Maximizes Network Connectivity

Optimizes Network Performance

Increases Network Security

Reduces Network Costs

X.25, the dominant communications protocol throughout the world, is used extensively for applications such as automatic teller machines, credit card approval systems, inventory control, loan application processing, and medical records processing. X.25 is one of the important transport services supported by Bay Networks Switched Internetworking Services (BaySIS™). BaySIS, an open internetwork architecture based on standards, supports today's internetworks and their evolution to switched internetworking.

X.25 is an interface specification that describes how a router or other data terminal equipment (DTE) access a packet switching network. Defined as a suite of layered protocols based on the OSI model, X.25 provides reliable end-to-end data transfer from the DTE to the packet switching network. Bay Networks Routing Services (BayRS™) supports standard X.25 functions to provide maximum interoperability for attached networks.

Bay Networks X.25 implementation for its routers complies with 1988 CCITT X.25 standards and provides extensive support for both essential and optional X.25 facilities, including IP Encapsulation of X.25 (IPEX), Flow Control Parameter Negotiation, Non-Standard Default Packet and Window Size, Extended Packet Sequence Numbering, More bit (M-bit), Fast Select, Load Balancing, Closed User Groups, Reverse Charging, and Reverse Charging Acceptance. Bay Networks routers support X.25 access to both private and public data networks (PDNs) and defense data networks (DDNs).

Bay Networks X.25 implementation supports line speeds up to 2 Mbps on a Bay Networks router's RS-232, RS-449, V.35, and X.21 serial interfaces. Network and bridging protocols supported include IP, OSI, DECnet Phase IV, Novell IPX, Banyan VINES, AppleTalk Phase 2, XNS, Data Link Switching (DLSw), Transparent Bridging, and Translational Bridging.

Optionally, synchronous ports of Bay Networks routers can be configured to transport X.25 traffic from legacy equipment (automatic teller machines or cash registers for example) across a multiprotocol backbone. This preserves the investment in legacy technology while extending the WAN backbone options to include other services such as Frame Relay, ISDN, or SMDS. LAN traffic can be consolidated onto one WAN link with the Legacy devices to access a shared internetwork backbone.

X.25 is a component of BayRS, which supports all major network, bridging, and WAN protocols. BayRS WAN support also includes Frame Relay, Switched Multimegabit Data Service (SMDS), Point-to-Point Protocol (PPP), ISDN, and ATM.

Bay Networks family of routers, hubs, switches, and network management products comprise an end-to-end, standards-based solution while providing a smooth transition to switched internetworking.

Bay Networks

Benefits

Maximizes Network Connectivity

Bay Networks X.25 implementation for Bay Networks routers adheres to ITU-T 1988 X.25 standards and provides public, private, and DDN X.25 network interoperability with support for all major routing and bridging standards. Additionally, extensive X.25 connectivity is provided by supporting up to 200 virtual circuits (VCs) per router slot. With support for Flow Control Parameter Negotiation and Non-Standard Default Window and Packet Sizes, X.25 connectivity is enhanced by allowing the use of packet and window sizes that best suit an application. Additionally, Bay Networks routers support recognized private operating agency (RPOA) selection for subscribers who require intermediate carriers between multiple X.25 networks.

Optimizes Network Performance

Extended Packet Sequence Numbering support increases X.25 efficiency by extending the number of packets outstanding before an acknowledgment is required from 7 to 127 (Modulo 8 to Modulo 128). This is particularly beneficial when used in high delay environments, such as satellites. Furthermore, the overhead and delay of X.25 session establishment and termination is reduced by router support of X.25's Fast Select facilities, which allow Call Request, Call Accept, and Clear Request packets to contain up to 128 bytes of data. Network performance is also enhanced by enabling load balancing across multiple VCs, which allows packets to be transmitted to a destination over up to four virtual circuits. Support for X.25's Transit Delay Selection and Indication allows Bay Networks routers to request specific performance parameters.

Increases Network Security

Bay Networks X.25 Closed User Group implementation support can restrict calls to and from defined DTE groupings, protecting data and resources, while support of X.25's Network User Identification facility provides standard identification information to the network. Additionally, Bay Networks supports Reverse Charging and Reverse Charging Acceptance through which network charges are borne by the destination DTE, and invalid calls are automatically cleared.

Reduces Network Costs

Bay Networks IP Encapsulation of X.25 (IPEX) traffic over wide area network services reduces WAN costs by combining legacy X.25 applications with LAN traffic over the same transmission facilities. In addition to X.25 as a WAN backbone technology, IPEX allows users to broaden their options to include Frame Relay, ISDN, leased lines, or SMDS. By extending the WAN backbone choices, users can select the optimum technology for their applications.

Features

Multiprotocol Support

Bay Networks X.25 support complies with the 1988 X.25 ITU-T Recommendation to provide a standards-based interface for X.25 physical, data link, and network layer protocols. The X.25 specification corresponds to the OSI reference model (see Figure 1).

This standards-based interface also supports BayRS, which supports all major network layer and bridging protocols, to provide maximum interoperability for attached networks (see Table 1). The broad range of protocols supported by BayRS maximizes connectivity and provides support for a diverse group of applications.

Table 1 **BayRS Protocols Supported**

Routing	IP with OSPF, RIP, EGP, BGP
	OSI with ES-IS and IS-IS
	DECnet Phase IV
	Novell IPX
	Banyan VINES
	AppleTalk Phase 2
	Xerox XNS
IBM Integration	Token Ring and FDDI
	Data Link Switching (DLSw)
	Binary Synchronous Communications Pass-Through
	Transparent Synchronous Pass-Through
	APPN Network Node
	LAN Network Manager Agent
Bridging	Transparent Bridge:
	Ethernet and FDDI
	Translation Bridge:
	Ethernet-to-Token Ring
	Ethernet-to-FDDI
	Token Ring - FDDI
	Native Mode LAN (NML)
Wide Area Networking	HDLC Encapsulation
	Point-to-Point Protocol (PPP)
	Switched Multimegabit Data Service (SMDS)
	Frame Relay
	ISDN
	X.25
	ATM
	Dial Backup
	Bandwidth-on-Demand
	Dial-on-Demand

The physical layer interface manages the transmission of data across the physical connection. X.21 and X.21bis are the two physical interfaces specified by X.25. X.21 is a high-speed interface commonly used in Europe. It is also the physical layer of ITU-T Recommendation X.21 for circuit switch network operations. Electrically, X.21 follows ITU-T V.11 recommendation, which is the equivalent of RS-422. Physically, X.21 uses a 15-pin (DB-15) connector. X.21bis is the equivalent of RS-232 and V.24/V.28. In practice however, X.25 is supported on any serial interface. Bay Networks routers support X.25 on RS-232, V.35, X.21, and RS-422/449 interfaces.

The X.25 recommendation for the data link layer describes the procedures for data exchange between a data terminal equipment (DTE) device (e.g., router) and a data communications equipment (DCE) device (e.g., packet switch). The aim is to ensure an orderly and reliable exchange of information. The data link layer protocol specified for X.25 is a high-level data link control (HDLC) protocol called Link Access Procedure Balanced (LAPB). The units of data passed between the router and the packet switch are called LAPB frames. Each LAPB frame consists of flag bits at either end, an address field, a control field, a variable-length information field, and a frame check sequence (FCS) field (see Figure 2).

X.25 data packets reside within the information field of LAPB frames. All X.25 data packets consist of a 3-byte header and a data field (see Figure 2). The first four bits of the X.25 data packet header make up the General Format Identifier (GFI), which indicates the layout for the remainder of the packet header. Bits 1 and 2 of the GFI are used in combination to indicate the packet sequence numbering used (Modulo 8 or Modulo 128). Bit 3 is the D or *delivery confirmation* bit, which indicates if the type of packet layer acknowledgment required has local or end-to-end significance. GFI bit 4 is the Q or *data qualifier* bit, which indicates if the packet carries conventional data or control information. The actual logical channel number specified for a given connection is a combination of the next two packet fields, the 4-bit logical channel group number (LGN) and the 8-bit logical channel number (LCN). Some networks treat these 12 bits as one continuous field. The third byte in the X.25 data packet header is the Packet Type Identification (PTI) field. The PTI is used to differentiate among 28 possible packet types.

When the receiver gets a LAPB frame, it performs a calculation using data contained in the FCS field. The results are then compared to the number in the FCS field of the received frame. If the result matches the frame's FCS number, the receiver responds with a Receiver Ready (RR) frame. If the result does not match the FCS, the receiver responds with a Reject (REJ) frame that signals the sender to retransmit the frame.

Three frame types are implemented by LAPB: Information or I-frames, Supervisory or S-frames, and Unnumbered or U-frames. I-frames transport data across

Figure 1 | **Bay Networks X.25 Support**

Network Layer	X.25 Packet Level Protocol (PLP)
Data Link Layer	Link Access Procedure Balanced (LAPB)
Physical Layer	X.21, RS-232 C, RS-422/449, V.35

the link. Each I-frame is assigned a sequence number from 0 to 7 (with Modulo 8 support) or 0 to 127 (with Modulo 128 support) to ensure that frames are not lost or interpreted out of order at their destination.

S-frames control information flow, request retransmissions, and acknowledge I-frames. When a switch receives an I-frame, it responds with either an RR frame or a Receiver Not Ready (RNR) frame. RR frames indicate that the packet has been accepted and that the switch is ready for more I-frames. An RNR frame indicates that the switch cannot process additional I-frames at this time. U-frames provide additional data link control functions, such as link initialization and disconnection, link reset, and invalid frame rejection.

In the X.25 environment, the network layer is referred to as the packet layer. The X.25 packet layer manages the transfer of packets from one end of an X.25 link to the other. When an X.25 DTE wants to communicate to a remote DTE through the packet switch network, it creates a virtual circuit (VC). A VC consists of separate logical router-to-packet switch, packet switch-to-packet switch, and packet switch-to-router connections. At the X.25 ends of the VC, the connection is assigned a unique logical channel number (LCN). LCNs are used by the packet layer to identify the logical connections on the physical link. The LCNs that identify connections between a Bay Networks router and an X.25 packet switch can be assigned either dynamically or statically through Site Manager, Bay Networks node management application.

Bay Networks routers support two types of VCs — switched virtual circuits (SVCs) and Bay Networks proprietary dedicated virtual circuits (DVCs). An SVC is analogous to a dial-up connection over the telephone network and requires three separate phases — call setup, data transfer, and call disconnection. A DVC provides a fixed point-to-point connection. DVCs are established by the exchange of Call Request and Call Accept packets and remain permanently available unless taken out of service with specific router commands. Bay Networks supports DVCs in a proprietary Point-to-Point mode.

Bay Networks Routing Services (BayRS)

X.25 is supported on all Bay Networks routers. X.25 is a component of BayRS, which supports all major network and bridging protocols including IP, OSI, DECnet Phase IV, Novell IPX, Banyan VINES, AppleTalk Phase 2, XNS, APPN, Data Link Switching (DLSw), Native Mode LAN (NML), Translation Bridge, Transparent Bridge, and Source Route Bridge.

Figure 2 **X.25 LAPB Frame and Data Packet Format**

			X.25 Data Packet						
Flag	Address Field	Control Field	General Format Identifier	Logical Group Number	Logical Channel Number	Packet Type ID	Data Field	Frame Check Sequence	Flag
(1)	(1)	(1)	(4 bits)	(4 bits)	(1)	(1)	(32 to 4,096)	(2)	(1)

(# of bytes)

Multiservice and Multiprotocol Support

Bay Networks supports three X.25 services – PDN, DDN, and Point-to-Point. Each of these services encapsulates LAN protocols into X.25 packets. PDN supports IP, OSI, IPX, AppleTalk (AURP), DECnet, and conforms to RFC 1356. RFC 1356 replaces RFC 877 that specified only IP operation. This allows a Bay Networks router to establish VCs with other routers or devices that also support RFCs 877 (IP only) or 1356. DDN is used to connect the Defense Data Network Standard Service and also supports IP and OSI. DDN supports RFC 1236 for dynamic IP-to-X.21 address translation. Point-to-Point is a proprietary encapsulation technique and can be used with all supported protocols including IP, OSI, DECnet Phase IV, IPX, VINES, AppleTalk Phase 2, XNS, APPN, Data Link Switching (DLSw), Translation Bridge, Transparent Bridge, and Source Route Bridge. PDN (public data network) and Point-to-Point can be used with both PDNs and private X.25 networks.

Legacy X.25 Support

Bay Networks X.25 services include tunneling X.25 over a TCP/IP Internet. This feature is called IP Encapsulation of X.25 (IPEX). IPEX lets the router send and receive messages between two X.25 systems via a TCIP/IP network. The tunneling is based on mapping TCP sockets to X.25 virtual circuits. IPEX works with X.25 SVCs, as well as with TCP/IP protocols over all interface types that Bay Networks routers support. Tunneling support attaches an X.25 DTE or DCE to the IPEX router, which converts X.25 data to TCP and uses TCP/IP to carry the X.25 data to another IPEX module in the same router or to a remote IPEX router. This remote IPEX router converts the data back to X.25. IPEX supports the following facilities: Default Packet Size, Default Window Size, and Flow Control Parameter Negotiation. IPEX has support for the More-bit (M-bit) used for large X.25 messages. Additionally, IPEX supports the Qualifier bit (Q-bit), which is used to indicate a control frame.

X.25 Facilities Support

Bay Networks X.25 implementation includes extensive support for X.25 facilities that enhance network connectivity, security, and performance. These include IP Encapsulation of X.25 (IPEX), Flow Control Parameter Negotiation, Non-Standard Default Packet and Window Size, Extended Packet Sequence Numbering, M-bit support, Fast Select, Load Balancing, Closed User Groups, and Reverse Charging.

IP Encapsulation of X.25 (IPEX) IPEX provides a transport function of X.25 across a multiprotocol backbone by encapsulating the X.25 packets within TCP/IP packets. TCP is used to provide the connection integrity required by applications that have historically relied on X.25 for its extensive error checking and flow control mechanisms. A separate TCP session is established for each X.25 VC.

IPEX provides significant cost savings by enabling consolidation of X.25 legacy networks with today's routed networks. It also assists in evolving existing applications from X.25 to LANs by supporting both environments simultaneously.

Flow Control Parameter Negotiation Flow Control Parameter Negotiation support allows a Bay Networks router to request nonstandard flow control parameter values for X.25 packet and window sizes. Available on a per call basis, this capability enhances X.25's flexibility and connectivity at the interface between the router and the packet switch. Because each direction of data travel is treated independently, it is possible to have split or dissimilar packet and window sizes in the transmit and receive directions of an X.25 session. Negotiation takes place between the source and destination DTEs, with bidding always toward the default values (packet size = 128 and window size = 2) or the maximum common packet and window size.

Non-Standard Default Packet and Window Size Bay Networks X.25 implementation supports a wide range of X.25 packet and window sizes to enhance X.25 implementation flexibility. The default size for data packets can be changed from the standard 128 bytes to a different value by prior agreement with the X.25 network provider. Possible nonstandard packet sizes include 16, 32, 64, 256, 512, 1,024, 2,048, and 4,096 bytes. This facility applies to all logical channels at both the router's and packet switch's interface. As an alternative, the packet size may be negotiated using the Flow Control Parameter Negotiation Facility on a per virtual call basis.

Support of Non-Standard Default Window Sizes allows a value other than the standard packet window of 2 to be selected as the default. Values are selected from a list of window sizes offered by each X.25 network provider and apply to the entire interface. Typically the window sizes range from 1 to 7, excluding the use of the Extended Packet Sequence Numbering facility.

Extended Packet Sequence Numbering
Extended Packet Sequence Numbering increases X.25 operation efficiency by extending the router's window size from 7 (Modulo 8) to 127 (Modulo 128). It affects all logical channels on an interface and is useful for satellite links that typically have long transmission delays.

More Bit (M-Bit) Support The M-bit in the Packet Type Identifier (PTI) field of the X.25 header allows packets to be logically grouped to convey a large block of related information. Often, user data will consist of a long stream of information that will not fit in one data packet. A typical data packet has a maximum capacity of 128 bytes, which is equivalent to 128 ASCII text characters. For example, the M-bit is used when fragmenting a large IP packet for transmission over an X.25 network. Packets with the M-bit set to a value of 1 inform the destination DTE that more data will follow in the next packet. The last packet of a multiple-packet message sets its M-bit to 0, indicating that the series is complete.

Fast Select Facilities Support Bay Networks support for X.25 Fast Select facilities allows subscribers to reduce the overhead and delay associated with X.25 session establishment and termination. Under normal X.25 network operation, a virtual call is initiated with a Call Request packet, which can transmit up to 16 bytes of data. The Fast Select Call facility allows Call Request packets to contain up to 128 bytes of data.

Routers can request this capability on a per call basis within the Call Request packet header. The destination router, in turn, can respond with a Clear Request or a Call Accept packet, which can also carry up to 128 bytes of data. By supporting large packet sizes, the Fast Select Call facility reduces overall traffic and maximizes bandwidth. If more data needs to be transmitted, the session proceeds with normal VC data transfer and clearing procedures.

The X.25 Fast Select facilities also include an Immediate Clear feature. Fast Select with Immediate Clear permits the originating DTE to send a Call Request packet with 128 bytes of data and forces the destination DTE to respond with a Clear Request packet, which can also contain up to 128 bytes of data. When the originating DTE receives the Clear Request packet, it responds with a Clear Confirmation packet (which does not contain data).

Closed User Groups (CUG) Bay Networks X.25 Closed User Group implementation provides security by allowing DTEs to be configured into logical closed user groups (CUGs). Restrictions can be placed on calls to and from these groupings. Several CUG functions have been defined and can be applied differently across a group of related DTEs. Bay Networks X.25 supports the following CUG functions:

- *Incoming calls barred within a CUG* — allows a DTE within a CUG to initiate calls to other members of a CUG, but not receive calls from members of the same CUG.
- *Outgoing calls barred within a CUG* — allows a DTE to receive calls from, but not initiate calls to, other members of the CUG.
- *CUG with incoming access* — allows a DTE to receive calls from DTEs that belong to the open part of the network (i.e., not that user group) and from DTEs that belong to other CUGs that have outgoing access.
- *CUG with outgoing access* — allows a DTE to initiate calls to DTEs that belong to the open part of the network and to DTEs belonging to other CUGs with incoming access.
- *CUG selection* — allows incoming packets to identify to the DTE which CUG has been selected; available on a per virtual call basis.

Reverse Charging and Reverse Charging Acceptance Reverse charging, X.25's equivalent of a collect telephone call, is supported nearly universally among PDNs. Typically, the default setting for a PDN's dial-up interfaces, Reverse Charging is available on a per call basis and is specified in the Call Request packet by the originating DTE. With this facility, all network connect times and traffic charges are borne by the destination DTE. Reverse Charging works in conjunction with the Reverse Charging Acceptance facility and must be subscribed to by the destination DTE. If the destination DTE has not subscribed to this facility, any reverse-charged call will be cleared by its adjacent DCE. Reverse Charging Acceptance consolidates network usage charges, which may qualify for volume discount under some PDN pricing arrangements.

Other X.25 Facilities Bay Networks X.25 implementation supports many other X.25 facilities including:

- *Recognized Private Operating Agency (RPOA) Selection* — used by subscribers who require intermediate carriers between X.25 networks (e.g., a gateway carrier between foreign and domestic PDNs).
- *Transmit Delay Selection and Indication Facility* — allows a router to specify a maximum network delay, in milliseconds, for the duration of a call.
- *Network User Identification (NUI)* — provides information to the network about the subscriber for billing, security, or network management purposes.
- *Call Redirection* — automatically routes calls to an alternate DTE device if the original destination DTE is inaccessible.
- *Throughput Class Negotiation Facility* — allows a router to request a throughput rate, in bits per second, that is different from its preassigned standard default.

Ping over X.25

Bay Networks X.25 implementation uses the Ping command to test the accessibility of remote Bay Networks routers. The Ping command transmits a message to a Bay Networks router's X.25 node in the network and waits for a response. If no response is received, an error condition message is generated. Because the accessibility of a node can be determined quickly, Ping is particularly important for troubleshooting large internetworks.

Load Balancing Across Multiple Virtual Circuits

Because most X.25 connections are low-speed lines — 19.2 Kbps or less — and most X.25 networks use a default packet window size of 2, using X.25 can possibly have a negative effect on router performance. To overcome this, Bay Networks routers will dynamically establish multiple VCs when the amount of data to be transmitted to the remote router exceeds the capacity of the existing VC. Because each VC has a window size of 2 and the router establishing the VCs will load balance traffic across the VCs, the effective window size is multiplied by the number of VCs that are established, increasing throughput.

In Figure 3, router R1 is configured with a packet window size of 2. Endstation 1 (ES1) initiates a VC (VC1) with ES2 through router R2. If the amount of data to be transmitted to ES2 exceeds the capacity of VC1, a second VC (VC2) will be established by router R1. Router R1 can establish up to four VCs between it and the remote router. This feature is available only with PDN RFC 1356 network service.

Serial Interface Support

Bay Networks X.25 implementation is supported on Bay Networks router Synchronous interfaces. The Synchronous interface operates from 1,200 bps to 2 Mbps, full duplex, and supports V.35, RS-232, RS-449/422, and X.21 physical connections, as well as internal or external clocking.

Traffic Management

Bay Networks ensures high performance using software-based data compression.

Data Compression Based on a Lempel-Ziv algorithm, Bay Networks software-based Data Compression features maximize internetwork performance by reducing the amount of bandwidth required to transport data over the wide area. Configurable on a per circuit or link basis, Data Compression provides features that enhance performance, reduce WAN costs, and maximize efficiency of available network segments.

Bay Networks software-based Data Compression feature is supported by all BayRS routers and is supported over Dial-up lines, including ISDN and leased lines using PPP, Frame Relay, and X.25. Bay Networks software-based payload compression provides a compressed throughput of up to 1.2 Mbps, full duplex, over a 512 Kbps link.

Software-based Data Compression offerings use Bay Networks compression protocol — WAN Compression Protocol (WCP) — to enable reliable transport of compressed data over Frame Relay and PPP connections. WCP provides end-to-end error control to ensure proper communications, keeping dictionaries synchronized between source and destination routers. The draft RFC Compression Control Protocol (CCP) to enable or disable compression for PPP is also supported.

Additionally, support for Continuous Packet Compression (CPC) mode and Packet-by-Packet Compression (PPC) mode is provided. CPC yields a higher compression rate and is used for maximum throughput. CPC mode maintains a compression history across packet boundaries and requires that the histories at each end of the link be synchronized through a reliable data link protocol. PPC mode resets the history for each packet and does not require a reliable data link protocol.

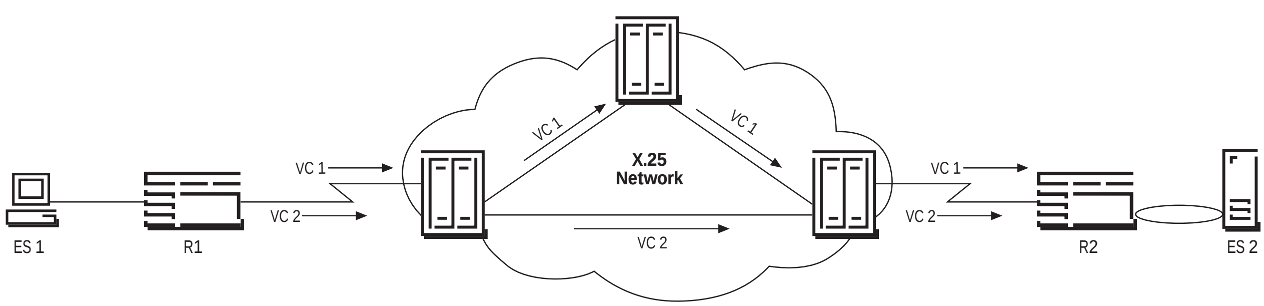
Network Management

Bay Networks offers a complete SNMP-based, enterprise management solution for any environment. As a member of Bay Networks Optivity® family of network management products, the UNIX-based Optivity Internetwork™ is a powerful tool for providing comprehensive node configuration, monitoring, and control.

Optivity Internetwork A component of Bay Networks UNIX-based Optivity Enterprise™ application suite, Optivity Internetwork provides a sophisticated, yet easy-to-use management solution for complex router-based internetworks. Optivity Internetwork simplifies and improves management of complex router internetworks by integrating Control-Center™, the revision control system for Bay Networks routers; Site Manager, the node management applications for Bay Networks routers; RouterMan™, an intuitive router monitoring application; and PathMan™, a graphical network diagnostic tool.

Optivity Internetwork operates with the leading SNMP platforms — HP OpenView, Tivoli NetView for AIX, and Solstice Domain Manager for additional capabilities.

Figure 3 | **Load Balancing Across Multiple Virtual Circuits**



Standards

The X.25 implementation described in this data sheet supports major internetworking standards as shown in Table 2.

Table 2 **X.25 Standards Support**

ITU-T (formerly CCITT)
Recommendation X.25 (1988)
Recommendation X.121
IETF
RFC 1356, Multiprotocol Interconnect on X.25 and ISDN in the Packet Mode
RFC 877, Transmission of IP Datagrams over Public Data Networks
RFC 1236, IP to X.121 Address Mapping for DDN
ISO
8208 Connectionless Network Layer Service (CLNS) over DDN X.25

System Requirements

Bay Networks X.25 described in this data sheet is supported in software Version 11.0 or later for Bay Networks System 5000™ Routing Modules, BayStack™ Access Node (AN®), Advanced Remote Node (ARN™), BayStack Access Node Hub (ANH™), Link Node (LN®), Concentrator Node (CN®), Backbone Link Node (BLN®), and Backbone Concentrator Node (BCN®).

Bay Networks recommends that users of the Dual Ethernet/Dual Synchronous link module with T1 links for performance-sensitive applications employ Bay Networks Ethernet high-speed filter option to satisfy their performance requirements.

Ordering Information

X.25 software is bundled with other WAN software for the Bay Networks BayStack AN, BayStack ANH, ASN, ARN, BLN, BCN, LN, and CN as shown in Table 3.

Table 3 **Ordering Information**

Model Number	Description
AE0008032	IP Access Suite for AN/ANH (includes X.25) 4 MB Flash
AE0008034	Corporate software suite for AN/ANH (includes all version11.0 software) 4 MB Flash
AE0008036	IP Access Suite for AN/ANH (includes X.25) 8 MB Flash
AE0008038	Corporate software suite for AN/ANH (includes all version11.0 software) 8 MB Flash
CV0008001	IP Access Suite for ARN (includes X.25) 4 MB Flash
CV0008003	Corporate software suite for ARN (includes all version11.0 software) 4 MB Flash
CV0008004	IP Access Suite for ARN (includes X.25) 8 MB Flash
CV0008006	Corporate software suite for ARN (includes all version11.0 software) 8 MB Flash
AF0008019	WAN Suite for ASN (includes X.25) 8 MB Flash
AF0008020	Corporate software suite for ASN (includes all version11.0 software) 8 MB Flash
AG0008019	WAN Suite for BLN and BCN (includes X.25) 8 MB Flash
AG0008020	Corporate software suite for BLN and BCN (includes all version 11.0 software) 8 MB Flash
42020V###*	LN/CN Version 11.0 Corporate Suite

* ### = Software version number (e.g., Version 11.0 = 011).

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United States

Bay Networks, Inc.
4401 Great America Parkway
Santa Clara, CA 95054
1-800-8-BAYNET

Bay Networks, Inc.
8 Federal Street
Billerica, MA 01821-5501
1-800-8-BAYNET

Europe, Middle East, and Africa

Bay Networks EMEA, S.A.
Les Cyclades – Immeuble Naxos
25 Allée Pierre Ziller
06560 Valbonne, France
+33-4-92-96-69-96 Fax
+33-4-92-96-69-66 Phone

Pacific Rim, Canada, and Latin America

Australia +61-2-9927-8888
Brazil +55-11-247-1244
Canada 416-733-8348
China +8610-6238-5177
Hong Kong +852-2-539-1388
India +91-11-301-0404
Japan +81-3-5402-7001
Mexico +52-5-480-1241
Singapore +65-323-3522

World Wide Web: **http://www.baynetworks.com**

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