C H A P T E R **3**

Configuring the Interfaces

This chapter provides the following major sections to describe how to configure and verify a router-to-modem interface.

✎
Note   For complete command syntax and usage, see Appendix A, "Command Reference."

Using the Interface Command

The following general instructions apply to all interface-configuration processes:

Step 1   At the privileged EXEC prompt, enter the **configure terminal** command to enter global configuration mode:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

Step 2   In global configuration mode, enter the **interface** command. Identify the interface type and the number of the connector on the interface card. The following example shows how to select a fast Ethernet interface of 0:

```
Router(config)# interface fastEthernet 0/0
Router(config-if)#
```

✎
Note   You do not need to add a space between the interface type and interface number. For example, in the preceding line you can specify either **fastEthernet0/0** or **fastEthernet 0/0**.

Step 3   Interface numbers are assigned at the factory at the time of installation. Enter the **show interfaces** EXEC command to see a list of all interfaces installed on your router. A report is provided for each interface that your router supports, as shown in this display:

```
Router(config-if)# Ctrl-Z
Router# show interfaces
FastEthernet0/0 is up, line protocol is up
  Hardware is MV96340 Ethernet, address is 001f.ca0f.6508 (bia 001f.ca0f.6508)
```

```
              Description: OPERATIONS ACCESS - DO NOT CHANGE ADDRESS
              Internet address is 9.9.9.10/24
              MTU 1500 bytes, BW 100000 Kbit/sec, DLY 100 usec,
                 reliability 254/255, txload 1/255, rxload 6/255
              Encapsulation ARPA, loopback not set
              Keepalive set (10 sec)
              Full-duplex, 100Mb/s, 100BaseTX/FX
              ARP type: ARPA, ARP Timeout 04:00:00
              Last input 00:00:00, output 00:00:06, output hang never
              Last clearing of "show interface" counters never
              Input queue: 18/75/0/0 (size/max/drops/flushes); Total output drops: 0
              Queueing strategy: fifo
              Output queue: 0/40 (size/max)
              5 minute input rate 2627000 bits/sec, 231 packets/sec
              5 minute output rate 0 bits/sec, 0 packets/sec
                 86251 packets input, 119155372 bytes
                 Received 5158 broadcasts (0 IP multicasts)
                 0 runts, 0 giants, 1 throttles
                 27 input errors, 0 CRC, 0 frame, 0 overrun, 27 ignored
                 0 watchdog
                 0 input packets with dribble condition detected
                 35714 packets output, 3513886 bytes, 0 underruns
                 0 output errors, 0 collisions, 0 interface resets
                 0 unknown protocol drops
                 0 babbles, 0 late collision, 0 deferred
                 0 lost carrier, 0 no carrier
                 0 output buffer failures, 0 output buffers swapped out
      Router#
```

Step 4   Follow each **interface** command with the interface-configuration commands your particular interface requires. The commands you enter define the protocols and applications that run on the interface. The commands are collected and applied to the **interface** command until you enter another **interface** command or press **Ctrl-Z** to exit interface configuration mode and return to privileged EXEC mode.

Step 5   You can use the **exit** command to exit interface configuration mode and return to global configuration mode.

Step 6   After you configure an interface, you can check the status of the interface by using the EXEC **show** commands listed in the "Monitoring and Maintaining Interfaces" section on page 3-4.

Configuring Interfaces

The following subsections describe interface configuration procedures:

- Configuring an IP Address, page 3-3
- Adding a Description for an Interface, page 3-3

Configuring an IP Address

To configure an IPv4 address and subnet mask on an interface, perform the following task:

	Command	Purpose
Step 1	`Router(config)# interface gigabitEthernet interface`	Specifies the interface to be configured.
Step 2	`Router(config-if)# ip address ip-addr mask`	Sets the IP address.

Example

The following example shows how to set the IPv4 address 10.108.1.27 with subnet mask 255.255.255.0 on interface gigabitEthernet 0/0:

```
Router(config)# interface gigabitEthernet 0/0
Router(config-if)# ip address 10.108.1.27 255.255.255.0
```

Adding a Description for an Interface

You can add a description about an interface to help you remember its function. The description displays in the output of the following commands: **show configuration**, **show running-config**, and **show interfaces**.

To add a description for an interface, enter the following command in interface configuration mode:

Command	Purpose
`Router(config-if)# description string`	Adds a description for an interface.

Examples

This example shows how to add the description *Operations* on gigabitEthernet interface 0/0:

```
Router(config)# interface gigabitEthernet 0/0
Router(config-if)# description Operations
Router(config-if)# end
```

This example shows how to verify the configuration:

```
Router# show interface gigabitEthernet 0/0
GigabitEthernet0/0 is up, line protocol is up
  Hardware is MV96340 Ethernet, address is 001f.ca0f.6508 (bia 001f.ca0f.6508)
  Description: OPERATIONS ACCESS - DO NOT CHANGE ADDRESS
  Internet address is 10.108.1.27/24
  MTU 1500 bytes, BW 100000 Kbit/sec, DLY 100 usec,
 reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s, 1000BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:02, output 00:00:09, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/38054/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     3289500 packets input, 1652322462 bytes
     Received 18932 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 37924 throttles
     1933147 input errors, 0 CRC, 0 frame, 0 overrun, 1933147 ignored
     0 watchdog
     0 input packets with dribble condition detected
     133400 packets output, 13054277 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
Router#
```

Monitoring and Maintaining Interfaces

The following sections describe how to monitor and maintain the interfaces:

Monitoring Interface and Controller Status

The router contains commands that you can enter at the EXEC prompt to display information about the interface. The following table lists some of the interface monitoring commands. You can display the full list of **show** commands by entering the **show ?** command at the EXEC prompt. These commands are fully described in the *Interface Command Reference*.

To display information about the interface, enter any of the following commands in user EXEC mode:

Command	Purpose
Router#**show interfaces** [*type interface*]	Displays the status and configuration of a specific interface or all interfaces.
Router#**show running-config**	Displays the configuration currently running in RAM.
Router#**show protocols** [*type interface*]	Displays the global (system-wide) and interface-specific status of any configured protocol.
Router#**show version**	Displays the hardware configuration, software version, names and sources of configuration files, and boot images.

This example shows how to display information about fastEthernet interface 0/0:

```
Router# show interfaces fastEthernet 0/0
GigabitEthernet0/0 is up, line protocol is up
  Hardware is MV96340 Ethernet, address is 001f.ca0f.6508 (bia 001f.ca0f.6508)
  Description: OPERATIONS ACCESS - DO NOT CHANGE ADDRESS
  Internet address is 10.108.1.27/24
  MTU 1500 bytes, BW 100000 Kbit/sec, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s, 1000BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:25, output 00:00:03, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/38054/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     3289517 packets input, 1652328854 bytes
     Received 18949 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 37924 throttles
     1933147 input errors, 0 CRC, 0 frame, 0 overrun, 1933147 ignored
     0 watchdog
     0 input packets with dribble condition detected
     133525 packets output, 13066527 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
Router#
```

Clearing and Resetting the Interface Counters

To clear the interface counters shown with the **show interfaces** command, enter the following command:

Command	Purpose
Router#clear counters *{type interface}*	Clears interface counters.

This example shows how to clear and reset the counters on Gigabit Ethernet interface 0/0:

```
Router#clear counters gigabitEthernet 0/0
Clear "show interface" counters on this interface [confirm] y
Router#
*Sep 30 08:42:55: %CLEAR-5-COUNTERS: Clear counter on interface gigabitEthernet0/0
by vty1 (171.69.115.10)
Router#
```

The **clear counters** command (without any arguments) clears all the current interface counters from all interfaces.

Note   The **clear counters** command does not clear counters retrieved with SNMP; it clears only those counters displayed with the EXEC **show interfaces** command.