



## Troubleshooting Gigabit Ethernet SPAs

- [Performing Basic Interface Troubleshooting, page 1](#)
- [Verifying the Interface, page 2](#)
- [Verifying the MAC Address, page 3](#)
- [Verifying MTU Size, page 4](#)
- [Verifying Per-Port Interface Status, page 4](#)
- [Verifying Loopback Status, page 5](#)
- [Troubleshooting Gigabit Ethernet SPAs Using Show Commands, page 5](#)
- [Using the Cisco IOS Event Tracer to Troubleshoot Problems, page 7](#)

## 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 output from the **show interfaces gigabitethernet** and **show interfaces tengigabitethernet** commands:

```
Router# show interfaces gigabitethernet 3/0/0

GigabitEthernet3/0/0 is down, line protocol is down
  Hardware is GigEther SPA, address is 000a.f330.2e40 (bia 000a.f330.2e40)
  Internet address is 2.2.2.1/24
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not supported
  Full-duplex, 1000Mb/s, link type is force-up, media type is SX
  output flow-control is on, input flow-control is on
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 03:18:49, output 03:18:44, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (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
    1703 packets input, 638959 bytes, 0 no buffer
```

```

Received 23 broadcasts (0 IP multicasts)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 1670 multicast, 0 pause input
1715 packets output, 656528 bytes, 0 underruns
0 output errors, 0 collisions, 4 interface resets
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 3/0/0**

```

TenGigabitEthernet3/0/0 is up, line protocol is up (connected)
Hardware is TenGigEther SPA, address is 0000.0c00.0102 (bia 000f.342f.c340)
Internet address is 15.1.1.2/24
MTU 1500 bytes, BW 10000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive not supported
Full-duplex, 10Gb/s
input flow-control is on, output flow-control is on
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output 00:00:10, output hang never
Last clearing of "show interface" counters 20:24:30
Input queue: 0/75/0/0 (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
L2 Switched: ucast: 0 pkt, 0 bytes - mcast: 0 pkt, 0 bytes
L3 in Switched: ucast: 0 pkt, 0 bytes - mcast: 0 pkt, 0 bytes mcast
L3 out Switched: ucast: 0 pkt, 0 bytes mcast: 0 pkt, 0 bytes
237450882 packets input, 15340005588 bytes, 0 no buffer
Received 25 broadcasts (0 IP multicasts)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 0 multicast, 0 pause input
0 input packets with dribble condition detected
1676 packets output, 198290 bytes, 0 underruns
0 output errors, 0 collisions, 4 interface resets
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

```

## Verifying the Interface

To verify that your interface is operating properly, complete the following steps:

- 1 From global configuration mode, enter the **show interfaces gigabitethernet** or **show interfaces tengigabitethernet** command.

```

Router# show interfaces gigabitethernet 1/3/0
Router# show interfaces tengigabitethernet 3/0/0

```

- 2 Verify that the interface is up.

```

Router# show interfaces gigabitethernet 1/3/0
GigabitEthernet1/3/0 is up, line protocol is up

Router# show interfaces tengigabitethernet 3/0/0
TenGigabitEthernet3/0/0 is up, line protocol is up
(connection)

```

- 3 Verify that the line protocol is up.

```

Router# show interfaces gigabitethernet 1/3/0
GigabitEthernet1/3/0 is up, line protocol is up

```

```
Router# show interfaces tengigabitethernet 3/0/0
TenGigabitEthernet3/0/0 is up, line protocol is up
(connection)
```

- 4 Verify that the interface duplex mode matches the remote interface configuration.

The following example shows that the local interface is currently operating in full-duplex mode:

```
Router# show interfaces gigabitethernet 1/3/0
[text omitted]
Keepalive not supported
Full-duplex, 1000Mb/s, link type is force-up, media type
is SX
```

```
Router# show interfaces tengigabitethernet 3/0/0
[text omitted]
Keepalive not supported
Full-duplex, 10Gb/s
```

- 5 Verify that the interface speed matches the speed on the remote interface.

The following example shows that the local interface is currently operating at 100 Mbps (Gigabit Ethernet) or 10Gbps (10-Gigabit Ethernet):

```
Router# show interfaces gigabitethernet 1/3/0
[text omitted]
Keepalive not supported
Full-duplex, 1000Mb/s, link type is force-up, media type
is SX
```

```
Router# show interfaces tengigabitethernet 3/0/0
[text omitted]
Full-duplex, 10Gb/s
```

- 6 Observe the output hang status on the interface.

```
ARP type: ARPA, ARP Timeout 04:00:00
Last input 03:18:49, output 03:18:44, output hang never
```

- 7 Observe the CRC counter.

```
0 input errors, 0 CRC, 0 frame, 130043940 overrun, 0
ignored
```

- 8 Observe the late collision counter.

```
0 output errors, 0 collisions, 4 interface resets
0 babbles, 0 late collision, 0 deferred
```

- 9 Observe the carrier signal counters.

```
0 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out
```

## Verifying the MAC Address

To verify the MAC address of an interface, use the **show interfaces gigabitethernet** privileged EXEC command and observe the value shown in the **address** field.

The following example shows output from the **show interfaces tengigabitethernet** command on a Cisco 1-Port 10-Gigabit Ethernet SPA in slot 1, SPA subslot 3. The second line of the output identifies the type of SPA and its MAC address.

```
Router# show interfaces tengigabitethernet 1/3/0
GigabitEthernet1/3/0 is up, line protocol is up
```

```

Hardware is TenGigEther SPA, address is 0005.00e7.2548 (bia 0005.00e7.2548)

MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive not set
Full Duplex, 1000Mbps, link type is auto, media type is SX
output flow-control is unsupported, input flow-control is XON
ARP type: ARPA, ARP Timeout 04:00:00
Last input 00:00:00, output 00:00:00, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Interface GigabitEthernet1/3/0 queueing strategy: PXF Class-based
5 minute input rate 19000 bits/sec, 23 packets/sec
5 minute output rate 17000 bits/sec, 23 packets/sec
  61860 packets input, 9470324 bytes, 0 no buffer
  Received 3151 broadcasts (0 IP multicasts)
    0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 watchdog, 3151 multicast, 0 pause input
  62413 packets output, 5726961 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
    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

```

## Verifying MTU Size

To verify the MTU size for an interface, use the **show interfaces** command in privileged EXEC command and observe the value shown in the **MTU** field.

The following example shows an MTU size of 1500 bytes for the Gigabit Ethernet SPA installed in the SIP that is located in slot 1 of the Cisco uBR10012 router:

```

Router# show interfaces GigabitEthernet 1/3/0

GigabitEthernet1/3/0 is up, line protocol is up
  Hardware is GigEther SPA, address is 0005.00e7.2548 (bia 0005.00e7.2548)

  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set

```

## Verifying Per-Port Interface Status

To find detailed interface information on a per-port basis for the Gigabit Ethernet SPAs, use the **show interfaces gigabitethernet** command.

The following example provides sample output on a Cisco 1-Port 10-Gigabit Ethernet SPA in slot 1, subslot 3, port 0:

```

Router# show interfaces tenGigabitEthernet 1/3/0

GigabitEthernet1/3/0 is up, line protocol is up
  Hardware is GigEther SPA, address is 0005.00e7.2548 (bia 0005.00e7.2548)

  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  Full Duplex, 1000Mbps, link type is auto, media type is SX
  output flow-control is unsupported, input flow-control is XON
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:00, output hang never

```

```

Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Interface GigabitEthernet1/3/0 queueing strategy: PXF Class-based
5 minute input rate 19000 bits/sec, 23 packets/sec
5 minute output rate 17000 bits/sec, 23 packets/sec
  61860 packets input, 9470324 bytes, 0 no buffer
  Received 3151 broadcasts (0 IP multicasts)
  0 runs, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
  0 watchdog, 3151 multicast, 0 pause input
  62413 packets output, 5726961 bytes, 0 underruns
  0 output errors, 0 collisions, 0 interface resets
  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

```

## Verifying Loopback Status

To verify whether loopback is enabled on an interface port on a SPA, use the **show interfaces gigabitethernet** or **show interfaces tengigabitethernet** command in privileged EXEC mode and observe the value shown in the **loopback** field.

The following example shows that loopback is disabled for interface port 0 (the first port) on the Gigabit Ethernet SPA installed in the top (0) subslot of the SIP that is located in slot 1 of the Cisco uBR10012 router:

```
Router# show interfaces gigabitethernet 1/0/0
```

```

GigabitEthernet1/0/0 is up, line protocol is up
  Hardware is GigMac 1 Port 10 GigabitEthernet, address is 0008.7db3.8dfe (bia)
  Internet address is 10.0.0.2/24
  MTU 1500 bytes, BW 10000000 Kbit, DLY 10 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set

```

The following example shows that loopback is disabled for interface port 0 (the first port) on the Cisco 1-Port 10-Gigabit Ethernet SPA installed in the top (0) subslot of the SIP that is located in slot 3 of the Cisco uBR10012 router:

```
Router# show interfaces tengigabitethernet 3/0/0
```

```

TenGigabitEthernet3/0/0 is up, line protocol is up (connected)
  Hardware is TenGigEther SPA, address is 0000.0c00.0102 (bia 000f.342f.c340)
  Internet address is 15.1.1.2/24
  MTU 1500 bytes, BW 10000000 Kbit, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set

```

## Troubleshooting Gigabit Ethernet SPAs Using Show Commands

**Problem** Interface is down.

- **Solution** If the interface is **administratively down**, use the **no shutdown interface** configuration command to enable the interface.
- **Solution** Be sure that the cable is fully connected.
- **Solution** Verify that the cable is not bent or damaged. If the cable is bent or damaged, the signal will be degraded.

- **Solution** Verify that a hardware failure has not occurred. Observe the LEDs to confirm the failure. If the hardware has failed, replace the SPA as necessary.

**Problem** The line protocol is down or the line protocol software processes have determined that the line is unusable.

- **Solution** Replace the cable.
- **Solution** Check the local and remote interface for incorrect configuration.
- **Solution** Verify that a hardware failure has not occurred. Observe the LEDs to confirm the failure. If the hardware has failed, replace the SPA as necessary.

**Problem** Interpreting the value in the **hang** field.

**Solution** The output hang provides the number of hours, minutes, and seconds since the last reset caused by a lengthy transmission. When the number of hours in the field exceeds 24 hours, the number of days and hours is shown. If the field overflows, asterisks are printed. The field shows a value of **never** if no output hangs have occurred.

**Problem** High CRC errors accompanied by a low number of collisions.

**Possible Cause** Excessive noise.

- **Solution** Check the cables for damage.
- **Solution** Verify that the correct cables are being used for the SPA interface.

**Problem** Late collisions on the interface.

- **Solution** Verify that the duplex mode on the local and remote interface match. Late collisions occur when there is a duplex-mode mismatch.
- **Solution** Verify the length of the Ethernet cables. Late collisions result from cables that are too long.

**Problem** Incrementing carrier signal counters.

**Possible Cause** 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 loopback mode or shut down.

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

# Using the Cisco IOS Event Tracer to Troubleshoot Problems

**Note**

This feature is intended for use as a software diagnostic tool and should be configured only under the direction of a Cisco Technical Assistance Center (TAC) representative.

The Event Tracer feature provides a binary trace facility for troubleshooting Cisco IOS software. This feature gives Cisco service representatives additional insight into the operation of the Cisco IOS software and can be useful in helping to diagnose problems in the unlikely event of an operating system malfunction or, in the case of redundant systems, Route Processor (RP) switch over.

Event tracing works by reading informational messages from specific Cisco IOS software subsystem components that have been preprogrammed to work with event tracing, and by logging messages from those components into system memory. Trace messages stored in memory can be displayed on the screen or saved to a file for later analysis.

The SPAs currently support the “spa” component to trace SPA OIR-related events.

For more information about using the Event Tracer feature, see the [Event Tracer](#) document.

