

Remote Access Software Version 5.3 Release Notes

Marketing Release 5.3

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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
Latin America	561-988-7661	561-988-7550

Information about customer service is also available on the World Wide Web at support.baynetworks.com.

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If you purchased a Bay Networks service program, call one of the following Bay Networks Technical Solutions Centers:

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

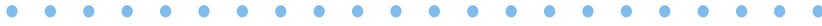


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Remote Access Software Version 5.3 Release Notes

These release notes apply to Marketing Release 5.3 of Bay Networks[®] Remote Access software, which comprises these individual software releases:

- Remote Access Concentrator Operational Code Version R14.1.9
- DSP Digital Modem Code Version:
 - V.34/x2: X1_00_54
 - K56flex: K0_00_26
- Microcom Modem Code Version 2_4_81
- Host Tools for UNIX Version R14.1
- Server Tools for Windows NT[®] R3.1
- Quick2Config[®] Annex R3.1
- Annex Manager[™] R3.1

You can view the most current version of these release notes on the Bay Networks World Wide Web page at <http://support.baynetworks.com/Library/tpubs>. Check this site for late information that is not included in this version of the release notes.

These Release Notes address the following topics:

- [*Supported RAC Hardware For Release 5.3*](#)
- [*Supported Software and Switch Types*](#)
- [*56K Modem Support*](#)
- [*New CLI Commands in R14.1.9*](#)
- [*New admin/na Parameters in R14.1.9*](#)
- [*TMUX and TSTTY*](#)
- [*Problems Resolved Since R14.1*](#)
- [*Features in Release 5.1*](#)
- [*Changes to UNIX CLIs Release 14.1*](#)

- [Changes to Annex Manager Release 3.1](#)
- [Changes to Quick2Config Annex Release 3.1](#)
- [Changes to the Network Administrator Utility \(na\) for Windows NT and Windows 95](#)
- [Changes to Remote Annex Server Tools for Windows NT R3.1](#)
- [24-Hour Unit Replacement Service](#)

Supported RAC Hardware For Release 5.3

Release 5.3 supports the following platforms:

- 5399 RAC
- 8000 RAC



Although your distribution media contain Release 5.3 for Remote Annexes, do not install Release 5.3 on any Remote Annex (that is, on any of the following platforms: RA2000, RA4000, RA6100, RA6300, RA5390, RA5391, or RA5393).



Throughout these release notes, the word “unit” is used as a synonym for “Remote Access Concentrator”.

Supported Software and Switch Types

Release 5.3 supports or is compatible with a number of operating systems, compilers, switch types, and security servers.

Supported Operating Systems

The distribution media contain binary files for the supported operating systems. When the installation script detects that there are binary files for the host operating system, it gives you the option of installing the binary files or loading the source code and compiling the software at a later time. If there are no binary files available, the script loads the source code and uses a supported compiler on the host system to build the image. If the script does not identify a compiler on your system, it ends the installation session.

Binary files and source code are provided on the distribution media for each of the following operating system versions:

- HP-UX 10.10/10.20
- IBM RS/6000 AIX 4.1.4/4.1.5
- Microsoft® Windows NT 3.51 for Intel
- Microsoft Windows NT 4.0 for Intel
- Microsoft Windows NT 4.0 for DEC Alpha
- Red Hat V4.0 Linux (2.0.18 Kernel)
- Solaris 2.4/2.5/2.5.1
- Sun Microsystems SunOS 4.1.3/4.1.4

Supported Compiler Versions

Release 14.1.9 supports the following compiler versions:

- Solaris 2.4: Workshop Compilers 4.2
- HP-UX 10.10: HP C Compiler
- SunOS 4.1.4: Bundled SunOS C Compiler
- ITRA-Linux 2.0.18: Version 2.7.2

RADIUS Server Information

The embedded RADIUS client in Remote Access Software Release 5.3 is known to be compatible with the following RADIUS servers:

- Any shipping Bay Secure Access Control (BSAC) server
- Livingston 2.01
- Ascend 22497
- Merit RADIUS 2.4.23C

SecurID/ACE Compatibility Information

Remote Access Software Release 5.3 is compatible with SecurID/ACE Server Version 2.2. Client software is supported on Windows NT versions 3.51 and 4.0, and on the following UNIX versions:

- HP-UX 10.10 and 10.20
- IBM AIX 4.1.x on RISC/6000
- Solaris 2.4, 2.5, and 2.5.1
- SunOS 4.1.3 and 4.1.4

SafeWord Compatibility Information

Remote Access Software Release 5.3 operates with Version 4.1 of the SafeWord server, and is compatible with Version 4.1 of the SafeWord UNIX client. There is no support for Windows NT.

Supported Switch Types

[Table 1](#) lists the PRI switch types supported in Release 14.1.9.

Table 1 Valid PRI switch_type Values

Protocol	switch_type	Description
T1/PRI	UST1	Used in North America
	AT9	AT&T 5ESS#9 switch
	AT4	AT&T 4ESS support
	DMS	Nortel's DMS100 switch
	NI2	A switch supporting National ISDN2
E1/PRI	ETS	Used in Europe; ETSI
	ETS-NCRC4	Used in Europe; ETSI without CRC
	AU1	Used in Australia

[Table 2](#) lists the CAS switch types supported in Release 14.1.9.

Table 2 Valid CAS switch_type Values

Protocol	switch_type	Description
Channelized T1	UST1	Used in North America
	HKT1	Used in Hong Kong
	UST1FD	US T1 with feature group D
Channelized T1 - R1	TWT1R1	Used in Taiwan
Channelized E1 - P7	SWE1P7	Used in Sweden
Channelized E1 - R2	BBE1R2	CCITT BlueBookR2; used in most of Europe, plus South Africa and Chile
	KRE1R2	Used in Korea
	BRE1R2	Used in Brazil
	IDE1R2	Used in Indonesia
	NZE1R2	Used in New Zealand
	PHE1R2	Used in the Philippines
	MYE1R2	Used in Malaysia
	THE1R2	Used in Thailand
	MXE1R2	Used in Mexico
	CNE1R2	Used in China
	ANE1R2	Used in St. Martin
	TRE1R2	Used in Turkey
	ILE1R2	Used in Israel
ARE1R2	Used in Argentina	

56K Modem Support

Release 5.3 introduces support on the 5399 RAC and the 8000 RAC for 56K modems using the Rockwell Semiconductor/Lucent Technologies K56flex protocol. Support for 56K modems using the U.S. Robotics x2 protocol (also on the 5399 RAC and the 8000 RAC) was introduced in Release 5.2.



A RAC can be configured for a single 56K protocol only; it may handle either K56flex calls or x2 calls, but not both.

General Notes on 56K Modem Support

56K modems will not work everywhere. While operating under diverse conditions, you should expect that in K56flex mode or x2 mode the system will exhibit negotiation failures, dropped calls, retrains, and renegotiations at a rate greater than that normally experienced with V.34 connections. In addition, the ability to establish a 56K connection is extremely dependent on specific line conditions. Therefore, it is normal for some users to be unable to make a 56K connection every time, or at all. In such cases, normal V.34 calls will take place.

56K modems do not offer similar performance in both directions, and both 56K protocols rely on the client modem to determine the final connect speed. They can achieve 56K throughput only when you are downloading files. Preliminary test results have shown download speeds ranging from 33.6 Kb/s to 52 Kb/s. The average download speed is in the range of 42 Kb/s to 46 Kb/s, as many industry publications have demonstrated with their benchmark testing. Your results may vary with the quality of your local phone line and the degree of multiplexing required to service your neighborhood's voice needs from your local phone company's central office. 56K modems upload at maximum speeds of 28.8 Kb/s or 33.6 Kb/s.

Notes on K56flex 56K Modem Support



Release 5.3 is not compatible with K56flex Version 1.0 or earlier. Note also that your individual modem manufacturer's software version number may be different from the corresponding version of K56flex.

Rockwell has acknowledged several problems with K56flex in an A law environment. These problems are in the K56flex protocol, and are common to all K56flex platforms. It is expected that Rockwell will release modem software that will correct this problem.

A weakness has been detected in PCM/CIA-based modems that include the Rockwell chipset. These problems can result in poor quality connections. In these cases, you might want to lower the connect speed or disable K56flex. Refer to your modem manufacturer's documentation for the specific modem command to do this.

All 56K modulations rely on the client modem to determine the final connect speed. In some cases, the speed selection algorithm used by Rockwell-based client modems may select a connect speed that is too high (often 50K), and this may result in errors or dropped calls.

Problems experienced using ZOOM modems (such as errors or dropped calls) can be reduced by lowering the maximum speed to 40K; this might not resolve the problems completely, however. The problems can be resolved by obtaining a modem software upgrade from ZOOM. All other K56flex modems tested, including Hayes, MultiTech, and Motorola, exhibit similar problems at speeds greater than 44K. You should limit the maximum speed to 44K in all A law applications via the **%digital_modem** section of the RAC configuration file.

Notes on x2 56K Modem Support

U.S. Robotics has set up a BBS where you can test your line for x2 support by dialing 1-888-877-9248 from a terminal program and logging in as LINE TEST. Refer to <http://x2.usr.com/connectnow/linetest.html> for complete details. If your phone line meets the criteria of the line test, you probably can use a 56K modem. Note, however, that a call to the U.S. Robotics test line may be routed differently than a call to your own facility. The only way to find out for certain if your line is compatible with x2 is to borrow a 56K modem and dial in to your 5399 RAC or 8000 RAC from your home or office.

The x2 protocol can be very optimistic in establishing a high speed connection. This may result in a connection that, while reporting a high connect speed, may actually underperform a V.34 connection. If this happens, you might want to disable x2 in the client modem. Refer to your modem manufacturer's documentation for the specific modem command to do this.

Using the set56k Command

The superuser CLI command **set56k** allows you to configure your RAC for 56K modem support if it does not have 56K modems enabled already. The **set56k** command uses a password as its argument; the key value indicates to the RAC which 56K modem protocol to enable. You can obtain a password from Bay Networks Customer Support via the World Wide Web; point your browser to www.baynetworks.com, then choose Service & Support, followed by Service Online.



Setting the 56K modem protocol is permanent, and can be changed only by returning the RAC to the factory for a unit swap-out.

The command syntax is:

```
set56k <key value>
```

Issuing the **set56k** command without an argument returns the name of the enabled protocol (either x2 or K56flex), or “none” if no protocol is enabled.

When you begin configuring the 56K protocol, the RAC warns you that the configuration is permanent. You can exit the configuration process at any time prior to confirming the key value you’ve entered by pressing the <Break> key. Once you have answered “yes” in response to the question “Are you sure?”, the configuration process is committed to running to completion. **The RAC then reboots automatically.**

An example configuration session follows. In this example, the specific key value that is used sets x2 as the 56K protocol; however, the procedure is identical for setting K56flex as the 56K protocol.

```
command: set56k
```

```
none
```

```
command: set56k <key value>
```

```
This will irrevocably set x2, and then reboot. Are you sure? y
```

```
Please answer yes or no: yes
```

```
Succeeded, rebooting.
```

Exchanging Your RAC

You may find that the needs of your dial-in users require you to change the 56K protocol for a RAC. Once you have configured a RAC for a 56K protocol, you cannot change the protocol.



If you need to exchange your RAC for one with a different 56K protocol, call your Bay Networks sales representative for details and instructions for making the exchange.

Accessing 56K Modem Statistics

The **histcall**, **actcall**, and **modem -s** commands display 56K speeds and modulation.

Acquiring Software Upgrades

Check the Bay Networks Customer Support page on the World Wide Web for the latest updates and patches to the digital modem code (point your browser to www.baynetworks.com, then choose Service & Support, followed by Service Online). Also, check your modem vendor's World Wide Web page or BBS for the latest release of your modem's firmware.

Digital Modem Configuration Parameter Changes

Bit settings for 17 of the digital modem configuration parameters have changed; many of the new bit settings support 56K modems. Refer to Appendix A of the manual *Managing Remote Access Concentrators Using Command Line Interfaces* for complete instructions on configuring and using these parameters.

Parameter 4

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0
Descr.	Unused								L	O	I	Mf	Hf			

Default **config_bytes** Setting:

Decimal base: 90

Octal base: 0132

Hexadecimal base: 0x5A

Hf: Host Flow Control

00: No flow control

01: Inbound flow control

10: Outbound flow control

11: Inbound and outbound flow control

Mf: Modem Flow Control

00: No flow control

01: Inbound flow control

10: Outbound flow control

11: Inbound and outbound flow control

I: Host Inbound Passthrough

0: Inbound remove

1: Inbound passthrough

O: Host Outbound Passthrough

0: Outbound no translation

1: Outbound translate to inbound

L: Host Link Passthrough

00: Inbound remove

01: Inbound passthrough

10: Inbound translate to outbound

11: Inbound translate and pass

Parameter 5

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Descr.	Unused								Reserved				R	T	L	

Default **config_bytes** Setting:

Decimal base: 1

Octal base: 01

Hexadecimal base: 0x1

L: Loss of CD

0: Disable

1: Enable

T: Tx Space Disconnect

0: Disable

1: Enable

R: Rx Space Disconnect

0: Disable

1: Enable

Parameter 6

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Descr.	Unused							Reserved			S	P		D		

Default **config_bytes** Setting:

Decimal base: 1

Octal base: 01

Hexadecimal base: 0x1

D: DCE Databits

0: Databits 7

1: Databits8

P: DCE Parity

000: Parity None

001: Parity Even

010: Parity Odd

011: Parity Mark

100: Parity Space

101: Unused

110: Unused

111: Unused

S: DCE Stopbits

0: Stopbits 1

1: Stopbits 2

Parameter 7

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Descr.	Unused							Reserved			P		D			

Default **config_bytes** Setting:

Decimal base: 1

Octal base: 01

Hexadecimal base: 0x1

D: DTE Databits

0: Databits 7

1: Databits 8

P: DTE Parity

000: Parity None

001: Parity Even

010: Parity Odd

011: Parity Mark

100: Parity Space

101: Unused

110 Unused

111 Unused

Parameter 11

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
Descr.	Unused							Lost CD Time								

Default **config_bytes** Setting:

Decimal base: 14

Octal base: 016

Hexadecimal base: 0xE

Lost CD Time: The modem waits the specified multiple of 100 milliseconds (the default value is 14, i.e., 1.4 seconds) after loss of carrier to report a failure and drop the connection.

Message: No carrier

Disconnect reason: Carrier lost

Parameter 14

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0							
Descr.	Unused								Inactivity Time-Out							

Default **config_bytes** Setting:

Decimal base: 0

Octal base: 00

Hexadecimal base: 0x0

Inactivity Time-Out: in seconds

Parameter 15

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0							
Descr.	Unused								Test Time-Out							

Default **config_bytes** Setting:

Decimal base: 0

Octal base: 00

Hexadecimal base: 0x0

Test Time-Out: in seconds

Parameter 16

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Descr.	Unused								Maximum Tx Line Speed							

Default **config_bytes** Setting (for V.34 and V.32):

Decimal base: 17

Octal base: 021

Hexadecimal base: 0x11

Default **config_bytes** Setting (for x2):

Decimal base: 52

Octal base: 064

Hexadecimal base: 0x34

Default **config_bytes** Setting (for K56flex):

Decimal base: 54

Octal base: 066

Hexadecimal base: 0x36

Maximum Tx Line Speed: The maximum transmission bit rate the modem supports.

0: Reserved

1: Speed 0 - 300

10: Speed 600

11: Speed 1200

100: Speed 2400

101: Speed 4800

110: Speed 7200

111: Speed 9600

1000: Speed 12000

1001: Speed 14400

1010: Speed 16800

1011: Speed 19200

1100: Speed 21600

1101: Speed 24000

1110: Speed 26400
1111: Speed 28800
10000: Speed 31200
10001: Speed 33600 (default for V.34 and V.32)
10010: Reserved
10011: Reserved
10100: Reserved
10101: Reserved
10110: Speed 25333 (x2)
10111: Speed 26666 (x2)
11000: Speed 28000 (x2)
11001: Speed 29333 (x2)
11010: Speed 30666 (x2)
11011: Speed 32000 (K56flex)/(x2)
11100: Speed 33333 (x2)
11101: Speed 34000 (K56flex)
11110: Speed 34666 (x2)
11111: Speed 36000 (K56flex)/(x2)
100000: Speed 37333 (x2)
100001: Speed 38000 (K56flex)
100010: Speed 38666 (x2)
100011: Speed 40000 (K56flex)/(x2)
100100: Speed 41333 (x2)
100101: Speed 42000 (K56flex)
100110: Speed 42666 (x2)
100111: Speed 44000 (K56flex)/(x2)
101000: Speed 45333 (x2)
101001: Speed 46000 (K56flex)
101010: Speed 46666 (x2)
101011: Speed 48000 (K56flex)/(x2)
101100: Speed 49333 (x2)
101101: Speed 50000 (K56flex)
101110: Speed 50666 (x2)
101111: Speed 52000 (K56flex)/(x2)
110000: Speed 53333 (x2)

- 110001: Speed 54000 (K56flex)
- 110010: Speed 54666 (x2)
- 110011: Speed 56000 (K56flex)/(x2)
- 110100: Speed 57333 (x2) (default for x2)**
- 110101: Speed 58000 (K56flex)
- 110110: Speed 60000 (K56flex) (default for K56flex)**

Parameter 18

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Descr.	Unused								Minimum TX Line speed							

Default **config_bytes** Setting:

- Decimal base: 1
- Octal base: 01
- Hexadecimal base: 0x1

Minimum Tx Line Speed: The minimum transmission bit rate the modem supports.

- 0: Reserved
- 1: Speed 0 - 300**
- 10: Speed 600
- 11: Speed 1200
- 100: Speed 2400
- 101: Speed 4800
- 110: Speed 7200
- 111: Speed 9600
- 1000: Speed 12000
- 1001: Speed 14400
- 1010: Speed 16800
- 1011: Speed 19200
- 1100: Speed 21600
- 1101: Speed 24000
- 1110: Speed 26400

1111: Speed 28800
10000: Speed 31200
10001: Speed 33600
10010: Reserved
10011: Reserved
10100: Reserved
10101: Reserved
10110: Speed 25333 (x2)
10111: Speed 26666 (x2)
11000: Speed 28000 (x2)
11001: Speed 29333 (x2)
11010: Speed 30666 (x2)
11011: Speed 32000 (K56flex)/(x2)
11100: Speed 33333 (x2)
11101: Speed 34000 (K56flex)
11110: Speed 34666 (x2)
11111: Speed 36000 (K56flex)/(x2)
100000: Speed 37333 (x2)
100001: Speed 38000 (K56flex)
100010: Speed 38666 (x2)
100011: Speed 40000 (K56flex)/(x2)
100100: Speed 41333 (x2)
100101: Speed 42000 (K56flex)
100110: Speed 42666 (x2)
100111: Speed 44000 (K56flex)/(x2)
101000: Speed 45333 (x2)
101001: Speed 46000 (K56flex)
101010: Speed 46666 (x2)
101011: Speed 48000 (K56flex)/(x2)
101100: Speed 49333 (x2)
101101: Speed 50000 (K56flex)
101110: Speed 50666 (x2)
101111: Speed 52000 (K56flex)/(x2)
110000: Speed 53333 (x2)
110001: Speed 54000 (K56flex)

- 110010: Speed 54666 (x2)
- 110011: Speed 56000 (K56flex)/(x2)
- 110100: Speed 57333 (x2)
- 110101: Speed 58000 (K56flex)
- 110110: Speed 60000 (K56flex)

Parameter 21

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Descr.	Unused							Reserved			Modulation					

Default **config_bytes** Setting (for V.34):

- Decimal base: 1
- Octal base: 01
- Hexadecimal base: 0x1

Default **config_bytes** Setting (for x2):

- Decimal base: 5
- Octal base: 05
- Hexadecimal base: 0x5

Default **config_bytes** Setting (for K56flex):

- Decimal base: 6
- Octal base: 06
- Hexadecimal base: 0x6

Modulation: Sets the maximum modulation the modem supports.

- 0: V34+ (bit rates up to 33.6Kbps)
- 1: V34 (bit rates up to 28.8Kbps)**
- 10: V32/V32bis (bit rates up to 19.2Kbps)
- 11: V22bis (bit rates up to 2400bps)
- 100: ITU-T PCM
- 101: x2 (default)**
- 110: K56flex (default)**

Parameter 26

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
Descr.	Unused								MC	AD	AB	PR	Pre-emphasis Filter			

Default **config_bytes** Setting:

Decimal base: 31

Octal base: 037

Hexadecimal base: 0x1F

Pre-emphasis Filter - Pre-emphasis is an equalization method in which the transmission signal spectrum compensates for amplitude distortion. During channel probing, the modem selects one of ten possible filters. When this option is set to **Negotiable**, the modem determines which pre-emphasis filter to use based on channel probing.
 0 - 1110: Reserved

1111: Negotiable

PR: Channel Probing - This option specifies whether or not the modem probes the phone line/channel to determine its characteristics and adjusts itself accordingly when establishing a V.34 connection.

0: Disable

1: Enable

AB: Asymmetric Baud Rates - This is the ability of the modem to operate at different baud rates for transmission and reception. It allows the modem to take advantage of differing line conditions in either direction.

0: Disable

1: Enable

AD: Asymmetric Baud Rates

0: Disable

1: Enable

MC: Mandatory Carrier Frequency - This option, effective only if Channel Probing is disabled, allows you to manually specify which carrier frequency (high or low) to use in V.34 modulation. Six baud rates are specified in V.34 modulation: 2400, 2743, 2800, 3000, 3200, and 3429. Out of these, the first five can operate at high or low carrier frequencies. During channel probing, one of these two carrier frequencies is selected in order to optimize the channel bandwidth usage.

0: Low

1: High

Parameter 30

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Descr.	Unused								P		RB	T	A/μ	D		

Default **config_bytes** Setting:

Decimal base: 3

Octal base: 03

Hexadecimal base: 0x3

D: Usb1 Early Detector - Detection of unscrambled binary ones supports V.34 modems under certain South American line conditions.

0: Disable

1: Enable

A/μ: Compander Type - Companding (compress/expand) limits the dynamic range (strongest to weakest signal) encoded into PCM (pulse code modulation) signals used by the PSTN. The U.S. and Japan utilize μlaw (mu law) companding while Europe and most of the rest of the world require A law.

0: A law

1: μ law

T: Trunk Type

- 00: PRI**
- 01: T1/E1
- 10: Reserved
- 11: Reserved

RB: Robbed Bit Signaling

- 0: Disable**
- 1: Enable

P: Higher Level Protocol Optimization

- 000: None**
- 001: PPP Framing
- 010: PPP AHDSL
- 011: Reserved
- 100: Reserved
- 101: Reserved
- 110: Reserved
- 111: Reserved

Parameter 32

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Descr.	Unused								R	p0	Reserved					

Default **config_bytes** Setting:

- Decimal base: 0
- Octal base: 00
- Hexadecimal base: 0x0

p0: lapm Negotiations via V8

- 0: Disable**
- 1: Enable

Parameter 34

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1
Descr.	Unused								R	E	V8	R	T	Eq		

Default **config_bytes** Setting:

Decimal base: 99

Octal base: 0143

Hexadecimal base: 0x63

Eq: Equalizer Type - This is for V.32 operation only and is provided to support certain international line conditions.

0: No compromise

1: Equalizer 1

10: Equalizer 2

11: Equalizer 3

T: Training Length

00: Long

01: Short

10: Ter

11: Reserved

V8: V8 Handshake - This feature must be enabled for V.34 operation.

It may be disabled to support certain non-compliant V.32bis modems.

0: Disable

1: Enable

E: V34 Extension - Often mistakenly referred to as V.34bis (this ITU specification has not been released), this option disables extended (33.6Kb/s) operation.

0: v.34 Bis

1: v.34 Extended

Parameter 35

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Descr.	Unused								CT	RL	S1	RS	Reserved		EP	

Default **config_bytes** Setting:

Decimal base: 0

Octal base: 00

Hexadecimal base: 0x0

EP: Echo Protection Tone - When this option is enabled, the modem sends an unmodulated carrier signal prior to the training and data signals to disable the telephone network echo suppressor.

0: Disable

1: Short

10: Long

11: Reserved

RS: Rx Space Disconnect - When this option is enabled, reception of a continuous space of specified duration from the remote modem will cause the modem to disconnect. The space required to cause a disconnect is either 1 second (or greater) or 2 seconds (or greater), depending on the setting of the TX/RX Space option.

0: Long

1: Short

S1: V22bis S1 Sequence - This option affects the duration of the S1 signal during a V22bis handshake. It is used to support certain older V.22bis modems.

0: 100 ms

1: 150 ms

RL: Response to RDL

0: Disable

1: Enable

CT: V25 Calling Tone - V25 calling tone. This tone is used in some international modems to identify a data call from a voice call.

0: Disable

1: Enable

Parameter 38

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Descr.	Unused							Reserved					FP	FE	NE	

Default **config_bytes** Setting:

Decimal base: 2

Octal base: 02

Hexadecimal base: 0x2

NE: Near End Echo Canceller - Echoes on the modem's phone line are due to transitions from digital or four-wire connections to two-wire analog service as found in domestic telephone connections. In most situations where the modem has a direct digital connection to the PSTN (T1, E1, or PRI ISDN), the signal is converted to two-wire analog only once, just before being routed to the subscriber's phone jack (client modem). In this case, only one echo is generated from the far end. This far end echo is expected and is compensated for by the modem's normal far end echo canceller.

In a very few situations, the telco converts the digital connection to two-wire analog and then back to digital before it is routed to the distant telco where the expected two-wire conversion is then performed. This additional conversion results in an unexpected near-end echo which may be compensated for by enabling this parameter.

This should be done only when normal operation is not possible and the telco indicates that such a conversion is taking place. Enabling this feature may result in an inability to achieve connect speeds in excess of 31.2 Kb/s. In addition, as in any situation where a downlink digital to analog conversion (PCM hop) is made, 56K (V.pcm) connections are not possible.

0 - Disable

1 - Enable

FE: Far End Echo Canceller

0: Disable

1: Enable

FP: Far End Echo PLL

0: Disable

1: Enable

Parameter 39

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Value	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Descr.	Unused								Transmit Power							

Default **config_bytes** Setting:

Decimal base: 12

Octal base: 014

Hexadecimal base: 0xC

Transmit Power, -dB

110: High Power Level

1100: Low Power Level

Known Modem Compatibility

[Table 3](#) lists modem models that are known to be compatible with Release 5.3. This list is not comprehensive; a modem's absence from this list does not mean that that modem is not compatible with Release 5.3.

Table 3 Modems Known To Be Compatible With Release 5.3

Type	Manufacturer	Model Name	Model Number
V.32t	AT&T Paradyne	Comsphere 3820	3820-A1-001
V.34	Best Data Products	Smart One 2834FX.VFX	2834FX
V.34b	Best Data Products	Smart One 336FLX	2834FLX
V.34	Boca Research	Office Communicator Internal	FDVSP34
56K	Boca Research	Bocamodem 56K INTERNET	M56E
V.34	Boca Research	Bocamodem 33,600 BPS	MV.34ED
V.34	Boca Research	Bocamodem 33,600 BPS	MV.34FEMS
V.34b	Boca Research	Bocamodem 33,600 BPS	MV.34E
V.32b	Boca Research	Bocamodem	M1440E
V.32t	BMC Box (Cadinal)	V.32 Turbo 19.2 Faster	02631
V.34	Cardinal	28.8 External V.34 Speaker (33.6)	020-0481
X2	Cardinal	56k External Fax Modem with X2	310-0029 Tradename3480
V.34b	Cardinal	33.6 Speakerphone Modem	020-053
V.34	GDC	Fast Pro	
V.34b	GlobalVillage	TelePort	A820
K56	Hayes	Accura with speakerphone V0.519DHY-K56_DLS	2975
K56	Hayes	Accura 56K + FAX V0.110HY-K56_ACF_DS2	5674US
K56	Hayes	Accura 56K + FAX V0.20HY-K56_ACF_DS2	5674US
V.34	Hayes Smartmodem	Optima 28800 V.FC Fax	5240AM
V.32b	Hayes	Optima 14400	5111AM

Table 3 Modems Known To Be Compatible With Release 5.3 (Continued)

Type	Manufacturer	Model Name	Model Number
V.34b	Hayes	Accura 288 DSVD Modem	5647US
V.34	Hayes	Optima 336 V.34/ V.FC + Fax/ Voice	5345US
V.32b	Hayes	Ultra 144 V.32bis	
K56	Maxtech Internal		
V.34b	Maxtech	NetPacer VOICE FAX MODEM	VF-1128V/R6
V.34b	Microcom	Deskporte Fast ES 28.8	
V.34	Microcom	Desk Porte FAST	
V.32b	Motorola	Codex V.32bis	3260 Fast
56K	Motorola	ModemSURFER 56K	3456 EXT MS US
V.34b	Motorola	Premier 33.6	62095419-05
V.34	Motorola	Lifestyle 28.8	
V.34	Motorola UDS	V.3400 LCD	RM16M 115V
V.34	MultiTech	Multimodem II	MT2834BL
V.34	MultiTech	Multimodem PCS	MT2834PCS
K56	MultiTech	K56Flex Data/Fax Modem	MT5600ZDX
K56	Practical Peripherals	56K Mini Tower	5677US
V.32b	Practical Peripherals	PM14400FXSA V32bis	
V.34	Practical Peripherals	PM288MT II V.FC (white case)	
V.34b	Practical Peripherals	336 Ext. Voice[External voice / Fax]	5638US
K56	Supra	Express 56	SUP2090
V.34	Supra	Express 288 PNP	
V.34b	Supra	FAX Modem 288 [33600]	
K56	Taicom Internal		
X2	US Robotics	Sportster 56k Fax modem with x2	0459

Table 3 Modems Known To Be Compatible With Release 5.3 (Continued)

Type	Manufacturer	Model Name	Model Number
V.34b	US Robotics	Sportster 33.6 Fax modem	0459
V.34	US Robotics	Sportster 28.8 V.34 & V.32bis	
V.34	US Robotics	Sportster 28800	
V.32b	US Robotics	Sportster 14.4bis with V.42 bis	
V.32b	US Robotics	Courier V.32 bis with ASL	
V.34b	US Robotics	Courier V.34+ V.Everything	
V.34b	US Robotics	Courier V.34+ V.Everything	
X2	US Robotics	Courier 56K+ V.Everything	
V.22b	Zenith	V.22bis	
V.32b	ZOOM	V.32bis	
V.34	ZOOM	V.34	
V.32b	ZOOM	FaxModem 14.4EX	165
K56	ZOOM	Zoom/FaxModem 56Kx	2849
V.32b	Zoltrix	External 14400 Voice/Fax/Modem	FM-VSP144UE
V.34	ZYXEL	Elite 2864V.34/FAX/VOICE	
PCMCIA Modem Cards			
V.34b	3Com	EtherLink III LAN+33.6	PN: 16-0034-000 REV: b
V.34b	Cardinal	33.6Kbps FAX MODEM	MVPV34PC #020-0472
V.34b	Hayes	OPTIMA 336 + FAX for PCMCIA	5347US
V.34b	IBM	28.8 Kbps/14.4 KBPS	85H4630
V.34b	Megahertz [USR]	Dell 33.6 Modem	XJ4336
V.34b	Motorola	Montana 33.6 Modem/FAX	
V.34b	MultiTech Systems	Multimodem 33.6Kbps	MT2834LTb
V.32	Practical Peripherals	ProClass 144 Data/Fax	PC144T2-EZ

Table 3 Modems Known To Be Compatible With Release 5.3 (Continued)

Type	Manufacturer	Model Name	Model Number
V.34	Psion Dacom	Gold Card 288	
K56	TDK	Cyberlink	
V.34b	Zoom Telephonic	PCMCIA FAX/MODEM 33.6 /Cell Ready	
K56	Xircom	CreditCard Modem 56	CM -56G
V.34b	Xircom	CreditCard Ethernet + Modem 28.8	PS-CEM-28
K56	ZOOM	PC Card 56k Fax Modem	2587ZP56K1062
K56	Global Village	56k Fax/Modem PC Card	A959
K56	Diamond Multimedia	Supra PC Card	

New CLI Commands in R14.1.9

Four commands have been added to the command line interface, **history**, **ppp -i**, **reset annex filter**, and **list -r**. Descriptions of **history** and **ppp -i** follow; refer to [RADIUS Filters](#) on page 34 for descriptions of **reset annex filter** and **list -r**.

history

The **history** CLI command is similar to the UNIX **history** command. By default, **history** displays the last 25 CLI commands, which is the maximum number of commands that can be shown. The command's syntax is:

history n - Display *n* previous CLI commands, up to a maximum of 25.

The **history** command incorporates four companion commands:

- **!!** - Re-issue the most recent CLI command.
- **!n** - Re-issue the *n*th CLI command.

- **Ctrl-p** - Display the previous CLI command, up to the 25th.
- **Ctrl-n** - Display the succeeding CLI command, if there is one (otherwise, nothing is displayed).

Ctrl-p and **Ctrl-n** work without a <CR>; use them to scroll backward and forward through the command history.

ppp -i

The **-i** argument now may be used with the **ppp** command. This argument displays the locally configured local and remote addresses.

New admin/na Parameters in R14.1.9

Four configuration parameters have been added.



In Release 14.1.9, these parameters can be accessed through the **admin** utility only.

Two parameters have been added to the Annex category to enable the RAC to negotiate the addresses of the primary and secondary NetBIOS name servers (per RFC 1877):

- **pref_nbns1_addr** - The IP address of the primary NetBIOS name server. The default value is 0.0.0.0.
- **pref_nbns2_addr** - The IP address of the secondary NetBIOS name server. The default value is 0.0.0.0.

Two parameters have been added to the Security category to enable an administrator to change the prompts for RADIUS user and RADIUS password. These prompts are used only when **auth_protocol** is set to **radius**, and are not used for local authentication, or when **auth_protocol** is set to **acp**.

- **radius_user_prompt** - The RAC's RADIUS login prompt string. The default string is **Annex%susername%c**.
- **radius_pass_prompt** - The RAC's RADIUS password prompt string. The default string is **Annex%spassword%c**.

RADIUS Filters

RADIUS filters now reside on the unit, rather than on the RADIUS server.

The unit reads these filters when it boots, and stores the filters in memory, applying them only to Framed PPP or SLIP users. This is achieved through the use of a **%filters** section in the unit's configuration file. An example **%filters** section follows:

```
%filters
begin_filter blockhost
output include ip dst_addr 132.245.33.8 discard
end
```

The **%filters** section begins with the keyword **%filters** and ends with the beginning of the next keyword section or with the end of the file. One or more **%include** statements can be used in the section to include filter definitions from other configuration files on the boot server or the local system.

The keyword **begin_filter**, followed by the filter's name, introduces each individual filter definition. The filter's name is case-sensitive and can be up to 23 characters long. The keyword **end** terminates each filter definition.

Each line of the filter definition is the same as a RADIUS VSA Annex-Filter string. (This is the same as the **filter** subcommand **add** in the CLI, but without the **add** command or the interface specification.)

A filter definition consists of these arguments, which are explained in [Table 4](#):

<direction> <scope> <family> <criteria> <actions>

Table 4 Filter Definition Arguments

Argument	Valid Values	Description
direction	input, output	This value specifies the direction of packets to which to apply the filter.
scope	include, exclude	This value causes the filter to be inclusive or exclusive.
family	ip	In Release 5.3, only IP is available for this argument.
criteria	dst_addr, dst_port, src_port, src_address, address_pair, port_pair, protocol	These are the conditions on which the filter accepts or rejects packets.
actions	discard, icmp, syslog	The action which may be performed upon meeting the criteria.

The **reset annex filters** command causes the unit to discard the filter definitions in memory and read them again from the **%filters** section of the configuration file. This also happens if you issue the **reset annex all** command.

The **filter** subcommand **list** now accepts the argument **-r**; this displays the loaded filters.

TMUX and TSTTY

As of Release 5.3, support for TMUX and TSTTY is discontinued. This is an issue only for customers who are using Remote Annexes.

Known Problems/Limitations in R14.1.9

- Setting the port mode to **ARAP** causes the unit to dump a core file when it receives a call.
- ATCP works only if the port mode is set to **ppp**. ATCP will not work if the port mode is set to **auto_adapt** or **auto_detect**.
- The RAC's K56flex DSP code (K0_54_26) does not support dialout; the RAC's x2/V.34 code (R1_00_54) does support dialout, however.

Problems Resolved Since R14.1

SPR 11117

Tunnel key decryption of the RADIUS received encrypted attribute is now supported on the unit.

SPR 9594

The unit should no longer panic when receiving CHAP challenges.

SPR 10519

LAT HIC printing should no longer skip the last few characters of a file.

SPR 11019

CCP should no longer panic.

SPR 11241

The unit now supports the use of the Domain Name Server Option (option 6) and NetBIOS over TCP/IP Name Server Option (option 44) from DHCP for the DNS and NBNS address requests during IPCP negotiations.

SPR 11253

RADIUS filters now reside on the unit, reducing additional network traffic and making them easier to manage.

SPR 10851

Switch type INE1R2_2 now is recognized by the WAN Manager.

SPR 11128

The unit no longer responds to ICMP router solicitations when **routed** is set to **no**.

SPR 11246

The event log parsing function now parses the log correctly.

SPR 11247

The parameters **pref_nbns1_addr** and **pref_nbns2_addr** have been added for primary and secondary NBNS (WINS) addresses per RFC 1877.

SPR 11368

PRI E1 SNG no longer is detected incorrectly as T1.

SPR 10954

You can change the unit's username and password prompts via embedded RADIUS using the parameters **radius_user_prompt** and **radius_pass_prompt**.

SPR 10954

The **ppp -i** command has been added.

Features in Release 5.1

The following sections describe the features supported in Release 5.1:

- [*Bay Networks Remote Access Concentrators \(RACs\)*](#)
- [*BayDSP \(Digital Signal Processing\) Modem Technology*](#)
- [*AFD \(Automatic Firmware Download\) Changes*](#)
- [*Single Number ISDN Dial-Up*](#)
- [*Channel and Modem Error Detection*](#)
- [*Obsolete option_key Parameter*](#)
- [*Embedded RADIUS Client*](#)
- [*Multi-System Multilink PPP*](#)
- [*Long User Names*](#)
- [*V.110 Rate Adaption Support*](#)
- [*X.75 Rate Adaption Support*](#)
- [*PPP Connections Over External Synchronous Port*](#)
- [*Data Compression Card*](#)
- [*Corrections to Embedded RADIUS Client Documentation*](#)
- [*Call Disconnect Reasons*](#)
- [*RADIUS Attributes - Additional Information*](#)

[Table 5](#) summarizes new feature support by platform.

Table 5 New Feature Support

		Platform								
		RA2000	RA4000	RA5390	RA5391	RA5393	RA 6100	RA 6300	5399 RAC	8000 RAC
Feature	RAC								X	X
	DSP modems								X	X
	Automatic Firmware Download				X	X	X	X	X	X
	Single number dial-up					X		X	X	X
	Channel and modem error detection								X	X
	Obsolete option_key	X	X	X	X	X	X	X	X	X
	Embedded RADIUS client	X	X	X	X	X	X	X	X	X
	Multi-System Multilink PPP					X		X	X	X
	Long user names	X	X	X	X	X	X	X	X	X
	V.110 support					X		X	X	X
	X.75 support					X		X	X	X
	PPP over synchronous port									X
	Data compression card								X	X

Bay Networks Remote Access Concentrators (RACs)

The 5399 RAC and the 8000 RAC introduce a number of new features.

The 5399 RAC is a member of the existing 539x family of Remote Access products built for the Bay Networks 5000 hub. The new high-performance Remote Access Concentrator features industry-leading dial access density, security, call management, and BayDSP integrated Digital Signal Processing (DSP) modem technology. The modular design of the Bay Networks carrier-class remote access concentrator solution enables flexible, high-performance configurations and consolidates all remote access traffic from dial-in analog and ISDN ports as well as industry-standard WAN and remote connection types onto a single, integrated module. The product provides two PRI lines or Channelized T1/E1 lines with support for up to 48 industry-standard V.34 33.6 Kb/s digital modems for North American networks or 62 modems for international networks with built-in redundancy. Up to 576 digital modems can be configured in a single 5000 MSX chassis, and 2,304 digital modems per standard 8-foot carrier-class cabinet for North America. Up to 744 digital modems per 5000 MSX chassis are supported for international networks.

The 8000 RAC is a standalone version of the 5399 RAC, and offers all of the features furnished by the 5399 RAC, plus an external synchronous port. Both RAC models also support an optional data compression card.

BayDSP (Digital Signal Processing) Modem Technology

Digital modems provide more density, reliability, and statistical information pertaining to calls. Existing analog modem technology does not allow for migration to new industry standards without significant hardware changes. DSP technology is programmable, allowing quick adoption of new standards and customized features.

AFD (Automatic Firmware Download) Changes

This section describes a new superuser CLI command, **afd**, and other changes to AFD not reflected in the Release 5.1 UNIX documentation.

The afd Command

The new superuser **afd** command allows manual downloading of firmware for a designated WAN module. The syntax is:

afd *device* [*filename*]

[Table 6](#) describes the arguments.

Table 6 Arguments for the **afd** Command

Argument	Description
<i>device</i>	Specifies the WAN module firmware to be downloaded. Use ct12 to designate WAN 1, and ct13 to designate WAN 2. ct12 and ct13 are the channels over which the firmware is downloaded.
<i>filename</i>	<p>Specifies the name of the load host file containing the firmware to be downloaded. If this argument is omitted, afd checks /usr/spool/erpcd/bfs/afd_list to determine the file to be downloaded.</p> <p>If you specify <i>filename</i>, the firmware in that file is downloaded once. When you reboot, the firmware file downloaded reverts to one of those listed in afd_list – unless download wan never or download wan check is specified in the configuration file. If download wan check is configured, AFD performs all the requisite testing for a download, but does not actually carry out the download. Test results are syslogged; you can then issue or not issue the afd command based on those results.</p> <p>Additional information on AFD and afd_list follows this table and is also contained in the manual <i>Managing Remote Access Concentrators Using Command Line Interfaces</i>.</p>

How AFD Works

The Automatic Firmware Download software starts when the RAC boots or when the **afd** command is issued. The software reads the **/usr/spool/erpcd/bfs/afd_list** file, which is a text file listing the firmware file names, hardware-type strings, switch types, and version strings. AFD uses this file to validate the image(s) stored in the WAN module(s).

The contents of the **afd_list** file follow. Each line contains two fields, a file name and version information, separated by white space. The version information is divided into three fields, separated by semicolons (;). The first field is the hardware type; the second field is the switch type (as set by the WAN **switch_type** parameter); and the third field is the version string.

```
# This file is generated automatically. Do not edit.
#
# Any "PRI X1" image can go on any "PRI X1" or "CAS X1" module.
# "CAS X1" images may go only on "CAS X1" modules or on "PRI X1"
# modules where the DSP presence has been detected.
#
pri_t1-1_128 PRI T1 USA|PRI T1;DMS|AT5|AT9|NI2;VERSION A MGR=1.128

pri_e1-1_68 PRI E1 ETSI|PRI E1;ETS|ETS-NCRC4;VERSION A MGR=1.68

pri_csu-1_222 CAS T1 CSU|PRI T1 USA CSU|PRI T1 CSU;AT9|DMS|NI2;VERSION A MGR=1.222

pri_4ess-1_13 PRI T1 4ESS CSU;AT4;VERSION A MGR=1.13

pri_aus-1_35 PRI E1 AUSTEL;AU1;VERSION A MGR=1.35

pri_sng-1_3 PRI E1 SINGAPORE;SNG;VER=VERSION A MGR=1.3

cas_elt1-1_39 CAS T1 CSU|CAS
E1;UST1|TWT1R1|HKT1|KRE1R2|BRE1R2|BBE1R2|SWE1P7|IDE1R2|TWT1|NZE1R2|PHE1R2|
THE1R2|MYE1R2|ARE1R2|CNE1R2|MXE1R2|ANE1R2|TRE1R2|ILE1R2|UST1FD;
VERSION CAS-E1T1-1.39

mod_mic-2_4_812880;;2.4.81/85

pri_dgt-1_2 PRI T1 TAIWAN CSU;DGT;VERSION AMGR=1,2

pri_hkt-1_3 PRI T1 HONGKONG CSU;HKT;VERSION AMGR=1.3
```

AFD interprets **afd_list** as follows:

- If the switch type set via the WAN **switch_type** parameter does not match any of the switch types in **afd_list**, no firmware is downloaded. If the switch type *does* match an entry in **afd_list**, AFD checks the entry's hardware type.
 - If the hardware type is "CAS T1.*" or "CAS E1.*" and the firmware in the WAN module is "CAS T1.*" or "CAS E1.*", the version is checked. If the version in **afd_list** does not match the version in the module, the firmware is downloaded.
 - If the hardware type is "CAS T1.*" and the firmware in the module is "PRI T1 USA" or "PRI T1 CAS", the module is tested to determine whether or not it can run CAS firmware, and, if it can, the firmware is downloaded.
 - Similarly, if the hardware type is "CAS E1.*" and the firmware in the module is "PRI E1.*", the module is tested for running CAS, and, if CAS can be run, the firmware is downloaded.
 - AFD does not accept an EXPLICIT command to force download "csu_e1t1-1_38" if the ATVER string is "PRI E1". This means that a T1 CAS module that has been accidentally loaded with the wrong code (PRI E1) can not be recovered. The command **afd ct12 cas_e1t1-1_38** causes AFD to download "pri_e1-1_23", because **afd_list** specifies this as the proper code for a PRI E1 module.
 - If the hardware type is "CAS T1.*" or "CAS E1.*" and there is no firmware in the module, the switch type is ignored, and the firmware image downloaded is the one appropriate for the first hardware type (CAS T1 or CAS E1) in **afd_list** that matches the hardware type of the module. Subsequently, AFD checks to see whether or not the module can run the CAS image appropriate for the switch type. If so, the firmware for that image is downloaded.



An empty module is rare and is usually the result of an interrupted download.

Single Number ISDN Dial-Up

The single number ISDN dial-up feature allows you to configure the unit to discriminate automatically between the various protocols that may be used for dial-up over ISDN. This allows you to lower operating costs by purchasing a single dial-in number to cover all remote access needs, rather than having separate numbers for TA (V.120 and V.110), synchronous PPP, and modem users. The design of this method great flexibility to determine how to handle calls because it does not require any particular disposition of a call solely based on the protocol in use. Instead, the session parameter block (SPB) mechanism is used to determine how to handle the call after the protocol has been detected, and a set of carefully chosen defaults allows simple configuration.



X.75 connections require a separate number, since X.75 is not autodetecting in this release.

Channel and Modem Error Detection

The RAC detects call errors by comparing counts of different events in the progress of calls coming in through channels (for CAS only) and modems. The error counts are kept separately because modems are assigned to channels dynamically, and are not mapped directly. Mismatches between the event counts for a call on a channel or modem indicate errors in the call. A call fails if it does not reach DCD assertion, or, in the case of a non-modem call, if it is not assigned to a device successfully. Failed calls for each channel or modem are counted as well, and when the count of consecutive failures reaches a specified threshold value, three events occur: a syslog message is sent, an SNMP trap is sent, and the corresponding channel or modem is taken out of service (busied-out). The intent of this is to notify a network administrator who can examine and correct the problem.

Busied-out channels and modems can be returned to service with the appropriate CLI commands, or by rebooting the RAC.

Counting the Call Events

The following events are counted for each incoming call on a channel:

Table 7 Call Event Descriptions

Event	Description
SEIZE	This message from a WAN module to a WAN manager process on the main processor indicates that the central office switch has sent a channelized T1/E1 seize event.
RING	This message from a WAN module to a WAN manager process on the main processor indicates that a call has arrived.
Modem/device assignment (start of session)	
CONNECT	This message from the WAN module to the WAN manager process means that the RAC has accepted the call and the WAN module and the CO have agreed that the call has been established.
Chat process	This process tells the modem to answer and waits for DCD.
DCD assertion	The modem has connected successfully with the remote modem.

Modems count only three of these events: modem assignment, the chat process, and DCD assertion.

For non-modem calls, the chat process and DCD assertion are not counted or don't occur at all. The call is considered to be successful once a device has been assigned.

The table below shows some possible causes for counts which are less than that of their preceding event:

Table 8 Event Count Discrepancy Causes

Missing Event	Description	Cause
RING	Call aborted, "short seize".	The T1/E1 is misconfigured, or the caller hung up.
Modem assignment	No modem available.	Not enough modems, or some modems have been removed from the pool.
CONNECT	Call aborted, "short seize".	The T1/E1 is misconfigured, or the caller hung up.
Chat process finished	Modem error or hang-up.	This may be caused by the modem.
DCD assertion	Modem did not establish a connection with its peer.	There are many possible causes for this, among them: <ul style="list-style-type: none"> • Modem error. • Bad data from a bad channel. • Low end-to-end line quality. • Noise. • The caller hung up. • The calling device wasn't a modem.

Specifying the Consecutive Failure Threshold

Error reporting is configurable through the use of two SNMP annex parameters, **ds0_error_threshold** for channel event counts, and **modem_error_threshold** for modem event counts. Each parameter specifies the number of consecutive failures to reach DCD assertion that is allowed before busying out the channel or modem and sending a syslog message and SNMP trap. Each value is a 16-bit unsigned number, allowing a range of values from 0 to 65535. The default value for both parameters is 0, meaning that no action is taken for failures.



Be careful not to set these values too low; this can cause modems or channels to be disabled improperly.

Displaying the Call Event Counts

There are two new superuser CLI commands for viewing call event counts: **inchanerr** and **inmoderr**.

The **inchanerr** command shows the progress of incoming calls for each CAS channel on a WAN interface, displaying counts for the seize, ring, assignment, connect, answer (chat process), and DCD events, as well as the consecutive failure count. The syntax for the command is:

```
inchanerr wan=<range> channel=<range>
```

The channel event counts are displayed by WAN number and channel number. Event counts are not displayed if the WAN uses PRI.

The **inmoderr** command shows the progress of incoming calls for each digital modem on the RAC, displaying counts for the assignment, answer (chat process), and DCD events, as well as the consecutive failure count. The syntax for the command is:

```
inmoderr modem=<range>
```

Issuing either command without arguments displays the event counts for all channels or all modems, respectively. Issuing either command with the flag **-f** displays only those channels or modems that have consecutive failure counts greater than 0.

Resetting the Consecutive Failure Counts to Zero

The consecutive failure counts for a range of channels or modems can be reset by issuing the **inchanerr** command or the **inmoderr** command with the **-c** flag. The first example below clears the consecutive failure counts for channels 1 through 23 on WAN 1; the second example clears the consecutive failure counts for modems 1 through 48:

```
inchanerr -c wan=1 channel=1-23
inmoderr -c modem=1-48
```

Consecutive failure counts are reset in the following cases as well:

- A successful modem call clears the consecutive failure count for the corresponding channel and modem.
- A successful non-modem call clears the consecutive failure count only for the corresponding channel.

Obsolete option_key Parameter

As of Release 5.1, all RACs and Remote Annexes are shipped with IP, IPX, AppleTalk, and TN3270 keys included. Although not reflected in the Release 5.1 documentation, setting the **option_key** parameter is no longer required for enabling these features; now they are enabled by default.

LAT is the only software protocol available that is optional and that requires a key. A key, or password, is needed to enable 56K modem support as well.

Since the features now enabled by default consume a significant amount of memory, you may want to disable those that you do not use. To do so, use the Annex parameter **disabled_modules**.



The **lat_key** parameter must be set in order to enable LAT.

Embedded RADIUS Client

Release 5.1 includes an embedded RADIUS client. This feature enables you to use a Remote Annex or RAC in conjunction with the following RADIUS servers:

- Any shipping BSAC server
- Livingston 2.01
- Ascend 22497
- Merit RADIUS 2.4.23C

RADIUS is an IETF-developed protocol that defines a communication standard between a Network Access Server (NAS), a Remote Annex or RAC in this case, and a host-based communication server.

RADIUS operates in three modes:

- RADIUS Authentication includes authentication of the dial-up user to the RADIUS server, as well as authentication of the RADIUS server to the NAS. RADIUS supports the authentication modes PAP (Password Authentication Protocol), CHAP (Challenge Handshake Authentication Protocol), and user name/password validation. Authorization is sent back to the client by the server.
- RADIUS Accounting defines a communication standard between a NAS and a host-based accounting server. It records duration of service, packet throughput, and raw throughput.

- RADIUS Authorization; a user's authorization information is supplied by the RADIUS server.

You can use the embedded RADIUS client independently, with the RAC's authentication protocol set to RADIUS, or you can use erpcd as a proxy RADIUS client running under the ACP authentication protocol.

Note that the capabilities provided by the proxy RADIUS client running under the ACP authentication protocol are a subset of those provided by the native RADIUS client; any transactions that take place between the proxy RADIUS client and ACP also take place when the authentication protocol is RADIUS.

Multi-System Multilink PPP

Release 5.1 supports multi-system Multilink PPP (MMP) on platforms that support PRI connections: RA 6300, RA 5393, 5399 RAC, and 8000 RAC.

MMP is a superset of Multilink PPP, allowing MP links belonging to the same MP bundle to terminate on multiple RACs. The RACs are combined together in an MMP group to use all of the incoming channels in the group, increasing the potential bandwidth of an MP bundle. An MMP group is a set of one or more RACs that act as a single entity for any MP links that terminate on any of the RACs in the group; all members of an MMP group must reside on the same Ethernet segment. MMP groups usually are organized to correspond to telco hunt groups.

Bay Networks RAs and RACs support MMP for incoming calls only. The locations of the MP links are completely transparent to remote users; users need (and receive) no information about which unit terminates a given MP link. The location of the MP bundle head is determined by the bundle discovery protocol. Layer 2 Tunneling Protocol (L2TP) tunnels MP links to remote MP bundle heads, ensuring that successive links on one unit in an MMP group are combined into the same bundle as the primary link on another unit.

MMP is disabled by default, through the annex parameter **mmp_enabled** set to **n**. To enable MMP, you must set **mmp_enabled** to **y** and configure the global port or inbound channels for MP, if you have not done so already.

Long User Names

Release 5.2 supports user names of up to 128 characters.

V.110 Rate Adaption Support

Release 5.2 supports the V.110 rate adaption protocol. V.110 data is handled as TA data, similar to V.120 and X.75 calls.

X.75 Rate Adaption Support

Release 5.2 supports the X.75 rate adaption protocol. X.75 data is handled as TA data, similar to V.120 and V.110 calls. X.75 calls are not autodetected in Release 5.2, however, and all X.75 calls must be directed to a separate phone number.

PPP Connections Over External Synchronous Port

The Model 8000 RAC includes a general synchronous port, which has a physical connector associated with it. This general synchronous port constitutes its own port class (GSY).

The GSY port is a dedicated PPP connection, and is not allocated dynamically like other port classes on the RAC. Like other sync ports (class SYN), the GSY port is configured as a route in the **%dialout** section of the configuration file. The GSY port does not require any dialout activity to instantiate the route, however; the route is brought up as soon as it receives valid PPP frames from the associated port. The route remains active until the **net_inactivity** timer expires.

The status of the GSY port is displayed along with that of the other port classes when you issue the **stats** command.

Data Compression Card

The Model 5399 and Model 8000 RACs support an optional data compression card which provides a hardware implementation of Stac LZS compression and Microsoft's Point-to-Point Compression Protocol (MPPC). The compression card removes the burden of data compression from the RAC's CPU, and provides a more efficient implementation of the supported compression methods. The card compresses data at 2.5Mbytes/sec and decompresses at 5Mbytes/sec, and supports up to 128 LZS or 64 MPPC full-duplex histories.

Corrections to Embedded RADIUS Client Documentation

This section contains corrections to the Embedded RADIUS Client information appearing in the manual *Managing Remote Access Concentrators Using Command Line Interfaces*.

The **radius_acct_level** parameter value **basic** has been renamed to **standard**. (The other available value for this parameter is **advanced**.)

The default value of the **radius_acct_port** parameter has been changed to **1646**. (Previously, the default value was **1813**.)

The default value of the **radius_auth_port** parameter has been changed to **1645**. (Previously, the default value was **1812**.)

The unit of measure associated with the **radius_timeout** parameter is seconds.

The RADIUS attributes **Unassigned(17)**, **Unassigned(21)**, **Termination-Action(29)**, **Proxy-State(33)**, **Login-LAT-Group(36)**, **Framed-AppleTalk-Link(37)**, **Framed-AppleTalk-Network(38)**, and **Framed-AppleTalk-Zone(39)** are not supported in this release.

RADIUS Attributes - Additional Information

After changing the setting of the **auth_protocol** parameter, you must reboot the unit in order for the change to take effect.

The **Annex-System-Disconnect** attribute (Bay Networks VSA 44) is supported. This integer attribute describes the system disconnect code, and is logged in RADIUS Accounting Stop messages. The reported values are shown in [Table 9](#).

Table 9 RADIUS Attributes

Value	Description
0	Unknown
1	Telephone disconnect: caller hung up
2	Dial failed
3	WAN manager error
4	Disconnect reset
5	Error from adm_notify()
6	Modem down from adm_notify()
7	PPP protocol disconnect
8	Inactivity timer (port data)
9	CLI “hangup” command
10	CLI last-job
11	Max logon or Session-Timeout timer
12	Normal slave termination (net disc)
13	Abnormal termination (TCP RST, other)
14	DCD wait (probably modem conn) failed
15	param cli_inactivity
16	Port was reset, probably by admin
17	CLI authentication failed
18	Slave port authentication failed
19	PPP PAP failed
20	PPP CHAP failed
21	We reset modem

Table 9 RADIUS Attributes (Continued)

Value	Description
22	Modem dead
23	PPP LCP negotiation failure
24	PPP last NCP failure (IPCP)
25	PPP last NCP failure (IPXCP)
26	PPP last NCP failure (ATCP)
27	PPP last NCP failure (CCP)
28	PPP last NCP failure (MP)
29	PPP last NCP timeout (IPCP)
30	PPP last NCP timeout (IPXCP)
31	PPP last NCP timeout (ATCP)
32	PPP last NCP timeout (CCP)
33	PPP last NCP timeout (MP)
34	PPP initialization failed
35	PPP unknown disconnect reason code
36	PPP dialback
37	PPP address in use
38	PPP no device
39	PPP modem hangup signal received
40	PPP hangup signal received
41	PPP termination signal received
42	PPP kill signal received
43	PPP time signal received
44	PPP no memory
45	PPP connection abort

Table 9 RADIUS Attributes (Continued)

Value	Description
46	PPP VPN LCP phase failure
47	PPP VPN AUTH phase failure
48	PPP MP invalid port configuration
49	PPP invalid operation for device type
50	PPP MMP bundle discovery failure
51	DVS registration failure
52	DVS home agent deregistration
53	DVS tunnel no renew
54	DVS tunnel expired

Annex-Modem-Disconnect (Bay Networks VSA 45): This integer attribute describes the disconnect reason reported by the modem. The reported values are shown in [Table 10](#).

Table 10 Modem Disconnect Reasons

Value	Description
0	Unknown
1	Local host disconnect (RAC hang-up)
2	CD timer expired
3	Reserved
4	Protocol disconnect by remote modem
5	Clear-down
6	Long space disconnect
7	Carrier lost
8	Retrain timeout

Annex-Disconnect-Reason (Bay Networks VSA 46): This integer attribute describes the composite disconnect reason reported by the unit. Essentially, this attribute is the more important of the **Annex-System-Disconnect** and **Annex-Modem-Disconnect** reasons. Its values are the same as those from **Annex-System-Disconnect** with the addition of those listed in [Table 11](#).

Table 11 Unit Disconnect Reasons

Value	Description
100,002	Local host disconnect
100,003	CD timer expired
100,004	Reserved
100,005	Protocol disconnect by remote modem
100,006	Long space disconnect
100,007	Carrier lost
100,008	Retrain timeout

Annex-Transmit-Speed (Bay Networks VSA 50): This integer equals the modem transmit speed (user download speed) in b/s.

Annex-Receive-Speed (Bay Networks VSA 51): This integer equals the modem receive speed (user upload speed) in b/s.

CLI IP Host Filtering - Corrected Information

The correct format for the values of the Bay Networks vendor-specific RADIUS attributes **Annex-Host-Restrict** and **Annex-Host-Allow** is **a.b.c.d n,n,n-n**, where **a.b.c.d** is the affected host's IP address and **n,n,n-n** is the list of affected ports on that host. The host's IP address and the list of ports must be separated by a single space. A "0" in any of the IP address fields matches any host on the corresponding subnet.

Call Disconnect Reasons

The 5399 RAC and 8000 RAC provide call and modem disconnect reasons through the CLI **histcall** command, through the SNMP MIB objects `callHistDisconnectReason`, `callHistAsyModemDisconnectReason`, and `callHistCompositeDisconnectReason`, and through RADIUS accounting attributes.

The following definitions apply to an overall “success” indication:

- Graceful disconnect.
- Forced disconnect - The system shuts down the user per the administrator’s instructions. This is used for inactivity timers, resets, etc.
- Authentication/authorization error.
- Indeterminate - This could be either successful or unsuccessful; there are a number of possible explanations for the disconnect, but there is not enough information to know which one for certain.

[Table 12](#) reports the disconnect reason that the RAC reports.

Table 12 Disconnect Reason Descriptions

Disconnect Reason	Success Indication	Explanation
Unexpected	Indeterminate	An unexpected condition has occurred. More details can be determined by examining the disconnect conditions for each system component (host and modem). This condition should occur rarely.

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
CD Timer Expired	Unsuccessful	<p>The local (RAC) modem did not detect carrier within the designated amount of time. This usually occurs because someone dialed the number to make a normal voice call, i.e. there was no modem at the calling end.</p> <p>Note that you can set the time to wait for CD via the modem configuration parameters. The default is 45 seconds. Typically, you should not change this setting.</p>
No Carrier	Unsuccessful	<p>The modem trained but the system never got DCD. Note that this condition is different from carrier lost, which implies that DCD had been reached at some time.</p>

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
Carrier Lost	Indeterminate	This indicates that the received signal was lost for a consecutive time longer than the debounce timer (1.4 seconds) without starting to retrain and the call terminated. This could be due to a problem with the telephone carrier, bad phone line, bad cable, or most likely, the user turned the modem off.
Modem Reset	Forced	The administrator reset the modem.
WAN/Channel Reset	Forced	The administrator reset the WAN (e.g., issued the adm reset wan command, reset a channel, or issued a WAN loopback command).
Dead Modem Reset	Unsuccessful	The RAS reset the modem because it did not respond to the host.

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
Modem Protocol - Remote	Graceful	<p>This indicates a modem protocol teardown by the modem at the remote end. The client software initiated a modem hangup request via the modem's AT command set. This would likely be due to the user requesting a termination of the session.</p> <p>Specifically, the remote (dial-in) modem dropped the call upon command from the link protocols, such as V.42bis or MNP, from the remote modem.</p>
Modem Cleardown	Graceful	<p>Cleardown is the same as "Modem Protocol - Remote", except that it deals with V.32 instead of V.34.</p> <p>This condition could be caused by the user pulling out the modem's RS232 cable, or, more likely, turning the computer (not modem) off.</p>

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
Modem Long Space	Graceful	Long space deals with the physical layer of the modem and does not require a link protocol. This is a disconnect mode that is used by the remote modem when there are no link protocols (the modem is in “dumb” mode). In this case, the modem requesting the teardown sends a “long space,” which is interpreted by the receiving modem as a hang-up request.
Retrain timeout	Unsuccessful	The modem hung up because it failed to negotiate a retrain (within 20 seconds), probably due to poor line conditions.
Telephone Disconnect	Indeterminate	The caller/switch hung up.
DialFailed	Unsuccessful	Busy or disconnect was received from the switch when attempting to place an outgoing call.

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
pppTerm	Graceful	The remote side initiated an LCP terminate. This would likely be due to the user requesting a termination of the session.
InactivityTimer	Forced	The timer defined by the administrator for the net_inactivity or inactivity_timer parameter expired, and the call was terminated by the system.
HangupCmd	Graceful	The user executed the CLI hangup command.
Last Job	Graceful	The timer defined by the cli_inactivity parameter was set to immediate and the last CLI job was exited.
MaxLogon	Forced	The timer defined by the administrator for the max_logon parameter expired, and the call was terminated by the system.
SlaveNormal	Graceful	Normal disconnect (from LAN side) when connected to a port from the network, i.e. slave port.

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
Slave Error	Unsuccessful	Abnormal termination, e.g. TCP RESET, when connected to a port from the network, i.e. slave port.
CLI Inactivity Timer	Forced	The timer defined by the administrator for the parameter cli_inactivity expired, and the call was terminated by the system.
Port Reset	Forced	The administrator reset the port, e.g. adm reset port .
CLI Auth Fail	Authentication/authorization	Failed CLI authentication/authorization.
slave Auth Fail	Authentication/authorization	Failed Port Server, i.e. outgoing call, authentication/authorization.
pppPapFail	Authentication/authorization	Failed PPP PAP authorization.
pppChapFail	Authentication/authorization	Failed PPP CHAP authorization.
pppLcpFail	Unsuccessful	LCP Negotiations Failed (locally) due to bad configuration. This could also be caused by an abnormal disconnect.

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
pppLastNCPFailIpcp	Unsuccessful	The NCP protocol (IPCP) failed negotiations, and all other NCP protocols failed before IPCP or were not negotiated at all.
pppLastNCPFailIpxcp	Unsuccessful	The NCP protocol (IPXCP) failed negotiations, and all other NCP protocols failed before IPXCP or were not negotiated at all.
pppLastNCPFailAtcp	Unsuccessful	The NCP protocol (ATCP) failed negotiations, and all other NCP protocols failed before ATCP or were not negotiated at all.
pppLastNCPFailCcp	Unsuccessful	The NCP protocol (CCP) failed negotiations, and all other NCP protocols failed before CCP or were not negotiated at all.
PppLastNCPFailMp	Unsuccessful	The NCP protocol (MP) failed negotiations, and all other NCP protocols failed before MP or were not negotiated at all.

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
PppLastNCPToIpcp	Unsuccessful	The NCP protocol (IPCP) failed due to protocol timeout, and all other NCP protocols failed before IPCP or were not negotiated at all.
pppLastNCPToIpxcp	Unsuccessful	The NCP protocol (IPXCP) failed due to protocol timeout, and all other NCP protocols failed before IPXCP or were not negotiated at all.
pppLastNCPToAtcp	Unsuccessful	The NCP protocol (ATCP) failed due to protocol timeout, and all other NCP protocols failed before ATCP or were not negotiated at all.
pppLastNCPToCcp	Unsuccessful	The NCP protocol (CCP) failed due to protocol timeout, and all other NCP protocols failed before CCP or were not negotiated at all.
PppLastNCPToMp	Unsuccessful	The NCP protocol (MP) failed due to protocol timeout, and all other NCP protocols failed before MP or were not negotiated at all.

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
pppInitFailed	Indeterminate	PPP not configured properly.
pppUnknownCode	Indeterminate	Code not defined for call management.
pppDialback	Graceful	Call Disconnect for purpose of dialback.
pppAddrInuse	Unsuccessful	Duplicate Address found in the Annex Routing of arp table which is caused by faulty configuration by either the user or the Annex administrator.
pppNoDevice	Unsuccessful	Problem with device during PPP Connection. This is considered a fatal internal problem, which is probably a major flaw or bug.
pppModSigHangup	Indeterminate	The PPP link received a low level device disconnect, which could be from a number of reasons.
pppSigHangup	Forced	A device reset for the device associated with the PPP link.
pppSigTerm	Indeterminate	Another process associated with PPP (such as MP) has requested the link come down.

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
pppSigKill	Indeterminate	Caused by an emergency abort within the system.
pppSigTime	Forced	Caused by an inactivity timer (ppp inactivity, or port inactivity) which caused the link to be shut down.
pppNoMem	Unsuccessful	Not enough memory was available to perform a PPP operation. This could indicate the need for more memory to be added to the system, or a flaw in the system.
pppConnAbort	Indeterminate	Connection aborted for any number of reasons. It is especially applicable when tunneling.
pppVpnLcpFail	Unsuccessful	For PPP links on VPN devices only, the inheritance of LCP options via an L2TP tunnel call failed.
pppVpnAuthFail	Unsuccessful	For PPP links on VPN devices only, the inheritance of Authentication information via an L2TP tunnel call either was missing or was invalid.

Table 12 Disconnect Reason Descriptions (Continued)

Disconnect Reason	Success Indication	Explanation
pppMpBadPortCfg	Unsuccessful	A port or channel was incorrectly configured for MP link processing.
pppInvOpDevType	Unsuccessful	Operation attempted for PPP link was invalid due to the device type.
mmpBunDiscFail	Unsuccessful	An MP link failed because a fatal error occurred when attempting MMP Bundle Discovery to find the MP Bundle Head.
dvsRegFail	UnSuccessful	A DVS tunnel call failed due to a problem registering via TMS.
dvsHaDereg	Indeterminate	The Home agent was deregistered from TMS, causing a tunnel failure.
dvsTnlNoRenew	Indeterminate	A DVS network address was not renewed, causing the tunnel to come down.
dvsTnlExpire	Indeterminate	The DVS tunnel expired which caused the tunnel to go down.
l2tpCallFail	Unsuccessful	An L2TP tunnel request failed, bringing the link to be tunneled down.
l2tpCallDiscNotify	Indeterminate	The L2TP tunnel call was signaled to terminate.

Remote Access Software Release 5.1 Corrections

SPR 10952

The calling number is included now in **erpcd** proxy RADIUS accounting messages.

SPR 10229

erpcd RADIUS class attributes now work with the Bay Networks Secure Access Control (BSAC) address pool.

SPR 10686

erpcd RADIUS now supports user names of up to 128 characters.

SPR 9824

The framed IP address is now included in the RADIUS accounting file.

SPR 9941

A PPP termination with data enqueued for output on a busy unit no longer causes mbuf corruption.

SPR 9937

The **stats -T** command now handles current PRM correctly.

SPR 9939

When you reset a WAN module from **admin**, the SYN front panel LED no longer stays illuminated.

SPR 9950

CCP BSD Compress now complies with RFC 1977.

SPR 9955

Handling of V.120 for dialback has been added.

SPR 8739

Port server connections show the username instead of “---” when the **who** command is executed.

SPR 9923

The RAC call history now records up to five disconnect events for each call, in the order that they occur. Usually, the first event is the cause of the call going away, and the other events are resulting stages of taking down the call.

SPR 9977

PPP termination with data enqueued for output on a busy box no longer causes mbuf corruption.

SPR 10210

DOS CR/LF handling functions only on non-macro entries; macro entries are treated as is.

SPR 9936

Log-in and log-out mechanisms are available for Annex web pages.

SPR 10137

The default port mode on all PRI products has changed from **cli** to **auto_adapt**.

SPR 10255

RIP updates should no longer stop on PPP interfaces.

SPR 9540

Annex printing no longer causes the Annex to panic.

SPR 10434

The **reset annex all** command now correctly updates modem type definitions in Annex memory, depending on the new list of session parameter blocks.

SPR 9991

The **rip_force_newrt** parameter allows you to tune the amount of time the RAS allows a primary router to send periodic RIP updates. If the RAS does not hear from the primary router within this timeout period, and a secondary router broadcasts a valid replacement route, the replacement route takes precedence regardless of the metric. The default state for this parameter is 0 (off), which disables the feature. The parameter can be set for 1 to 255 seconds (the real internal minimum is 5 seconds).

SPR 10483

The **answer_delay** keyword is available for SPBs. This keyword takes a single decimal argument in seconds. The keyword specifies the delay for answering the call to putting the modem or other resource (sync, TA) on the channel. The default value is 2 seconds for SPBs that set **call_action modem** when **call_action detect** is not in use for that call. The default is 0 for all other SPBs.

SPR 10457

USR 28.8 and 33.6 Sportster modems now work with the RA2000/4000 product line.

SPR 10568

The **pool** keyword in **acp_userinfo** now recognizes **ta**.

SPR 10494

Annex prompts are no longer displayed with CLI hooks.

SPR 10525

Autodetect mode now works for Trumpet and other PPP clients.

Changes to UNIX CLIs Release 14.1

This section describes changes to the UNIX command line interfaces for Release 14.1 of the Remote Annex/RAC operational code.

Known Problems/Limitations

- If you are using acp logging, you need to be certain that you have sufficient disk space available for log messages. If both the primary and secondary acp hosts run out of disk space, the unit will cache acp messages while it waits for space on the host to be freed. The unit will hang if it uses all of its storage space.
- In order to install the host tool sources for Linux and compile successfully, a preliminary step is required if you are running a release of Linux that includes the Linux 2.0 kernel (such as Redhat Linux or Slackware 3.1).

Under these releases of Linux, a bug in one of the system include files will prevent the remote access software from compiling successfully on your host, and must be repaired before the remote access software is installed.

To repair the file, follow these steps:

1. Edit the file **/usr/include/time.h**.
2. Go to line 121.
3. Change the first instance of the keyword "const" to "**__const**", as it is in all the other uses of the keyword in this file.

Line 121 as shipped:

```
extern int nanosleep __P((const struct timespec
    *__rntp,
```

Line 121 after editing:

```
extern int nanosleep __P((__const struct timespec
    *__rntp,
```

4. Save the file and exit the editor.

- V.FC (Fast Class) and V.FAST modems are not supported by BayDSP Digital Modems.
- The current alarm status for PRI/T1 isn't reported through SNMP.
- The version of BayDSP Digital Modem code included in Release 5.2 does not support MNP modems. If the originating modem only supports MNP, the connection will be made in a non-error correcting mode.
- V.verbo operation (a 19.2 Kb/s mode of operation similar to V.FC) may operate with some modems but is not supported with this release.
- The version of BayDSP Digital Modem code included in Release 5.1 supports speeds from 2400 b/s (V.22bis) up to 33.6 Kb/s (V.34bis). Support for 300 b/s (Bell 103A) and 1200 b/s (Bell 212A) will be added to a future release.
- Support for 56K modes of operation will be provided in Release 5.2 (x2) and Release 5.3 (K56flex).
- The following modems are known to exhibit compatibility problems with the BayDSP digital modems:
 - AT&T Paradyne Comsphere 3810
 - AT&T Paradyne 3740-A1-201
 - Motorola Codex 3261
 - UDS V.3225
 - Diamond Telecommander 2500 and 3500
 - Racal V.34 models 3292 and 3264
 - GVC 33.6
- The ISDN TAs listed below are known to have compatibility problems running Multilink PPP with the RA 6300, RA5393, 5399 RAC, and 8000 RAC models. However, running single-link PPP with these TAs on those models is supported:
 - Courier I-Modem (firmware version 2.1.4)
 - Zyxel2864I (firmware version 2.05)

- When a voice call is placed to a RAC (PRI) and no modems are available, the caller will get a ring-no-answer signal rather than a busy signal.
- If you are using a BitSurfer PRO, the BitSurfer Configuration Manager software does not set all the parameters necessary to make async PPP or MP connections. They must be set manually to the following:

```
AT&F&C1&D2\Q3%A2=95@M2=P@B0=1%A4=0
```

(put this in the **setup** string in your dialer).

Change **B0=1** to **B0=2** for 2-channel MP.

- In Release 14.1, TMS is not backward-compatible with the Release 14.0 database. You must run the convert utility in order to make the database compatible.
- Security does not work on the VCI type CLI.
- The UNIX installation script currently recognizes and installs software on many platforms other than those that are officially supported by this release. Please see the section [Supported RAC Hardware For Release 5.3](#) for the list of officially supported platforms.
- In some instances, AFD does not update the Microcom modem firmware properly. If this happens, use **admin** to issue the **modem all** command, then the **set modem busy_out n** command, and reboot the unit.
- When using the **cli** option from the Console monitor prompt to start a CLI session, always close the session (hang-up) and return to the Console monitor before rebooting or resetting the 5399 RAC. Otherwise, it is possible to get the RAC Console monitor into an inaccessible state, which will then require the unit to be physically removed/reinserted in the 5000 hub. This is especially likely if the Hub Supervisory **Reset module** command is executed when a CLI session is left open from the Console monitor.

- IPX dialup addressing is completely rearranged when **address_origin** is set to **local** and the addresses are to be selected from the WAN; the remote addresses are set to 0.0.0.0. An example of the WAN setup follows (the format of the screen text has been altered slightly to fit the page):

```

WAN B/DS0 Channel Parameters

remote_address:
  0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0
  0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0
  0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0
  0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0
  0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0

ipx_network:*
  a00000ab a00000b7 a00000c3 a00000cf
  a00000db a00000e7 a00000f3 a00000ff
  a000000b a0000017 a0000023 a000002f
  a000003b a0000047 a0000053 a000005f
  a000006b a0000077 a0000083 a000008f
  a000009b a00000a7 a00000b3 a00000bf

ipx_node:*
  00-00-00-00-00-aa 00-00-00-00-01-54 00-00-00-00-01-fe
  00-00-00-00-02-a8 00-00-00-00-03-52 00-00-00-00-03-fc
  00-00-00-00-04-a6 00-00-00-00-05-50 00-00-00-00-05-fa
  00-00-00-00-06-a4 00-00-00-00-07-4e 00-00-00-00-07-f8
  00-00-00-00-08-a2 00-00-00-00-09-4c 00-00-00-00-09-f6
  00-00-00-00-0a-a0 00-00-00-00-0b-4a 00-00-00-00-0b-f4
  00-00-00-00-0c-9e 00-00-00-00-0d-48 00-00-00-00-0d-f2
  00-00-00-00-0e-9c 00-00-00-00-0f-46 00-00-00-00-0f-f0

      THESE ARE THE NEGOTIATED ADDRESSES:

*** NCP (IPXCP) Status ***

Options          Local:          Remote:
Network No       a0              a0000083
Node No          00802d054ac4   000000000c9e
Compression      Telebit 15/ 0   Telebit 15/ 0
Routing Prot     RIP/SAP        None
Router Name      LM054AC4       None
  
```


SPR 10025

The UNIX installation can install the host tool sources on nonsupported UNIX platforms.

SPR 10269, 10270, 10271

Deficiencies in the help for the **admin** CLI.

SPR 10610

You must specify wan=1 for the CLI **admin** command you are using, even if the RAC contains only a single WAN interface.

SPR 10367

Compiling the UNIX host tools on Solaris 2.5 generates nonfatal compiler warnings.

SPR 10893

The Ascend RADIUS server does not authenticate SecurID users when it receives authentication requests from the embedded RADIUS client.

SPR 8482, 9901

SNMP does not report input or output frame or byte counts for the T1 and E1 interfaces.

SPR 10846

V.110 and X.75 connections are reported as V.120 calls in the RADIUS accounting logs.

SPR 10653

You cannot expire old passwords and enter new passwords using the Windows NT **erpcd** server.

SPR 10585

The Windows NT install shield appears to hang during server tool installation. Please be patient; it will complete the installation.

SPR 10037

The RA 6300 and RA 5393 support the **actcall/histcall** CLI commands, but not all modem information is available with those commands.

SPR 10380

If you boot a RAC from another RAC, issuing the **stats** command on the booted RAC displays corrupted statistics.

Changes to Annex Manager Release 3.1

System Requirements

Annex Manager Release 3.1 runs on several popular UNIX systems. The following sections list the hardware and software requirements for installing and running Annex Manager.

For all systems, a minimum of 10MB of free disk space must be available prior to installation. A minimum of 32 MB of RAM is recommended, although specific memory requirements will vary, depending on the type of workstation and the other tasks that may be concurrent with Annex Manager. In all cases, a color monitor or X Windows terminal is recommended, although Annex Manager is usable with a monochrome X Windows terminal.

Sun Requirements

Annex Manager runs under Sun OS releases 4.1.3c and 4.1.4 and Solaris releases 2.4 and 2.5.1 on SPARC systems. The following patches are required for SunOS versions earlier than 4.1.3c:

- Patch number 100444-48 OpenWindows 3.0: OpenWindows V3.0 Server Patch 3000-86.
- Patch number 100492-01_09 OpenWindows 3.0: jumbo patch for olwm 3.0.

HP Requirements

Annex Manager runs under HP-UX 10.10 and 10.20 on HP 9000 Series 700 Workstations.

IBM Requirements

Annex Manager runs on IBM RS/6000 workstations under AIX 4.1.4 and 4.1.5.

Remote Display Requirements

If you use Annex Manager on an X Windows terminal, Bay Networks recommends that you have more than 2MB of RAM to avoid problems when you have multiple windows open simultaneously.

New Features and Commands

Annex Manager Release 3.1 supports the model 5399 and model 8000 RACs. For more information on the new RAC product features and commands, please see other sections of these release notes and the revised *Annex Manager User's Guide* included with your documentation.

Known Problems/Limitations

The following items are problems and limitations of Annex Manager Release 3.1:

- If you select a PRI-supporting unit (RA 6300, RA 5393, 5399 RAC, or 8000 RAC) and you change the switch type, you should ignore the resulting error message:

```
<annex_name (node port 0)> anxt1CasDnisDigits :  
Parameter cannot be set: it does not exist or is read-  
only.  
  
There was an error setting one or more parameters.  
This may be due to a timeout.
```
- There is no online help available for the Reset options, which follow editing the configuration file. If you change the configuration file using Annex Manager, a dialog box appears with the various Reset options that you can select.

- Annex Manager will crash occasionally if you try to go into Setup mode when running SunOS 2.5.1.
- On AIX UNIX platforms, in the Setup>Security screen, the Security/Incoming On/Off buttons are misaligned with the text fields. This may be due to fonts not being installed on the system.
- Customize mode is not supported for this release.

Changes to Quick2Config Annex Release 3.1

System Requirements

- Hardware/software requirements - 80486 100MHz recommended
- Monitor - VGA or SVGA
- RAM - 8MB minimum; 16MB recommended for Windows 95; 32MB recommended for Windows NT
- Free space on hard drive - 6MB for Windows 95 and Windows NT
- Mouse - Microsoft compatible
- Communications stack - compatible with the standard TCP/IP stacks included with Windows NT and Windows 95

Known Problems/Limitations

The following items are problems and limitations of Quick2Config Annex Release 3.1:

- If you select a T1-supporting unit (RA 6100, RA 5391, 5399 RAC, or 8000 RAC) in the tree, then select the WAN Interface tab, you should ignore the resulting error message:

```
<annex name> 1.3.6.1.4.1.15.2.11.2.1.15.2 Error:MIB  
Variable doesn't exist
```

- You should ignore the following erroneous error message:
MSVCR_T40.dll can not be found
- PRI in and out statistics show no activity even though PRI has been in use.
- Clicking on the <http://www.baynetworks.com> URL in the World Wide Web help page brings up an error message.
- In the Basic Dial Access tab, if an inappropriate or out of range value is applied, a MIB error appears on the screen instead of an appropriate error message.
- If there is a device in the list that has become unreachable, selecting it can cause Quick2Config to crash occasionally. This happens rarely and randomly, and only if the device is unreachable and is in an unknown state.
- In the WAN interface tab, switch types are not dimmed by module type. For example, even though the WAN is running a channelized T1 protocol, the E1 switch types (Korea, China, Brazil, etc.) are still available. If you select an E1 switch type for a T1 module (or vice-versa), the unit may enter an erroneous state.
- The following screens are not available for RACs in this release:
 - WAN Internal Modems
 - PRI channels
 - PRI Internal CSU
 - T1 Internal CSU
 - T1 Modem Calls

Corrections to Quick2Config Annex Release 3.1

SPR 10518

Quick2Config Annex no longer crashes when there are multiple units in the list and you select the WAN tab.

SPR 9155

You can use Quick2Config Annex to set all valid combinations of PPP interface protocols.

Changes to the Network Administrator Utility (na) for Windows NT and Windows 95

Hardware/Software Requirements

You must use the following hardware and operating system version to use the **na** utility on Windows NT or Windows 95:

- Personal computer - 80486 100MHz recommended
- Monitor - VGA or SVGA
- RAM - 8MB minimum; 16MB recommended for Windows 95; 32MB recommended for Windows NT
- Free space on hard drive - 1MB
- Microsoft-compatible Mouse
- CD-ROM (required for initial installation)
- Windows 95, Windows NT 3.51, or Windows NT 4.0

Special Considerations

The **na** utility no longer requires that you have administrator privileges on an NT host to make changes to the configuration of the RAC. You should set the superuser password on the unit to prevent unauthorized access.

Changes to Remote Annex Server Tools for Windows NT R3.1

System Requirements

You will need the following to install and run Remote Annex Server Tools for Windows NT Release 3.1:

- A 486 or greater CPU with a minimum of 32MB of RAM, or a DEC Alpha CPU with a minimum of 32MB of RAM
- A server running Windows NT Version 4.0, configured to support TCP/IP
- Administrative privileges on the server
- At least 10MB of free disk space on an NTFS drive
- Four or more formatted 3.5 inch 1.44MB floppy disks, if you choose to create a set of installation diskettes
- A CD-ROM drive for installation of the software

Installing Windows NT Server Tools

The installation instructions for Windows NT Server Tools state that you must run the **setup.exe** file for both Windows NT 3.51 and 4.0. This is true only for Windows NT 3.51; if you are using Windows NT 4.0, the **seteup.exe** file will run automatically.

Manually Removing Remote Annex Server Tools for Windows NT

Presently, there is no uninstall program included in this release. You will have to manually remove the program and files if you want to uninstall them. Use the following procedure to remove the program:

1. **Go to the Control Panel > Services and stop Annex erpcd, Annex syslogd, and Annex timed.**
2. **Start the registry editor:**
 - a) For **Windows NT 3.51**, you can find the registry in **\windows_install_dir\system32\regedt32.exe**. Remove the following keys:

HKEY_LOCAL_MACHINE (on the local machine)

SOFTWARE

Bay Networks

Remote Annex Server Tools (and all subkeys)

HKEY_LOCAL_MACHINE (on the local machine)

SOFTWARE

RAPProduct

HKEY_LOCAL_MACHINE (on the local machine)

SYSTEM

CurrentControlSet

Services

erpcds, syslogd, timed (three separate keys)

HKEY_LOCAL_MACHINE (on the local machine)

SYSTEM

CurrentControlSet

Services

EventLog

Application

ANNEX syslog, Annex_ACP, Annex_syslog (three separate keys)

HKEY_LOCAL_MACHINE (on the local machine)

SOFTWARE

PROGRAM GROUPS

Bay Networks (To avoid removing Q2CAnnex or NA icons, go to the group and delete the icons for the Remote Annex Server Tools for Windows NT)

b) For **Windows NT 4.0**, you can find the registry file in **\windows_install_dir\regedt.exe**. Remove the following keys:

HKEY_LOCAL_MACHINE (on the local machine)

SOFTWARE

Bay Networks

Remote Annex Server Tools (and all subkeys)

HKEY_LOCAL_MACHINE (on the local machine)

SOFTWARE

RAProduct

HKEY_LOCAL_MACHINE (on the local machine)

SYSTEM

CurrentControlSet

Services

erpcds, syslog, timed (three separate keys)

HKEY_LOCAL_MACHINE (on the local machine)

SYSTEM

CurrentControlSet

Services

EventLog

Application

ANNEX syslog, Annex_ACP, Annex_syslog (three separate keys)

Go to Settings > Taskbar > Start Menu Programs > Advanced and delete the Bay Networks Remote Annex programs.

3. Go to the File Manager or Explorer and delete the following files/directories:

Delete the installation directory **c:WIN32APP\BayNet\RAAnnex** and its files.

Delete the installation backup directory **c:WIN32APP\BayNet\RAAnnex.bak** and its files.

Delete the directory **c:\bfs** and its files.

Delete the directory **c:\etc** and its files.

4. Reboot the system.

Known Problems/Limitations

- You should halt all **erpcd** processes running in debug mode prior to installing Remote Annex Server Tools for Windows NT.
- Installing Remote Annex Server Tools for Windows NT on a system that has **erpcd** running causes the following error:
An application error has occurred and an application log is being opened erpcd.exe
Exception: access violation (0xc0000005), Address: 0x004152276
- In order to run the **erpcd** authentication function under debug mode, you need special privileges. Use “Act as operation system” from the Windows NT user manager to resolve the problem.
- You must use care when transferring **acp_files**, etc. from UNIX hosts to Windows NT hosts, because the end-of-line characters are different. To avoid this problem, use a utility such as **unix2dos** (available on the World Wide Web).

- Remote Annex Server Tools for Windows NT do not support the following UNIX utilities:
 - aprint - the Remote Annex printer utility
 - ch_passwd - the Remote Annex user password change utility
 - ien116d - the IEN-116 name server
 - rtelnet - remote telnet
- This release of the Remote Annex Server Tools for Windows NT supports up to two units booting or dumping from/to a server simultaneously and up to 10 user login requests per minute per server.
- Remote Annex Server Tools for Windows NT R3.1 does not allow the **config.annex** file to be correctly uploaded to the unit during booting. A workaround for this problem is to use **ftp** to put the **config.annex** file on the EEPROM on the Annex and set the **load_dump_seq** to **net,self**.
- Occasionally, installation will not be able to shut down the Annex time service in an existing installation of the Remote Annex Server Tools for Windows NT R3.1. This is exhibited by a long pause before the file copying process starts and an error message in writing the registry after files are copied. The installation fails. One workaround is to reinstall. The second install succeeds. A second option is to use control panel services to shut down the Annex processes manually and then install.
- During the installation of Remote Annex Server Tools on Windows NT 4.0, the install shield appears to hang. The wizard asks you twice for the appropriate geographic location, and when you click the “Next” button, the application appears to hang, not responding to mouse-clicks or keystrokes. After a few minutes, the installation process proceeds normally.

24-Hour Unit Replacement Service

This service is named “Next Day With Labor - BJ 2300.” You must follow the procedures in this section in order for the Next Day With Labor Service Agreement to be honored.

Saving the RAC Configuration

When you have finished configuring your RAC, Bay Networks recommends that you save your configuration to a host file. This ensures that you will have the configuration at your disposal in the event that the configuration file becomes damaged in any way, or otherwise needs to be replaced. Keeping a backup of the configuration file greatly simplifies the reconfiguration process, should you need to do it.

This procedure guides you through saving the configuration using the **na** utility. By default, **na** is installed in the **/usr/annex** directory for UNIX and in the **win32app\Annex** directory for Windows NT. You can change this location from its default during the installation process. Supported platforms and requirements are listed in [Known Problems/Limitations](#) on page 75.



Passwords and option keys (except for the 56K password) are not saved when you save the configuration file using the **na write** command. These values must be restored individually if the unit is replaced or the configuration is changed or erased. Note that 56K passwords are an exception to this rule; these passwords are saved, and cannot be changed.

On a UNIX host, you can start **na** by typing **.na** from the directory in which you installed **na**. On a Windows NT host, you can either double-click on the **na** icon or use File Manager and click on **na.exe**.



You must have root permission on the host.

To save a RAC's configuration:

1. At the command prompt, issue this command:

command: **annex** <IP address>

This identifies the RAC to which you will issue subsequent commands.



The next prompt might not be a command prompt. You will be prompted for a password if one is specified for the RAC.

2. You now see the RAC IP address, the RAC type, and the version of code that it is running. To save the configuration to a file: for UNIX:

command: **write** <IP address> <filename.param>

for Windows NT):

command: **write** <IP address> <filename.txt>

This creates a file with a file name you specify. It places this file in the same directory from which you are running **na**. The file name should identify the RAC for which you are saving the configuration.

The **write** command for Windows NT works the same as the UNIX **write** command, but it puts the file in a form that Notepad can read.

3. To exit the utility, enter:

quit

The following is a typical login procedure prompting you for a password (on Windows NT, only the first line is different):

```
# /usr/annex/na
command: Annex 192.32.30.49
Password for 192.32.30.49 <unknown>: abc
192.32.30.49: Micro-Annex-UX R11.1, 8 async ports
command: write 192.32.30.49 annex.param
command: quit
```

Excerpts from a sample **annex.param** file follow:

```
# Annex 192.32.30.49
echo setting Annex parameters
set annex subnet_mask 255.255.255.0
set annex pref_load_addr 192.32.30.30
set annex pref_dump_addr 192.32.30.30
set annex load_broadcast N
set annex broadcast_addr 192.32.30.255
set annex load_dump_gateway 0.0.0.0
set annex load_dump_sequence net,self
set annex image_name "oper.56.enet "
set annex motd_file "motd"
set annex config_file "config.Annex"
set annex authoritative_agent Y
set annex routed Y
set annex server_capability none
set annex disabled_modules atalk,ipx,vci
set annex tftp_load_dir "10.0//"
set annex tftp_dump_name ""
set annex ipencap_type ethernet
set annex ip_forward_broadcast N
.
.
.
echo setting parameters for interface asy8
set interface=asy8 rip_send_version compatibility
set interface=asy8 rip_rcv_version both
set interface=asy8 rip_horizon poison
set interface=asy8 rip_default_route off
set interface=asy8 rip_next_hop needed
set interface=asy8 rip_sub_advertise Y
set interface=asy8 rip_sub_accept Y
set interface=asy8 rip_advertise all
set interface=asy8 rip_accept all
```

You may want to create a backup directory elsewhere and copy this file into that directory. This ensures that there is no chance of the file being corrupted or otherwise changed when you upgrade the unit.

Restoring the RAC Configuration

This process is necessary for restoring a configuration to a RAC.

Placing the File onto the RAC

If you have previously saved a RAC configuration in a file on a UNIX or Windows NT host, you can use that file to configure a new unit.



The new unit must have an IP address assigned to it already. See [Using monitor Mode to Provide an IP Address for a New Unit](#) on page 96 for basic instructions on booting a unit. Complete instructions are in the hardware installation manual for your unit.

Also, passwords and keys are not saved, and must be restored individually.

If you plan to edit the configuration file that you are going to place on another RAC, copy the file and rename it before you start making changes. Pay special attention to unit-specific parameters such as **local_address** and **remote_address**.

On a UNIX host, you can start **na** by entering **./na** from the directory in which you installed **na**. On a Windows NT host, you can either double-click on the **na** icon or use File Manager and click on **na.exe**.



You must have root permission on the host.

To restore a RAC's configuration:

1. **At the command prompt, enter the following:**

```
command: annex <IP address*>
```

This identifies which RAC you want for subsequent commands.

2. **(For UNIX) command: read <filename.param >**
(For Windows NT) command: read <filename.txt>

This copies the **filename.param** file to the RAC that you specified and changes the parameters to ones specified in the file.

3. command: **quit**

This exits **na**.



The script file does not contain the IP address of the unit; this allows you to transfer the file from one unit to another. However, you must be careful if you have specified IP addresses specified for the ports; they will be copied to the new unit. Remember that you cannot have the same IP addresses across different units; IP addresses must be unique.

The following is a sample of **login** and **read** commands on a UNIX host (on Windows NT, only the first line is different):

```
#!/usr/annex/na
command: Annex 192.32.30.49
Password for 192.32.30.49 <unknown>: abd
192.32.30.49: Micro-Annex-UX R11.1, 8 async ports
```

```
command: read annex.param
setting annex parameters
setting parameters for async port 1
setting parameters for async port 2
setting parameters for async port 3
setting parameters for async port 4
setting parameters for async port 5
setting parameters for async port 6
setting parameters for async port 7
setting parameters for async port 8
setting parameters for interface en0
setting parameters for interface asy1
setting parameters for interface asy2
setting parameters for interface asy3
setting parameters for interface asy4
setting parameters for interface asy5
setting parameters for interface asy6
setting parameters for interface asy7
setting parameters for interface asy8
command: quit
```

Using monitor Mode to Provide an IP Address for a New Unit

If you are configuring a new RAC, you must use the monitor prompt to assign an IP address to the RAC. You need the following equipment to do this:

- A terminal (VT100, laptop, etc.).
- A straight-through RJ45 cable.
- A console terminal adapter. If you are using a laptop, you typically need a DB25 to DB9 converter, straight-through.

To assign an IP address to a RAC:

1. **Insert the RJ45 connector in the console port of the RAC.**
2. **Set your terminal to the following settings:** 9600 baud, 8 data, 1 stop, no parity, and XON/XOFF.
3. **Insert the other end of the RJ45 connector into the console adapter and connect the console adapter to your laptop.**
4. **Turn on the RAC.**
5. **As soon as the unit powers up, all of the LEDs come on; wait for any one of the LEDs to go out, then press the Test button.**
6. **Wait approximately one to two minutes and press the <Return> key. The monitor prompt resumes.**
7. **At the monitor prompt you can start setting the IP address and the initial configuration parameters. Enter `addr` to make these initial configuration settings.**
8. **Check the boot sequence by typing `seq`. Since you are booting from the network, set it to `net,self`. `self` can be set only if the option was purchased for that particular unit.**
9. **Check the image to make sure that it is the correct operational image. Enter `image` to verify this.**
10. **Enter `boot`, then press <Return> to boot the RAC. A steady stream of dots appears on the screen and eventually ends at the `eof`.**
11. **At the `eof`, press <Return> to access the console monitor or `annex:` prompt, depending on the type of unit you are working with.**
12. **Use `na` to configure the RAC.**

