CHAPTER 4

Configuring the AccessPro PC Card

This chapter describes the procedures for configuring the AccessPro PC card and contains the following sections:

- Configuring the AccessPro Card Using AutoInstall
- Configuring the AccessPro Card Using the Setup Routine
- Configuring the AccessPro Card without Using the Setup Routine
- Configuring the ISDN Interface
- Using Windows NT with the AccessPro Card
- For Further Information

You should follow the configuration procedure that best fits the needs of your PC and network configuration.

Configuring the AccessPro card requires terminal emulation software. You can use Configuration Builder software to create the configuration file you will use with your AccessPro card. If you have an ASCII configuration file already prepared, you should install manually without using the setup routine.

Note You can boot and configure your AccessPro card from a Trivial File Transfer Protocol (TFTP) server that is attached to the same LAN as the AccessPro card. This process is referred to as netbooting. Follow the instructions in the section “Loading Software Images from a TFTP Server” in the chapter “Maintaining the AccessPro PC Card” to netboot your AccessPro card.

Configuring the AccessPro Card Using AutoInstall

The AutoInstall process is designed to configure the AccessPro card automatically after connection to a WAN. In order for AutoInstall to work properly, a Transmission Control Protocol/Internet Protocol (TCP/IP) host on your network must be preconfigured to provide the required configuration files to the AccessPro card. The TCP/IP host is typically a UNIX-based system. The TCP/IP host may exist anywhere on the network, as long as the following two conditions are maintained:

1. The host is on the opposite side of the AccessPro card's serial connection to the WAN.
2. User Datagram Protocol (UDP) broadcasts to and from the AccessPro card and the TCP/IP host are enabled.

This functionality is coordinated by your system adminstrator at the site where the TCP/IP host is located. You should not attempt to use AutoInstall unless the required files have been provided on the TCP/IP host.

Before performing the AutoInstall process, power on the PC, start the terminal emulation software, and initiate a console session.

AutoInstall Process

Once you have initiated a console session, the AccessPro card loads the operating system image from Flash memory. If the remote end of the WAN connection is connected and properly configured, the AutoInstall process begins. This process consists of the following operations:

1. The AccessPro card sends a Serial Line Address Resolution Protocol (SLARP) packet over the serial line. When the packet reaches the opposite end of the WAN connection, the remote router replies with the Internet Protocol (IP) address of its serial interface. The AccessPro card increments the serial interface address by one and assigns this address to its own serial interface. This process takes approximately one minute.

Note The remote router's IP address must have a 1 as the fourth byte—for example, 127.100.21.1.

---

2 After the serial interface on the AccessPro card is assigned a valid serial interface IP address, the AccessPro card resolves its host name. It sends a TFTP request on the serial line for the configuration file called network-confg. If the TCP/IP host responds with this file, AutoInstall searches the file's contents for the host name associated with its IP address.

3 If the TCP/IP host does not respond with the network-confg file, AutoInstall broadcasts a reverse domain name server request containing the IP address for the AccessPro card's serial port that it was assigned over the network. If the domain name server services have been set up, AutoInstall resolves the AccessPro card's name from this file.

4 After the IP address and host name have been found, AutoInstall broadcasts a TFTP request to the TCP/IP host for the file called hostname-confg. If this file has been set up by the system administrator, it is downloaded automatically to the AccessPro card's memory, completing the configuration.

Once the AutoInstall has completed successfully, you should copy the configuration data to the AccessPro card's NVRAM and reset the configuration registers. (See the following section, "Copying Configuration Data to NVRAM.")

If the AutoInstall process does not complete successfully, configure the AccessPro card using the setup routine, following the instructions in the section "Configuring the AccessPro Card Using the Setup Routine" later in this chapter.

Copying Configuration Data to NVRAM

To copy the configuration data to the AccessPro card's NVRAM and reset the configuration registers, perform the following steps:

Step 1 Enter the command **enable** at the EXEC prompt to enter privileged EXEC mode. Configuration changes can only be made in privileged EXEC mode.

```
Hostname> enable
```

Step 2 Enter the enable password that was configured into the AccessPro card by the AutoInstall process:

```
Password:*******
```

Step 3 Enter the command **copy running-config startup-config** at the Hostname# prompt:

```
Hostname# copy running-config startup-config
```

Entering this command will save the configuration settings that the AutoInstall process created in the AccessPro card. If you fail to do this, your configuration will be lost the next time you reload the AccessPro card.

Note If you are using Cisco Internetwork Operating System (Cisco IOS) software earlier than Release 11.0, enter the command **write memory** to save the configuration settings created during the AutoInstall process.

Step 4 You can check the value of the configuration settings by entering the command **show version** at the Hostname# prompt:

```
Hostname# show version
.
.
configuration register is 0x0 (will be 0x2102 at next reload)
```

If the AutoInstall feature is not set up, or if your AccessPro card is unable to locate the appropriate files, you should configure the AccessPro card using the setup routine or manually, without using the setup routine.

Configuring the AccessPro Card Using the Setup Routine

If you do not plan to use AutoInstall, disconnect the AccessPro card's serial (WAN) cable from the CSU/DSU and from the AccessPro card before using the setup routine. The AccessPro card will attempt to run AutoInstall whenever you start it if the serial (WAN) connection is connected and the AccessPro card does not have a configuration stored in NVRAM. Disconnecting this cable will prevent the AccessPro card from attempting to run the AutoInstall process.

Warning Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages. (To see translated versions of this warning, refer to the appendix "Translated Safety Warnings.")

It can take several minutes for the AccessPro card to determine that AutoInstall is not set up on a remote TCP/IP host. Once the AccessPro card has determined that AutoInstall is not configured, it will default to the setup routine. If the serial (WAN) cable is not connected, the AccessPro card will boot from Flash memory and go into the setup routine.

Note You can run the setup routine any time you are at the privileged EXEC prompt (#) by entering the **setup** command.

Take the following steps to complete the setup routine:

Step 1 When you have booted from Flash memory, the following information will appear after about 30 seconds. When you see this information displayed, you have successfully booted your AccessPro card. Enter **yes** or press **Return** to enter the initial configuration dialog.

```
Booting igs-bfpx.100-2.5 from Flash address space
F3: 3324128+95896+305628 at 0x3000060

               Restricted Rights Legend

Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.

               Cisco Systems, Inc.
               170 West Tasman Drive
               San Jose, California 95134-1706

Cisco Internetwork Operating System Software
Cisco IOS (tm) 3000 Software (IGS-BFPX), Version 10.0(2.5),
Copyright (c) 1986-1995 by cisco Systems, Inc.
```

```
Compiled Sat 25-Jul-95 19:17 by daveu
cisco AP-EC (68030) processor (revision A) with 4096K/2048K bytes of
memory.
Processor board serial number 01240319
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
Bridging software.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
Authorized for Enterprise software set.  (0x0)
1 Ethernet/IEEE 802.3 interface.
1 Serial network interface.
1 PCbus interface.
32K bytes of non-volatile configuration memory.
4096K bytes of flash memory sized on embedded flash.

Enter “yes” to start the initial configuration.
Would you like to enter the initial configuration dialog? [yes]: yes
```

Step 2 To configure global parameters, choose what protocols to support on your Ethernet or Token Ring interface. For IP-only installations, you can accept the default values (in brackets) for most of the questions by pressing **Return**. A typical configuration follows; you will enter your own host name and passwords:

```
         --- System Configuration Dialog ---

At any point you may enter a question mark '?' for help.
Refer to the 'Getting Started' Guide for additional help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

Continue with configuration dialog? [yes]: yes

First, would you like to see the current interface summary? [yes]: yes

Interface   IP-Address     OK?  Method    Status             Protocol
Ethernet0   172.22.9.181    YES  NVRAM     up                  up
BRI0         1.1.1.2        YES  NVRAM     up                  up

Configuring global parameters:

  Enter host name [Router]: acpro
```

Step 3 If you are using Cisco IOS software earlier than Release 10.3(2), you will enter an enable password. If you are using Cisco IOS Release software 10.3(2) or later, you will enter an enable secret password.

Enable secret is an encrypted password which is used, when it exists, instead of the enable password.

Note Because it is encrypted, the enable secret password cannot be recovered using the procedure described in the section "Recovering a Lost Password" in the chapter "Maintaining the AccessPro PC Card." See the section "Configuring a New Enable Secret Password" in the chapter "Maintaining the AccessPro PC Card."

If you can enter an enable secret password, do as follows:

```
Enter enable secret: david
```

The enable password is used when there is no enable secret password, and when you are using older software and some boot images:

```
Enter enable password: gareth
Enter virtual terminal password [gareth]: janice
Configure SNMP Network Management? [yes]: n
Configure XRemote font servers? [no]:
Configure DECnet? [no]:
Configure IP? [yes]:
Configure IGRP routing? [yes]:
  Your IGRP autonomous system number [X]:
Configure IPX? [no]:
Configure XNS? [no]:
Configure AppleTalk? [no]:
Configure Apollo? [no]:
Configure CLNS? [no]:
Configure Vines? [no]:
Configure bridging? [no]:
Configure LAT? [no]:
```

Note You will need to acquire the correct network addresses from your system administrator before you can complete the next two steps.

Step 4 To configure the interface parameters, you need to know your Ethernet or Token Ring interface and subnetwork addresses, as well as the address for your serial WAN and BRI interfaces. Respond as follows to the setup prompts:

```
Configuring interface parameters:
Configuring interface Ethernet0:
  Is this interface in use? [yes]:
  Configure IP on this interface? [yes]:
    IP address for this interface: xx.xx.xx.xx
    Number of bits in subnet field [0]:
    Class A network is xx.xx.xx.xx, 0 subnet bits;
    mask is 255.0.0.0
```

Step 5 The PC bus is not used on the AccessPro card, so it is not configured. Enter **no** at the PC bus inquiry:

```
Configuring interface PCbus0:
  Is this interface in use? [yes]: n
```

Step 6 Once you have configured the Ethernet or Token Ring interface on your AccessPro card, you need to configure the serial WAN interface:

```
Configuring interface serial0:
  Is this interface in use? [yes]:
  Configure IP on this interface? [yes]:
    IP address for this interface: xx.xx.xx.xx
    Number of bits in subnet field [0]:
    Class A network is xx.xx.xx.xx, 0 subnet bits;
    mask is 255.0.0.0
```

Step 7 Once you have configured the serial WAN interface on your AccessPro card, you need to configure the BRI interface. Respond to the prompts as follows, substituting the correct IP address where appropriate:

```
Configuring interface BRI0:
  Is this interface in use? [yes]: yes
  Configure IP on this interface? [yes]: yes
    IP address for this interface: xx.xx.x.x
    Number of bits in subnet field [0]: 0
    Class A network is xx.xx.xx.xx, 0 subnet bits;
    mask is 255.0.0.0
```

Step 8 The configuration you have entered is now displayed and you are asked if you want to use it. If you answer **no**, you can begin the configuration again and make any changes you want. If you answer **yes**, this configuration will be entered and saved in the configuration database.

```
Use this configuration? [yes/no]: yes
#####

use the enabled mode 'configure' command to modify this
configuration.
```

Your AccessPro card is now configured.

Checking Your Settings

You can check the value of the settings you have entered by entering the command **show version** at the Hostname> (EXEC mode) or the Hostname# (privileged EXEC mode) prompt:

```
acpro# show version
.
.
.
configuration register is 0x0 (will be 0x2102 at next reload)
```

Configuring the AccessPro Card without Using the Setup Routine

You can configure the AccessPro card manually if you prefer not to use the setup routine or AutoInstall.

Take the following steps to configure the AccessPro card manually:

Step 1 When you are asked if you would like to enter the initial configuration dialog, enter **no** to go into the normal operating mode of the AccessPro card:

```
Would you like to enter the initial dialog? [yes]: no
```

Step 2 After a few seconds you will see the default prompt (Router>). Enter **enable** to enter enable mode. Configuration changes can only be made in enable mode:

```
Router> enable
```

The prompt will change to the enable mode prompt:

```
acpro#
```

Step 3 Enter the **config terminal** command at the enable prompt to enter configuration mode:

```
acpro# config terminal
```

You can now make any configuration changes required. Press **Ctrl-Z** to exit configuration mode.

To see the currently operating configuration, enter the command **show running-config** at the enable prompt:

```
acpro# show running-config
```

Note If you are using Cisco IOS software earlier than Release 11.0, enter the command **write terminal** to see the currently operating configuration.

To see the configuration in NVRAM, enter the command **show startup-config** at the enable prompt:

```
acpro# show startup-config
```

Note If you are using Cisco IOS software earlier than Release 11.0, enter the command **show config** to see the configuration in NVRAM.

The results of the commands **show running-config** and **show startup-config** will vary if you have made changes to the configuration in enable mode but have not yet written them to NVRAM.

Remember that to make your changes permanent you must enter the command **copy running-config startup-config** at the enable prompt:

```
acpro# copy running-config startup-config
```

Your AccessPro card is now configured and will boot with the configuration each time it or the PC is booted.

Configuring the ISDN Interface

After configuring the BRI interface, you must configure the AccessPro card to operate with ISDN. Typical ISDN configurations for a single B channel and for a dual B channel arrangement are described in this section.

Note The IP address and other information used in these examples should be replaced with IP addresses and information that is specific for your installation.

Configuring the ISDN Interface for a Single B Channel

To configure the AccessPro card for a basic ISDN point-to-point connection on a single B channel, take the following the steps, substituting the correct addresses and host names where appropriate:

Step 1 Enter the global configuration mode using the command **config terminal** at the privileged EXEC prompt:

```
router# config term
```

Step 2 Enter the command **username** *name* **password** *password* to specify the host name and password for the router to which the ISDN connection is being made:

```
username mainrouter password abc
```

Note The username and password are the exact host name and password of the router to which the ISDN connection is to be made. Enter this information carefully because the username and password are case-sensitive.

Step 3 Enter the ISDN switch type using the command **isdn switch-type**. The switch type is typically National ISDN-1 (NI-1) or AT&T 5ESS depending on the equipment you have installed:

```
isdn switch-type basic-ni1
```

Step 4 Enter the BRI interface, the encapsulation method (Point-to-Point Protocol [PPP]), the PPP authentication method, the target router's host name and IP address, and the ISDN number to be dialed, followed by the dialer group:

```
interface bri 0
encapsulation ppp
ppp authentication chap
dialer map ip 160.10.1.1 mainrouter 5551234
dialer group 1
```

Note Do not use periods or hyphens when you enter dialing numbers for ISDN interfaces.

Step 5 Enter the command **ip route** to configure a static route to allow connectivity to the target router's local network. Enter the network number for the target router's local IP network (160.10.1.0), the subnet mask (255.255.255.0), and the IP address of the target router's BRI interface:

```
ip route 160.10.1.0 255.255.255.0 160.10.1.1
```

Step 6 Enter the command **access-list** to configure a filter that causes the ISDN line to be brought up whenever any IP packets are to be sent:

```
access-list 101 permit ip 0.0.0.0 255.255.255.255 0.0.0.0
255.255.255.255
dialer-list 1 list 101
```

Some ISDN switch types require that you configure a Service Profile Identifier (SPID). See the section "Configuring a Service Profile Identifier" later in this chapter.

Configuring the ISDN Interface for Two B Channels

To configure the AccessPro card for a basic ISDN point-to-point connection on two ISDN B channels, take the following steps, substituting the correct addresses and host names where appropriate:

Step 1 Enter the global configuration mode using the command **config terminal** at the privileged EXEC prompt:

```
router# config term
```

Step 2 Enter the command **username** *name* **password** *password* to specify the host name and password for the router to which the ISDN connection is being made:

```
username mainrouter password abc
```

Note The username and password are the exact host name and password of the router to which the ISDN connection is to be made. Enter this information carefully because the username and password are case-sensitive.

Step 3 Enter the ISDN switch type using the command **isdn switch-type**. The switch type is typically National ISDN-1 (NI-1) or AT&T 5ESS depending on the equipment you have installed:

```
isdn switch-type basic-ni1
```

Step 4 Enter the BRI interface, the encapsulation method (PPP), the PPP authentication method, the target router's host name and IP address, and the ISDN number to be dialed, followed by the dialer group:

```
interface bri 0
encapsulation ppp
ppp authentication chap
dialer map ip 160.10.1.1 mainrouter 5551234
```

Note Do not use periods or hyphens when you enter dialing numbers for ISDN interfaces.

Step 5 Enter the command **dialer load-threshold** to set the load threshold for the ISDN interface. The load threshold determines the percentage of network loading at which the second ISDN B channel is triggered. The value ranges from 255 (100 percent) to 1:

```
dialer load-threshold 128
```

In this example, the value of 128 means that when the first B channel reaches 50 percent of its bandwidth capacity (128 equals 50 percent of 255), the second B channel will be activated to assist with the bandwidth load.

Step 6 Enter the command **ip route** to configure a static route to allow connectivity to the target router's local network. Enter the network number for the target router's local IP network (160.10.1.0), the subnet mask (255.255.255.0), and the IP address of the target router's BRI interface:

```
ip route 160.10.1.0 255.255.255.0 160.10.1.1
```

Step 7 Enter the command **access-list** to configure a filter that causes the ISDN line to be brought up whenever any IP packets are to be sent:

```
access-list 101 permit ip 0.0.0.0 255.255.255.255 0.0.0.0
255.255.255.255
dialer-list 1 list 101
```

Configuring a Service Profile Identifier

Some ISDN switch types, such as Basic NI-1 or DMS-100, require that you configure a SPID. Enter the information as follows, substituting the SPIDs for your ISDN switch where appropriate:

```
router# config t
interface bri 0
isdn spid1 613785215300 7852153
isdn spid2 613785215200 7852152
```

The ISDN interface is now configured.

Using Windows NT with the AccessPro Card

During the boot process for Microsoft Windows NT, the PC COMports will receive a **Break** command as a result of Windows NT probing for a serial mouse. This **Break** command will cause the AccessPro card to break out of the system image and go to the ROM monitor (monitor prompt), interrupting operation of the AccessPro card.

Consult your Microsoft Windows NT documentation for instructions on how to disable this process for the COMport used by the AccessPro card.

For Further Information

For more information on router software configuration, refer to the following publications:

Internetworking Technology Overview

Configuration Builder Getting Started Guide

CiscoWorks for Windows Getting Started Guide

Router Products Getting Started Guide

Router Products Configuration Guide

Router Products Command Reference

Troubleshooting Internetworking Systems (as needed)

To order UniverCD, Cisco's online library of product information, or paper documentation, refer to *Ordering Cisco Documentation*, which is in the warranty pack that accompanied your AccessPro card.