Troubleshooting the Cisco ASR 1000 Series Fixed Ethernet Line Card

This chapter describes techniques that you can use to troubleshoot the operation of your Cisco ASR 1000 Series Fixed Ethernet Line Cards, and includes the following sections:

The first section provides information about basic interface troubleshooting. If you are having a problem with your Ethernet Line Card, use the steps provided in the Performing Basic Interface Troubleshooting, on page 2 to begin your investigation of a possible interface configuration problem.

To perform advanced troubleshooting, see the other sections in this chapter.

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General Troubleshooting Information

This section describes general information for troubleshooting the Cisco ASR 1000 Series Fixed Ethernet Line Card, and includes the following subsections:

Using debug Commands

Caution Because debugging output is assigned high priority in the CPU process, it can render the system unusable. For this reason, use **debug** commands only to troubleshoot specific problems or during troubleshooting sessions with Cisco technical support staff. Moreover, it is best to use **debug** commands during periods of lower network traffic and fewer users. Debugging during these periods decreases the likelihood that increased **debug** command-processing overhead will affect system use.

Along with the other **debug** commands supported on the Cisco ASR 1000 Series Aggregation Services Routers, you can obtain specific debug information for the Ethernet Line Cards on the using the **debug hw-module subslot** privileged EXEC command.

The **debug hw-module subslot** command is intended for use by Cisco technical support personnel.

For information about other **debug** commands supported on the Cisco ASR 1000 Series Aggregation Services Routers, refer to the Cisco IOS Debug Command Reference and any related feature documents for the applicable Cisco IOS release.

Using show Commands

There are several **show** commands that you can use to monitor and troubleshoot the Cisco ASR 1000 Series Fixed Ethernet Line Card on the Cisco ASR 1000 Series Routers. This chapter describes using the **show interfaces** command to perform troubleshooting of your Ethernet Line Card.

For more information about **show** commands to verify and monitor Ethernet Line Cards, see Chapter 3, "Configuring the Cisco ASR 1000 Series Fixed Ethernet Line Card" , and the Cisco IOS technology area command reference books.

Performing Basic Interface Troubleshooting

You can perform most of the basic interface troubleshooting using the **show interfaces gigabitethernet**, or **show interfaces tengigabitethernet** command and examining several areas of the output to determine how the interface is operating.

The following example shows an output of both the **show interfaces gigabitethernet** and **show interfaces tengigabitethernet** commands:

```
Router# show interfaces GigabitEthernet 3/0/0
GigabitEthernet3/0/0 is up, line protocol is up
Hardware is BUILT-IN-2T+20X1GE, address is badb.adbb.79c0 (bia badb.adbb.79c0)
MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive not supported
Full Duplex, 1000Mbps, link type is auto, media type is SX
output flow-control is off, input flow-control is off
ARP type: ARPA, ARP Timeout 04:00:00
Last input 2d14h, output 2d06h, output hang never
Last clearing of "show interfaces" counters 2d06h
Input queue: 0/375/0/0 (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
70388928 packets input, 24628646826 bytes, 0 no buffer
Received 0 broadcasts (0 IP multicasts)
0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 0 multicast, 0 pause input
70399206 packets output, 24905239826 bytes, 0 underruns
0 output errors, 0 collisions, 3 interface resets
0 unknown protocol drops
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out
Router# show interfaces TenGigabitEthernet 3/0/20
TenGigabitEthernet3/0/20 is up, line protocol is up
Hardware is BUILT-IN-2T+20X1GE, address is badb.adbb.79d4 (bia badb.adbb.79d4)
MTU 1500 bytes, BW 10000000 Kbit/sec, DLY 10 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive not supported
Full Duplex, 10000Mbps, link type is force-up, media type is 10GBase-LR
output flow-control is unsupported, input flow-control is unsupported
ARP type: ARPA, ARP Timeout 04:00:00
```

```
Last input 2d14h, output 2d06h, output hang never
Last clearing of "show interfaces" counters 2d06h
Input queue: 0/375/0/0 (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
702060742 packets input, 245584812270 bytes, 0 no buffer
Received 0 broadcasts (0 IP multicasts)
0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 0 multicast, 0 pause input
702060725 packets output, 248397436760 bytes, 0 underruns
0 output errors, 0 collisions, 3 interface resets
0 unknown protocol drops
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out
```

To verify that your interface is operating properly, complete the steps described in Table 3-1 :

Action	Example
From the global configuration mode, enter the **show interfaces gigabitethernet or the show interfaces tengigabitethernet** command.	`Router# show interfaces gigabitethernet 2/0/1` `Router# show interfaces tengigabitethernet 5/0/20`

Verify that the interface is up.	`Router# show interfaces gigabitethernet 2/0/1`
	`GigabitEthernet2/0/1 is up`
	`, line protocol is up`
	`Router# show interfaces tengigabitethernet 2/0/21`
	`TenGigabitEthernet2/0/21 is up,`
	`line protocol is up (connected)`

Verify that the line protocol is up.	`Router# show interfaces gigabitethernet 2/0/1`
	`GigabitEthernet2/0/1 is up, line protocol is up`
	
	`Router# show interfaces tengigabitethernet 2/0/21`
	`TenGigabitEthernet2/0/21 is up, line protocol is up (connected)`

Observe the Cyclic Redundancy Check (CRC) counter.	`0 input errors, 0 CRC, 0 frame, 130043940 overrun, 0 ignored`

Observe the carrier signal counters.	`0 lost carrier, 0 no carrier`
	`, 0 pause output`
	`0 output buffer failures, 0 output buffers swapped out`

For more information about the verification steps and possible responses to correct the detected problems, see the following sections:

Verifying that the Interface is Up

In the output of the **show interfaces gigabitethernet or the show interfaces tengigabitethernet** command, verify that the interface is up. If the interface is down, perform the following corrective actions:

- If the interface is *administratively down* , use the **no shutdown** interface configuration command to enable the interface.
- Be sure that the cable is fully connected.
- Verify that the cable is not bent or damaged. If the cable is bent or damaged, the signal will be degraded.
- Verify that a hardware failure has not occurred. Observe the LEDs to confirm the failure. See the other troubleshooting sections in this chapter, and refer to the Cisco ASR 1000 Series Aggregation Services Router Hardware Installation Guide . If the hardware has failed, replace the Ethernet Line Card as necessary.
- Check the autonegotiation status.

Verifying if the Line Protocol is Up

In the output of the **show interfaces gigabitethernet or the show interfaces tengigabitethernet** command, verify that the line protocol is up. If the line protocol is down, then it means that the line protocol software processes have determined that the line is unusable.

Perform the following corrective actions:

- Replace the cable.
- Check the local and remote interfaces for misconfiguration.
- Verify that a hardware failure has not occurred. Observe the LEDs to confirm the failure. See the other troubleshooting sections in this chapter. If the hardware has failed, replace the Ethernet Line Card as necessary.

Verifying the CRC Counter

In the output of the **show interfaces gigabitethernet and the show interfaces tengigabitethernet** commands, observe the value of the CRC counter. Excessive noise will cause high CRC errors accompanied by a low number of collisions.

Perform the following corrective actions if you encounter high CRC errors:

- Check the cables for damage.
- Verify that the correct cables are being used for the Ethernet Line Card interface.

Verifying the Carrier Signal

In the output of the **show interfaces gigabitethernet and the show interfaces tengigabitethernet** command, observe the value of the carrier signal counters. The lost carrier counter shows the number of times that the carrier was lost during transmission. The no carrier counter shows the number of times that the carrier was not present during transmission.

Carrier signal resets can occur when an interface is in the loopback mode or shut down.

Perform the following corrective actions if you observe the carrier signal counter incrementing outside of these conditions:

- Check the interface for a malfunction.
- Check for a cable problem.