Configuring Asynchronous Mode

This chapter describes how to configure a Cisco 1600 series router to dial into a central-site router over a standard telephone line and provides verification steps and troubleshooting tips.

This chapter contains the following sections:

Before You Begin

The configurations in this chapter are based on the following assumptions:

- Your Cisco 1600 hardware is correctly installed according to the *Cisco 1600 Series Hardware Installation Guide* that came with the router.
- Your Cisco 1600 is dialing into a central-site router.
- Your Cisco 1600 is using Point-to-Point Protocol (PPP).

Before you begin configuration, be aware of the following:

- You need to enter the commands in the order shown in the task tables.
- The values shown in italics are examples. You should substitute the values shown with values that are appropriate for your network.
- You should be familiar with Cisco IOS software and its conventions.

Note In order to use the verification steps described in this chapter, you must be familiar with Cisco IOS commands and command modes. When you use the verification steps, you need to change to different command modes. If you are not familiar with command modes, refer to the "Understanding Command Modes" section in the "Cisco IOS Basic Skills" chapter.

Asynchronous Mode

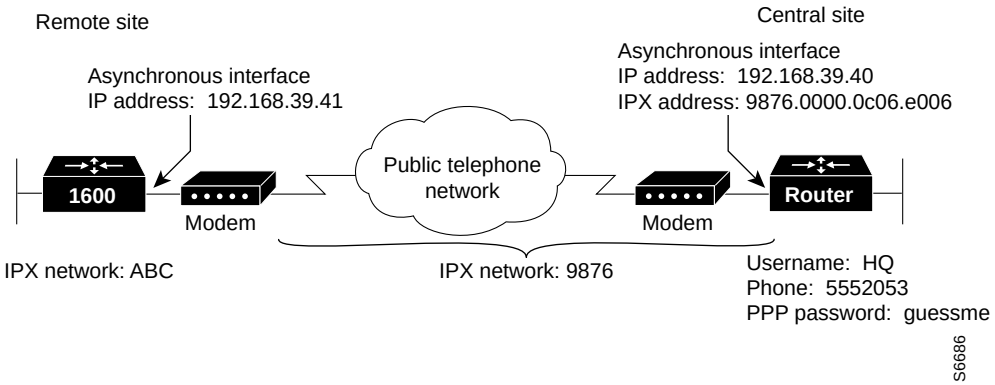
In this configuration, a modem is attached to the routers serial port and dials into the central-site router over a standard telephone line, which is an asynchronous connection.

These are the major tasks when configuring your router for an asynchronous WAN connection:

- Configuring Global Parameters
- Configuring Security
- Configuring the Ethernet Interface
- Configuring the Asynchronous Interface
- Configuring When the Router Dials
- Configuring Command Line Access to the Router

Figure 4-1 illustrates the example configuration used in this chapter.

Figure 4-1 Asynchronous Example Configuration



Configuring Global Parameters

Use this table to configure some global parameters on the router, including enabling IPX routing on the router (the default setting for the router is IPX routing disabled) and creating a chat script for the modem that is attached to the router.

		Router Prompt	Command
Step 1	Enter configuration mode.	Router#	configure terminal
Step 2	Configure the router to show the date and time of all debug messages. This command is optional, but recommended if you use debug commands to troubleshoot your configuration.	`Router(config)#`	`service timestamps debug datetime msec`
Step 3	Configure the router to show the date and time of all log messages. This command is optional, but recommended if you use the verification steps described in this guide. This feature is enabled for all the example command output shown in this guide.	`Router(config)#`	`service timestamps log datetime msec`

		Router Prompt	Command
Step 4	Enable IPX routing and configure the router with an IPX address.	`Router(config)#`	**ipx routing** *0060.834f.66dd*
Step 5	Create a script that causes the modem connected to the router to place a call to the central site.	`Router(config)#`	**chat-script** *dialout " " atdt\t timeout 60 connect\c*

Configuring Security

Use this table to configure the router with some security measures, including the password used to access the router and the username and password used for Challenge Handshake Authentication Protocol (CHAP) and Password Authentication Protocol (PAP) authentication with the central-site router.

Step	Task	Router Prompt	Command
Step 1	Specify a password to prevent unauthorized access to the router.	`Router(config)#`	**enable password** *1600user*
Step 2	Configure the router with a host name, which is used in prompts and default configuration file names. For PPP authentication, the host name entered with this command must match the username of the central-site router.	`Router(config)#`	**hostname** *1600*
Step 3	Specify the password used during caller identification and CHAP and PAP authentication. For CHAP and PAP authentication, the username entered with this command must match the host name of the central-site router.	`1600(config)#`	**username** *HQ* **password** *guessme*

Configuring the Ethernet Interface

Use this table to configure the Ethernet interface (which connects the router to your local network) with an IP address. This gives your router a unique address on your local network.

		Router Prompt	Command
Step 1	Enter configuration mode for the Ethernet interface.	`1600(config)#`	`interface Ethernet0`
Step 2	Configure this interface with an IP address and a subnet mask.	`1600(config-if)#`	**`ip address`** *`172.16.25.42 255.255.255.224`*
Step 3	Configure an IPX network address for this interface.	`1600(config-if)#`	`ipx network` *`ABC`*
Step 4	Enable the interface and the configuration changes that you have just made on the interface.	`1600(config-if)#`	`no shutdown`
Step 5	Exit configuration mode for the interface.	`1600(config-if)#`	`exit`

Configuring the Asynchronous Interface

Use this table to configure the asynchronous interface for the following:

- Asynchronous data connection on the router serial interface.
- IP and IPX addresses.
- DDR routing on this interface.
- PPP packet encapsulation, so that the router can use specific PPP functions.
- PPP authentication, so that the router is authenticated by the central-site router using a standard PPP authentication method, Challenge Handshake Authentication Protocol (CHAP).

		Router Prompt	Command
Step 1	Enter configuration mode for the serial interface.	`1600(config)#`	`interface Serial0`
Step 2	Specify the mode of this slow-speed serial interface as asynchronous.	`1600(config-if)#`	`physical-layer async`
Step 3	Configure this interface with an IP address and a subnet mask.	`1600(config-if)#`	**ip address** *192.168.39.41 255.255.255.0*
Step 4	Enable IPX routing on this interface.	`1600(config-if)#`	**ipx network** *9876*
Step 5	Specify that dial-on-demand routing (DDR) is supported on this interface.	`1600(config-if)#`	`dialer in-band`
Step 6	Configure a static route to the central-site device.	`1600(config-if)#`	`ipx route` *1234 9876.0000.0c06.ec c6*
Step 7	Enable snapshot routing. Because your router is dialing into a central-site router, it is considered the client router. The first number is the amount of "active time" (in minutes) during which routing updates are exchanged between your router and the central-site router. The second number is the amount of "quiet time" (in minutes) during which routing entries are frozen and remain unchanged.	`1600(config-if)#`	**snapshot client** *5 60*
Step 8	Assign the dialer interface to a dialer group.	1600(config-if)#	**dialer-group** *1*
Step 9	Set the encapsulation method on this interface to PPP.	1600(config-if)#	encapsulation ppp
Step 10	Enable CHAP or PAP authentication on this interface. CHAP authentication is attempted first.	1600(config-if)#	ppp authentication chap pap callin
Step 11	Enable the interface and the configuration changes that you have just made on the interface.	`1600(config-if)#`	`no shutdown`
Step 12	Exit configuration mode for this interface.	`1600(config-if)#`	`exit`

Verifying Your Configuration

You can verify your configuration to this point by

- Confirming Connectivity to the Central-Site Router.
- Confirming the Serial Interface Status.

Confirming Connectivity to the Central-Site Router

Step 1 From the privileged EXEC command mode, enter the **ping** command followed by the IP address of the central-site router:

Note The modem might need time to synchronize with the central-site modem. You might have to enter the **ping** command several times before you get a response.

```
1600# ping 192.168.37.40

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.37.40, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 40/43/48 ms
1600#
*Mar  1 03:37:46.526: %LINK-3-UPDOWN: Interface BRI0:1, changed state
to up
*Mar  1 03:37:46.923: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:1, changed state to up
*Mar  1 03:37:46.939: %LINK-3-UPDOWN: Interface Virtual-Access1,
changed state to up
*Mar  1 03:37:47.923: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Virtual-Access1, changed state to up
 *Mar  1 03:35:57.217: %ISDN-6-CONNECT: Interface BRI0:1 is now
connected to 5552053 HQ
```

Step 2 Note the percentage in the “Success rate...” line (shown in bold in the example). A success rate of 60 percent (3/5) or greater means that your router is successfully transferring data to the central-site router.

Step 3 To continue configuration, re-enter global configuration mode.

Confirming the Serial Interface Status

Step 1 From the privileged EXEC command mode, enter the **show interface serial 0** command.

Step 2 Confirm that the lines (shown in bold in the example) appear in the command output:

```
1600# show interface serial 0
Serial0 is up, line protocol is up
Hardware is QUICC Serial in async mode (TTY1)

Internet address is 192.168.39.41/24
MTU 1500 bytes, BW 9 Kbit, DLY 100000 usec, rely 255/255, load 1/255
Encapsulation PPP, loopback not set, keepalive not set DTR is pulsed
for 5 seconds on reset
LCP Open, multilink open

Open: ipcp

Last input never, output never, output hang never Last clearing of
"show interface" counters never Queueing strategy: fifo
Output queue 0/10, 0 drops; input queue 0/75, 0 drops 5 minute input
rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0
packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants 2 input errors, 0 CRC, 2
frame, 0 overrun, 0 ignored, 0 abort 0 packets output, 0 bytes, 0
underruns
0 output errors, 0 collisions, 0 interface resets 0 output buffer
failures, 0 output buffers swapped out 0 carrier transitions
```

Step 3 To continue configuration, re-enter global configuration mode.

Configuring When the Router Dials

Use this table to configure some parameters that tell the router how and when to dial into the central-site router.

		Router Prompt	Command
Step 1	Enter configuration mode for the serial interface.	`1600(config)#`	`interface Serial0`
Step 2	Define a dialer map for snapshot routing.	`1600(config)#`	**`dialer map snapshot`** *`1`* **`name`** *`HQ`*
Step 3	Configure a dialer map to send IP data over the modem line to the central-site router.	`1600(config)#`	`dialer map ip` *`192.168.39.40`* `name` *`HQ`* `modem-script dialout` *`5552053`*
Step 4	Configure a dialer map to send IPX data over the modem line to the central-site router.	`1600(config)#`	`dialer map ipx` *`9876.0000.0c06.ecc6`* `modem-script dialout` *`5552053`*
Step 5	Configure a route to IPX services, such as servers and printers, on the central-site network.	`1600(config)#`	`ipx sap` *`4 HQ`* `server` *`AA 1234.0000.0000.0001`* `2`
Step 6	Exit configuration mode for this interface.	`1600(config-if)#`	`exit`

Configuring Command Line Access to the Router

Use this table to configure some parameters that control access to the router, including the type of terminal line used with the router, how long the router waits for a user entry before it times out, and the password used to start a terminal session with the router.

		Router Prompt	Command
Step 1	Specify the console terminal line.	`1600(config)#`	**line console** *0*
Step 2	Set the interval that the EXEC command interpreter waits until user input is detected.	`1600(config-line)#`	**exec-timeout** *5*
Step 3	Specify a virtual terminal for remote console access	`1600(config-line)#`	**line vty** *0 4*
Step 4	Specify a password on the line.	`1600(config-line)#`	**password** *lineaccess*
Step 5	Enable password checking at terminal session login.	`1600(config-line)#`	**login**
Step 6	Exit configuration mode.	`1600(config-line)#`	`end`

Troubleshooting Asynchronous Mode Problems

If you are having problems or the output that you received during the verification steps is very different from what is shown, you can troubleshoot your router with the Cisco IOS **debug** commands. The **debug** commands provide extensive command output that is not included in this document.

Caution If you are not familiar with Cisco IOS debug commands, you should read the "Using Debug Commands" section in the "Cisco IOS Basic Skills" chapter before attempting any debugging.

Following are the **debug** commands that are helpful when troubleshooting asynchronous configurations. Follow these commands with the **ping** command to begin debug output:

- debug modem
- debug chat-script
- debug dialer
- debug ppp negotiation