 0
Minneapolis, MN 55440 (612) 853-8100

Infotron Systems Corp.
9 N. Olney Avenue
Cherry Hill, NJ 08003 (609) 424-9400

International Business Machines Corp. (IBM)
Old Orchard Road
Armonk, NY 10504
Contact your local IBM representative.

Lemcom Systems, Inc.
2104 W. Peoria Avenue
Phoenix, AZ 85029 (602) 944-1543

NCR Comten
2700 Snelling Avenue N.
St. Paul, MN 55113 (612) 638-7777

NTX Communications Corp.
508 Tasman Drive
Sunnyvale, CA 94089 (408) 747-1444

Periphonics Corp.
4000 Veterans Highway
Bohemia, NY 11716 (516) 467-0500

SBE
2400 Bisso Lane
Concord, CA 94520 (415) 680-7722

Thomas Engineering Co.
2440 Stanwell Drive
Concord, CA 94520 (415) 680-8640

Unisys Corp.
P.O. Box 500
Blue Bell, PA 19424 (215) 986-4011

Communications Processors
Comparison Column Entry Descriptions

Computer Systems Interfaced

Manufacturer/Models. If processors serve IBM and plug-compatible mainframes, the vendor indicated that information here. Vendors of processors operating in open network architectures also listed the computers interfaced here.

Direct Attachment to Host. This entry distinguishes between a front-end processor and a network processor, which do not connect directly to the host.

Functional Characteristics

Front-End Processor. The front-end processor (FEP) intercepts and handles communications activities for the host.

Max. Hosts Attachable to FEP. In this space, the vendor noted the highest number of hosts that can be channel-attached to the system.

Max. Hosts Supported Simultaneously. This entry notes the highest number of hosts that can be active at the same time.

IBM Emulation. Some types of IBM emulation performed by the communications processors include 270X/370X, 370X/37X5, SNA/SDLC, ACP, NCP, CTCA, EP, and 3270 BSC.

PU Type within Network. This entry indicates the physical unit (PU) type within the network. These devices are also known as Node Types (NT). The most common types are PU Type 1, PU Type 2, PU Type 4, and PU Type 5.

Remote Line Concentrator. A "yes" response indicates that the processor can serve as a line concentrator located remotely from any host processor in its network.

Max. Hosts Served by One Concentrator. Since many concentrators can serve more than one host, vendors noted the maximum number here.

Host-Independent Network Processor. Some models can control a network based on open architecture without the direction of a host computer.

Host Channel Extender. The architectures of some processors enable them to function as host channel extenders.

Terminal Controller. The architectures of some processors enable them to function as terminal controllers.

Store-and-Forward Message-Switching. Some processors can function as standalone, store-and-forward messages switches.

Distributed Processing Node. In addition to their principal networking functions, some processors can support distributed applications.

Network Architecture Compliance. Some communications processors function exclusively within their vendors' network architectures; others support open architectures such as X.25. If a processor supports no network architecture, it may be a transparent device.

Communications Line Capacity

No. Half-Duplex Lines Attachable. In half-duplex operation, transmission occurs alternately in either direction, but not in both simultaneously. This entry lists the number of half-duplex lines attachable to the processor.

Highest Line Speed Supported (bps). Vendors filled in line speeds in bits per second (bps).

Communications Features

Multiplexing/ Demultiplexing. Multiplexing refers to the division of a transmission facility into two or more channels, either by splitting the frequency band into narrower bands or by allotting a common channel to several different information channels. Demultiplexing restores the datastream to its original number of channels.

Terminal-Initiated Applications Switching. This entry indicates that the processor, at the terminal's request, supports the selection of applications within a session between an attached terminal and an attached host.

Dynamic Line Reconfiguration. Vendors noted if the processor can switch a session, without operator intervention, from a connection with a failed line or component to a healthy connection when it senses the failure.

Interface to Ethernet LAN. If the processor can connect to an Ethernet Local Area Network (LAN), it is noted here.

Protocol Conversion. Some of the popular forms of protocol conversion are async to 3270 BSC, async to Uniscope, SDLC to X.25, and async to X.25.

Code Conversion. The most common code conversion is from ASCII to IBM's EBCDIC. Baudot to ASCII can also occur.

Error Control. Some types of error control techniques are parity checking with retransmit, parity checking, longitudinal redundancy check (LRC) and cyclic redundancy check (CRC), and automatic repeat request (ARQ)-cyclic redundancy check (CRC).

System Characteristics

Processor Type. Some of the processors are proprietary. Other widely used processors are Tymnet, Motorola 6800, Z80B,

MC68010, MC68020, LSI 11/23, LSI 11/73, Intel 186, and Intel 286.

Main Memory Word Size (bits). In most cases, the main memory word size is also the width of the processor's internal transmission path along its bus.

Main Memory Storage Capacity (bytes). This entry lists the capacity of main memory in bytes. Large main memory capacity is useful for transmission with high-speed protocols in which large blocks of data must be stored for retransmission in case of error.

Data Unit Transferred across I/O Channel. Communications processors configured as front ends transfer data to and from the host through an I/O channel. The width, in bits, of the I/O channel, along with the communications processor's main memory word size, yields the level of data transferred (e.g., byte or block).

Data Support, Memory and Comm. Lines. In some communications processors, only the CPU has access to main memory, and other components must interrupt the CPU to read from or write information to main memory. In others, microprocessors in the subsidiary components share control of main memory with the CPU and can read and write memory on their own. The latter process is called direct memory access (DMA).

I/O, Backup, and Diagnostic Peripherals Supported. Most communications processors interact only with their attached hosts and terminals, relying on host disk systems for storage and on host software for detailed diagnostics. Some newer models, however, support local disk storage for control software, traffic, and support information and feature diagnostic consoles for direct operator intervention.

Support for Remote Console. Some processors that support local operators' consoles can also support an operator's console attached over communications lines.

Support for X.25 Level 3 Capabilities. X.25 is a CCITT recommendation that specifies the interface between user data terminal equipment (DTE) and packet-switching data circuit-terminating equipment (DCE). X.25 Level 3 defines procedures for call initiation, data transfer, interrupts, reset, restart, and clearing.

Operating Software

Operating System Implemented in. This entry explains how the processor stores its control program: wired directly into the hardware; in software that must be loaded into memory from the outside; in firmware (local read-only memory) on-board the processor; or in some combination of these.

IPL Method. This entry indicates how the processor receives its initial program load (IPL): from its host processor, from a locally attached diskette activated by an operator, or from on-board read-only memory.

Network Management/Control

Diagnostic Tests Supported. Examples of diagnostic tests are remote and local loopback, port/link status, and internal diagnostics.

Data Collected. The processor can collect data relating to traffic loading, line outages, line hits, link loading, node/link/software status, port statistics, error rates, accounting, trace, and events.

Pricing and availability

Purchase Price ($). Vendors provided the price of the unit, excluding any options.

Date of First Commercial Delivery. The the date on which the product reached the marketplace.

Serviced by. Usually the vendor offers service on an on-site or factory repair/return basis. In some cases, a third party provides the service.

Comments. This space affords vendors the opportunity to describe significant or unusual features, capabilities, or applications that are not reflected in the standard entries.

Vendor	Amdahl Communications	Amdahl Communications	Bull HN Worldwide Information Systems	Bull HN Worldwide Information Systems
Product	**Amdahl 4745-110**	**Amdahl 4745-210**	**DATANET 8/05 DPS 7000**	**DATANET 8/10**
Computer Systems Interfaced				
Manufacturer/Models	370 class mainframes	370 class mainframes	Bull DPS 7000	Bull DPS7, DPS7000, DPS8, DPS8000, DPS88, DPS90, DPS9000
Direct Attachment to Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	4	8	1	1 or 2
Max. Hosts Supported Simultaneously	2	6	1	1 or 2
IBM Emulation	270X/370X, ACP, EP, 370X/37X5, NCP, SNA/SDLC	270X/370X, ACP, EP, 370X/37X5, NCP, SNA/SDLC	370X/37X5, NCP	370X/37X5, NCP
PU Type within Network	PU Type 4	PU Type 4	PU Type 5, DSA node/FE to host	DSA node
Remote Line Concentrator	Yes	Vendor did not specify	No	Yes
Max. Hosts Served by One Concentrator	SNA/NCP-defined	SNA/NCP-defined	1,000	1,000
Host-Independent Network Processor	No	No	No	Yes
Host Channel Extender	No	No	No	No
Terminal Controller	No	No	Yes	Yes
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	No	No	No	No
Network Architecture Compliance	SNA, BSC, X.25	SNA, BSC, X.25	BSC, OSI, X.25, DSA	BSC, OSI, DSA
Communications Line Capacity				
No. Half-Duplex Lines Attachable	64	256	15	31
Highest Line Speed Supported (bps)	256K	256K	64K	64K
Communications Features/Functions				
Multiplexing/Demultiplexing	No	No	Yes	Yes
Terminal-Initiated Applications Switching	No	No	Yes	Yes
Dynamic Line Reconfiguration	No	No	Yes	Yes
Interface to Ethernet LAN	No	No	No	No
Protocol Conversion	SDLC to X.25, async to X.25	SDLC to X.25, async to X.25	Async, VIP, DSC, RCI	Async, VIP, DSC, RSI
Code Conversion	ASCII to EBCDIC	ASCII to EBCDIC	ASCII to EBCDIC	ASCII to EBCDIC
Error Control	Parity check w/retransmit on error, LRC & CRC detection/correction, parity, ARQ-CRC	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Parity check w/retransmit on error, LRC & CRC detection/correction, parity
System Characteristics				
Processor Type	Proprietary	Proprietary	Proprietary	Proprietary
Main Memory Word Size (bits)	16	16	16	16
Main Memory Storage Capacity (bytes)	8M	8M	2M	2M
Data Transferred Across I/O Channel	Byte, block	Byte, block	Word, (36 bit)	Word (36 bit)
Data Transfer Supported between:				
Memory and Comm. Lines	DMA & interrupt	DMA & interrupt	DMA & interrupt	DMA & interrupt
Memory and Mass Storage	DMA & interrupt	DMA & interrupt	Vendor did not specify	Vendor did not specify
Memory and Other Peripherals	Interrupt	Interrupt	DMA	DMA
I/O, Backup, and Diagnostic Peripherals	FEP console, diskette, patch panel, disk	FEP console, diskette, patch panel, disk	FEP console, diskette, host/mainframe	FEP console, host/mainframe
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software	Software, firmware	Software, firmware
IPL Method	Host download, internal self-load, hard disk	Host download, internal self-load, IPL & hard disk	Host download, IPL diskette, tele-load	Host download, tele-load
User Programmability	No	No	No	No
Network Management/Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status, network management	Local/remote loopback, internal diagnostics, problem determination, port/line status, network management
Data Collected	NPA NetView statistics	NetView/NPA	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, error rates, events, link loading	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, error rates, events, link loading
Pricing and Availability				
Purchase Price ($)	100,650.00	132,000.00	12,000.00	33,890.00
Monthly Maintenance ($)	303.00	319.00	150.00	244.00
Monthly Lease/Rental ($)	Not available	Not available	Vendor did not specify	1,160.00
Date of First Commercial Delivery	June 1988	June 1988	September 1987	September 1985
Serviced by	Amdahl	Amdahl	Bull Worldwide Info Sys	Bull Worldwide Info Sys
Comments	Runs NCP-3 or NCP-4 and NCP-5; runs in 3725 mode or 3745 mode	Runs NCP-3 or NCP-4 and NCP-5; runs in 3725 mode or 3745 mode	—	—

Vendor	Bull HN Worldwide Information Systems	Bull HN Worldwide Information Systems	Chi Corp.	Computer Communications, Inc.
Product	**DATANET 8/20**	**DATANET 8/30**	**CCP 3205**	**Data Express**
Computer Systems Interfaced				
Manufacturer/Models	DPS7, DPS7000, DPS8, DPS88, DPS90, DPS8000, DPS9000	Bull DPS7, DPS7000, DPS8, DPS8000, DPS88, DPS90, DPS9000	Sperry 1100, 2200	Any host SNA compatible, SAA compatible, TCP/IP compatible
Direct Attachment to Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	4	4	2	Open-ended
Max. Hosts Supported Simultaneously	4	4	2	Open-ended
IBM Emulation	370X/37X5, NCP	370X/37X5, NCP	3270 BSC	270X/370X, ACP, 370X/37X5, SNA/SDLC
PU Type within Network	PU Type 2, PU Type 4, DSA node	PU Type 2, PU Type 4, DSA node	PU Type 2	PU Type 2
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	1,000	1,000	Unlimited	256
Host-Independent Network Processor	Yes	Yes	Yes	Yes
Host Channel Extender	No	No	No	Yes
Terminal Controller	Yes	Yes	Yes	Yes
Store-and-Forward Switching	No	No	No	Yes
Distributed Processing Node	No	No	No	Yes
Network Architecture Compliance	SNA, BSC, OSI, X.25, DSA	SNA, BSC, OSI, X.25, DSA	OSI, X.25, TCP/IP	SNA, X.25, TCP/IP
Communications Line Capacity				
No. Half-Duplex Lines Attachable	127	127	16-line expansion	256
Highest Line Speed Supported (bps)	2.5M	2.50M	64K	T1
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Applications Switching	Yes	Yes	Yes	Yes
Dynamic Line Reconfiguration	Yes	Yes	Yes	Yes
Interface to Ethernet LAN	No	No	Yes	Yes
Protocol Conversion	SDLC to X.25	SDLC to X.25, async, VIP, BSC, RCI	Async to uniscope	SDLC to X.25, async to X.25, ALC, TCP/IP
Code Conversion	ASCII to EBCDIC	ASCII to EBCDIC	ASCII to EBCDIC	ASCII to EBCDIC
Error Control	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	Parity check w/retransmit on error, LRC & CRC detection/correction, parity	LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction, parity, ARQ-CRC
System Characteristics				
Processor Type	Proprietary	Proprietary	Concurrent Computer 3205	Motorola 6800
Main Memory Word Size (bits)	16	16	32	18
Main Memory Storage Capacity (bytes)	2M	2M	8M	8M
Data Transferred Across I/O Channel	Word (36 bit)	Word (36 bit)	Byte	Byte, file, block
Data Transfer Supported between:				
Memory and Comm. Lines	DMA & interrupt	DMA & interrupt	DMA & interrupt	DMA & interrupt
Memory and Mass Storage	Not applicable	Vendor did not specify	Byte or ESI channel	DMA & interrupt
Memory and Other Peripherals	DMA	DMA	DMA & interrupt	DMA & interrupt
I/O, Backup, and Diagnostic Peripherals	FEP console, diskette, Host/mainframe	FEP console, diskette, host/mainframe	FEP console	Magnetic tape
Support for Remote Console	Yes	Yes	Vendor did not specify	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software, firmware	Software, firmware	Software	Software, firmware
IPL Method	Host download, IPL diskette, tele-load	Host download, IPL diskette, tele-load	Host download	Disk
User Programmability	No	No	Via user-selected parameters	Via user-selected parameters, via console
Network Management/Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status, network management	Local/remote loopback, internal diagnostics, problem determination, port/line status, network management	Local/remote loopback, internal diagnostics, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, error rates, events, link loading	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, error rates, events, link loading	Node/link/software status, port statistics	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, line hits, error rates, events, link loading
Pricing and Availability				
Purchase Price ($)	47,990.00	47,990.00	35,000.00	Vendor did not specify
Monthly Maintenance ($)	329.00	329.00	300.00	Vendor did not specify
Monthly Lease/Rental ($)	1,640.00	1,640.00	Not available	Vendor did not specify
Date of First Commercial Delivery	September 1985	September 1985	1985	Vendor did not specify
Serviced by	Bull Worldwide Info Sys	Bull Worldwide Info Sys	Chi Corp.	Vendor did not specify
Comments	—	—	Fully compliant TCP/IP and Ethernet support; allows for PC LAN interface to 1100s with full UTS emulation at each PC	—

Vendor	Computer Network Technology Corp.	Computerm Corp.	Control Data Corp.	Control Data Corp.
Product	**CHANNELlink**	**3800/3890 channel extension system**	**CDCNET 2600 Series**	**Distributed Network System (DNS)**
Computer Systems Interfaced				
Manufacturer/Models	IBM S/370 & compat., Cray Supercomputers, DEC/VAX-BI Bus	IBM S/370, 43XX, 30XX, and compatibles	Control Data Corp. CDCNET 2600 Series	IBM & compatibles, Unisys, Digital Equipment, AT&T, Control Data
Direct Attachment to Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	8/unit	7	2	16
Max. Hosts Supported Simultaneously	255/network	7	2	16
IBM Emulation	CTCA	Not applicable	3270 BSC, SNA/SDLC	CTCA
PU Type within Network	PU Type 1, PU Type 2, channel attached	Not applicable	PU Type 2	PU Type 5
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	255	7	All connected to LAN	64 comm line connect
Host-Independent Network Processor	Yes	Yes	Yes	Yes
Host Channel Extender	Yes	Yes	No	Yes
Terminal Controller	No	No	Yes	Yes
Store-and-Forward Switching	Yes	No	Yes	No
Distributed Processing Node	Yes	No	Yes	Yes
Network Architecture Compliance	SNA, BSC, TCP/IP	Transparent	OSI, X.25	SNA, BSC, X.25
Communications Line Capacity				
No. Half-Duplex Lines Attachable	16	8	64 per DI	192
Highest Line Speed Supported (bps)	100.0M	1.544M (T1)	256K	1.544M clear channel
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	No	Yes	No
Terminal-Initiated Applications Switching	No	Yes	Yes	Yes
Dynamic Line Reconfiguration	Yes	No	Yes	Yes
Interface to Ethernet LAN	Yes	No	Yes	Yes
Protocol Conversion	Yes	No	Async to X.25	BSC-SNA, SNA-BSC
Code Conversion	None	None	ASCII to EBCDIC, international sets	Vendor did not specify
Error Control	LRC & CRC detection/correction	LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction
System Characteristics				
Processor Type	MC68020, MC68000	IBM Series/1	MC68000, 68020, 68030	Proprietary
Main Memory Word Size (bits)	32	16	16	24
Main Memory Storage Capacity (bytes)	10M	512K	1M, 2M, 3M, 4M, 8M, 12M	3M
Data Transferred Across I/O Channel	Block	Byte, block	Block	Block
Data Transfer Supported between:				
Memory and Comm. Lines	DMA	DMA	DMA & interrupt	DMA
Memory and Mass Storage	Not applicable	None	Not available	DMA
Memory and Other Peripherals	PC	DMA	Interrupt	DMA
I/O, Backup, and Diagnostic Peripherals	Remote dial-in access	FEP console, diskette	FEP console, printer	FEP console
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	No	No	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Firmware	Software, firmware	Hardware, software, firmware	Software
IPL Method	Internal self-load	Internal self-load, IPL diskette	Host download	Internal self-load, remote console
User Programmability	Via user-selected parameters	User configurable	Via user-selected parameters	No
Network Management/Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status, remote problem resolution	Internal diagnostics	Local/remote loopback, internal diagnostics, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, line outages, trace, error rates, realtime monitor	Traffic loading, node/link/software status, accounting, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading
Pricing and Availability				
Purchase Price ($)	45,000.00	73,000.00	13,670.00	Vendor did not specify
Monthly Maintenance ($)	Vendor did not specify	613.00	70.00	Vendor did not specify
Monthly Lease/Rental ($)	Vendor did not specify	1,621.00	Not available	Not available
Date of First Commercial Delivery	January 1987	December 1982	December 1985	1986
Serviced by	Storage Technology	Computerm and IBM	Control Data Corp.	Control Data Corp.
Comments	CHANNELlink delivers networking solutions for data center consolidation, disaster recovery, multiple data centers	Channel extension support for printers, CRTs, check sorters, mag tape, and EEPs with satellite-efficient protocols	A modular multinode local area network product with extended features including front-end functions	—

Vendor	Infotron Systems Corp.	Infotron Systems Corp.	Infotron Systems Corp.	International Business Machines Corp. (IBM)
Product	**892NP**	**990NP**	**992NP**	**IBM 3270**
Computer Systems Interfaced				
Manufacturer/Models	Not applicable	Not applicable	Not applicable	IBM 43XX, 303X, 308X, 309X
Direct Attachment to Host	No	No	No	Yes
Functional Characteristics				
Front-end Processor	No	No	No	Yes
Max. Hosts Attachable to FEP	None	None	None	4
Max. Hosts Supported Simultaneously	None	Over 10	Over 10	4
IBM Emulation	None	3270 BSC	3270 BSC	Yes
PU Type within Network	None	None	None	Vendor did not specify
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	2	Over 10	Over 10	4
Host-Independent Network Processor	Yes	Yes	Yes	No
Host Channel Extender	No	No	No	No
Terminal Controller	No	No	No	No
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	Yes	Yes	Yes	No
Network Architecture Compliance	Proprietary	Proprietary	Proprietary	SNA
Communications Line Capacity				
No. Half-Duplex Lines Attachable	104 channels	640	640	28
Highest Line Speed Supported (bps)	64K	64K	64K	64K
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Applications Switching	Yes	Yes	Yes	No
Dynamic Line Reconfiguration	Yes	Yes	Yes	Yes
Interface to Ethernet LAN	No	No	No	No
Protocol Conversion	No	No	No	Yes
Code Conversion	None	None	None	Yes
Error Control	ARQ-CRC	ARQ-CRC	ARQ-CRC	LRC & CRC detection/correction
System Characteristics				
Processor Type	6502, 80186	6502, 8086, 80186	6502, 8086, 80186	Proprietary
Main Memory Word Size (bits)	Vendor did not specify	Vendor did not specify	Vendor did not specify	18
Main Memory Storage Capacity (bytes)	Vendor did not specify	Vendor did not specify	Vendor did not specify	1M, to 2M
Data Transferred Across I/O Channel	Vendor did not specify	Vendor did not specify	Vendor did not specify	Block
Data Transfer Supported between:				
Memory and Comm. Lines	DMA & interrupt	DMA & interrupt	DMA & interrupt	DMA
Memory and Mass Storage	Not applicable	Vendor did not specify	Vendor did not specify	DMA
Memory and Other Peripherals	Not applicable	Vendor did not specify	Vendor did not specify	DMA
I/O, Backup, and Diagnostic Peripherals	FEP console, network manager	FEP console, diskette	FEP console, diskette	FEP console
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	No	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Firmware	Software, firmware	Software, firmware	Software
IPL Method	Internal self-load	EEPROM	EEPROM	Internal self-load
User Programmability	Via console	Via console	Via console	Yes
Network Management/Control				
Diagnostic Tests Supported	Local/remote loopback, problem determination	Vendor did not specify	Vendor did not specify	Vendor did not specify
Data Collected	Traffic loading, line outages, trace, error rates, events	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Purchase Price ($)	11,200.00	20,000.00	20,000.00	Vendor did not specify
Monthly Maintenance ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Monthly Lease/Rental ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	October 1986	June 1984	June 1984	1986
Serviced by	Infotron	Infotron	Infotron	IBM
Comments	8 nodes per network; ANM-800 network manager optional; multiple links up to 64K, auto alternate routing	Provides adaptive routing; comprehensive network management features; bisync emulation and async/BSC/SDLC support	Provides adaptive routing; comprehensive network management features; bisync emulation and async/BSC/SDLC support	Contact local IBM rep.

Vendor	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)
Product	**IBM 3725**	**IBM 3745 130**	**IBM 3745 150**	**IBM 3745 170**
Computer Systems Interfaced				
Manufacturer/Models	IBM S/370 (except Models 115 & 125), 303X	IBM 43XX, 937X, 308X, 3090	IBM 43XX, 937X, 308X, 3090	IBM 43XX, 937X, 308X, 3090
Direct Attachment to Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	8	4	4	4
Max. Hosts Supported Simultaneously	8	Vendor did not specify	Vendor did not specify	Vendor did not specify
IBM Emulation	270X/370X	Yes	Yes	Yes
PU Type within Network	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	8	Vendor did not specify	Vendor did not specify	Vendor did not specify
Host-Independent Network Processor	No	No	No	No
Host Channel Extender	No	No	No	No
Terminal Controller	No	No	No	No
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	No	No	No	No
Network Architecture Compliance	SNA	SNA	SNA	SNA
Communications Line Capacity				
No. Half-Duplex Lines Attachable	256 w/expansion	Vendor did not specify	Vendor did not specify	Vendor did not specify
Highest Line Speed Supported (bps)	256K (LIC Type 4B)	Vendor did not specify	Vendor did not specify	Vendor did not specify
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Applications Switching	No	No	No	No
Dynamic Line Reconfiguration	Yes	Yes	Yes	Yes
Interface to Ethernet LAN	No	No	No	No
Protocol Conversion	Yes	Yes	Yes	Yes
Code Conversion	Yes	Yes	Yes	Yes
Error Control	LRC & CRC detection/correction	LRC & CRC detection/correction	LRC & CRC detection/correction	LRC & CRC detection/correction
System Characteristics				
Processor Type	Proprietary	Proprietary	Proprietary	Proprietary
Main Memory Word Size (bits)	18	18	18	18
Main Memory Storage Capacity (bytes)	3M	Vendor did not specify	Vendor did not specify	Vendor did not specify
Data Transferred Across I/O Channel	Block	Block	Block	Block
Data Transfer Supported between:				
Memory and Comm. Lines	DMA	DMA	DMA	DMA
Memory and Mass Storage	DMA	DMA	DMA	DMA
Memory and Other Peripherals	DMA	DMA	DMA	DMA
I/O, Backup, and Diagnostic Peripherals	FEP console	FEP console	FEP console	FEP console
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software	Software	Software
IPL Method	Internal self-load	Internal self-load	Internal self-load	Internal self-load
User Programmability	Yes	Yes	Yes	Yes
Network Management/Control				
Diagnostic Tests Supported	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Data Collected	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Pricing and Availability				
Purchase Price ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Monthly Maintenance ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Monthly Lease/Rental ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	1983	1989	1989	1989
Serviced by	IBM	IBM	IBM	IBM
Comments	Contact local IBM rep.	Contact local IBM rep.	Contact local IBM rep.	Contact local IBM rep.

Vendor	International Business Machines Corp. (IBM)	International Business Machines Corp. (IBM)	Lemcom Systems, Inc.	Lemcom Systems, Inc.
Product	**IBM 3745 210**	**IBM 3745 410**	**Distributed Network Processor**	**DNP 9000**
Computer Systems Interfaced				
Manufacturer/Models	IBM S/370, 43XX, 937X, 3033, 308X, 3080	IBM S/370, 43XX, 937X, 3033, 308X, 3080	Vendor did not specify	Lemcom Systems, Inc. DNP 9000
Direct Attachment to Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	16	16	32	16
Max. Hosts Supported Simultaneously	8	8	32	16
IBM Emulation	Yes	Yes	270X/370X, EP, 370X/37X5, 3270 BSC, SNA/SDLC, CTCA	3270 BSC, SNA/SDLC, CTCA, ASCII, custom
PU Type within Network	Vendor did not specify	Vendor did not specify	PU Type 2, PU Type 4	PU Type 2, PU Type 4
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	Unlimited	Unlimited	32	16
Host-Independent Network Processor	No	No	Yes	Yes
Host Channel Extender	No	No	No	No
Terminal Controller	No	No	Yes	Yes
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	No	No	Yes	Yes
Network Architecture Compliance	SNA, X.25	SNA, X.25	SNA, BSC	SNA, BSC
Communications Line Capacity				
No. Half-Duplex Lines Attachable	512	512	1,024	Over 1,000
Highest Line Speed Supported (bps)	1.544M	1.544M	64K	2.0486M
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Vendor did not specify	Yes
Terminal-Initiated Applications Switching	No	No	Yes	Yes
Dynamic Line Reconfiguration	Yes	Yes	Vendor did not specify	Yes
Interface to Ethernet LAN	No	No	Vendor did not specify	No
Protocol Conversion	Yes	Yes	Async to 3270 BSC, async to 3270 SDLC	Async to 3270 BSC, BSC to SDLC
Code Conversion	Yes	Yes	ASCII to EBCDIC, others programmable	ASCII to EBCDIC
Error Control	LRC & CRC detection/correction	LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction, parity, ARQ-CRC	LRC & CRC detection/correction, parity, ARQ-CRC
System Characteristics				
Processor Type	Proprietary	Proprietary	MC6809	MC68020
Main Memory Word Size (bits)	Vendor did not specify	Vendor did not specify	32	32
Main Memory Storage Capacity (bytes)	8M (per CCU)	8M (per CCU)	4M	2M
Data Transferred Across I/O Channel	Block	Block	Byte, block	Byte, block
Data Transfer Supported between:				
Memory and Comm. Lines	DMA	DMA	DMA & interrupt	DMA & interrupt
Memory and Mass Storage	DMA	DMA	Vendor did not specify	DMA
Memory and Other Peripherals	DMA	DMA	Vendor did not specify	Not available
I/O, Backup, and Diagnostic Peripherals	Vendor did not specify	Vendor did not specify	FEP console, PC as console	FEP console, diskette
Support for Remote Console	Yes	Yes	Vendor did not specify	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Vendor did not specify	No
Communications Operating Software				
Operating System Implemented in	Software	Software	Software, firmware	Software
IPL Method	Internal self-load	Internal self-load	Internal self-load	Internal self-load
User Programmability	Yes	Yes	Via user-selected parameters, via user-created programs	Via user-selected parameters, via user-created programs, via console
Network Management/Control				
Diagnostic Tests Supported	Vendor did not specify	Vendor did not specify	Internal diagnostics, problem determination, port/line status, online trace capabilities	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Vendor did not specify	Vendor did not specify	Vendor did not specify	Traffic loading, node/link/software status, line outages, trace, line hits, error rates, events, link loading
Pricing and Availability				
Purchase Price ($)	137,800.00	207,250.00	15,000.00	Contact vendor
Monthly Maintenance ($)	775.00	725.00	Contact vendor	Contact vendor
Monthly Lease/Rental ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	March 1988	March 1988	1980	1990
Serviced by	IBM	IBM	Hitachi Data Systems	Hitachi Data Systems
Comments	Contact local IBM rep.	Contact local IBM rep.	FEP looks to host processor as IBM 3274-1A, IBM 3274-1D, or IBM 3737	Concurrently used as IBM-compatible FEP and RCTCA, and as concentrator; DES encryption to be added in late 1990

Vendor	NCR Comten	NCR Comten	NCR Comten	NCR Comten
Product	**Model 5620**	**Model 5655**	**Model 5665**	**Model 5675**
Computer Systems Interfaced				
Manufacturer/Models	IBM 360/370, 303X, NCR 8500/8600, 308X, 43XX	IBM 360/370, 303X, 308X, 43XX, & compat.	IBM 360/370, 303X, 308X, 43XX, & compat.	IBM 360/370, 303X, 308X, 43XX, & compat.
Direct Attachment to Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	2	8	8	16
Max. Hosts Supported Simultaneously	2	8	8	16
IBM Emulation	270X/370X, EP, 370X/37X5, NCP, 3270 BSC, SNA/SDLC	270X/370X, EP, 370X/37X5, NCP, 3270 BSC, SNA/SDLC	270X/370X, EP, 370X/37X5, NCP, 3270 BSC, SNA/SDLC	270X/370X, EP, 370X/37X5, NCP, 3270 BSC, SNA/SDLC
PU Type within Network	PU Type 4	PU Type 4	PU Type 4	PU Type 4
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Host-Independent Network Processor	No	No	No	No
Host Channel Extender	Yes	Yes	Yes	Yes
Terminal Controller	Yes	Yes	Yes	Yes
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	Yes	Yes	Yes	Yes
Network Architecture Compliance	SNA, BSC, OSI, X.25	SNA, BSC, OSI, X.25	SNA, BSC, OSI, X.25	SNA, BSC, OSI, X.25
Communications Line Capacity				
No. Half-Duplex Lines Attachable	64	512	1,024	1,024
Highest Line Speed Supported (bps)	T1 or token-ring	T1 or token-ring	T1 or token-ring	T1 or token-ring
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Applications Switching	Yes	Yes	Yes	Yes
Dynamic Line Reconfiguration	Yes	Yes	Yes	Yes
Interface to Ethernet LAN	No	No	No	No
Protocol Conversion	Async to 3270 BSC, SDLC to X.25, async to X.25	Async to 3270 BSC, SDLC to X.25, async to X.25	Async to 3270 BSC, SDLC to X.25, async to X.25	Async to 3270 BSC, SDLC to X.25, async to X.25
Code Conversion	ASCII to EBCDIC	ASCII to EBCDIC	ASCII to EBCDIC	ASCII to EBCDIC
Error Control	LRC & CRC detection/correction	LRC & CRC detection/correction	LRC & CRC detection/correction	LRC & CRC detection/correction
System Characteristics				
Processor Type	Proprietary	Proprietary	Proprietary	Proprietary
Main Memory Word Size (bits)	32	32	32	32
Main Memory Storage Capacity (bytes)	4M	8M	16M	16M
Data Transferred Across I/O Channel	Block	Block	Block	Block
Data Transfer Supported between:				
Memory and Comm. Lines	DMA & interrupt	DMA & interrupt	DMA & interrupt	DMA & interrupt
Memory and Mass Storage	DMA	DMA	DMA	DMA
Memory and Other Peripherals	DMA	DMA	DMA	DMA
I/O, Backup, and Diagnostic Peripherals	FEP console, diskette, disk, printer	FEP console, diskette, disk, printer	FEP console, diskette, disk, printer	FEP console, diskette, disk, printer
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software	Software	Software
IPL Method	Host download, disk	Host download, disk	Host download, disk	Host download, disk
User Programmability	Via user-selected parameters	Via user-selected parameters	Via user-selected parameters	Via user-selected parameters
Network Management/Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading, none
Pricing and Availability				
Purchase Price ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Monthly Maintenance ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Monthly Lease/Rental ($)	Vendor did not specify	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	March 1989	March 1989	March 1989	March 1989
Serviced by	NCR Comten	NCR Comten	NCR Comten	NCR Comten
Comments	Field-upgradable processor performance; T1, token-ring, and host connectivity can be expanded in field	Field-upgradable processor performance; T1, token-ring, and host connectivity can be expanded in field	Field-upgradable processor performance; T1, token-ring, and host connectivity can be expanded in field	Field-upgradable processor performance; T1, token-ring, and host connectivity can be expanded in field

Vendor	NTX Communications Corp.	Periphonics Corp.	Periphonics Corp.	Periphonics Corp.
Product	**NTX 3800**	**VPS 7000**	**VPS 7500**	**VPS 9000**
Computer Systems Interfaced				
Manufacturer/Models	IBM 3090, 308X, PCM	IBM 3274 SNA/SDLC/Bisync, IBM 5251 SDLC, Async	IBM 3274 SNA/SDLC/Bisync, IBM 5251 SDLC, Async	IBM 3274 SNA/SDLC/Bisync, IBM 5251 SDLC, Async
Direct Attachment to Host	Yes	Yes	Yes	Yes
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	Yes
Max. Hosts Attachable to FEP	4	4	4	4
Max. Hosts Supported Simultaneously	2	4	4	4
IBM Emulation	CTCA	270X/370X, 370X/37X5, 3270 BSC, SNA/SDLC	270X/370X, 370X/37X5, 3270 BSC, SNA/SDLC	270X/370X, 370X/37X5, 3270 BSC, SNA/SDLC
PU Type within Network	Vendor did not specify	PU Type 2	PU Type 2	PU Type 2
Remote Line Concentrator	No	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	Vendor did not specify	2	2	2
Host-Independent Network Processor	No	Yes	Yes	Yes
Host Channel Extender	No	Yes	Yes	Yes
Terminal Controller	No	Yes	Yes	Yes
Store-and-Forward Switching	No	No	No	No
Distributed Processing Node	No	Yes	Yes	Yes
Network Architecture Compliance	SNA	SNA, BSC, async	SNA, BSC, async	SNA, BSC, async
Communications Line Capacity				
No. Half-Duplex Lines Attachable	8	1 - 64 analog	1 - 64 analog	1 - 64 analog
Highest Line Speed Supported (bps)	6M	9600	9600	9600
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Applications Switching	No	Yes	Yes	Yes
Dynamic Line Reconfiguration	No	Yes	Yes	Yes
Interface to Ethernet LAN	No	Yes	Yes	Yes
Protocol Conversion	No	Async to 3270 BSC	Async to 3270 BSC	Async to 3270 BSC
Code Conversion	None	ASCII to EBCDIC	ASCII to EBCDIC	ASCII to EBCDIC
Error Control	ARQ-CRC	Vendor did not specify	Vendor did not specify	Vendor did not specify
System Characteristics				
Processor Type	Proprietary	Motorola 68030	Motorola 68030	Motorola 68030
Main Memory Word Size (bits)	72	Vendor did not specify	Vendor did not specify	Vendor did not specify
Main Memory Storage Capacity (bytes)	Vendor did not specify	Up to 600M	Up to 600M	Up to 600M
Data Transferred Across I/O Channel	Block	Byte	Byte	Byte
Data Transfer Supported between:				
Memory and Comm. Lines	DMA & interrupt	Interrupt	Interrupt	Interrupt
Memory and Mass Storage	None	Interrupt	Interrupt	Interrupt
Memory and Other Peripherals	None	Interrupt	Interrupt	Interrupt
I/O, Backup, and Diagnostic Peripherals	FEP console	Diskette, disk, magnetic tape	Diskette, disk, magnetic tape	Diskette, disk, magnetic tape
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	No	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Hardware, firmware	Software	Software	Software
IPL Method	Internal self-load	Host download, internal self-load	Host download, internal self-load	Host download, internal self-load
User Programmability	No	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs, via console
Network Management/Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Traffic loading, line outages, line hits, error rates, link loading	Traffic loading, node/link/software status, line outages, port statistics, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, line hits, error rates, events, link loading
Pricing and Availability				
Purchase Price ($)	65,000.00	Contact vendor	Contact vendor	Contact vendor
Monthly Maintenance ($)	485.00	Vendor did not specify	Contact vendor	Vendor did not specify
Monthly Lease/Rental ($)	Not available	Vendor did not specify	Vendor did not specify	Vendor did not specify
Date of First Commercial Delivery	1986	1987	1987	1987
Serviced by	NTX	Periphonics	Periphonics	Periphonics
Comments	—	—	—	—

Vendor	Periphonics Corp.	SBE, Inc.	SBE, Inc.	Thomas Engineering Company
Product	**VPS 9500**	**CPS1100**	**CPS1200**	**UNI-TEC**
Computer Systems Interfaced				
Manufacturer/Models	IBM 3274 SNA/SDLC/Bisync, IBM 5251 SDLC, Async	Vendor did not specify	Vendor did not specify	Uni-Tec
Direct Attachment to Host	Yes	No	No	No
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	No
Max. Hosts Attachable to FEP	4	Vendor did not specify	Vendor did not specify	Vendor did not specify
Max. Hosts Supported Simultaneously	4	Vendor did not specify	Vendor did not specify	8
IBM Emulation	270X/370X, 370X/37X5, 3270 BSC, SNA/SDLC	Vendor did not specify	Vendor did not specify	3270 BSC, SNA/SDLC
PU Type within Network	PU Type 2	Vendor did not specify	Vendor did not specify	PU Type 2
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	2	Flexible	Flexible	8
Host-Independent Network Processor	Yes	Yes	Yes	Yes
Host Channel Extender	Yes	No	No	No
Terminal Controller	Yes	Yes	Yes	Yes
Store-and-Forward Switching	No	Yes	Yes	No
Distributed Processing Node	Yes	No	No	No
Network Architecture Compliance	SNA, BSC, async	X.25, Ethernet via TCP/IP	X.25, Ethernet via TCP/IP	SNA, BSC, X.25
Communications Line Capacity				
No. Half-Duplex Lines Attachable	1 - 64 analog	8	8	43
Highest Line Speed Supported (bps)	9600	1.544M	1.544M	56K
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Vendor did not specify	Vendor did not specify	Yes
Terminal-Initiated Applications Switching	Yes	Vendor did not specify	Vendor did not specify	Yes
Dynamic Line Reconfiguration	Yes	Yes	Yes	Vendor did not specify
Interface to Ethernet LAN	Yes	Yes	Yes	Yes
Protocol Conversion	Async to 3270 BSC	Async to X.25, Ethernet to X.25	Async to X.25, Ethernet to X.25	Async to 3270 BSC, async to uniscope, SDLC and async to X.25, Bull VIP, ALC
Code Conversion	ASCII to EBCDIC	Vendor did not specify	Vendor did not specify	ASCII to EBCDIC
Error Control	Vendor did not specify	Parity	Parity	Parity check w/retransmit on error, LRC & CRC detection/correction
System Characteristics				
Processor Type	Motorola 68030	Motorola 6800, MC68010, MC68020	Motorola 6800, MC68010, MC68020	Z80B, MC68000
Main Memory Word Size (bits)	Vendor did not specify	8, 16, 32	8, 16, 32	16
Main Memory Storage Capacity (bytes)	Up to 600M	512K, 1M, 2M, 4M, 6M, 8M	512K, 1M, 2M, 4M, 6M, 8M	512K
Data Transferred Across I/O Channel	Byte	Byte	Byte	Byte
Data Transfer Supported between:				
Memory and Comm. Lines	Interrupt	Interrupt, dual port buffer	Interrupt, dual port buffer	Interrupt
Memory and Mass Storage	Interrupt	Interrupt, dual port buffer	Interrupt, dual port buffer	Interrupt
Memory and Other Peripherals	Interrupt	Not applicable	Not applicable	Interrupt
I/O, Backup, and Diagnostic Peripherals	Diskette, disk, magnetic tape	FEP console, diskette, disk, magnetic tape	FEP console, diskette, disk, magnetic tape	FEP console, diskette, printer
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software	Software, firmware	Software, firmware	Software
IPL Method	Host download, internal self-load	Host download	Host download	IPL diskette
User Programmability	Via user-selected parameters, via user-created programs, via console	Via user-selected parameters, via user-created programs	Via user-selected parameters, via user-created programs	Via user-selected parameters, via user-created programs, via console
Network Management/Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Internal diagnostics, port/line status
Data Collected	Traffic loading, node/link/software status, line outages, port statistics, line hits, error rates, events, link loading	Determined by programming	Determined by programming	Trace, events
Pricing and Availability				
Purchase Price ($)	Contact vendor	3,910.00	6,035.00	3,495.00
Monthly Maintenance ($)	Vendor did not specify	Not available	Not available	90.00
Monthly Lease/Rental ($)	Vendor did not specify	Not available	Not available	Vendor did not specify
Date of First Commercial Delivery	1987	Vendor did not specify	Vendor did not specify	October 1985
Serviced by	Periphonics	SBE, Inc.	SBE, Inc.	Thomas Engineering
Comments	—	—	—	—

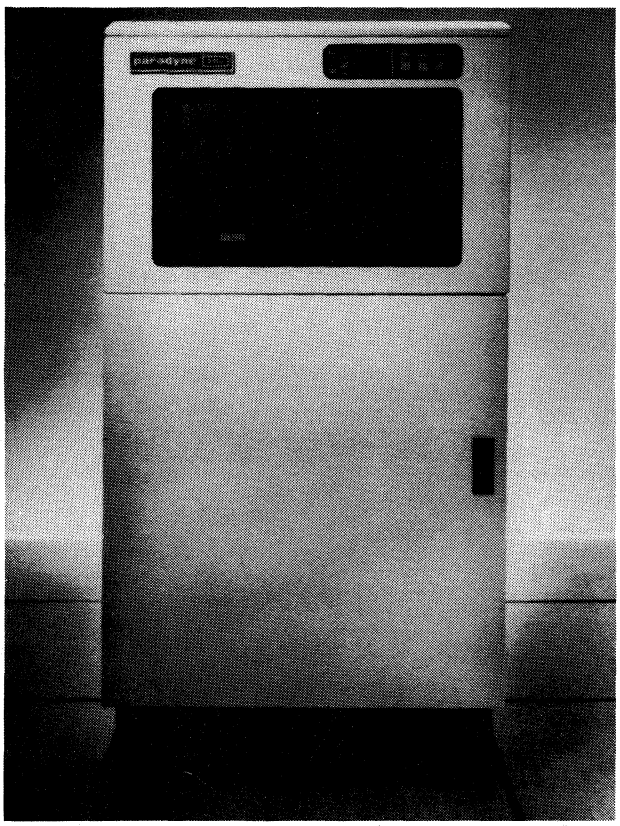
Vendor	**Unisys Corp.**	**Unisys Corp.**	**Unisys Corp.**	**Unisys Corp.**
Product	**CP2000**	**DCP/15**	**DCP/30**	**DCP/5**
Computer Systems Interfaced				
Manufacturer/Models	Unisys A & V series mainframes	All models of Unisys 1100/2200 and System 80	All models of Unisys 1100/2200 and System 80	All models of Unisys 1100/2200 and System 80
Direct Attachment to Host	Yes	Yes	Yes	No
Functional Characteristics				
Front-end Processor	Yes	Yes	Yes	No
Max. Hosts Attachable to FEP	99	2	10	Vendor did not specify
Max. Hosts Supported Simultaneously	99	2	Unlimited	Vendor did not specify
IBM Emulation	3270 BSC, SNA/SDLC	270X/370X, 370X/37X5, 3270 BSC, SNA/SDLC	270X/370X, 370X/37X5, 3270 BSC, SNA/SDLC	270X/370X, 370X/37X5, 3270 BSC, SNA/SDLC
PU Type within Network	PU Type 2, PU Type 5	PU Type 2, PU Type 4, PU Type 5	PU Type 2, PU Type 4, PU Type 5	PU Type 2, PU Type 4, PU Type 5
Remote Line Concentrator	Yes	Yes	Yes	Yes
Max. Hosts Served by One Concentrator	Unlimited	Any host in network	Any host in network	Any host in network
Host-Independent Network Processor	No	Yes	Yes	Yes
Host Channel Extender	No	No	No	No
Terminal Controller	Yes	No	No	No
Store-and-Forward Switching	No	Yes	Yes	Yes
Distributed Processing Node	No	No	No	Vendor did not specify
Network Architecture Compliance	SNA, X.25, Unisys BNA, TCP/IP	SNA, BSC, OSI, X.25, DDN, X.21	SNA, BSC, OSI, X.25, DDN, X.21	SNA, BSC, OSI, X.25, DDN, X.21
Communications Line Capacity				
No. Half-Duplex Lines Attachable	56	Vendor did not specify	Vendor did not specify	Vendor did not specify
Highest Line Speed Supported (bps)	64K	10M/LAN, 64K/V.35	64K/V.35, 250K/coax	64K (V.35)
Communications Features/Functions				
Multiplexing/Demultiplexing	Yes	Yes	Yes	Yes
Terminal-Initiated Applications Switching	Yes	Yes	Yes	Yes
Dynamic Line Reconfiguration	Yes	Yes	Yes	Yes
Interface to Ethernet LAN	Yes	Yes	Yes	Yes
Protocol Conversion	SDLC to X.25, BDLC to ET X.25	Async to uniscope, SDLC to X.25, async to X.25, 3270/Uni, Uni/3270	Async to uniscope, SDLC to X.25, async to X.25, 3270/Uni, Uni/3270	Async to uniscope, SDLC to X.25, async to X.25, 3270/Uni, Uni/3270
Code Conversion	ASCII to EBCDIC	ASCII to EBCDIC	ASCII to EBCDIC	ASCII to EBCDIC
Error Control	Parity check w/retransmit on error, LRC & CRC detection/correction	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC
System Characteristics				
Processor Type	Intel 80386	Proprietary	Proprietary, Unisys DCP/30	Proprietary
Main Memory Word Size (bits)	16	16	32	16
Main Memory Storage Capacity (bytes)	5M	4M	4M	2M
Data Transferred Across I/O Channel	Byte	Byte, block, word	Byte, block, word	Byte, block
Data Transfer Supported between:				DMA
Memory and Comm. Lines	DMA & interrupt	DMA	DMA	
Memory and Mass Storage	DMA & interrupt	DMA	DMA	DMA
Memory and Other Peripherals	Not applicable	DMA	DMA	
				DMA
I/O, Backup, and Diagnostic Peripherals	Disk	FEP console, diskette, patch panel, disk, printer	FEP console, diskette, patch panel, disk, printer	FEP console, diskette, patch panel, disk, printer
Support for Remote Console	Yes	Yes	Yes	Yes
Support for X.25 Level 3 Capabilities	Yes	Yes	Yes	Yes
Communications Operating Software				
Operating System Implemented in	Software, firmware	Software, firmware	Software, firmware	Software, firmware
IPL Method	Host download	IPL diskette	Host download, IPL diskette	Host download, IPL diskette
User Programmability	No	Via user-created programs	Via user-created programs	Yes, via user-created programs
Network Management/Control				
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading
Pricing and Availability				
Purchase Price ($)	18,888.00	21,650.00	55,000.00	9,800.00
Monthly Maintenance ($)	141.50	89.10	175.00	72.00
Monthly Lease/Rental ($)	705.00	600.00	2,095.00	Not available
Date of First Commercial Delivery	1986	April 1987	October 1988	March 1989
Serviced by	Unisys	Unisys	Unisys	Unisys
Comments	When used as a front-end processor, multiple CP2000s are connected to the A & V series mainframes via 802.3 LAN	—	—	—

Vendor	**Unisys Corp.**
Product	**DCP/50**
Computer Systems Interfaced	
Manufacturer/Models	All models of Unisys 1100/2200 and System 80
Direct Attachment to Host	Yes
Functional Characteristics	
Front-end Processor	Yes
Max. Hosts Attachable to FEP	57
Max. Hosts Supported Simultaneously	Unlimited
IBM Emulation	270X/370X, 370X/37X5, 3270 BSC, SNA/SDLC
PU Type within Network	PU Type 2, PU Type 4, PU Type 5
Remote Line Concentrator	Yes
Max. Hosts Served by One Concentrator	Any host in network
Host-Independent Network Processor	Yes
Host Channel Extender	No
Terminal Controller	No
Store-and-Forward Switching	Yes
Distributed Processing Node	No
Network Architecture Compliance	SNA, BSC, OSI, X.25, DDN, X.21
Communications Line Capacity	
No. Half-Duplex Lines Attachable	Vendor did not specify
Highest Line Speed Supported (bps)	64K/V.35, 250K/coax
Communications Features/Functions	
Multiplexing/Demultiplexing	Yes
Terminal-Initiated Applications Switching	Yes
Dynamic Line Reconfiguration	Yes
Interface to Ethernet LAN	Yes
Protocol Conversion	Async to uniscope, SDLC to X.25, async to X.25, 3270/Uni, Uni/3270
Code Conversion	ASCII to EBCDIC
Error Control	Parity check w/retransmit on error, LRC & CRC detection/correction, ARQ-CRC
System Characteristics	
Processor Type	Proprietary
Main Memory Word Size (bits)	32
Main Memory Storage Capacity (bytes)	8M
Data Transferred Across I/O Channel	Byte, block, word
Data Transfer Supported between:	
Memory and Comm. Lines	DMA
Memory and Mass Storage	DMA
Memory and Other Peripherals	DMA
I/O, Backup, and Diagnostic Peripherals	FEP console, diskette, patch panel, disk, printer
Support for Remote Console	Yes
Support for X.25 Level 3 Capabilities	Yes
Communications Operating Software	
Operating System Implemented in	Software, firmware
IPL Method	Host download, IPL diskette
User Programmability	Via user-created programs
Network Management/Control	
Diagnostic Tests Supported	Local/remote loopback, internal diagnostics, problem determination, port/line status
Data Collected	Traffic loading, node/link/software status, line outages, port statistics, trace, line hits, error rates, events, link loading
Pricing and Availability	
Purchase Price ($)	275,000.00
Monthly Maintenance ($)	595.00
Monthly Lease/Rental ($)	4,680.00
Date of First Commercial Delivery	December 1987
Serviced by	Unisys
Comments	—

User Ratings of Communications Processors

The communications processor market, while basically steady this past year, did offer a few surprises—compliments of IBM and NCR Comten. NCR Comten led off in May with the introduction of the Comten 5660, a powerful new communications processor that offers three times the processing power of anything currently on the market. Before the dust had settled on that announcement, IBM came along and announced some new enhancements to the 3725, a new low-end communications processor family, and new host and front-end processor software releases. IBM hoped that these announcements would have the potential to diminish the importance of the Comten announcement. Some experts feel that the one thing that might hurt NCR Comten and its new 5660 is the new IBM release of its VTAM host communications software. Release 3.1.1 will work only with the new front-end processor software, also introduced by IBM. These releases are important, because they will allow users to utilize IBM's NetView network management program.

However, NCR Comten does not give up easily, and in June the company came back with announcements on new models for their Comten 3690 communications processor, the Comten 3690 Model L8 and the Comten 3695. The Comten 3690 Model L8 is designed for medium-sized networks, while the Comten 3695 can be used in medium- to large-networks.



Paradyne's PIXNET-XL system extends the block or byte multiplexer channel of IBM mainframes to connect remote high speed devices.

In this report, Datapro presents the results of the 1986 Data Communications Users Survey that specifically deals with communications/network processors. Over 490 data communications users responded to the communications/network processors part of the survey, representing 6,796 communications/network processors. The respondents are all subscribers to *Data Communications* magazine.

While the communications market was kept hopping for awhile this summer, NCR Comten and IBM were not the only ones who had new offerings in the communications processor market this year. Honeywell has come out with the DPS 6 Plus, a mid-sized processor geared for data communications. The system can handle OSI (Open Systems Interconnection) link levels and higher. Daughterboards in the processor support a variety of LANs, protocols, and multiples of either. The DPS 6 Plus is available in two configurations, Model 410 that has a 16-slot chassis, and Model 420 that supports a 32-slot chassis.

IBM remains the leader in the communications processor market with NCR Comten holding on to the number two spot. Other vendors competing with NCR Comten for the number two position include Amdahl, Computer Communications, Inc. (CCI), Memorex, and NTX. The mainframe vendors, such as Burroughs, Honeywell, and Sperry do not really compete with each other in this marketplace. Their communications processors are designed to work within their own network architecture.

USER EXPERIENCE

Datapro is proud to present the 1986 edition of our Data Communications Users Survey. The survey is based on results received from questionnaires mailed to a cross section of *Data Communications* magazine subscribers.

Survey Methodology

A questionnaire was designed and produced by Datapro and mailed in March 1986 to approximately 10,000 addresses selected at random from a cross section of *Data Communications'* U.S. end-user subscriber base.

The questionnaire contained 33 questions, and was divided into six basic parts. In the first part, users were asked to provide information concerning the general characteristics of their transmission facilities. In the remaining five parts, the users were asked to specify within a given category the types of data communications equipment and services being used in their networks, and to provide usage information and equipment ratings on each type. The remaining categories of equipment/services included communica- ▷

User Ratings of Communications Processors

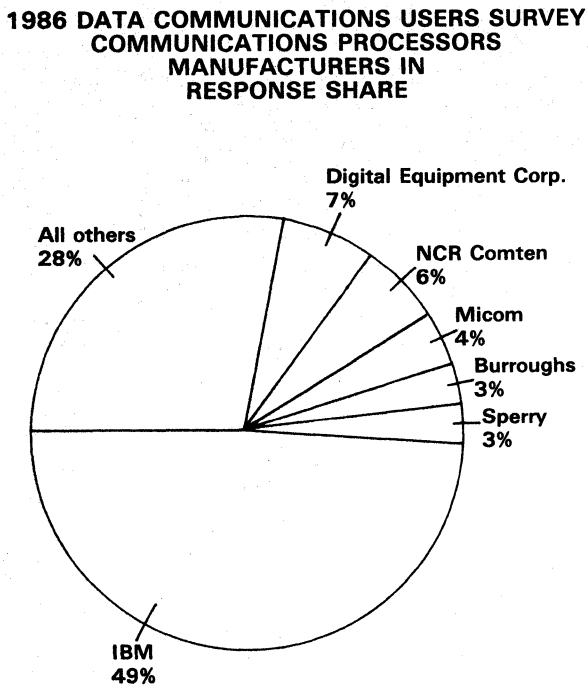


Figure 1. This chart shows the top communications processors manufacturers in terms of responses to the 1986 Communications Processors Users Survey. IBM has almost 50 percent of the total 493 responses to the survey.

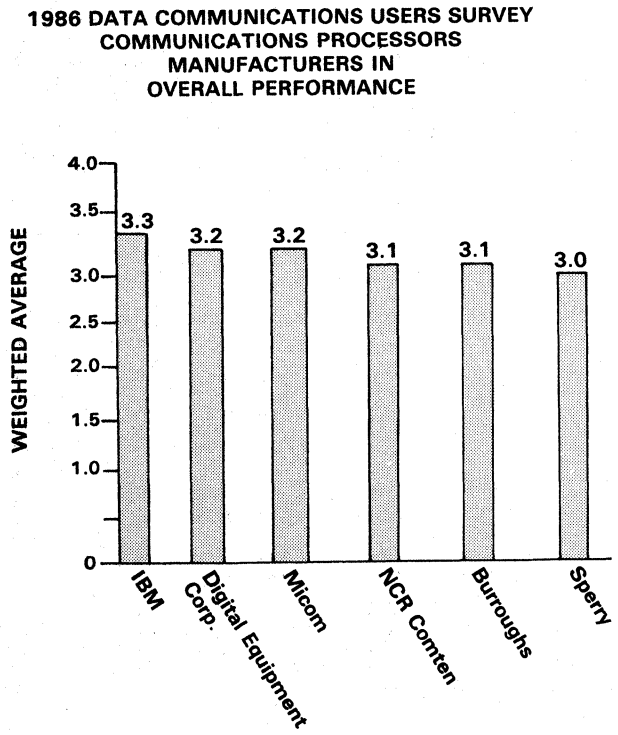


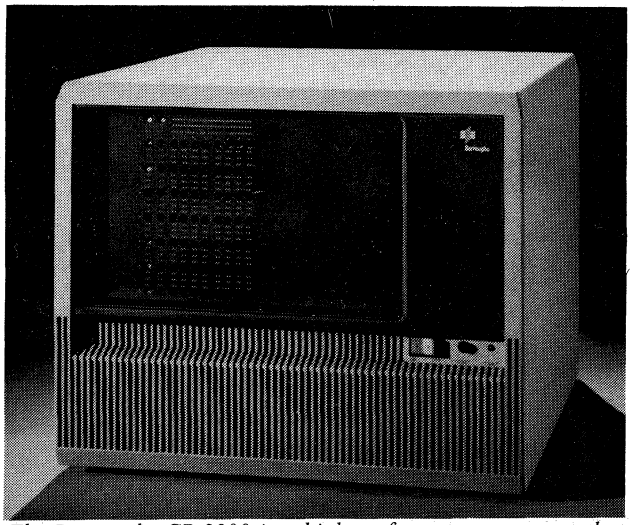
Figure 2. This graph shows the six communications processors manufacturers who received over 15 responses and how they were rated in Overall Performance by the users.

tions and network processors, modems, multiplexers, network management systems, and testing and monitoring equipment. The questionnaire allowed the user to rate up to two (or in some cases, three) vendor/model types within each category of equipment. (Reproduction of the form was permitted so that additional vendor/model types within a given product category could be rated.) The results of each of these five parts will be shown only in the Datapro report to which they are applicable. This report contains a summary of the user ratings provided by respondents to the Communications and Network Processors section.

When Datapro received the returns, they were audited by our senior-level editors. All forms were carefully examined for validity before being sent for tabulation. The *Data Communications* labels were used for initial validation and identification. Responses to specific questionnaire sections or individual questions were disqualified whenever a vendor/model identity was omitted, user ratings were not assigned, a vested interest on the part of the respondent was judged to exist, or incomprehensible or unreasonable answers were given.

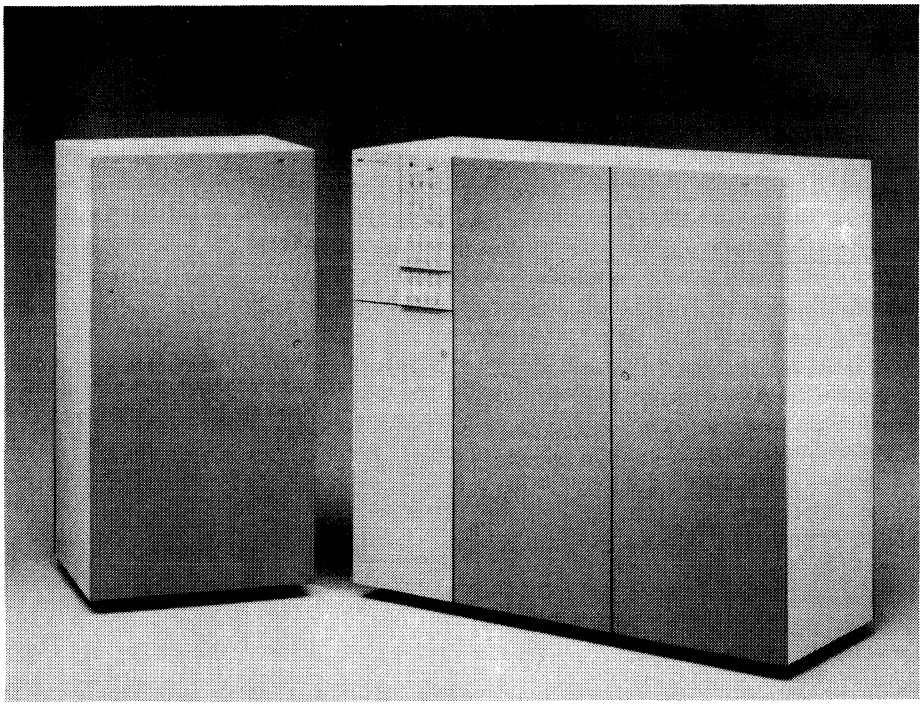
By the editorial cutoff of April 25, 1986, Datapro had processed 542 valid forms, which were then shipped to Mathematica Policy Research, Inc. for key entry and tabulation by computer. Summary information was prepared in the form of totals, percentages, or weighted averages, as appropriate for each question. Weighted averages were computed in a manner similar to most college grading systems: "Excellent" is weighted as 4, "Good" as 3, "Fair" as 2, and "Poor" as 1. The tallied numbers for each value were then multiplied by the corresponding weight, and the average taken by dividing the sum of the products by the total number of responses for that category.

Datapro strongly suggests that the reader uses the information presented with discretion. The individual equipment



The Burroughs CP 2000 is a high performance processor that may be used as a front end processor for Burroughs mainframes or placed in a remote location. Through Burroughs Network Architecture, the CP 2000 provides communications between Burroughs mainframes and terminals, as well as mainframes of other vendors.

User Ratings of Communications Processors



The Comten 5660, from NCR Comten, is designed to support up to eight mainframes running concurrently, can support up to 1,024 full-duplex communications lines, and offers up to 16MB of main memory. VLSI and ECL macrocell functions are used extensively in the system architecture.

ratings are not intended as a statistically accurate indicator of the capabilities of a device. Rather, the ratings and other information should be used as guides to potential strengths and weaknesses of that device. The responses may also be examined to provide an indication of a manufacturer's share of the market. Any equipment acquisition decision should be made only after further investigation on the part of the buyer.

The Results

Table 1 shows the user ratings given to the various manufacturers and models of communications and network processors. A total of 17 vendors received a sufficient number of responses to be rated separately. A minimum of three responses was required to break out the ratings for a specific manufacturer. Some of these vendors include IBM, Burroughs, NCR Comten, Honeywell Information Systems, and Sperry.

The users were asked to rate each of their communications processors in eight specific categories: Overall Performance, Ease of Installation, Ease of Operation, Ease of Expansion, Hardware Reliability, Quality of Manufacturer's Software/Firmware, Ease of Programming, and Quality of Manufacturer's Maintenance Service/Technical Support. The ratings were based on a weighted average ranging from 1.0 (Poor) to 4.0 (Excellent). Hardware Reliability received a high (3.4) rating, while Ease of Installation, Ease of Operation, and Overall Performance each received a 3.2 rating. Ease of Expansion (2.9) and Ease of Programming (2.8) received the lowest scores. The Quality of Manufacturer's Software/Firmware and Quality of Manufacturer's Maintenance Service/Technical Support each received a 3.1 rating.

The users were also asked to list the primary functions performed by the communications processors operating in their networks. Some users responded more than once, so the total percentage is over 100 percent. The three main functions performed by the communications processors were as a front-end processor (72.5%), terminal controller functions (52.8%), and remote line concentration (35.8%). Protocol conversion was performed 31 percent of the time by the communications processors, while distributed processing node functions were performed 28.3 percent of the time. Other functions performed by the communications processors included X.25 PAD or gateway functions (20.8%), message/packet switching (19.4%), applications switching (15.1%), standalone network processing (14.3%), and other unlisted functions (1.3%).

The use of a communications processor for front-end processing increased by seven percent over last year's figures. Terminal controller functions and remote line concentration increased by twelve percent and eight percent respectively. Distributed processing functions increased by ten percent over last year while X.25 PAD or Gateway functions increased by seven percent. Message/packet switching functions increased by eight percent, applications switching decreased three percent, and standalone network processing functions increased by three percent. Protocol conversion was not listed as a function on last year's survey.

SUMMARY

The 1986 Communications/Network Processors survey shows that IBM is still the leader receiving 49 percent of total responses for 1,671 installed units. As we mentioned earlier, since IBM has 90 percent of the communications processor market, these numbers come as no surprise. What is of interest is the inclusion of GTE Telenet and Tymnet in the survey and the number of installed units. These numbers throw off the normal pattern of leaders in the communications processor field, which is why IBM has

User Ratings of Communications Processors

a 90 percent market share, but only 49 percent of total survey responses. (See Figure 1.) The Tymnet and GTE offerings are not true standalone communications processors, but GTE's TP Series and Tymnet's Engine can perform the functions associated with a true communications processor, and that is why they were included in the survey. We also included several computer systems this year, as user responses seemed to indicate, that they were being used to perform communications processing functions. NCR Comten, who has the number two spot in the communications processor market, shared that spot this year with Digital Equipment Corporation, whose VAX computers received 33 responses against NCR Comten's 30 responses.

In Overall Performance, the scores ranged from (low) 2.7 to (high) 3.4. The ratings for Overall Performance among the six communications processors manufacturers who received 15 or more responses are shown in Figure 2. IBM received a (high) 3.3 rating, while Sperry received a low (3.0). Other vendors in the survey may have received higher or lower ratings, but they did not receive a minimum of 15 user responses.

The Datapro Research staff extends a sincere thanks to all for responding to our 1986 Data Communications Users Survey. We hope that this compendium of user experience will be of significant value to you. We look forward to hearing from you again. □

User Ratings of Communications Processors

TABLE 1. USER RATINGS OF COMMUNICATIONS PROCESSORS

Manufacturer/ Model	No. of User Responses	No. of Units Installed	Ease of Installation					Ease of Operation					Ease of Expansion				
			WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Amdahl—																	
4705	6	19	3.3	3	2	1	0	3.3	2	4	0	0	2.7	1	3	1	1
Others & unspecified	5	19	3.0	1	3	1	0	3.0	0	5	0	0	2.3	0	2	1	1
Subtotal	11	38	3.2	4	5	2	0	3.2	2	9	0	0	2.5	1	5	2	2
BBN—																	
C30	4	111	3.0	0	4	0	0	3.0	1	2	1	0	2.3	0	2	1	1
Others & unspecified	3	61	3.0	0	3	0	0	3.3	1	2	0	0	2.3	0	2	0	1
Subtotal	7	172	3.0	0	7	0	0	3.1	2	4	1	0	2.3	0	4	1	2
Burroughs—																	
All models	17	49	3.1	4	11	2	0	3.0	5	7	5	0	2.9	5	7	3	2
Codex—																	
All models	10	47	3.5	6	3	1	0	3.6	6	4	0	0	3.2	3	6	1	0
Control Data Corp. (CDC)—																	
All models	5	20	3.2	1	4	0	0	2.8	0	4	1	0	2.4	1	1	2	1
Data General—																	
All models	5	19	3.2	3	0	2	0	3.4	2	3	0	0	2.8	3	0	0	2
Digital Communications Associates (DCA)—																	
355	6	39	3.5	3	3	0	0	3.2	1	5	0	0	3.5	3	3	0	0
Digital Equipment Corp. (DEC)—																	
VAX	4	106	3.5	2	2	0	0	3.5	2	2	0	0	3.3	1	3	0	0
VAX 750	4	6	3.0	1	1	1	0	3.0	1	2	1	0	3.0	0	4	0	0
VAX 780	5	9	3.6	3	2	0	0	3.8	4	1	0	0	3.6	3	2	0	0
Others & unspecified	20	162	3.2	7	9	2	1	3.2	7	11	1	1	3.1	6	11	2	1
Subtotal	33	283	3.3	13	14	3	1	3.3	14	16	2	1	3.2	10	20	2	1
GTE Telenet—																	
TP4000	3	57	3.3	1	2	0	0	3.3	1	2	0	0	2.7	0	2	1	0
Hewlett-Packard—																	
All models	5	8	3.2	2	2	1	0	3.0	2	1	2	0	3.4	2	3	0	0
Honeywell Information Systems—																	
DATANET 8	5	22	2.8	0	4	1	0	2.4	1	1	2	1	2.4	0	3	1	1
Others & unspecified	8	306	2.9	2	2	3	0	3.0	2	4	2	0	2.9	1	6	0	1
Subtotal	13	328	2.8	2	6	4	0	2.8	3	5	4	1	2.7	1	9	1	2
IBM—																	
3705	79	160	3.1	18	50	11	0	3.0	19	44	14	2	2.5	18	38	21	12
3725	98	274	3.2	26	65	5	1	3.2	30	56	8	3	3.0	24	47	23	2
Series 1	8	367	3.1	1	7	0	0	3.1	2	5	1	0	3.1	1	7	0	0
Others & unspecified	56	870	3.4	25	27	4	0	3.3	21	28	7	0	2.9	13	25	17	0
Subtotal	241	1,671	3.2	70	149	20	1	3.1	72	133	30	5	2.8	46	117	61	14
Micom—																	
Micro 600	11	42	3.1	2	8	1	0	3.1	2	8	1	0	3.5	7	3	1	0
Micro 800	3	8	3.3	1	2	0	0	3.3	1	2	0	0	2.7	0	2	1	0
Others & unspecified	5	19	2.8	0	4	1	0	3.0	1	3	1	0	3.0	1	3	1	0
Subtotal	19	69	3.1	3	14	2	0	3.1	4	13	2	0	3.3	8	8	3	0
NCR Comten—																	
3650	6	6	3.0	0	6	0	0	3.0	0	6	0	0	3.0	0	6	0	0
3670	3	4	3.0	1	1	1	0	3.0	1	1	1	0	2.7	1	0	2	0
3690	14	113	3.2	5	6	2	0	3.2	4	9	1	0	2.9	4	5	5	0
Others & unspecified	7	54	3.3	2	5	0	0	3.4	3	4	0	0	3.3	3	3	1	0
Subtotal	30	177	3.2	8	18	3	0	3.2	8	20	2	0	3.0	8	14	8	0

User Ratings of Communications Processors

TABLE 1. USER RATINGS OF COMMUNICATIONS PROCESSORS (Continued)

Manufacturer/ Model	Hardware Reliability					Quality of Manufacturer's Software/ firmware					Ease of Programming					Quality of Manufacturer's Maintenance svc/tech supp.					Overall Performance				
	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Amdahl—																									
4705	3.3	2	4	0	0	3.0	1	3	1	0	2.4	0	3	1	1	3.0	1	4	1	0	3.0	1	4	1	0
Others & unspecified	3.3	2	1	1	0	3.0	0	5	0	0	3.3	1	3	0	0	3.4	2	3	0	0	3.2	1	4	0	0
Subtotal	3.3	4	5	1	0	3.0	1	8	1	0	2.8	1	6	1	1	3.2	3	7	1	0	3.1	2	8	1	0
BBN—																									
C30	3.3	1	3	0	0	2.5	0	2	2	0	*	0	1	0	0	3.3	1	3	0	0	3.0	0	4	0	0
Others & unspecified	3.7	2	1	0	0	2.3	0	1	2	0	*	0	0	0	0	1.7	0	1	0	2	2.3	0	1	2	0
Subtotal	3.4	3	4	0	0	2.4	0	3	4	0	*	0	1	0	0	2.6	1	4	0	2	2.7	0	5	2	0
Burroughs—																									
All models	3.5	9	7	1	0	3.2	7	5	4	0	3.2	7	5	4	0	2.6	2	7	7	1	3.1	5	9	3	0
Codex—																									
All models	3.7	7	3	0	0	3.3	3	7	0	0	3.3	3	6	0	0	3.4	4	6	0	0	3.4	4	6	0	0
Control Data Corp. (CDC)—																									
All models	2.8	0	4	1	0	2.4	1	0	4	0	2.3	0	1	2	0	2.4	1	1	2	1	3.0	0	4	0	0
Data General—																									
All models	3.2	3	0	2	0	2.8	2	0	3	0	1.3	0	0	1	2	3.2	3	0	2	0	3.0	2	1	2	0
Digital Communications Associates (DCA)—																									
355	3.5	3	3	0	0	3.2	2	3	1	0	3.0	1	4	1	0	3.3	2	4	0	0	3.3	2	4	0	0
Digital Equipment Corp. (DEC)—																									
VAX	3.3	2	1	1	0	3.3	1	3	0	0	3.3	1	3	0	0	3.0	0	4	0	0	3.0	0	4	0	0
VAX 750	2.8	0	3	1	0	3.0	1	2	1	0	2.5	0	1	1	0	2.8	0	3	1	0	2.8	1	1	2	0
VAX 780	3.6	3	2	0	0	3.8	4	1	0	0	3.4	2	3	0	0	3.4	2	3	0	0	3.8	4	1	0	0
Others & unspecified	3.3	8	11	1	0	2.9	3	12	5	0	2.8	4	8	5	1	3.0	5	11	3	1	3.1	5	12	3	0
Subtotal	3.3	13	17	3	0	3.1	9	18	6	0	3.0	7	15	6	1	3.0	7	21	4	1	3.2	10	18	5	0
GTE Telenet—																									
TP4000	3.3	1	2	0	0	2.3	0	1	2	0	2.5	0	1	1	0	2.0	0	0	2	0	2.7	0	2	1	0
Hewlett-Packard—																									
All models	3.4	3	1	1	0	3.8	4	1	0	0	3.0	1	2	1	0	3.4	3	1	1	0	3.4	3	1	1	0
Honeywell Information Systems—																									
DATANET 8	3.0	2	1	2	0	2.6	1	2	1	1	2.5	1	0	3	0	2.6	0	4	0	1	2.8	2	1	1	1
Others & unspecified	3.3	3	4	1	0	3.3	2	5	0	0	2.7	0	6	0	1	3.5	4	1	1	0	3.0	1	5	1	0
Subtotal	3.2	5	5	3	0	3.0	3	7	1	1	2.6	1	6	3	1	3.1	4	5	1	1	2.9	3	6	2	1
IBM—																									
3705	3.5	46	30	2	1	3.1	23	44	10	2	2.6	6	32	25	6	3.2	29	41	8	1	3.1	18	53	8	0
3725	3.6	66	27	3	1	3.3	36	56	3	1	2.8	10	47	21	3	3.3	37	47	11	1	3.3	35	59	1	1
Series 1	3.4	4	3	1	0	2.6	0	5	3	0	3.0	1	4	1	0	2.9	1	5	2	0	3.3	2	6	0	0
Others & unspecified	3.4	27	27	2	0	3.3	22	26	6	1	3.1	13	26	10	0	3.3	23	27	5	1	3.3	20	34	2	0
Subtotal	3.5	143	87	8	2	3.2	81	131	22	4	2.8	30	109	57	9	3.2	90	120	26	3	3.3	75	152	11	1
Micom—																									
Micro 600	3.5	5	6	0	0	3.1	2	8	1	0	2.8	1	5	3	0	2.8	1	7	3	0	3.3	4	6	1	0
Micro 800	3.7	2	1	0	0	3.3	1	2	0	0	3.3	1	2	0	0	3.3	1	2	0	0	3.3	1	2	0	0
Others & unspecified	3.0	1	3	1	0	2.8	0	4	1	0	2.3	0	1	3	0	2.4	1	2	0	2	2.8	0	4	1	0
Subtotal	3.4	8	10	1	0	3.1	3	14	2	0	2.8	2	8	6	0	2.8	3	11	3	2	3.2	5	12	2	0
NCR Comten—																									
3650	3.8	5	1	0	0	3.2	2	3	1	0	2.8	0	4	1	0	3.5	3	3	0	0	3.3	2	4	0	0
3670	3.3	1	2	0	0	3.0	1	1	1	0	2.3	0	2	0	1	2.7	0	2	1	0	3.0	1	1	1	0
3690	3.5	7	7	0	0	2.5	1	7	4	2	2.8	1	6	3	0	2.9	4	5	5	0	2.9	2	9	3	0
Others & unspecified	3.3	2	5	0	0	3.3	2	5	0	0	3.3	1	2	0	0	3.3	3	3	1	0	3.4	3	4	0	0
Subtotal	3.5	15	15	0	0	2.9	6	16	6	2	2.8	2	14	4	1	3.1	10	13	7	0	3.1	8	18	4	0

**Weighted averages were not calculated where there were less than three responses.*

User Ratings of Communications Processors

TABLE 1. USER RATINGS OF COMMUNICATIONS PROCESSORS (Continued)

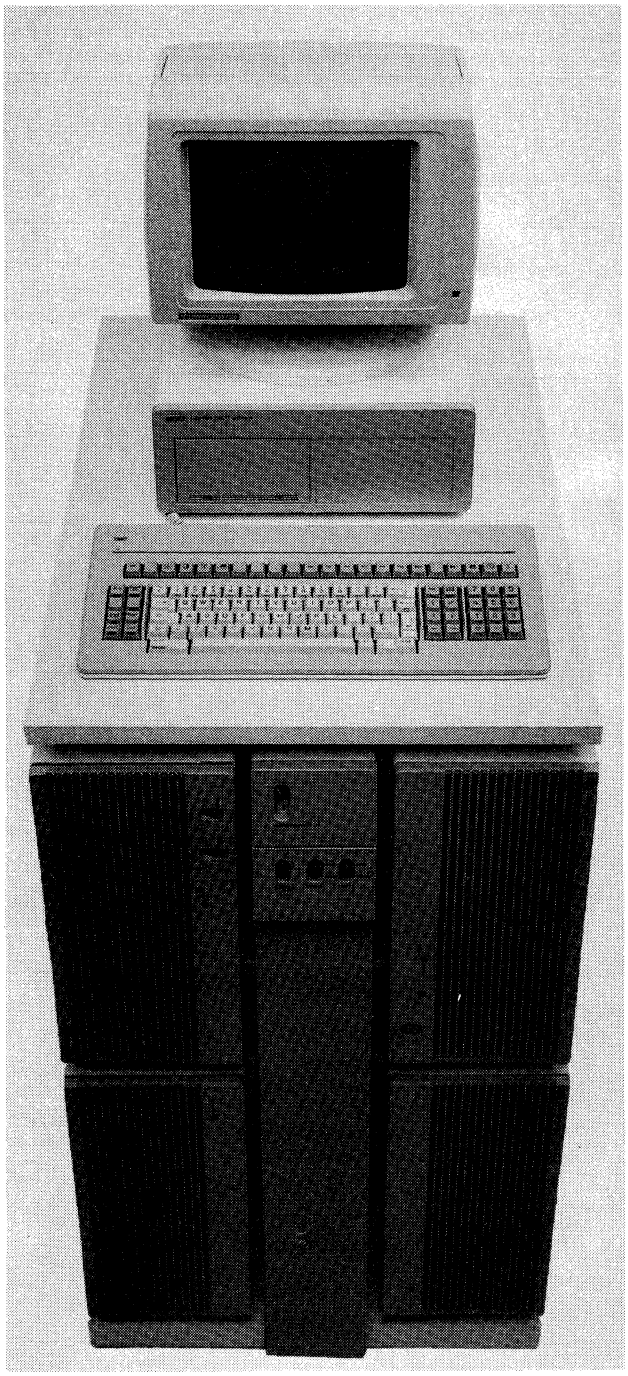
Manufacturer/ Model	No. of User Re- sponses	No. of Units In- stall.	Ease of Installation					Ease of Operation					Ease of Expansion				
			WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Sperry—																	
DCP/40	11	32	2.9	1	7	2	0	2.9	2	5	3	0	2.9	2	6	1	1
Others & unspecified	4	4	3.3	1	3	0	0	2.8	0	3	1	0	2.8	0	3	1	0
Subtotal	15	36	3.0	2	10	2	0	2.9	2	8	4	0	2.9	2	9	2	1
Tandem—																	
TXP	5	113	3.4	2	3	0	0	3.0	1	3	1	0	3.4	3	1	1	0
Tymnet—																	
Engine	4	2,706	3.8	3	1	0	0	3.8	3	1	0	0	4.0	4	0	0	0
Others & unspecified	5	65	3.8	4	1	0	0	3.6	3	2	0	0	2.8	2	1	1	1
Subtotal	9	2,771	3.8	7	2	0	0	3.7	6	3	0	0	3.3	6	1	1	1
All others	59	899	3.1	16	32	9	2	3.2	18	37	3	1	3.0	18	27	11	3
Grand Total	493	6,796	3.2	147	285	51	4	3.2	149	277	57	8	2.9	120	237	100	31

Manufacturer/ Model	Hardware Reliability					Quality of Manufacturer's Software/ firmware					Ease of Programming					Quality of Manufacturer's Maintenance svc/tech supp.					Overall Performance				
	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Sperry—																									
DCP/40	3.3	5	4	2	0	2.5	2	3	4	2	2.2	0	4	4	2	3.0	3	4	3	0	3.0	3	5	3	0
Others & unspecified	3.3	1	3	0	0	2.8	0	3	1	0	3.5	1	1	0	0	3.3	1	3	0	0	3.0	0	4	0	0
Subtotal	3.3	6	7	2	0	2.5	2	6	5	2	2.4	1	5	4	2	3.1	4	7	3	0	3.0	3	9	3	0
Tandem—																									
TXP	3.4	3	1	1	0	3.2	2	2	1	0	3.3	1	3	0	0	3.5	3	0	1	0	3.4	3	1	1	0
Tymnet—																									
Engine	3.5	2	2	0	0	2.8	1	2	0	1	3.0	2	0	2	0	3.3	2	1	1	0	3.3	2	1	1	0
Others & unspecified	4.0	5	0	0	0	3.8	4	1	0	0	2.3	1	0	2	1	3.6	3	2	0	0	3.2	2	2	1	0
Subtotal	3.8	7	2	0	0	3.3	5	3	0	1	2.6	3	0	4	1	3.4	5	3	1	0	3.2	4	3	2	0
All others	3.2	24	27	6	2	2.8	12	31	9	6	2.8	8	20	14	2	2.7	11	26	14	6	3.0	13	34	10	2
Grand Total	3.4	257	200	30	4	3.1	143	256	71	16	2.8	68	206	109	20	3.1	156	236	75	17	3.2	142	293	50	4

**Weighted averages were not calculated where there were less than three responses.*

User Ratings of Communications Processors

The communications processor market has remained steady over the past year. IBM continues to sell ninety percent of the communications processors, while the other vendors compete for the remaining ten percent. NCR Comten holds the lead in that area and was one of the few vendors who introduced a new communications processor, the NCR Comten 5620.



The NCR Comten 5620 can handle application switching, polling, routing, error recovery, automated dialing, and multiplexing for up to 32 lines.

In this report, Datapro presents the results of the 1985 Network Users Survey that specifically deal with communications/network processors. Over 660 data communications users responded to the communications/network processors part of the survey, representing 10,421 communications/network processors. The respondents are all subscribers to *Data Communications* magazine.

Other vendors competing with NCR Comten for that ten percent market include Amdahl, Computer Communications, Inc. (CCI), Memorex, and NTX. The mainframe vendors, such as Burroughs, Honeywell, and Sperry do not really compete with each other in this marketplace. Their communications processors are designed to work within their own network architecture.

USER EXPERIENCE

Datapro is proud to present the 1985 edition of our Network Users Survey. The survey is based on results received from questionnaires mailed to a cross-section of *Data Communications* magazine subscribers.

Survey Methodology

A questionnaire was designed and produced by Datapro and mailed in March 1985 to approximately 10,000 addreses selected at random from a cross section of *Data Communications'* U.S. end-user subscriber base.

The questionnaire contained 37 questions, and was divided into six basic parts. In the first part, users were asked to provide information concerning the general characteristics of their data communications networks. In each of the remaining five parts, the users were asked to specify within a given category the types of data communications equipment and services being used in their networks, and to provide usage information and equipment ratings on each type. The five categories of equipment/services included: transmission facilities, communications and network processors, modems, line multiplexers, and testing and monitoring equipment. The questionnaire allowed the user to rate up to two (or in some cases, three) vendor/model types within each category of equipment. (Reproduction of the form was permitted so that additonal vendor/model types within a given product category could be rated.) The results of each of these five parts will be shown only in the Datapro report to which they are applicable. This report contains a summary of the user ratings provided by respondents to the Communications and Network Processors section.

When Datapro received the returns, they were audited by our senior-level editors. All forms were carefully examined for validity before being sent for tabulation. The *Data Communications* labels were used for initial validation and ➢

User Ratings of Communications Processors

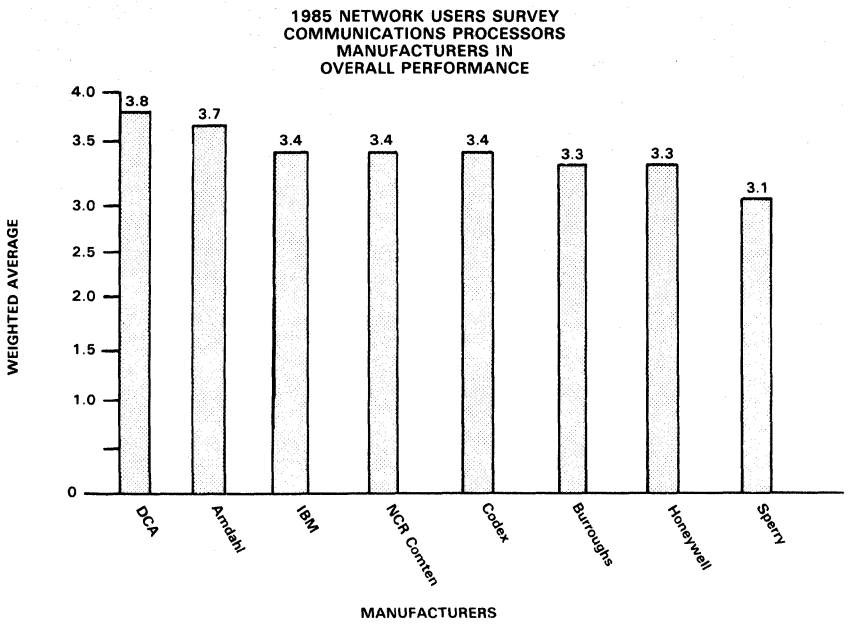


Figure 1. This graph shows the eight communications processors manufacturers who received over 15 responses and how they were rated in Overall Performance by the users.

identification. Responses to specific questionnaire sections or individual questions were disqualified whenever a vendor/model identity was omitted, user ratings were not assigned, a vested interest on the part of the respondent was judged to exist, or incomprehensible or unreasonable answers were given.

Forms were shipped to Mathematica Policy Research, Inc. for key entry and tabulation by computer. Summary information was prepared in the form of totals, percentages, or weighted averages, as appropriate for each question. Weighted averages were computed in a manner similar to most college grading systems: "Excellent" is weighted as 4, "Good" as 3, "Fair" as 2, and "Poor" as 1. The tallied numbers for each value were then multiplied by the corresponding weight, and the average taken by dividing the sum of the products by the total number of responses for that category.

Datapro strongly suggests that the reader use the information presented with discretion. The individual equipment ratings are not intended as a statistically accurate indicator of the capabilities of a device. Rather, the ratings and other information should be used as guides to potential strengths and weaknesses of that device. The responses may also be examined to provide an indication of a manufacturer's share of the market. Any equipment acquisition decision should be made only after further investigation on the part of the buyer.

The Results

The first part of the Network Users Survey consisted of nine questions that solicited information on the general characteristics of the users' networks. Taken together, the results provide a brief summary of the extent and complexity of these users' network configurations.

First, the users were asked to indicate the number of sites that are linked by their networks, with the following results:

	Number of Responses	Percent of Responses
1 to 3 sites	116	16
4 to 10 sites	172	23
11 to 25 sites	138	18
26 to 50 sites	88	12
Over 50 sites	232	31
Total	746	100

These results present a fairly even spread of network sizes, with half the users in the 1-to-25 site range, and the other half in the 25-and-over range. Note that no distinction is made here as to the type or intelligence of the devices located at any site.

The second question asked the number of computers participating as hosts. As you can see, over 70 percent of these users are operating in multiple-host environments:

	Number of Responses	Percent of Responses
1 host	180	24
2 to 4 hosts	313	42
5 to 10 hosts	134	18
Over 10 hosts	118	16
Total	745	100

This adds some degree of clarity to the responses to Question 1, as well as developing a better picture of the level of sophistication of these users.

User Ratings of Communications Processors

The users were also asked to indicate the total number of end-user workstations (CRTs, teleprinters, etc.), that are in use on their networks:

	Number of Responses	Percent of Responses
1 to 10	25	3
11 to 25	44	6
26 to 100	124	17
100 to 500	264	35
Over 500	290	39
Total	747	100

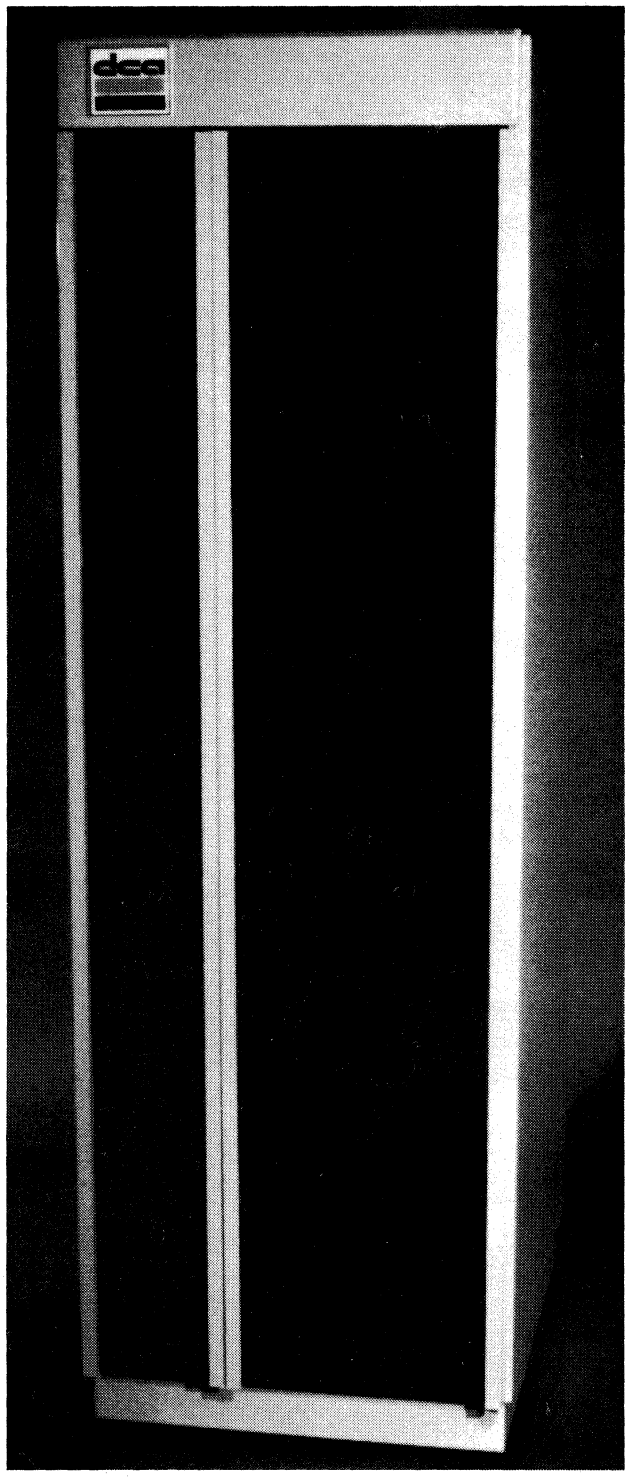
When examined in conjunction with Questions 1 and 2, these results characterize the typical respondent to the survey as having a network configuration consisting of approximately 25 sites, two to four hosts, and over 100 terminals (an average of 10 per site).

This year's results indicate a continuation of the trend of growth in the size of user networks that we observed in our 1983 and 1984 results.

Another question asked the users to identify the overall network architecture with which their networks comply, with the following results:

	Number of Responses	Percent of Total Responses
IBM BSC (non-SNA environment)	313	42
IBM SNA	352	47
Digital Equipment Corporation DNA and DECnet	118	16
Hewlett-Packard DSN	41	5
Sperry DCA	24	3
Burroughs BNA	27	4
Honeywell DSE or DSA	32	4
Prime Primenet	29	4
Data General Xodiac	11	1
Other vendor-supplied architecture	133	17
None, or user-supplied architecture	124	17

The number of responses total 1,204, indicating that a significant number of the respondents are using more than one of the listed architectures in their networks. In our 1983 and 1984 surveys, the largest group of users operated in an IBM BSC environment. This year, IBM SNA users have overtaken BSC users by almost 9 percent. Interestingly, 17 percent of the respondents (up from 13 percent in 1984) are not complying with any vendor-supported architectural scheme, presumably either because their environments do not currently require it (but potentially may in the future) or because they have found other satisfactory alternatives.



DCA's System 355 Master Network Processor can be used as a nodal processor in DCA's Integrated Network Architecture (INA). The System 355 will route and switch data from DCA statistical multiplexers, as well as hosts and terminals.

User Ratings of Communications Processors

TABLE 1. USER RATINGS OF COMMUNICATIONS PROCESSORS

MANUFACTURER/ MODEL	No. of User Responses	No. of Units Installed	Overall Performance					Ease of Installation					Ease of Operation				
			WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Amdahl—																	
4705	14	38	3.7	10	4	0	0	3.1	5	6	3	0	2.9	4	5	5	0
4705E	5	17	3.6	3	2	0	0	3.4	2	3	0	0	3.4	2	3	0	0
Others & unspecified	4	20	3.5	2	2	0	0	3.3	1	3	0	0	2.8	0	3	1	0
Subtotal	23	75	3.7	15	8	0	0	3.2	8	12	3	0	3.0	6	11	6	0
AT&T Information Systems—																	
All models	9	39	3.6	6	2	1	0	3.3	4	3	1	0	3.9	7	1	0	0
Burroughs—																	
B-874	8	12	3.9	7	1	0	0	3.8	6	2	0	0	3.6	5	3	0	0
CP 9500	3	19	3.3	1	2	0	0	2.7	1	1	0	1	2.7	1	0	2	0
CP	10	43	3.4	4	6	0	0	2.6	1	3	5	0	2.9	1	8	0	1
NSP	8	49	3.1	2	5	1	0	3.0	1	6	1	0	3.3	2	6	0	0
Others & unspecified	9	200	2.9	1	6	2	0	2.9	2	5	1	1	2.8	2	4	0	2
Subtotal	38	323	3.3	15	20	3	0	3.0	11	17	7	2	3.1	11	21	2	3
Codex—																	
6000 SE	6	29	3.7	4	2	0	0	3.0	2	2	2	0	3.3	2	4	0	0
6050	7	17	3.3	3	3	1	0	2.4	1	2	3	1	3.1	3	2	2	0
Others & unspecified	4	4	3.0	1	2	1	0	2.3	0	2	1	1	3.0	1	2	1	0
Subtotal	17	50	3.4	8	7	2	0	2.6	3	6	6	2	3.2	6	8	3	0
Computer Communications Inc., (CCI)—																	
CC-8085	6	21	3.0	2	2	2	0	3.0	1	4	1	0	2.7	1	3	1	1
Control Data Corp. (CDC)—																	
2551	4	10	2.0	0	2	2	0	2.0	0	1	2	1	2.5	0	2	2	0
Digital Communications Associates—																	
355	10	78	3.6	6	4	0	0	3.5	6	3	1	0	3.4	5	4	1	0
Others & unspecified	7	30	4.0	7	0	0	0	3.9	6	1	0	0	3.9	6	1	0	0
Subtotal	17	108	3.8	13	4	0	0	3.7	12	4	1	0	3.6	11	5	1	0
GTE Telenet—																	
TP3000	5	304	3.2	1	4	0	0	2.8	1	3	0	1	3.0	1	3	1	0
TP4000	4	30	3.5	2	2	0	0	3.0	0	4	0	0	3.5	2	2	0	0
Subtotal	9	334	3.3	3	6	0	0	2.9	1	7	0	1	3.2	3	5	1	0
Honeywell Information Systems—																	
DATANET 8	12	42	3.3	3	9	0	0	2.9	2	8	1	1	3.0	2	8	2	0
DATANET 6661	7	14	3.3	2	5	0	0	3.1	1	6	0	0	3.3	2	5	0	0
Subtotal	19	56	3.3	5	14	0	0	3.0	3	14	1	1	3.1	4	13	2	0
IBM—																	
3705	204	615	3.5	103	92	9	0	2.9	48	110	42	4	3.1	57	104	41	3
3725	125	500	3.4	53	65	6	1	3.1	33	69	20	2	3.1	32	73	17	2
Others & unspecified	4	26	3.5	2	2	0	0	3.3	1	2	0	0	3.0	1	2	1	0
Subtotal	333	1,141	3.4	158	159	15	1	3.0	82	181	62	6	3.1	90	179	59	5
Infotron—																	
All models	7	112	3.9	6	1	0	0	3.6	4	3	0	0	3.6	4	3	0	0
NCR Comten—																	
3650	18	69	3.4	9	8	1	0	3.0	5	9	3	1	3.2	4	13	1	0
3670	10	35	3.3	5	3	2	0	3.0	3	5	1	1	3.3	4	5	1	0
3690	38	354	3.5	20	17	1	0	3.1	12	22	4	1	3.3	15	21	2	1
Others & unspecified	13	45	3.1	4	6	3	0	2.9	4	5	3	1	3.1	3	8	2	0
Subtotal	79	503	3.4	38	34	7	0	3.1	24	41	11	4	3.2	26	47	6	1
Paradyne—																	
All models	5	7	2.8	0	4	1	0	2.4	0	2	3	0	2.0	0	2	1	2

User Ratings of Communications Processors

TABLE 1. USER RATINGS OF COMMUNICATIONS PROCESSORS (Continued)

MANUFACTURER/ MODEL	Ease of Expansion					Hardware Reliability					Qlty. of Manufacturer's Software/firmware					Ease of Programming					Qlty. of Manufacturer's Maintenance svc./tech. supp.				
	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Amdahl—																									
4705	2.7	3	5	5	1	3.6	9	5	0	0	3.2	6	4	3	0	2.9	0	6	1	0	3.4	7	6	1	0
4705E	3.6	3	2	0	0	4.0	5	0	0	0	3.5	2	2	0	0	3.7	2	1	0	0	3.4	3	1	1	0
Others & unspecified	3.3	1	3	0	0	3.3	2	1	1	0	2.8	1	2	0	1	3.3	1	2	0	0	2.8	1	1	2	0
Subtotal	3.0	7	10	5	1	3.7	16	6	1	0	3.2	9	8	3	1	3.2	3	9	1	0	3.3	11	8	4	0
AT&T Information Systems—																									
All models	3.6	5	3	0	0	3.6	6	1	1	0	3.5	5	2	1	0	3.6	5	1	1	0	3.5	4	4	0	0
Burroughs—																									
B-874	3.0	1	6	1	0	3.9	7	1	0	0	3.4	4	3	1	0	3.0	1	6	1	0	3.4	4	3	1	0
CP 9500	2.7	1	0	2	0	3.3	2	0	1	0	2.7	1	1	0	1	2.3	1	0	1	1	2.7	1	1	0	1
CP	2.9	1	6	2	0	3.4	4	6	0	0	3.2	2	7	0	0	3.4	4	6	0	0	2.6	1	6	1	2
NSP	2.9	1	5	2	0	3.1	3	4	0	1	2.8	2	3	2	1	3.1	3	2	2	0	2.5	1	4	1	2
Others & unspecified	2.6	2	3	1	2	3.2	4	3	2	0	2.7	2	4	1	2	2.9	2	5	1	1	3.1	3	3	2	0
Subtotal	2.8	6	20	8	2	3.4	20	14	3	1	3.0	11	18	4	4	3.1	11	19	5	2	2.9	10	17	5	5
Codex—																									
6000 SE	3.0	2	3	0	1	3.7	4	2	0	0	3.0	1	4	1	0	3.2	1	4	0	0	2.7	0	4	2	0
6050	3.4	4	2	1	0	3.6	4	3	0	0	3.1	2	4	1	0	3.0	1	4	1	0	2.9	1	5	0	1
Others & unspecified	2.3	0	1	3	0	2.5	0	2	2	0	2.5	0	2	2	0	2.3	0	1	2	0	2.3	0	1	3	0
Subtotal	3.0	6	6	4	1	3.4	8	7	2	0	2.9	3	10	4	0	2.9	2	9	3	0	2.7	1	10	5	1
Computer Communications Inc., (CCI)—																									
CC-8085	2.0	0	1	3	1	2.8	2	1	3	0	2.5	0	3	3	0	2.3	0	1	3	0	2.3	0	3	2	1
Control Data Corp. (CDC)—																									
2551	2.5	0	2	2	0	2.5	0	3	1	0	2.3	0	2	1	1	*	0	0	0	1	1.5	0	1	0	3
Digital Communications Associates—																									
355	3.6	7	2	1	0	3.3	5	3	2	0	3.0	3	5	1	1	3.2	4	4	0	1	3.0	3	4	3	0
Others & unspecified	4.0	7	0	0	0	3.9	6	1	0	0	3.9	6	1	0	0	3.9	6	1	0	0	3.9	6	1	0	0
Subtotal	3.8	14	2	1	0	3.5	11	4	2	0	3.4	9	6	1	1	3.5	10	5	0	1	3.4	9	5	3	0
GTE Telenet—																									
TP 3000	3.0	1	3	1	0	2.6	0	3	2	0	2.8	1	3	0	1	2.7	1	1	0	1	2.6	0	3	2	0
TP 4000	3.5	2	2	0	0	3.5	2	2	0	0	3.0	1	2	1	0	3.0	1	1	1	0	2.5	0	2	2	0
Subtotal	3.2	3	5	1	0	3.0	2	5	2	0	2.9	2	5	1	1	2.8	2	2	1	1	2.6	0	5	4	0
Honeywell Information Systems—																									
DATANET 8	3.1	3	7	2	0	3.3	5	6	1	0	2.9	1	9	2	0	2.6	2	2	3	1	3.1	3	7	2	0
DATANET 6661	3.0	1	5	1	0	3.1	2	4	1	0	3.1	2	4	1	0	3.0	2	2	2	0	3.1	2	4	1	0
Subtotal	3.1	4	12	3	0	3.3	7	10	2	0	3.0	3	13	3	0	2.8	4	4	5	1	3.1	5	11	3	0
IBM—																									
3705	2.7	34	88	63	19	3.6	126	73	6	0	3.2	60	119	24	1	2.7	24	73	50	9	3.3	77	103	19	1
3725	3.0	25	72	20	4	3.5	70	47	7	1	3.1	28	82	15	0	2.8	12	55	18	5	3.1	38	69	15	3
Others & unspecified	3.0	1	2	1	0	3.5	2	2	0	0	3.0	1	2	1	0	3.0	1	2	1	0	3.5	2	2	0	0
Subtotal	2.8	60	162	84	23	3.6	198	122	13	1	3.1	89	203	40	1	2.8	37	130	69	14	3.2	117	174	34	4
Infotron—																									
All models	3.4	4	2	1	0	3.3	2	5	0	0	3.3	2	5	0	0	3.0	1	5	1	0	3.3	2	5	0	0
NCR Comten—																									
3650	2.9	5	8	3	2	3.4	9	8	1	0	2.8	5	7	2	3	2.6	1	8	5	1	3.1	7	5	5	0
3670	3.2	5	2	3	0	3.1	5	2	2	1	2.8	3	4	1	2	3.2	2	2	1	0	3.0	3	5	1	1
3690	3.2	15	17	6	1	3.4	22	12	5	0	3.1	11	20	5	2	2.8	7	14	8	2	3.0	11	19	8	1
Others & unspecified	2.5	3	2	7	1	3.0	4	6	2	1	2.7	3	6	1	3	2.6	1	5	0	2	2.7	3	4	5	1
Subtotal	3.0	28	29	19	4	3.3	40	28	10	2	2.9	22	37	9	10	2.8	11	29	14	5	3.0	24	33	19	3
Paradyne—																									
All models	1.8	0	1	2	2	2.3	0	1	3	0	2.0	0	1	3	1	1.8	0	1	1	2	2.4	0	2	3	0

User Ratings of Communications Processors

TABLE 1. USER RATINGS OF COMMUNICATIONS PROCESSORS (Continued)

MANUFACTURER/ MODEL	No. of User Responses	No. of Units Installed	Overall Performance					Ease of Installation					Ease of Operation				
			WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Sperry—																	
DCP/40	10	23	3.3	4	5	1	0	3.0	1	7	1	0	2.8	1	6	1	1
Others & unspecified	9	32	2.9	3	2	4	0	2.8	3	2	3	1	2.8	3	2	3	1
Subtotals	19	55	3.1	7	7	5	0	2.9	4	9	4	1	2.8	4	8	4	2
Tandem—																	
All models	12	62	3.3	6	4	2	0	3.4	6	5	1	0	3.3	5	5	2	0
Tymnet—																	
Engine	5	5,568	3.0	1	3	1	0	3.0	1	3	1	0	3.0	1	3	1	0
Others & unspecified	4	802	3.3	1	3	0	0	3.3	1	3	0	0	3.0	1	2	1	0
Subtotal	9	6,370	3.1	2	6	1	0	3.1	2	6	1	0	3.0	2	5	2	0
All Others	57	1,155	3.2	21	27	9	0	3.0	16	24	13	3	3.1	18	28	8	2
Grand Total	663	10,421	3.4	305	307	50	1	3.0	181	339	117	21	3.1	198	346	100	16

The users were also asked to indicate the primary protocols supported by their networks:

	Number of Responses	Percent of Total Responses
Asynchronous	495	66
IBM BSC	426	57
IBM SDLC	366	49
X.25 packet-level	155	21
Other bit-oriented synchronous protocol (e.g., ANSI ADCCP, ISO HDLC, Sperry UDLC, or Burroughs BDLC)	109	15
Other byte-oriented synchronous protocol (e.g., DEC DDCMP)	128	17
Other	63	8

These results correlate to the results of the preceding question, showing that a large number of users are using more than one protocol in their network. ASCII and IBM BSC are the most widely used protocols, with IBM SDLC coming in a close third place. The high response for multiple protocol usage suggests that many of these users are still in various stages of migration to SNA.

The users were requested to identify which vendors' systems are functioning as hosts. The following list summarizes their responses:

	Number of Responses	Percent of Total Responses
IBM	497	66
Digital Equipment Corporation	222	29
Amdahl	63	8
Burroughs	66	9
Sperry	44	6
Hewlett-Packard	83	11
Honeywell	65	9
Data General	42	6
Prime	56	7
Control Data	33	4
NCR	28	4
National Advanced Systems	23	3
Other	100	13

As was the case last year, IBM came out well ahead of all other vendors, while Digital Equipment Corporation placed second with a strong showing. Many of the users are using more than one vendors' systems as hosts, indicating that the multiple-host environments represented in Question 2 are frequently multiple-vendor environments as well.

User Ratings of Communications Processors

TABLE 1. USER RATINGS OF COMMUNICATIONS PROCESSORS (Continued)

MANUFACTURER/ MODEL	Ease of Expansion					Hardware Reliability					Qlty. of Manufacturer's Software/firmware					Ease of Programming					Qlty. of Manufacturer's Maintenance svc./tech. supp.				
	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P	WA	E	G	F	P
Sperry—																									
DCP/40	3.0	2	6	0	1	3.1	3	5	2	0	2.6	2	3	2	2	2.3	0	3	4	1	2.9	2	5	1	1
Others & unspecified	2.6	3	1	3	2	2.8	3	2	3	1	2.3	1	2	3	2	2.4	1	2	3	1	2.8	2	3	4	0
Subtotals	2.8	5	7	3	3	3.0	6	7	5	1	2.4	3	5	5	4	2.3	1	5	7	2	2.8	4	8	5	1
Tandem—																									
All models	3.3	6	3	3	0	3.5	7	4	1	0	2.9	4	5	1	2	3.0	3	2	3	0	3.5	6	4	1	0
Tymnet—																									
Engine	3.0	1	3	1	0	2.6	0	3	2	0	2.6	1	2	1	1	2.4	1	1	2	1	2.4	0	3	1	1
Others & unspecified	3.3	1	3	0	0	2.8	1	1	2	0	3.3	3	0	0	1	2.7	0	2	1	0	2.3	0	2	1	1
Subtotal	3.1	2	6	1	0	2.7	1	4	4	0	2.9	4	2	1	2	2.5	1	3	3	1	2.3	0	5	2	2
All Others	2.8	14	21	15	6	3.2	22	21	13	0	2.8	15	19	16	6	2.8	12	11	16	3	2.8	13	21	16	3
Grand Total	2.9	164	292	155	43	3.4	348	243	66	5	3.0	181	344	96	34	2.8	103	236	133	33	3.1	206	316	106	23

We also asked these users to indicate which, if any, teleprocessing monitor software packages they are using:

	Number of Responses	Percent of Total Responses
IBM CICS and CICS/VS	330	44
Cullinane IDMS-DC	37	5
Sperry CMS and CMS/1100	20	3
Cincom Environ/1	10	1
Software AG Com-plete	12	2
SDA Intercomm or Minicomm	8	1
ADR Datacom/DC	10	1
Westinghouse Westi	4	1
Other	115	15
None	195	26

These results indicate that, although IBM software is of course predominant, various alternatives are sought out by many users.

Another question requested that the users indicate any commercial local area networks which they operate, have installed now, and any that they plan to implement in the coming year:

	Number of Responses	
	Installed Now	Planned for 1985
Xerox Ethernet	84	61
IBM 8100 Loop	44	3
IBM PC	30	91
IBM Series/1 Ring	11	6
Wang WangNet	34	20
Datapoint ARCnet	22	2
Network Systems Corp. Hyperchannel	19	14
Ungermann-Bass Net/One	17	20
Sytek LocalNet	15	4
Prime Ringnet	15	3
Nestar	9	2
Interactive Systems/ 3M Videodata	6	5
Other	70	29
Total	376	260

User Ratings of Communications Processors

Putting aside the possibility that a few users may have indicated more than one type of local network, approximately 59 percent of these users currently have a local area network installed. This compares to last year's figure of 26 percent and 1983's figure of 17 percent. The IBM 8100 Loop, with 36 networks in use, was the predominant LAN installed in 1984. The 1984 survey also showed that Ethernet was the predominant LAN planned to be installed. From the results of our 1985 survey, we can see that the survey respondent's plans were carried out, as Ethernet is now the predominant LAN with 84 installations.

The final question in the first part of the questionnaire provided a list of 10 possible sources of networking problems, and asked the respondent to indicate whether they had had any problems related to each possible source, with these results:

	Percent of Total Responses.		
	Severe or Frequent Problems	Less Severe or Occasional Problems	No Problems
Local loops	16	43	29
Nonlocal communications lines	14	55	19
Terminals	5	61	25
Terminal controllers	2	43	40
Modems	3	53	36
Multiplexers	2	31	46
Front-end software	3	39	45
Front-end hardware	2	35	49
Host software	4	54	33
Host hardware	1	44	43

Not unexpectedly, communications lines cause the most headaches in users' networks. Although few users experience severe or frequent problems with their terminals, these devices seem to be the greatest single source of minor or sporadic problems. The least frequently experienced source of problems is multiplexer equipment.

The remaining parts of the questionnaire focused on specific categories of networking services and equipment. Users were asked to list the specific vendors and types of equipment they are using in their networks, and to provide user rating based on their experience with each. Each section of the questionnaire asked the user to provide the manufacturer and model numbers of each type of equipment currently in use, the number of units installed, and ratings in specific categories of user experience relevant to that specific equipment category. A summary of the results of these question for all communications/network processors is shown in Table 1.

Table 1 shows the user ratings given to the various manufacturers and models of communications and network processors. A total of 16 vendors received a sufficient number of responses to be rated separately. A minimum of three responses was required to break out the ratings for a specific manufacturer. Some of these vendors include IBM, Burroughs, NCR Comten, Honeywell Information Systems, and Sperry.

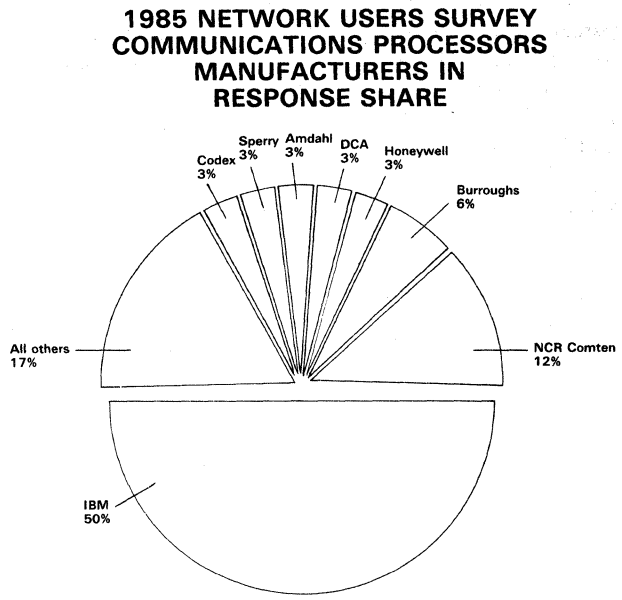


Figure 2. This chart shows the top communications processors manufacturers in terms of responses to the 1985 Communications Processors Users Survey. IBM has 50 percent of the total 663 responses to the survey.

The users were asked to rate each of their communications processors in eight specific categories: Overall Performance, Ease of Installation, Ease of Operation, Ease of Expansion, Hardware Reliability, Quality of Manufacturer's Software/Firmware, Ease of Programming, and Quality of Manufacturer's Maintenance Service/Technical Support. The ratings were based on a weighted average ranging from 1.0 (Poor) to 4.0 (Excellent). Overall performance and Hardware Reliability each received a high (3.4) rating, while Ease of Expansion (2.9) and Ease of Programming (2.8) received the lowest scores.

The users were also asked to list the primary functions performed by the communications processors operating in their networks. Some users responded more than once, so the total percentage is over 100 percent. The main functions performed by the communications processors were as a front-end processor (65%), terminal controller functions (40%), and remote line concentration (27%). Other functions given were distributed processing node functions and applications switching (both 18%), standalone network processing and message/packet switching (11%), X.25 PAD or Gateway functions (13%), and other unlisted functions (1%).

SUMMARY

The 1985 Communications/Network Processors survey showed that IBM was still the leader receiving over 50

User Ratings of Communications Processors

percent of total responses for 1,141 installed units. Since, as we mentioned earlier, IBM has 90 percent of the communications processor market, these numbers came as no surprise. What is of interest is the inclusion of GTE Telenet and Tymnet in the survey and the number of installed units. These numbers throw off the normal pattern of leaders in the communications processor field, which is why IBM has a 90 percent market share, but only 50 percent of total survey responses. Their offerings are not true standalone communications processors, but GTE's TP Series and Tymnet's Engine can do the functions associated with a true communications processor, and that is why they were included in the survey. NCR Comten was the clear leader, after IBM, with 79 responses and 503 installed units. One interesting note is that in Overall Performance, IBM came in fourth, tying with Codex and NCR Comten (See Figure 1.).

The Datapro Research staff extends a sincere thanks to all for responding so enthusiastically to our 1985 Network Users Survey. Without your participation, it could not be the success it is, and we hope that this compendium of user experience will be of significant value to you. We look forward to hearing from you again. □