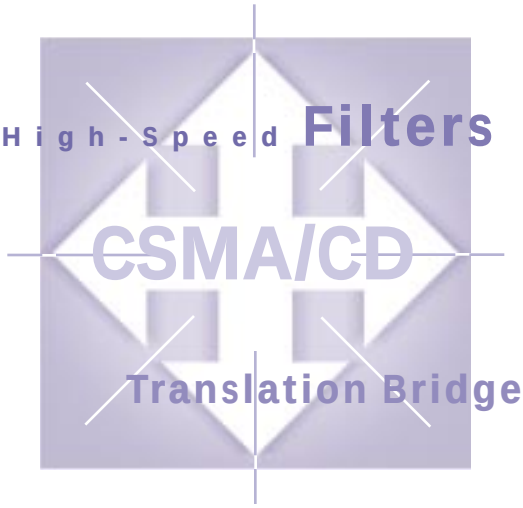
Ethernet/802.3



Extends Network Connectivity

Improves Network Performance

Leverages Network Investments

Ethernet/802.3 interfaces for the Bay Networks family of routers combine high performance with a broad range of connectivity options to address the full range of requirements in evolving internetworks:

- Cost-effective internetwork access for single workgroups
- Centralized collapsed backbone routers with many LAN connections
- Expandability to accommodate future growth and change
- High performance regardless of the number of LAN connections

The Ethernet interfaces provide LAN transport services in Bay Networks Switched Internetworking Services (BaySIS™) architecture, delivering the connectivity and performance capabilities required for the most demanding networks.

Ethernet/802.3 is a 10-Mbps local area network (LAN) that uses Carrier Sense Multiple Access with Collision Detection (CSMA/CD) protocol to control access to the medium. End stations use CSMA/CD to monitor the medium and wait until it is idle before transmitting data. If multiple stations transmit simultaneously, a collision occurs and each station waits a random interval before attempting to transmit again.

Bay Networks Routing Services (BayRS™) supports all major network, bridge, and WAN protocols on the Ethernet interface. The Bay Networks Ethernet interface adheres to IEEE 802.3 and Ethernet Version 1.0/2.0 frame formats, as specified by Digital Equipment Corp., Intel Corp., and Xerox Corp. It supports multiprotocol routing and IEEE's transparent bridging. Bay Networks Ethernet/802.3 implementation offers scalable performance and connectivity that takes advantage of the symmetric multiprocessor architecture pioneered in Bay Networks router/bridges. An innovative High-Speed Filters option filters packets at Ethernet wire speeds without impacting forwarding performance.

Ethernet interfaces are supported in the BayStack™ Access Node (AN®), BayStack Access Node Hub (ANH™), Access Stack Node (ASN™), Link Node (LN®), Concentrator Node (CN®), Backbone Link Node (BLN®), and Backbone Concentrator Node (BCN®) from Bay Networks. They also complement 100BASE-T, Token Ring, FDDI, and ATM interfaces, as well as its family of serial WAN interfaces.

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

Benefits

Extends Network Connectivity

Bay Networks routers support from 1 to 52 Ethernet interfaces to meet a broad range of site-specific requirements. Ethernet connectivity is supported by all Bay Networks routers — link modules, providing 1, 2, or 4 Ethernet AUI interfaces, are available for the LN, CN, BLN, and BCN; a dual-interface net module provides connectivity for the ASN; the BayStack AN supports one Ethernet interface; and both BayStack ANH routers are available with one or two Ethernet interfaces. AUI and/or 10BASE-T connectors are supported on these interfaces. Additionally, the ANH supports either 8 or 12 Ethernet hub ports for end system connection. This range of support provides the flexibility to select the best media/topology for unique distance, cost, and connectivity requirements. Furthermore, Bay Networks Ethernet/802.3 interface supports a comprehensive family of network protocols, IEEE 802.1 Transparent Bridging, and 802.1d Spanning Tree Algorithm. This range of options provides routing and/or bridging technology concurrently on a single network interface for application-specific requirements.

Improves Network Performance

Bay Networks Ethernet/802.3 interfaces sustain high performance as the internetwork expands to support more users and more bandwidth-intensive applications. The forwarding performance of an Ethernet link module with an MC68040-based or MC68060-based Fast Routing Engine (FRE®) is 14,500 packets per second (pps) per interface in a BLN or BCN, meeting the needs of collapsed backbone network architectures. The BLN and BCN offer a High-Speed Filters option, a performance innovation based on Bay Networks-developed gate arrays, which allows packet filtering at 58,000 pps per array while off-loading the routing engine. To satisfy remote office connections, the AN, ANH, and ASN provide performance levels matched to application requirements, such as remote office connections for the AN and ANH, and regional remote sites for the ASN.

Leverages Network Investments

Bay Networks routers adhere to IEEE and Ethernet Version 1.0/2.0 standards, ensuring multivendor interoperability and maximum return on network investments. The compatibility of the Ethernet interfaces and the expandability of Bay Networks router/bridges guard against hardware obsolescence.

Features

High Performance

Forwarding Rates Bay Networks router Ethernet/802.3 interfaces forward packets at rates that optimize utilization of the 10 Mbps bandwidth of Ethernet/802.3 LANs. Forwarding rates are dependent on the processor used in a Bay Networks router (see Table 1). The two FRE processor modules for the BLN and BCN (see Figure 1) forward 64-byte packets from board to board at wire speed (14,500 pps) across four Ethernet interfaces. The high-performance FRE 060 is recommended for environments with LAN-intensive applications. The aggregate module performance for the FRE 040-2 and the FRE 060 in a BCN or BLN reaches 58,000 pps.

Bridge Filtering Optional High-Speed Filters are available for the LN, CN, BLN, and BCN. The filters perform wire-speed filtering of 14,500 pps per Ethernet interface without degrading a processor module's packet forwarding performance. This is particularly important when a quad-interface link module is used and both bridging and routing are enabled. Bay Networks-developed gate arrays, implemented on a daughterboard, learn source addresses from incoming frames and build an address table in content addressable memory. For each incoming packet, the gate arrays consult the address table and drop those packets whose source and destination addresses reside on the same network. While many products use a shared microprocessor to both filter and forward packets, a Bay Networks router's High-Speed Filters option off-loads filtering responsibilities from the processor module, leaving additional processor resources for high-performance forwarding of bridged and routed packets.

LAN Filtering Outbound traffic filters can be easily established for all network and bridged protocol traffic sent over an Ethernet LAN interface. Filters can be configured to drop outgoing packets destined for a Bay Networks router's LAN interface. Additionally, a filter can be configured to execute a log action when a datagram's fields match the values defined in the filter.

Bay Networks Routing Services (BayRS)

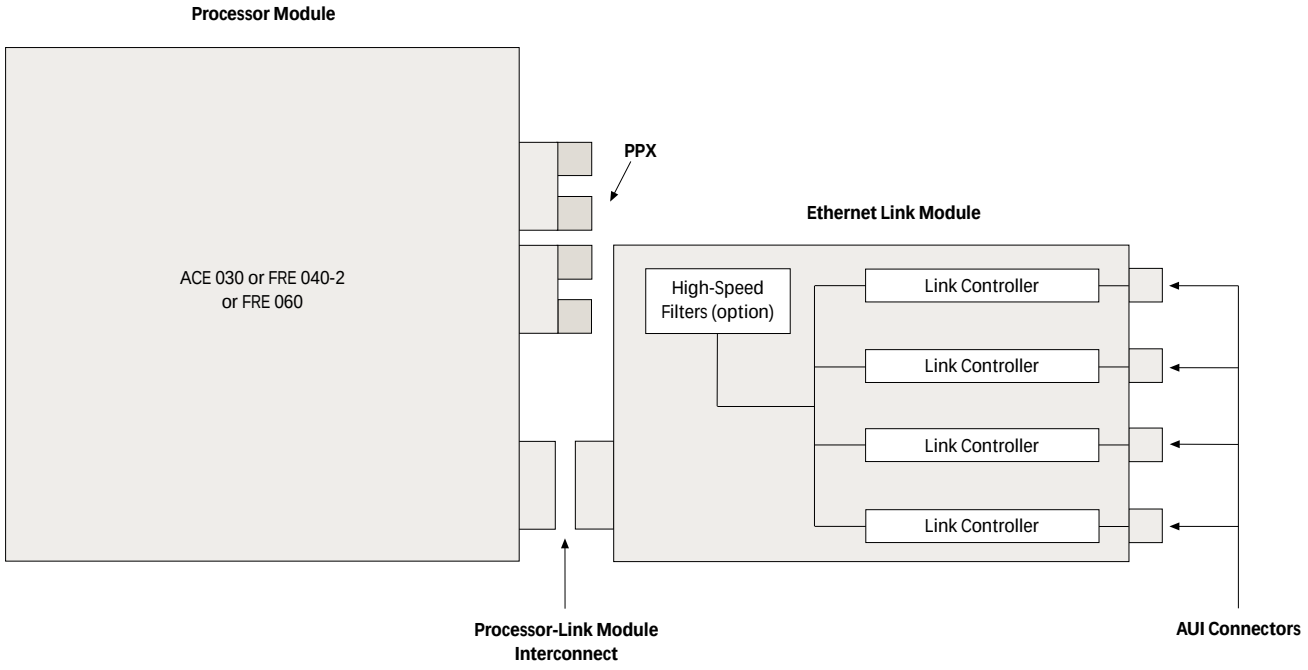
The Ethernet interfaces with support for BayRS maximize connectivity and interoperability in multivendor, multiprotocol environments by supporting all major network, bridging, and WAN protocols. Industry-standard IBM transport is also supported via the Bay Networks router's Bisynchronous Pass-Through (BiSync), Data Link Switching (DLSw), and APPN support to maintain network availability. Additionally, multiple routed protocols and bridging are supported concurrently on a single interface.

Table 1 **Ethernet Forwarding and Filtering Rates**

Router	Processor Module	Forwarding Performance (pps)	Filtering Performance (pps)
BLN, BCN	FRE 040-2	58,000	58,000
	FRE 060	58,000	58,000
ASN	MC68040	58,000†	58,000†
LN, CN	ACE 030	18,000	58,000*
AN/ANH	MC68030	7,000	7,000

* Using a quad-interface link module and High-Speed Filters option.
† Two ASNs in a stack configuration.

Figure 1 **Ethernet Intelligent Link Interface (ILI)**



Transparent Bridging IEEE 802.1 transparent bridging is supported for communications between Ethernet LANs. The IEEE 802.1d Spanning Tree Algorithm works in conjunction with transparent bridging to prevent a condition known as loops, in which alternate paths exist between network nodes. Loops can develop in topologically complex environments that may contain redundant or parallel bridge connections between multiple LANs.

Translation Bridge Bay Networks Translation Bridge enables end stations generating nonroutable protocols located on Token Ring and Ethernet LANs to connect and interoperate. This enhances productivity by enabling information and resources on dissimilar networks to be shared. Bay Networks Translation Bridge is interoperable with IBM's 8209 LAN Bridge. It is also compatible with existing source route bridges and end stations. This compatibility enables the Bay Networks router to provide seamless interoperability between any Token Ring and Ethernet environment.

With Bay Networks Translation Bridge support, the bridge performs Token Ring/802.5-to-Ethernet/802.3 MAC layer translation by resolving bit-order and link-layer encapsulation differences. Frame size differences, however, must

Table 2 | **Ethernet Interface Capacity per Router**

System	Maximum Number of Ethernet Interfaces
AN	2
ANH	2
ASN	24
LN	16
CN	52
BLN	16
BCN	52

be resolved by appropriately configuring end-station frame sizes. The Token Ring end stations use source route bridging and regard the translation bridge as a source route bridge. All transparently bridged Ethernet/802.3 networks on the other side of the bridge are considered attached to a single ring that is "one hop" away. Conversely, the Ethernet end stations view all end stations attached to the Token Rings on the other side of the bridge as being on a single Ethernet segment.

Bay Networks also supports Source Route Bridging on FDDI networks. Because FDDI is included in Bay Networks native source route bridge environment, Translation Bridge support is also extended to include source route bridged FDDI to Ethernet transparently bridged environments. Through Source Route Bridge for FDDI, FDDI end stations are viewed as stations on a source route bridged Token Ring LAN.

Spanning Tree Algorithm The Spanning Tree Algorithm provides a single (primary) path (composed of bridges and intervening LANs) between any two end stations by restricting access to redundant or parallel links that exist in the network. If there is a topological change or a bridge or data path failure, the algorithm derives a new spanning tree, maintaining network availability.

With support for this range of routed protocols and bridging standards, Bay Networks Ethernet/802.3 supports virtually all end-user applications.

Range of Ethernet Configurations

Bay Networks routers offer a wide selection of Ethernet/802.3 link modules, which provide tremendous flexibility in satisfying site-specific configuration requirements ranging from workgroup access to backbone network hubs (see Table 2).

The AN's, ANH's, and link modules' Synchronous interfaces support V.35, RS-449/RS-422, RS-232, and X.21 connections.

Link Modules The Ethernet link modules (see Table 3) are supported by the LN, CN, BLN, and BCN from Bay Networks to minimize sparing requirements and give users a simple upgrade path to expand from 1 to 52 LAN connections. Link modules come with Ethernet/802.3 attachment unit interface (AUI) connectors (see Figure 2), providing flexibility to accommodate the media that best suits distance, cost, and reliability criteria. The AUI connectors are compatible with the IEEE 10BASE2, 10BASE5, and 10BASE-T physical layer alternatives and support broadband media and baseband coaxial, shielded twisted-pair, and fiber-optic connections through external transceivers.

Net Modules Ethernet connectivity for the ASN is provided by a Dual Ethernet net module, which offers one 10BASE-T (RJ-45) and one AUI connector for a choice of Ethernet connectivity (see Figure 3). As one of its configuration options, the ASN can support up to four Dual Ethernet net modules, providing connectivity for as many as 8 Ethernet interfaces per ASN unit (see Table 2) and up to 24 per four-unit stack configuration.

Integrated Interfaces

The BayStack AN and BayStack ANH are highly integrated single-board designs that also support the Ethernet interface. BayStack AN Ethernet configurations include Dual Ethernet, Single Ethernet/Dual Synchronous, and Single Ethernet/Single Token Ring/Dual Synchronous (see Figure 4). The BayStack ANH provides 8 or 12 managed 10BASE-T (RJ-45) repeater ports for shielded or unshielded twisted-pair cable attachments and is available with an optional second Ethernet adapter module (see Figure 5).

The Ethernet BayStack AN and 8-port BayStack ANH models also support an optional integrated Remote Monitoring (RMON) Data Collection Module (DCM). This option provides standards-based Ethernet RMON (RFC 1271 — all nine groups) capabilities plus real-time packet capture and filtering.

Table 3 | **Ethernet/802.3 Link Modules**

Dual Ethernet Link Module*
Dual Ethernet Net Module (for ASN)
Quad Ethernet Link Module*
Single Ethernet/Single Synchronous Link Module
Dual Ethernet/Dual Synchronous Link Module*
Single Ethernet Adapter Module (second Ethernet for ANH)

*Available with High-Speed Filters option.

The Ethernet segment of the AN or BayStack ANH is continuously monitored by the RMON DCM, collecting data to be used in analyzing remote network performance, topology, faults, departmental usage (for accounting), and protocols.

Node Upgrades

The LN, CN, BLN, BCN, and ASN can be easily upgraded at any time by simply adding a new ILI or net module in a vacant slot or removing an existing module (a BLN/BCN's dual-interface Ethernet module, for example) from its slot and inserting another module (a quad-interface module, for example) in its place. The dual-interface module(s) can then be redeployed in sites where fewer connections are needed. The ability to upgrade connectivity with existing modules saves space and costs by reducing the need for large spare parts inventories.

Interface Redundancy

The Ethernet interfaces can be configured for 1-for-1 redundancy, allowing two similar LAN interfaces on the same or different net module in the same router to be attached to a single LAN. One of the interfaces is designated Primary and is fully operational while the other is in a nonoperational backup mode. If the Primary interface fails, the backup interface becomes operational, ensuring continued availability. IP, IPX, and Source Route Bridging are supported by this feature.

Network Management

Bay Networks offers a complete SNMP-based, enterprise management solution for any environment. As members of Bay Networks Optivity® family of network management products, UNIX-based Optivity Internetwork,™ and Windows-based Optivity Campus™ and EZ Internetwork,™ are powerful tools 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 Site Manager, the node management application 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, IBM NetView for AIX, and Solstice SunNet Manager for additional capabilities.

EZ Internetwork A component of the DOS/Windows-based Optivity Workgroup™ application suite, EZ Internetwork provides a comprehensive set of network management capabilities accessible through a point-and-click, Windows-based user interface for the Bay Networks ASN, and BayStack AN, and ANH routers. EZ Internetwork integrates Quick2Config,™ Bay Networks application that allows Bay Networks router configuration files to be quickly and easily created or modified with a Windows-based version of RouterMan (see the "Optivity Internetwork" section). With Quick2Config, the most novice network administrator can have the router configured and operational in minutes. Quick2Config is fully compatible with Bay Networks Site Manager application.

Optivity Campus Bay Networks provides two Windows-based network management applications that enable Ethernet and Token Ring networks to be managed from a central platform — Optivity Campus for NetWare Management System (NMS) and Optivity Campus for HP OpenView (Windows). These applications offer a wide range of features for managing shared media, frame-switched, and routed networks.

Optivity Campus contains the Autotopology™ dynamic mapping feature, which automatically discovers and displays all hubs, bridges, switches, routers, and end stations to create an accurate blueprint of the network configuration. Optivity Campus also includes applications for managing particular network devices, including RouterMan for Windows, which provides complete real-time monitoring and management of multiple routers from a single workstation.

Designed for midsize to large enterprise networks, Optivity Campus for NetWare NMS enables NetWare systems in IPX-only and mixed IP/IPX networks to be managed from a single console. Optivity for NetWare NMS operates in a client/server arrangement requiring a DOS/Windows station and a NetWare server.

Optivity Campus for HP OpenView (Windows) provides a single-station solution for NetWare accounts not desiring NetWare server dependence. Based on a DOS/Windows architecture, this application provides advanced management for department and campus-sized networks.

Ethernet Connectivity Options

Figure 2 **Quad Ethernet Link Module**

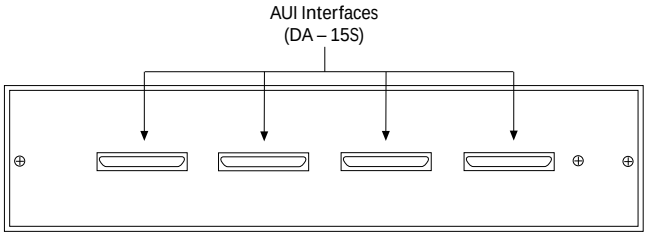


Figure 3 **Access Stack Node Ethernet Net Module**

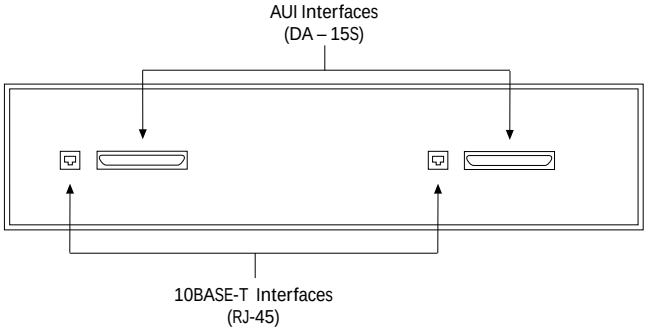


Figure 4 **Access Node Ethernet Connector**

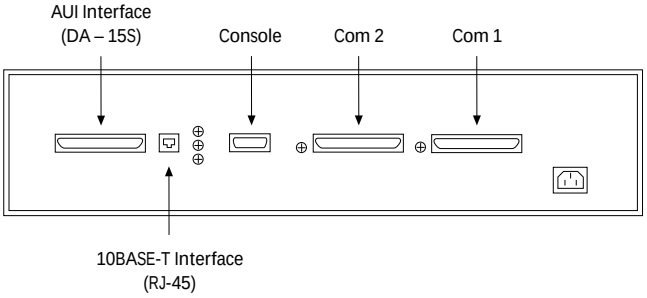
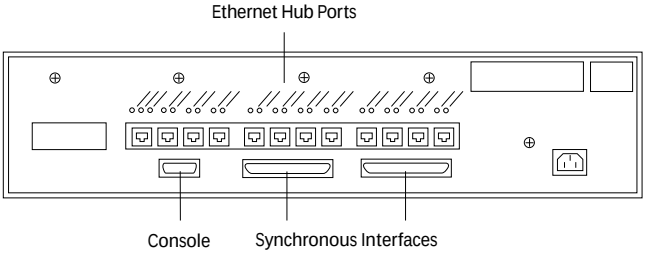


Figure 5 **12-Port Access Node Router/Hub Connector Panel**



Standards Support

Bay Networks routers comply with both IEEE 802.3 and Ethernet Version 1.0/2.0 frame formats, which vary slightly (see Table 4). By supporting both IEEE 802.3 and Ethernet Version 1.0/2.0, Bay Networks routers ensure the highest level of multivendor interoperability.

Table 4 **Ethernet/802.3 Feature Definition**

Feature	Function	Supported by
Heartbeat Signaling	Confirms collision signaling works	Version 2.0, IEEE 802.3
Jabber (self-interrupt)	Stops frames exceeding 1518 bytes from reaching mediums	Version 2.0, IEEE 802.3
Length Field	Specifies number of LLC bytes that follow	IEEE 802.3
Type Field	Specifies end user's protocol	Version 1.0/2.0

The Ethernet interfaces described in this data sheet support major IEEE and Digital-Intel-Xerox standards shown in Table 5.

Table 5 **Standards**

Feature	Function
IEEE	
802.1	Transparent Bridging, including Spanning Tree Algorithm
802.3	Physical Layer standard for LANs with CSMA/CD
Digital-Intel-Xerox	
Ethernet Version 1.0/2.0	

Specifications

The physical and electrical attributes of the Ethernet interfaces are listed in Table 6.

Table 6 **Specifications**

Feature	Function
Link Modules (BLN, BCN, LN, CN)	
Slot Requirements	1 per Ethernet/802.3 link module
Power Requirements (average)	
Dual Ethernet	2 A at +5 V, 1 A (max) at +12 V
Dual Ethernet/High-Speed Filters	3 A at +5 V, 1 A (max) at +12 V
Quad Ethernet	2.5 A at +5 V, 2 A (max) at +12 V
Quad Ethernet/High-Speed Filters	3 A at +5 V, 2 A (max) at +12 V
Single Ethernet/Single Synchronous	2 A at +5 V, 2.5 A (max) at +12 V, 0.1 A at -12 V
Dual Ethernet/Dual Synchronous	3.5 A at +5 V, 2.5 A (max) at +12 V, at -12 V
Dual Ethernet/Dual Synchronous/High-Speed Filters	4 A at +5 V, 2.5 A (max) at +12 V, 0.2 A at -12 V
Physical Dimensions	9.2 in. x 6.3 in. (23.4 cm x 16 cm)
Ethernet Connector	AUI (Female 15-pin subminiature DA-15S)
Net Modules (ASN)	
Slot Requirements	1 per Dual Ethernet/802.3 net module
Power Requirements (average)	
Dual Ethernet	2 A at +5 V, 1 A (max) at +12 V
Physical Dimensions	7.0 in. x 7.0 in. (17.78 cm x 17.78 cm)
Ethernet Connectors	AUI (Female 15-pin subminiature DA-15S) 10BASE-T (RJ-45)
Integrated Interface (AN, ANH)	
Ethernet Connectors	AUI (Female 15-pin subminiature DA-15S) 10BASE-T (RJ-45)
AN	AUI or 10BASE-T
ANH (8-port)	Single AUI and (8) 10BASE-T
ANH (12-port)	(12) 10BASE-T

MIB Information

The Ethernet MIB defines a number of "objects" or variables to be monitored, as shown in Table 7.

Table 7 **MIB Information**

Object	Description
1. csmacd_create/delete	States whether CSMA/CD parameter has been created (1) or deleted (2).
2. csmacd_enable/disable	States whether CSMA/CD is enabled (1) or disabled (2).
3. csmacd_state	Indicates whether CSMA/CD is up (1), down (2), initialized (3), or not present (4).
4. csmacd_slot	Indicates location of CSMA/CD in router (1 through 14).
5. csmacd_connector	Indicates connector on Bay Networks Ethernet interface (1 through 4).
6. csmacd_cct	Indicates circuit number for line instance (minimum = 1, maximum = 1023).

Table 7 | **MIB Information (continued)**

Object	Description
7. csmacd_bofl_enable/disable	Indicates whether Breath of Life (BofL) test is enabled (1) or disabled (2).
8. csmacd_bofl_tmo	Indicates frequency of BofL test (minimum = 1, maximum = 60, default = 5).
9. csmacd_octets_rx_ok	Indicates number of error-free bytes received.
10. csmacd_frames_rx_ok	Indicates number of error-free frames received.
11. csmacd_octets_tx_ok	Indicates number of error-free bytes transmitted.
12. csmacd_frames_tx_ok	Indicates number of error-free frames transmitted.
13. csmacd_deferred_tx	Indicates number of deferred transmissions.
14. csmacd_latecolln_tx	Indicates number of late collisions.
15. csmacd_excessv_colln_tx	Indicates number of excessive collisions.
16. csmacd_babl_err_tx	Indicates number of frames transmitted larger than 1518 octets.
17. csmacd_buf_err_tx	Indicates number of internal buffer errors.
18. csmacd_car_tx	Indicates number of loss of carrier errors.
19. csmacd_uflo_tx	Indicates number of transmitter underflow errors.
20. csmacd_fcs_error_rx	Indicates number of receiver checksum errors.
21. csmacd_align_error_rx	Indicates number of receiver alignment errors.
22. csmacd_lack_resc_error_rx	Indicates number of receiver lack of resources errors.
23. csmacd_too_long_error_rx	Indicates number of frames received exceeding 1518 octets.
24. csmacd_o_flo_rx	Indicates number of receiver overflow errors.
25. csmacd_m_err	Indicates number of internal memory errors.
26. csmacd_d_cerr	Indicates number of collision errors.
27. csmacd_hrdwre_filter_create/delete	States whether hardware filtering parameter has been created (1) or deleted (2).
28. csmacd_tx_queue_length	States current queue length.
29. csmacd_rx_queue_length	States current receive queue length.
30. csmacd_tx_clip_frames	Indicates number of frames clipped in driver's transmit routine due to transmit congestion.
31. csmacd_rx_replen_misses	Indicates number of packet buffer misses while attempting to replenish driver receive ring.
32. csmacd_cfg_tx_queue_length	States configured transmit queue length (maximum 255).
33. csmacd_cfg_rx_queue_length	States configured receive queue length (maximum 255).
34. csmacd_module	States module number for ASN platform, filled in by driver.
35. csmacd_actual_connector	Indicates actual connector number for ASN platform, filled in by driver.
36. csmacd_last_change	Indicates the value of SysUpTime at the time the interface entered its current operational state.
37. csmacd_out_q_length	Indicates the current length of the output packet queue, in packets.
38. csmacd_int_processings	Counts the number of times the interrupt service routine has been called.
39. csmacd_ tx_processings	Counts the number of times the transmit routine has been called.
40. csmacd_ tx_cmpl_processings	Counts the number of times the transmit complete processing takes place.
41. csmacd_ tx_queue_reductions	Counts the number of times the transmit queue has been shrunk in size due to the number of tx clips exceeding the threshold.

Operation

A set of Ethernet/802.3-specific physical and data-link layer parameters must be configured for each Ethernet/802.3 interface, as shown in Tables 8 and 9.

Table 8 | **Physical Layer**

Parameter	Function	Action
Slot Number	Specifies backplane slot housing Ethernet interface.	Enter slot number.
Physical Access Method	Specifies a line access protocol.	Press return to select CSMA/CD.
Connector	Specifies a physical connector to the Ethernet medium.	Select XCVR1, XCVR2, XCVR3, or XCVR4.
Circuit Name	Specifies a circuit name.	Assign a name of up to 12 characters (cannot include periods).

Table 9 | **Data Link Layer**

Parameter	Function	Action
Circuit Name	Specifies a LAN (Ethernet) circuit.	Enter circuit name.
Auto Enable	Enables circuit at boot.	Enter yes or no.
Quality of Service	Specifies LLC service.	Enter LLC1 or LLC2.
Circuit Type	Specifies a LAN (Ethernet) circuit.	Enter LAN.
LAN Address	Specifies a MAC-level router address.	If using IP router or IP router with bridge (in cases when Spanning Tree Algorithm is disabled), use default by pressing return, or assign a 48-bit router address; on circuits supporting AppleTalk, DECnet, IPX, XNS,OSI, VINES, or with Spanning Tree enabled, the software asserts an internally generated LAN address.
XCVR Polling	Tests hardware integrity.	Press return to accept the default, Active.

System Requirements

The Ethernet/802.3 interfaces described in this data sheet are currently supported in software Version 8.11 for Bay Networks AN, ANH, AFN, ASN, LN, CN, BLN, and BCN, unless otherwise indicated in this document.

Ordering Information

Bay Networks offers a wide range of Ethernet interfaces for its family of routers (see Table 10). External cables and transceivers to support various media types are available from third-party suppliers.

Table 10 **Ordering Information**

Model Number	Description
Intelligent Link Interfaces (ILIs)	
For LN and CN (ACE 030-based)	
4415-8/-16	Single Ethernet/Single Synchronous with 8 MB/16 MB memory
4425-8/-16	Single Ethernet/Dual Synchronous with 8 MB/16 MB memory
4435-8/-16	Dual Ethernet/Dual Synchronous with 8 MB/16 MB memory
4605-8/-16	Dual Ethernet with High-Speed Filters with 8 MB/16 MB memory
4606-8/-16	Dual Ethernet with 8 MB/16 MB memory
4630-8/-16	Dual Ethernet/Dual Synchronous with High-Speed Filters with 8 MB/16 MB memory
4655-8/-16	Quad Ethernet with 8 MB/16 MB memory
4635-8/-16	Quad Ethernet with High-Speed Filters with 8 MB/16 MB memory
For BLN and BCN (FRE 040-2-based)	
74005-8/-16/-32	Quad Ethernet with 8 MB/16 MB/32 MB memory
74006-8/-16/-32	Quad Ethernet with High-Speed Filters with 8 MB/16 MB/32 MB memory
74008-8/-16/-32	Dual Ethernet/Dual Synchronous with 8 MB/16 MB/32 MB memory
74010-8/-16/-32	Dual Ethernet/Dual Synchronous with High-Speed Filters with 8 MB/16 MB/32 MB memory
For BLN and BCN (FRE 060-based)	
AG1004001	Quad Ethernet with 16 MB memory
AG1004002	Quad Ethernet with High-Speed Filters and 16 MB memory
AG1004003	Quad Ethernet with 32 MB memory
AG1004004	Quad Ethernet with High-Speed Filters and 32 MB memory
AG1004006	Quad Port Ethernet with 64 MB memory
AG1004007	Quad Port Ethernet with High-Speed Filters and 64 MB memory
Options (For LN, CN, BLN, or BCN)	
4590	Dual Ethernet/High-Speed Filters Expansion Option
Net Modules (ASN)	
34000	Dual Ethernet Net Module
Integrated Interfaces	
Ethernet AN/ANH Models	
AE1001006	AN with one Ethernet interface, two Synchronous interfaces, and 4 MB DRAM memory (110/220 V)
AE1001007	AN with one Ethernet interface, two Synchronous interfaces, and 8 MB DRAM memory (110/220 V)
AE1001008	AN with one Ethernet interface, two Synchronous interfaces, and 16 MB DRAM memory (110/220 V)
AE1001010	ANH with 8 Ethernet hub ports (single segment), two Synchronous interfaces, and 4 MB DRAM memory (110/220 V)

Table 10 | **Ordering Information (continued)**

Model Number	Description
Ethernet AN/ANH Models (continued)	
AE10010011	ANH with 8 Ethernet hub ports (single segment), two Synchronous interfaces, and 8 MB DRAM memory (110/220 V)
AE10010012	ANH with 8 Ethernet hub ports (single segment), two Synchronous interfaces, and 16 MB DRAM memory (110/220 V)
AE10010014	ANH with 12 Ethernet hub ports (single segment), two Synchronous interfaces, and 4 MB DRAM memory (110/220 V)
AE10010015	ANH with 12 Ethernet hub ports (single segment), two Synchronous interfaces, and 8 MB DRAM memory (110/220 V)
AE10010016	ANH with 12 Ethernet hub ports (single segment), two Synchronous interfaces, and 16 MB DRAM memory (110/220 V)
Mixed LAN Media AN Models	
AE1101006	AN with one Ethernet interface, one Token Ring interface, two Synchronous interfaces, and 4 MB DRAM memory (110/220 V)
AE1101007	AN with one Ethernet interface, one Token Ring interface, two Synchronous interfaces, and 8 MB DRAM memory (110/220 V)
AE1101008	AN with one Ethernet interface, one Token Ring interface, two Synchronous interfaces, and 16 MB DRAM memory (110/220 V)
AN/ANH Ethernet Adapter Modules	
AE0004003	AN/12-port ANH Second Ethernet Interface
AE0004007	8-port ANH Second Ethernet Interface

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