Release Notes for BayRS Version 12.10

BayRS Version 12.10
Site Manager Software Version 6.10

BCC Version 3.20

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Bay Networks

Bay Networks

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Region	Telephone number	Fax number
United States and Canada	800-2LANWAN; then enter Express Routing Code (ERC) 290, when prompted, to purchase or renew a service contract 978-916-8880 (direct)	978-916-3514
Europe	33-4-92-96-69-66	33-4-92-96-69-96
Asia/Pacific	61-2-9927-8888	61-2-9927-8899
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Technical Solutions Center	Telephone number	Fax number
Billerica, MA	800-2LANWAN	978-916-3514
Santa Clara, CA	800-2LANWAN	408-495-1188
Valbonne, France	33-4-92-96-69-68	33-4-92-96-69-98
Sydney, Australia	61-2-9927-8800	61-2-9927-8811
Tokyo, Japan	81-3-5402-0180	81-3-5402-0173

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Through Bay Networks Educational Services, you can attend classes and purchase CDs, videos, and computer-based training programs about Bay Networks products. Training programs can take place at your site or at a Bay Networks location. For more information about training programs, call one of the following numbers:

Region	Telephone number
United States and Canada	800-2LANWAN; then enter Express Routing Code (ERC) 282 when prompted 978-916-3460 (direct)
Europe, Middle East, and Africa	33-4-92-96-15-83
Asia/Pacific	61-2-9927-8822
Tokyo and Japan	81-3-5402-7041

Release Notes for BayRS Version 12.10

This document contains the latest information about Bay Networks® BayRS™ Version 12.10.

These release notes include information about:

Upgrading to Version 12.10

To upgrade BayRS to Version 12.10, or to upgrade Site Manager software to Version 6.10, refer to *Upgrading Routers from Version 7-11.xx to Version 12.00*, also in your upgrade package and the upgrade section of the *BayRS Version 12.10 Document Change Notice*.

Using the BCC

The BCC™ is a command-line interface for configuring Bay Networks devices. It also supports Technician Interface commands and scripts.

Before using the BCC, refer to the following sections listing the platforms, protocols, and interfaces that the BCC supports.

Platforms Supported

The BCC runs on AN®, ANH™*, and BN® platforms including ARE†, FRE®, and FRE-2 processor cards. Each slot must have:

- 8 MB of dynamic RAM (DRAM)
- 1.5 MB of free memory space

If you try to start the BCC with insufficient DRAM or free memory on a slot, the BCC returns an error message. In that case, use Site Manager instead of the BCC.

Note: You can run the BCC on BN platforms using 8 MB of DRAM. However, large router configurations may require 16 MB of DRAM.

*You cannot use BCC commands to configure the operation of any ISDN, DCM, or DSU/CSU daughterboard in an AN or ANH device. (Use Site Manager to configure these daughterboards.)

†The BCC runs on ARE processor cards to let you configure the protocols and interfaces listed in this section. However, the BCC does not support ATM.

Interfaces Supported

You can use BCC commands to configure the following interfaces:

- Console
- Ethernet
- FDDI
- HSSI
- Synchronous
- Token ring
- Virtual

Tables 1 and 2 on pages 6 and 7 list the link and net modules the BCC supports.

Global Protocols Supported

You can use BCC commands to configure the following global protocols:

- IP (including access policies and static routes)
- ARP
- BGP (including accept and announce policies)
- IGMP
- OSPF (including accept and announce policies)
- RIP (including accept and announce policies)
- FTP
- NTP
- SNMP
- Telnet
- TFTP

Interface Protocols Supported

You can use BCC commands to configure the following interface protocols:

- IP
- ARP
- IGMP
- OSPF
- RIP
- Router Discovery (RDISC)
- Proprietary Standard Point-to-Point
- PPP (certain line parameters only; no multiline or multilink supported)

  Refer to *Configuring PPP Services* for details.

Getting Started

Caution: BCC configuration and **source** commands make immediate changes to the active device configuration. Read about the **source** command in *Using the Bay Command Console (AN/BN Routers)*.

Before using the BCC, save your configuration files by copying them onto the same flash memory card using new file names.

To start the BCC on an AN, ANH, BCN®, or BLN® router, enter **bcc** at the Technician Interface prompt.

To display the online instructions for new BCC users, enter **help learning-bcc** at the bcc> prompt. Then to display a full summary of the Help features of the BCC interface, enter **help -more**.

For more information about how to use the BCC interface, refer to *Using the Bay Command Console (AN/BN Routers)*.

For instructions on using the BCC to add and change protocol services, see the documentation for that protocol.

Configuring the BCC

This section supplements the instructions in *Using the Bay Command Console (AN/BN Routers).*

Only one BCC session can be active at a time.

If you use the BCC **show config** command to view a router configuration, the BCC displays only the protocols it supports.

Deleting Interfaces with the BCC

Before using the BCC to delete an interface, make sure that you did not use Site Manager to configure it with a protocol that the BCC does not recognize. If you did, use Site Manager to delete the interface.

Identifying Board Types

This section supplements the instructions in the documentation set.

Tables 1 and 2 identify the Board Type parameter values displayed by the BCC. Use the "Board Type" column to identify a hardware module in an AN or BN router configuration.

Table 1 lists the AN and ANH board types.

Note: You cannot use BCC commands to configure the operation of any ISDN, DCM, or DSU/CSU daughterboard in an AN or ANH device. (Use Site Manager to configure these daughterboards.) Inserting a daughterboard into an AN base module redefines its module ID and board type.

Table 1. BCC Board Types: AN and ANH Modules

BCC Board Type	Technician Interface or MIB Module ID	Description
andeds	1033	AN-ENET (2 Ethernet ports, 2 synchronous ports) with 8 MB or 16 MB DRAM
andedsg	1050	ANH-8 (2 Ethernet ports, 2 synchronous ports) with 8 MB or 16 MB DRAM and an 8-port Ethernet hub active for the first Ethernet port
andedsh	1035	ANH-12 (2 Ethernet ports, 2 synchronous ports) with 8 MB or 16 MB DRAM and a 12-port Ethernet hub
andedst	1034	AN-ENET (2 Ethernet ports, 2 synchronous ports, 1 token ring port) with 8 MB or 16 MB DRAM
andst	1037	AN-TOKEN (2 synchronous ports, 1 token ring port) with 8 MB or 16 MB DRAM
ansdsedst	1041	AN-ENET/TOKEN (1 Ethernet port, 2 synchronous ports, 1 token ring port) with 8 MB or 16 MB DRAM
anseds	1024	AN-ENET (1 Ethernet port, 2 synchronous ports) with 8 MB or 16 MB DRAM
ansedsg	1047	ANH-8 (1 Ethernet port, 2 synchronous ports) with 8 MB or 16 MB DRAM and an 8-port Ethernet hub
ansedsh	1026	ANH-12 (1 Ethernet port, 2 synchronous ports) with 8 MB or 16 MB DRAM and a 12-port Ethernet hub
ansedst	1025	AN-ENET/TOKEN (1 Ethernet port, 2 synchronous ports, 1 token ring port) with 8 MB or 16 MB DRAM
ansets	1030	AN-ENET (1 Ethernet port, 3 synchronous ports) with 8 MB or 16 MB DRAM
ansetsg	1049	ANH-8 (1 Ethernet port, 3 synchronous ports) with 8 MB or 16 MB DRAM and an 8-port Ethernet hub
ansetsh	1032	ANH-12 (1 Ethernet port, 3 synchronous ports) with 8 MB or 16 MB DRAM and a 12-port Ethernet hub
ansetst	1031	AN-ETS (1 Ethernet port, 3 synchronous ports, 1 token ring port) with 8 MB or 16 MB DRAM
antst	1039	AN-TOKEN (3 synchronous ports, 1 token ring port) with 8 MB or 16 MB DRAM

Table 2 lists the BLN and BCN board types.

Table 2. BCC Board Types: BLN and BCN Modules

BCC Board Type	Technician Interface or MIB Module ID	Site Manager Model Number	Description
comp	4353	AG2104037	Octal Sync with 32-context compression daughterboard
comp128	4354	AG2104038	Octal Sync with 128-context compression daughterboard
de100	4864	50038	100BASE-T Ethernet
dst416	40	5740	Dual Sync with token ring
dtok	176	5710	Dual token ring
enet3	132	5505	Dual Ethernet
esaf	236	5531	Dual Sync Dual Ethernet with 2-CAM filters
		5532	Dual Sync Dual Ethernet with 6-CAM filters
esafnf	232	5431	Dual Sync Dual Ethernet without hardware filters
osync	4352	5008	Octal Sync
qef	164	5950	Quad Ethernet with hardware filters
qenf	162	5450	Quad Ethernet without hardware filters
qtok	256	50021	Quad token ring
shssi	225	5295	HSSI
sse	118	5410	Single Sync with Ethernet
sync	80	5280	Quad Sync
wffddi1m	193	5943	Hybrid FDDI with single mode on connector B
wffddi1mf	197	5949	Hybrid FDDI with single mode on connector B and with hardware filters
wffddi1s	195	5942	Hybrid FDDI with single mode on connector A
wffddi1sf	199	5948	Hybrid FDDI with single mode on connector A and with hardware filters
wffddi2m	192	5930	Multimode FDDI
wffddi2mf	196	5946	Multimode FDDI with hardware filters
wffddi2s	194	5940	Single Mode FDDI
wffddi2sf	198	5947	Single Mode FDDI with hardware filters

Sending BCC Feedback

After you use the BCC, we welcome your feedback. Please visit the BCC Web site at the following URL, where you can leave us a message:

http://support.baynetworks.com/library/tpubs/bccfeedbk

New Features in BayRS Version 12.10

BayRS Version 12.10 provides the following new features.

ATM Half Bridge

ATM Half Bridge (AHB) is a protocol operating on BLN and BCN routers. This protocol connects remote Ethernet hosts (PCs and workstations) attached via digital subscriber line (DSL) devices (modems) to an IP routed network. AHB supports a WAN infrastructure network by performing the bidirectional conversion of Ethernet bridged packets for IP routing to and from ISPs and corporate networks. For information about AHB, see *Configuring ATM Half-Bridge Services*.

DLSw/APPN Boundary

DLSw/APPN boundary allows DLSw to provide remote communications via an IP backbone. DLSw/APPN boundary provides access over this backbone from enterprise-level applications using an APPN/HPR network. For information about this feature, see the *BayRS Version 12.10 Document Change Notice*.

Frame Relay PVC Pass Through

PVC pass through lets a single frame relay network access link carry both conventional network protocol traffic and otherwise unroutable frame relay access device (FRAD) traffic. It works with hybrid mode PVCs only. PVC pass through connects two PVCs on separate interfaces so that the router can transmit traffic it receives on one PVC out the other with no encapsulation requirements. For information about PVC pass through, see *Configuring Frame Relay Services*.

Frame Relay SVCs

SVCs over frame relay provide the advantage of “any-to-any” switched connectivity between clients, without requiring the use or configuration of permanent virtual circuits (PVCs).

Hi/fn Software Compression

Bay Networks Stac LZS data compression software, based on the Hi/fn Stac LZS algorithm, transports compressed packets across a PPP link. Stac LZS can detect whether packets are lost during transmission and will not retransmit data packets that are lost. For information about this feature, see *Configuring Data Compression Services*.

HTTP Web Server

The router operating system contains an embedded Web server engine which, along with Web-based management pages, provides a simple, easy, and cost-effective way to monitor Bay Networks devices. For information about the HTTP Web server, see *Managing Your Network Using the HTTP Server.*

IP Multicasting for DLSw

IP multicasting over DLSw supports RFC 2166 (Version 2.0) of the DLSw standard. This feature uses multicasting to support “any-to-any” peer configuration. For information about this feature, see the *BayRS Version 12.10 Document Change Notice*.

Layer 2 Tunneling Protocol (L2TP)

The Layer 2 Tunneling Protocol (L2TP) provides remote users, such as telecommuters, mobile professionals, and users in remote branch offices, with dial-in access to a corporate network. L2TP enables users to create a virtual private network, which uses the existing physical infrastructure of a public network, such as the Internet, but offers the security and exclusivity of a private network. L2TP is supported on the ASN and BN platforms. For information about L2TP, see *Configuring L2TP Services*.

QLLC Wildcard

This enhancement to QLLC address mapping reduces configuration work for certain network configurations. Wildcards work for LLC end stations that send data to QLLC hosts, and for QLLC end stations that send data to LLC hosts. You can configure a single end station-to-host map and apply it to any number of QLLC connections. For information about QLLC wildcards, see *Configuring X.25 Services*.

Redundant LES/BUS

LAN emulation server (LES) and broadcast and unknown server (BUS) redundancy reduces the risk of network failure by overcoming a single point of failure. This feature is now supported on the ATM routing engine (ARE). For information about this feature, see the *BayRS Version 12.10 Document Change Notice*.

RMON2

Remote monitoring Version 2 (RMON2) provides statistics on network and application layer traffic (layers 3 through 7 of the OSI model). By monitoring at the higher layer protocols, you can obtain an internetwork or enterprise-wide view of network traffic. For information about RMON2, see *Configuring RMON and RMON2*.

RMON Alarms and Events

RMON alarms and events are MIB groups supported on all Bay Networks routers. The alarm group lets you set an alarm threshold and sampling interval to enable the RMON agent to generate alarms on any network segment it monitors. The event group lets you generate an SNMP trap, log entry, or both for any event you choose. For information about RMON alarm and event groups, see *Configuring RMON and RMON2*.

WAN Compression Protocol (WCP) and Priority Queuing over Multilink PPP

In BayRS Version 12.10, WCP and priority queuing allows negotiation one layer above PPP multilink. Negotiation above the multilink bundle improves load balancing. For priority queuing this feature improves the resequencing of packets. This feature also allows for compatibility with the Nautica® product line.

For more information about this feature, see the *BayRS Version 12.10 Document Change Notice*.

X.25 PAD Software Support

BayRS Version 12.10 provides configuration and management support for the new X.25 packet assembler/disassembler (PAD). For information about the hardware portion of this product, see the next section, "New Hardware." For information about X.25 PAD software, see *Configuring X.25 Services*.

New Hardware

BayRS Version 12.10 supports the following new hardware.

Model 5782 ATM Virtual Network Router (VNR)

The Model 5782 ATM VNR extends the Bay Networks ATM VNR capability to the Model 5000BH ATM switching platform. The Model 5000BH chassis supports up to four VNRs (two per Centillion ATM bus). For information about the Model 5782 VNR, see *Using the Model 5782 ATM Virtual Network Router.*

Using the Model 5782 VNR requires an MCP configured with SpeedView™ 3.0 for Windows®. For additional information about how to configure an MCP switch module, see *Using SpeedView 3.0 for Windows*.

Fractional T1 DSU/CSU WAN Adapter Module

Fractional T1 (FT1) DSU/CSU is a new WAN adapter module for the ARN, AN, and ANH router platforms. For information about the FT1 adapter module on an ARN platform, see *Installing and Operating BayStack ARN Routers*. For information about the FT1 adapter module on AN and ANH platforms, see *Installing and Operating BayStack AN and ANH Routers*. Also see the *Installing the FT1/T1 DSU/CSU Upgrade Kit*. For information about how to configure FT1, see *Configuring WAN Line Services*.

ARN 10/100 Mb Ethernet

The new 10BASE-T/100BASE-T Mb Ethernet base module for the ARN platform provides autosense 10/100 Ethernet connectivity at full-duplex operation. The new 100BASE-FX Ethernet base module suppports 100 Mb full-duplex operation. For information about how to install and use this module on an ARN platform, see *Installing and Operating BayStack ARN Routers*.

X.25 PAD

The X.25 packet assembler/disassembler (PAD) provides access to an X.25 service for devices that are not capable of loading or unloading data packets or are not able to send and receive packets across an X.25 interface. The X.25 PAD hardware comprises an 8-port asynchronous communications controller in the form of a serial adapter module for the router. For information about the X.25 PAD module, see *Installing and Operating BayStack AN and ANH Routers* and the *Release Notes for X.25 PAD Services*.

Guidelines for Working with BayRS Version 12.10

Note the following guidelines when using BayRS Version 12.10. These guidelines supplement the instructions in the Version 12.10 documentation set.

AN/ANH and ARN Guidelines

Note the following operational guidelines when using AN, ANH, or ARN routers.

Allocating Memory on ARN Routers

Although you can change the default memory allocation on other Bay Networks router platforms, the ARN platform does not support this "buffer carving" feature.

On the ARN, Site Manager does not support the Admin > Kernel Configuration option, and the Technician Interface does not support the **set** command for wfKernCfgParamEntry objects. Attempting to set wfKernCfgParamGlobMem on the ARN results in a warning message.

Cycling Power to the ARN

To ensure a complete power cycle, Bay Networks recommends that you wait at least 4 seconds after turning off the ARN before you turn it back on.

Caution: Cycling power to the ARN too quickly could cause an error.

DSU/CSU Test LED Remains On After Reset

The ARN DSU/CSU Test LED properly goes on when the interface enters test or loopback mode. However, the LED remains on after resetting the DSU/CSU module, even though all looping terminates and the module hardware resets.

Restarting the router turns the LED off. However, this action is not necessary for proper operation of the DSU/CSU interface.

Network Booting on DSU/CSU Interfaces

AN and ANH DSU/CSU interfaces do not support network booting in BayRS Version 12.10. The ARN DSU/CSU supports network booting only over interfaces configured for 64 Kb/s Clear Channel service.

ASN Boot and Diag PROM Images

BayRS Version 12.10 includes a new boot PROM image (*asnboot.exe*) as well as a new diag PROM image (*asndiag.exe*; Version 2.28). You must use these files together; in other words, when you upgrade the boot PROM, you must also upgrade the diag PROM. The new boot PROM image corrects a problem with the previous boot PROM on the ASN. The previous boot PROM caused the boot/diagnostic PROM checksum to fail following a cold start.

For information about upgrading boot and diag PROMs for the ASN router, see *Upgrading Routers from Version 7-11.xx to Version 12.00*.

BayRS Version 12.10 Flash Memory Requirements

BayRS Version 12.10 software ships on the following flash memory cards:

Platform	Flash Memory Required	Associated Software Suites
AN/ANH	8 MB	ip_access, office_suite, corp_suite
ARN	4 MB	ip_access
ARN	8 MB	office_suite, corp_suite

Compression Restructuring

In BayRS Version 12.10, WCP and priority queuing allows negotiation one layer above the PPP multilink bundle. Prior to this version, WCP negotiation occured below the PPP multilink bundle and PPQ was not supported. This restructuring requires that both sides of a PPP link communicate at the same level. This change is automatic when using existing configurations, but requires you to change the compression mode for configurations created with Site Manager Version 6.10.

For example, if you have two routers using either hardware or software compression, upgrade one router to BayRS Version 12.10, and then reboot the router using the existing configuration, the router negotiates compression below the PPP multilink bundle on both routers without any configuration changes.

However, if you create a new Site Manager Version 6.10 configuration for one of the routers using compression, and you do not upgrade the other router, you must change the Compression Mode parameter on the upgraded router to ilccp before rebooting. If you do not change the Compression Mode parameter, compression will not successfully negotiate over the PPP link.

FT1/T1 DSU/CSU Guidelines

Note the following operational guidelines when using the FT1/T1 DSU/CSU.

Allocating DS0s

If you have an FT1/T1 DSU/CSU or E1 card and an ISDN S/T or U card installed on the same ARN, you can alternate assigned DS0 channels with unassigned channels, up to a maximum rate of 512 Kb/s (8 channels).

Caution: You cannot alternate assigned and unassigned channels across the 24 channels in a T1 line (768 Kb/s).

If you have rates above 512 Kb/s, Bay Networks recommends that you configure the DS0s contiguously, even though some noncontiguous channel configurations may work. If you have an unsupported channel configuration, the following message appears in the event log:

```
Connector COM <COM#>, Current timeslot assignment is not supported.
```

This message indicates an invalid assignment of DS0s for the specified connector; you should have your service provider change the T1 channel assignments. Using contiguous channel assignments addresses this problem.

FT1/T1 and ISDN Phone Line Configuration

If you configure FT1/T1 after configuring an ISDN ST or U interface, you may experience line manager faults if you have 2B+D channel (one physical RJ-45 cable with two phone circuits) with only one phone line configured. To avoid any line manager faults, configure both phone lines.

FT1/T1 DSU/CSU Diagnostic PROM Requirements

The ARN requires diagnostic PROM (*arndiag.exe*) Version 2.00 or later to support the FT1/T1 DSU/CSU adapter module. The FT1/T1 hardware documentation incorrectly specifies diagnostic PROM Version 1.34 as the minimum required version.

Selecting 56K Rate Adaption on FT1/T1 DSU/CSU Lines

Rate adaption determines the number of bits and their bit positions within a time slot. The FT1/T1 logical line rate adaption is 64 Kb/s per DS0. You cannot change this rate.

Hi/fn (Stac) LZS Compression Executable

Using Hi/fn™ (Stac) LZS data compression requires the purchase of a separate CD containing the Hi/fn LZS executable for BayRS Version 12.10 software.

L2TP Guidelines

Note the following operational guidelines when using L2TP.

Dial Backup on a Primary Leased Line

You cannot configure dial backup service for a primary leased line that is using L2TP, even if the dial backup line resides on a different slot than the primary line.

Dial Services

L2TP is not compatible with dial services. Do not enable L2TP on the same slot that you enable for a dial service, such as dial-on-demand, dial backup, or bandwidth-on-demand.

Dynamic L2TP Configuration

When you configure L2TP in dynamic mode, Site Manager can take several minutes to create the required circuits and related MIB instances.

Outbound LAN Traffic Filters

When implementing outbound traffic filters for LAN protocols, note that in some configurations the filters may cause a decline in throughput performance. For LAN circuits where the forwarding rate of the router is critical, you should monitor the throughput performance after configuring outbound LAN filters. If you notice an unacceptable performance degradation, try using inbound traffic filters to accomplish the filtering goal.

Protocol Prioritization No Call Filters and TCP Applications

Using a no call filter that applies to any TCP application can cause TCP to retransmit the filtered packet.

When two routers running a TCP application are connected using a demand line, and the demand line becomes inactive, the TCP application remains innactive.

If a demand line configured with a no call filter goes down, the no call filter drops any TCP packets it receives. Because TCP never receives an acknowledgment for transmitting its packets, the TCP application continues to retransmit packets until the connection eventually times out and the application stops operating.

Note: No call filters are specific to dial services. For additional information about traffic filters and protocol prioritization, see *Configuring Traffic Filters and Protocol Prioritization*.

RMON and RMON2 Guidelines

Note the following operational guidelines when using RMON and RMON2.

DCM Memory Requirements for RMON2

RMON2 requires 8 MB of dynamic random access memory (DRAM) on the data collection module (DCM).

Enabling RMON on the ARN 10/100 Router

You cannot enable RMON through both the router software and Ethernet DCM at the same time.

You can enable RMON to operate through the router software image on the 10/100 Mb Ethernet base module or on an optional Ethernet DCM (residing on an optional Ethernet parallel daughterboard).

Technician Interface Guidelines

The following sections pertain to the Technician Interface and BayRS Version 12.10 software.

Configuring NTP Using the Technician Interface

When you use the Technician Interface to configure the Network Time Protocol (NTP), you must configure NTP on each slot on the router to ensure that NTP initializes correctly.

You can configure NTP on each slot by setting the following MIB variable from the Technician Interface:

set wfProtocols.68.0 0xffffffff;commit

68 represents the wfNTPLoad attribute.

Setting Modem Initialization Strings Using the Technician Interface

Several AT modem commands contain a dollar sign ($) or backslash (\). The Technician Interface uses the $ to reference a variable and the \ to prevent the substitution of a variable. If one of these symbols appears in the wfModemEntry.wfModemCfgInitString initialization command, the Technician Interface does not set the string. For example:

```
[1:1]$ get wfModemEntry.wfModemCfgInitString.1.2

wfModemEntry.wfModemCfgInitString.1.2 = "ATF"

[1:1]$ set wfModemEntry.wfModemCfgInitString.1.2 "AT$SB64000";commit

Variable: Undefined Variable - SB64000
```

The Technician Interface interprets the command as containing an undefined variable and does not change the MIB value.

To set the MIB variable, you must add a backslash (\) in front of the symbol causing the confusion (that is, the $ or \). For example:

```
[1:1]$ get wfModemEntry.wfModemCfgInitString.1.2

wfModemEntry.wfModemCfgInitString.1.2 = "ATF"

[1:1]$ set wfModemEntry.wfModemCfgInitString.1.2 "AT\$SB64000";commit
```

X.25 PVCs

BayRS Version 12.10 software supports X.25 PVCs for X.25 IPEX Gateway services only.

Protocols Supported

BayRS Version 12.10 supports the following bridging/routing protocols and router configuration features:

- Advanced Peer-to-Peer Networking (APPN)
- AppleTalk and AppleTalk Update Routing Protocol (AURP)
- Asynchronous transfer mode (ATM)
- ATM Data Exchange Interface (ATM DXI)
- ATM Half Bridge (AHB)
- ATM LAN Emulation (802.3 and 802.5)
- Bandwidth Allocation Protocol (BAP)
- Binary Synchronous Communication Type 3 (BSC3)
- Bisync over TCP (BOT)
- Bootstrap Protocol (BootP)
- Border Gateway Protocol (BGP-3 and BGP-4)
- Classless interdomain routing (CIDR)
- Data compression (WCP and Hi/fn)
- Data link switching (DLSw)
- DECnet Phase IV
- Distance Vector Multicast Routing Protocol (DVMRP)
- Dynamic Host Configuration Protocol (DHCP)
- Encryption (WEP; proprietary)
- Exterior Gateway Protocol-2 (EGP-2)
- File Transfer Protocol (FTP)
- Frame relay (PVC, SVC)
- HP Probe
- Integrated Services Digital Network (ISDN)
- Interface redundancy (proprietary)
- Internet Control Message Protocol (ICMP)

- Internet Gateway Management Protocol (IGMP)
- Internet Packet Exchange (IPX)
- Internet Protocol (IP)
- Internet Protocol Version 6 (IPv6)
- IPv6 PPP Control Protocol (CP)
- Internet Stream Protocol (ST2)
- Layer 2 Tunneling Protocol (L2TP)
- Learning Bridge
- Logical Link Control 2 (LLC2)
- Multicast OSPF (MOSPF)
- Native Mode LAN (NML)
- Network Core
- Network Time Protocol (NTP)
- Open Shortest Path First (OSPF)
- Open Systems Interconnection (OSI)
- Point-to-Point Protocol (PPP)
- Polled Asynch (PAS), also called Asynch Passthru over TCP
- Protocol prioritization
- Qualified Logical Link Control (QLLC)
- RaiseDTR dialup
- Remote Authentication Dial-In User Service (RADIUS)
- Resource Reservation Protocol (RSVP)
- Router discovery
- Router redundancy (proprietary)
- Routing Information Protocol (RIP)
- Service Advertisement Protocol (SAP)
- Simple Network Management Protocol (SNMP)
- Source Routing Bridge

- Source Routing Bridge over ATM permanent virtual circuits (PVCs)
- Spanning Tree
- Switched Multimegabit Data Service (SMDS)
- Synchronous Data Link Control (SDLC)
- Telnet (inbound and outbound)
- Transmission Control Protocol (TCP)
- Transparent Bridge
- Transparent-to-Source Routing Translation Bridge
- Trivial File Transfer Protocol (TFTP)
- User Datagram Protocol (UDP)
- V.25bis dialup
- Virtual Network Systems (VINES)
- X.25 with QLLC
- Xerox Network System (XNS)
- XMODEM and YMODEM

Standards Supported

Table 3 lists the Request For Comments (RFCs) and other standards documents with which Version 12.10 complies. Version 12.10 may support additional standards that are not listed in this table.

Table 3. Standards Supported by Version 12.10

Standard	Description
ANSI T1.107b-1991	Digital Hierarchy - Supplement to formats specifications
ANSI T1.404	DS3 Metallic Interface Specification
ANSI X3t9.5	Fiber Distributed Data Interface (FDDI)
Bellcore FR-440	Transport Systems Generic Requirements (TSGR)
Bellcore TR-TSY-000009	Asynchronous Digital Multiplexes, Requirements and Objectives
Bellcore TR-TSY-000010	Synchronous DS3 Add-Drop Multiplex (ADM 3/X) Requirements and Objectives
IEEE 802.1	Logical Link Control (LLC)
IEEE 802.3	Carrier Sense Multiple Access with Collision Detection (CSMA/CD)
IEEE 802.5	Token Ring Access Method and Physical Layer Specifications
IEEE 802.10	Bridge with Spanning Tree
ITU Q.921	ISDN Layer 2 Specification
ITU Q.931	ISDN Layer 3 Specification
ITU X.25	Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuits
RFC 768	User Datagram Protocol (UDP)
RFC 791	Internet Protocol (IP)
RFC 792	Internet Control Message Protocol (ICMP)

(continued)

Table 3. Standards Supported by Version 12.10 *(continued)*

Standard	Description
RFC 793	Transmission Control Protocol (TCP)
RFC 813	Window and Acknowledgment Strategy in TCP
RFC 826	Ethernet Address Resolution Protocol
RFC 827	Exterior Gateway Protocol (EGP)
RFC 854	Telnet Protocol Specification
RFC 855	Telnet Option Specification
RFC 856	Telnet Binary Transmission
RFC 857	Telnet Echo Option
RFC 858	Telnet Suppress Go Ahead Option
RFC 859	Telnet Status Option
RFC 860	Telnet Timing Mark Option
RFC 861	Telnet Extended Options: List Option
RFC 863	Discard Protocol
RFC 877	Transmission of IP Datagrams over Public Data Networks
RFC 879	TCP Maximum Segment Size and Related Topics
RFC 888	"STUB" Exterior Gateway Protocol
RFC 894	Transmission of IP Datagrams over Ethernet Networks
RFC 896	Congestion Control in IP/TCP Internetworks
RFC 903	Reverse Address Resolution Protocol
RFC 904	Exterior Gateway Protocol Formal Specification
RFC 919	Broadcasting Internet Datagrams
RFC 922	Broadcasting Internet Datagrams in Subnets
RFC 925	Multi-LAN Address Resolution
RFC 950	Internet Standard Subnetting Procedure

(continued)

Table 3. Standards Supported by Version 12.10 *(continued)*

Standard	Description
RFC 951	Bootstrap Protocol
RFC 959	File Transfer Protocol
RFC 994	Protocol for Providing the Connectionless-mode Network Service
RFC 1009	Requirements for Internet Gateways
RFC 1027	Using ARP to Implement Transparent Subnet Gateways
RFC 1042	Transmission of IP over IEEE/802 Networks
RFC 1058	Routing Information Protocol
RFC 1075	Distance Vector Multicast Routing Protocol (DVMRP)
RFC 1076	Redefinition of Managed Objects for IEEE 802.3 Repeater Devices (AN hubs only)
RFC 1079	Telnet Terminal Speed Option
RFC 1084	BOOTP Vendor Information Extensions
RFC 1091	Telnet Terminal-Type Option
RFC 1108	Security Options for the Internet Protocol
RFC 1112	Host Extensions for IP Multicasting Appendix I. Internet Group Management Protocol
RFC 1116	Telnet Line-mode Option
RFC 1139	Echo Function for ISO 8473
RFC 1155	Structure and Identification of Management Information for TCP/IP-based Internets
RFC 1157	Simple Network Management Protocol (SNMP)
RFC 1163	BGP-2 (obsoleted by RFC 1267)
RFC 1164	Application of BGP in the Internet
RFC 1166	Internet Numbers
RFC 1188	Proposed Standard for the Transmission of IP over FDDI
RFC 1191	Path MTU Discovery

(continued)

Table 3. Standards Supported by Version 12.10 *(continued)*

Standard	Description
RFC 1209	Transmission of IP Datagrams over SMDS
RFC 1212	Concise MIB Definitions
RFC 1213	MIB for Network Management of TCP/IP-based Internets
RFC 1267	Border Gateway Protocol 3 (BGP-3; obsoletes RFC 1163)
RFC 1293	Inverse ARP for Frame Relay
RFC 1294	Multiprotocol Interconnect over Frame Relay (obsoleted by RFC 1490)
RFC 1304	Definition of Managed Objects for the SIP Interface Type
RFC 1305	Network Time Protocol
RFC 1315	Management Information Base for Frame Relay DTEs
RFC 1323	TCP Extensions for High Performance
RFC 1331	Point-to-Point Protocol (PPP; obsoleted by RFC 1661)
RFC 1332	PPP Internet Protocol Control Protocol (IPCP)
RFC 1333	PPP Link Quality Monitoring (obsoleted by RFC 1989)
RFC 1334	PPP Authentication Protocols
RFC 1350	The TFTP Protocol (Revision 2)
RFC 1356	Multiprotocol Interconnect on X.25 and ISDN in the Packet Mode
RFC 1376	PPP DECnet Phase IV Control Protocol (DNCP)
RFC 1377	OSI over PPP
RFC 1378	PPP AppleTalk Control Protocol (ATCP)
RFC 1390	Transmission of IP and ARP over FDDI Networks
RFC 1403	BGP OSPF Interaction
RFC 1434	Data Link Switching: Switch-to-Switch Protocol
RFC 1483	Multiprotocol Encapsulation over ATM AAL5
RFC 1490	Multiprotocol Interconnect over Frame Relay (obsoletes RFC 1294)

(continued)

Table 3. Standards Supported by Version 12.10 *(continued)*

Standard	Description
RFC 1552	The PPP Internetwork Packet Exchange Control Protocol (IPXCP)
RFC 1577	Classical IP and ARP over ATM
RFC 1583	OSPF Version 2
RFC 1585	MOSPF: Analysis and Experience
RFC 1634	Novell IPX over Various WAN Media (IPXWAN)
RFC 1638	PPP Bridging Control Protocol (BCP)
RFC 1654	Border Gateway Protocol 4 (BGP-4; obsoleted by RFC 1771)
RFC 1661	Point-to-Point Protocol (PPP; obsoletes RFC 1331)
RFC 1662	PPP in HDLC-like Framing
RFC 1717	PPP Multilink Protocol (MP; obsoleted by RFC 1990)
RFC 1755	Signaling Support for IP over ATM
RFC 1757	Remote Network Monitoring Management Information Base (RMON), for AN, ANH, and ARN equipped with data collection module only
RFC 1762	PPP Banyan VINES Control Protocol (BVCP)
RFC 1763	PPP DECnet Phase IV Control Protocol (DNCP)
RFC 1764	PPP XNS IDP Control Protocol (XNSCP)
RFC 1771	Border Gateway Protocol 4 (BGP-4; obsoletes RFC 1654)
RFC 1795	Data Link Switching: Switch-to-Switch Protocol, Version 1
RFC 1819	Internet Stream Protocol, Version 2
RFC 1989	PPP Link Quality Monitoring (obsoletes RFC 1333)
RFC 1990	PPP Multilink Protocol (MP; obsoletes RFC 1717)
RFC 2138	Remote Authentication Dial In User Service (RADIUS)
RFC 2139	RADIUS Accounting
RFC 2166	Data Link Switching, Version 2.0, Enhancements

(continued)

Table 3. Standards Supported by Version 12.10 *(continued)*

Standard	Description
RFC 2205	Resource ReSerVation Protocol (RSVP) -- Version 1 Functional Specification
VINES 4.11	BayRS works with the Banyan VINES 4.11 standard. BayRS Version 8.10 (and later) also supports VINES 5.50 sequenced routing.

Flash Memory Cards Supported

You use Personal Computer Memory Card International Association (PCMCIA) flash memory cards to store the software image and the configuration files in Bay Networks routers. Table 4 lists the flash memory cards approved for use.

Table 4. Approved Flash Memory Cards

Size	Vendor	Part Number
4 MB	Advanced Micro Devices (AMD)	AMC004CFLKA-150
	AMP	797262-3
		797263-2
	Centennial	FL04M-20-11119
		FL04M-20-11138
	Epson	HWB401BNX2
	IBM	IBM1700400D1DA-25
	Intel	IMC004FLSAQ1381

(continued)

Table 4. Approved Flash Memory Cards *(continued)*

Size	Vendor	Part Number
8 MB	AMD	AMC008CFLKA-150
		AMC008CFLKA-200
		AMC008CFLKA-250
		AMC008DFLKA-150
		AMC008DFLKA-200
		AMC008DFLKA-250
	Centennial	FL08M-25-11119-01
		FL08M-15-11119-01
		FL08M-20-11138
		FL08M-20-11119-01
	Epson	HWB801BNX0
	Intel	IMC008FLSP/Q1422
16 MB	Centennial	FL16M-20-11119-03
	Epson	HWB161BNX2

Note: The Intel 4 MB flash memory card (Part Number IMC004FLSAQ1381) is not compatible with the Accelar product line. See the Accelar release note documentation for details.