

Chapter 18

Monitor Fast Ethernet and Gigabit Ethernet Interfaces

This chapter describes how to monitor Fast Ethernet and Gigabit Ethernet interfaces, and begin the process of isolating Fast Ethernet and Gigabit Ethernet interface problems when they occur. (See Table 36.)

Table 36: Checklist for Monitoring Fast Ethernet and Gigabit Ethernet Interfaces

Monitor Fast Ethernet and Gigabit Ethernet Interface Tasks	Command or Action
Monitor Fast Ethernet and Gigabit Ethernet Interfaces on page 186	
1. Display the Status of Fast Ethernet and Gigabit Ethernet Interfaces on page 186	show interfaces terse (fe* ge*)
2. Display the Status of a Specific Fast Ethernet or Gigabit Ethernet Interface on page 188	show interfaces (fe-fpc/pic/port ge-fpc/pic/port)
3. Display Extensive Status Information for a Specific Fast Ethernet or Gigabit Ethernet Interface on page 189	show interfaces (fe-fpc/pic/port ge-fpc/pic/port) extensive
4. Monitor Statistics for a Fast Ethernet or Gigabit Ethernet Interface on page 192	monitor interface (fe-fpc/pic/port ge-fpc/pic/port)
5. Fiber-Optic Ethernet Interface Specifications on page 193	

Monitor Fast Ethernet and Gigabit Ethernet Interfaces

Purpose By monitoring Fast Ethernet and Gigabit Ethernet interfaces, you begin to isolate Fast Ethernet and Gigabit Ethernet interface problems when they occur.

Steps To Take To monitor your Fast Ethernet and Gigabit Ethernet interfaces, follow these steps:

1. Display the Status of Fast Ethernet and Gigabit Ethernet Interfaces on page 186
2. Display the Status of a Specific Fast Ethernet or Gigabit Ethernet Interface on page 188
3. Display Extensive Status Information for a Specific Fast Ethernet or Gigabit Ethernet Interface on page 189
4. Monitor Statistics for a Fast Ethernet or Gigabit Ethernet Interface on page 192

Step 1: Display the Status of Fast Ethernet and Gigabit Ethernet Interfaces

Action To display the status of Fast Ethernet or Gigabit Ethernet interfaces, use the following JUNOS command-line interface (CLI) operational mode command:

```
user@host> show interfaces terse (fe* | ge*)
```

Sample Output

```
user@host> show interfaces terse fe*
Interface  Admin Link Proto Local      Remote
fe-2/1/0   up   up
fe-2/1/0.0 up   up  inet 10.116.115.217/29
fe-3/0/2   up   down
fe-3/0/2.0 up   down
fe-3/0/3   up   up
fe-3/0/3.0 up   up  inet 192.168.223.65/30
fe-4/1/0   down up
fe-4/1/0.0 up   down inet 10.150.59.133/30
fe-4/1/1   up   up
fe-4/1/1.0 up   up  inet 10.150.59.129/30
fe-4/1/2   up   down
fe-4/1/2.0 up   down
```

What It Means The sample output lists only the Fast Ethernet interfaces. It shows the status of both the physical and logical interfaces.

For a description of what the output means, see Table 37.

Table 37: Status of Fast Ethernet Interfaces

Physical Interface	Logical Interface	Status Description
fe-2/1/0 Admin Up Link Up	fe-2/1/0.0 Admin Up Link Up	This interface has both the physical and logical links up and running.
fe-3/0/2 Admin Up Link Down	fe-3/0/2.0 Admin Up Link Down	This interface has the physical link down (Link Down). The logical link is also down as a result.

Physical Interface	Logical Interface	Status Description
fe-4/1/0 Admin Down Link Up	fe-4/1/0.0 Admin Up Link Down	This interface is administratively disabled and the physical link is healthy (Link Up), but the logical interface is not established. The logical interface is down because the physical link is disabled.
fe-4/1/2 Admin Up Link Down	fe-4/1/2.0 Admin Up Link Down	This interface has both the physical and logical links down.

Sample Output

```

user@host> show interfaces terse ge*
Interface  Admin Link Proto Local Remote
ge-2/2/0   down down
ge-2/2/0.0 up   down inet 65.113.23.105/30
ge-2/3/0   up   up
ge-2/3/0.0 up   up  inet 65.115.56.57/30
ge-3/1/0   up   up
ge-3/1/0.0 up   up  inet 65.115.56.193/30
ge-3/2/0   up   down

```

What It Means This sample output lists only the Gigabit Ethernet interfaces. It shows the status of both the physical and logical interfaces. See Table 38 for a description of what the output means.

Table 38: Status of Gigabit Ethernet Interfaces

Physical Interface	Logical Interface	Status Description
ge-2/2/0 Admin Down Link Down	ge-2/2/0.0 Admin Up Link Down	This interface is administratively disabled (Admin Down). Both the physical and logical links are down (Link Down).
ge-2/3/0 Admin Up Link Up	ge-2/3/0.0 Admin Up Link Up	This interface has both the physical and logical links up and running.
ge-3/2/0 Admin Up Link Down	ge-3/2/0.0 Admin Up Link Down	This interface has both the physical link and the logical interface down.

Step 2: Display the Status of a Specific Fast Ethernet or Gigabit Ethernet Interface

Action To display the status of a specific Fast Ethernet or Gigabit Ethernet interface when you need to investigate its status further, use the following JUNOS CLI operational mode command:

```
user@host> show interfaces (fe-fpc/pic/port | ge-fpc/pic/port)
```

Sample Output 1 The following sample output is for a Fast Ethernet interface with the physical link up:

```
user@host> show interfaces fe-2/1/0
Physical interface: fe-2/1/0, Enabled, Physical link is Up
Interface index: 31, SNMP ifIndex: 35
Description: customer connection
Link-level type: Ethernet, MTU: 1514, Source filtering: Disabled
Speed: 100mbps, Loopback: Disabled, Flow control: Enabled
Device flags : Present Running
Interface flags: SNMP-Traps
Link flags   : None
Current address: 00:90:69:86:71:1b, Hardware address: 00:90:69:86:71:1b
Input rate   : 25768 bps (11 pps), Output rate: 1576 bps (3 pps)
Active alarms : None
Active defects : None
Logical interface fe-2/1/0.0 (Index 2) (SNMP ifIndex 43)
Flags: SNMP-Traps, Encapsulation: ENET2
Protocol inet, MTU: 1500, Flags: Is-Primary
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.116.151.218/29, Local: 10.119.115.217
Broadcast: 10.116.151.225
```

Sample Output 2 The following output is for a Gigabit Ethernet interface with the physical link up:

```
user@host> show interfaces ge-3/1/0
Physical interface: ge-3/1/0, Enabled, Physical link is Up
Interface index: 41, SNMP ifIndex: 55
Description: customer connection
Link-level type: Ethernet, MTU: 1514, Source filtering: Disabled
Speed: 1000mbps, Loopback: Disabled, Flow control: Enabled
Device flags : Present Running
Interface flags: SNMP-Traps
Link flags   : None
Current address: 00:90:69:85:71:99, Hardware address: 00:90:69:85:71:99
Input rate   : 7412216 bps (1614 pps), Output rate: 2431184 bps (1776 pps)
Active alarms : None
Active defects : None
Logical interface ge-3/1/0.0 (Index 11) (SNMP ifIndex 57)
Flags: SNMP-Traps, Encapsulation: ENET2
Protocol inet, MTU: 1500
Addresses, Flags: Is-Preferred Is-Primary
Destination: 10.117.65.192/30, Local: 10.115.65.193
Broadcast: 10.115.65.195
```

What It Means The first line of sample output 1 and 2 shows that the physical link is up. This means that the physical link is healthy and can pass packets. Further down the sample output, look for active alarms and defects. If you see active alarms or defects, to further diagnose the problem, see Step 3, “Display Extensive Status Information for a Specific Fast Ethernet or Gigabit Ethernet Interface” on page 189, to display more extensive information about the Fast Ethernet interface and the physical interface that is down.

Step 3: Display Extensive Status Information for a Specific Fast Ethernet or Gigabit Ethernet Interface

Action To display extensive status information about a specific Fast Ethernet or Gigabit Ethernet interface, use the following JUNOS CLI operational mode command:

```
user@host> show interfaces (fe-fpc/pic/port | ge-fpc/pic/port) extensive
```

Sample Output The following sample output is for a Fast Ethernet interface:

```
user@router> show interfaces fe-1/3/3 extensive
Physical interface: fe-1/3/3, Enabled, Physical link is Up
Interface index: 47, SNMP ifIndex: 38
Description: Test
Link-level type: Ethernet, MTU: 1514, Source filtering: Disabled
Speed: 100mbps, Loopback: Disabled, Flow control: Enabled
Device flags : Present Running
Interface flags: SNMP-Traps
Link flags : None
Current address: 00:90:69:8d:2c:de, Hardware address: 00:90:69:8d:2c:de
Statistics last cleared: 2002-01-11 23:03:09 UTC (1w2d 23:54 ago)
Traffic statistics:
Input bytes :      373012658          0 bps
Output bytes :      153026154        1392 bps
Input packets:      1362858          0 pps
Output packets:      1642918          3 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runt: 0, Policed discards: 503660
L3 incompletes: 1, L2 channel errors: 0, L2 mismatch timeouts: 0
FIFO errors: 0
Output errors:
Carrier transitions: 0, Errors: 0, Collisions: 0, Drops: 0, Aged packets: 0
HS link CRC errors: 0, FIFO errors: 0
Active alarms : None
Active defects : None
MAC statistics:

```

	Receive	Transmit
Total octets	439703575	177452093
Total packets	1866532	1642916
Unicast packets	972137	1602563
Broadcast packets	30	2980
Multicast packets	894365	37373
CRC/Align errors	0	0
FIFO errors	0	0
MAC control frames	0	0
MAC pause frames	0	0
Oversized frames	0	
Jabber frames	0	
Fragment frames	0	
VLAN tagged frames	0	
Code violations	0	

```
Filter statistics:
Input packet count      1866532
```

```

Input packet rejects          0
Input DA rejects             503674
Input SA rejects             0
Output packet count          1642916
Output packet pad count      0
Output packet error count    0
CAM destination filters: 5, CAM source filters: 0
Autonegotiation information:
Negotiation status: Complete, Link partner status: OK
Link partner: Full-duplex, Flow control: None
PFE configuration:
Destination slot: 1, Stream number: 15
CoS transmit queue bandwidth:
  Queue0: 95, Queue1: 0, Queue2: 0, Queue3: 5
CoS weighted round-robin:
  Queue0: 95, Queue1: 0, Queue2: 0, Queue3: 5
Logical interface fe-1/3/3.0 (Index 8) (SNMP ifIndex 69)
Description: Test
Flags: SNMP-Traps, Encapsulation: ENET2
Protocol inet, MTU: 1500, Flags: None
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 10.115.107.192/29, Local: 10.115.107.193
  Broadcast: 10.115.107.199

```

What It Means The sample output shows where the errors might be occurring and includes autonegotiation information. See Table 39 for a description of errors to look for.

Table 39: Errors to Look For

Error	Meaning
Policed discards	Discarded frames that were not recognized or were not of interest, for example, Cisco Discovery Protocol (CDP) packets.
L2 channel errors	Packets for which the router could not find a valid logical interface. For example, the packet is for a virtual LAN (VLAN) that is not configured on the interface.
MTU	The maximum transmission unit (MTU) must match the interface of either the router at the remote end of the Fast Ethernet or Gigabit Ethernet link, or that of the switch.
Input DA rejects	Number of packets with a destination Media Access Control (MAC) address that is not on the accept list. It is normal to see this number increment.
Input SA rejects	Number of packets with a source MAC address that is not on the accept list. This number only increments when source MAC address filtering is configured.

If the physical link is down, look at the active alarms and defects for the Fast Ethernet or Gigabit Ethernet interface and diagnose the Fast Ethernet or Gigabit Ethernet media accordingly. See “Locate the Fast Ethernet and Gigabit Ethernet LINK Alarm and Counters” on page 205 for an explanation of Fast Ethernet and Gigabit Ethernet alarms.

Table 40 lists and describes some MAC statistics errors to look for.

Table 40: MAC Statistics Errors

Error	Meaning
CRC/Align errors	The total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad FCS with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error).
MAC control frames	The number of MAC control frames.
MAC pause frames	The number of MAC control frames with pause operational code.
Jabber frames	The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either an FCS error or an alignment error. Note that this definition of jabber is different from the definition in IEEE-802.3 section 8.2.1.5 (10BASE5) and section 10.3.1.4 (10BASE2). These documents define jabber as the condition where any packet exceeds 20 ms. The allowed range to detect jabber is between 20 ms and 150 ms.
Fragment frames	The total number of packets received that were less than 64 octets in length (excluding framing bits, but including FCS octets), and had either an FCS error an alignment error. Note that it is entirely normal for fragment frames to increment because both runts (which are normal occurrences due to collisions) and noise hits are counted.

Autonegotiation is the process that connected Ethernet interfaces use to communicate the information necessary to interoperate. Table 41 explains the autonegotiation information of the show interface *interface-name* extensive command output.

Table 41: Autonegotiation Information

Autonegotiation Field Information	Explanation
Negotiation status: Incomplete	The Negotiation status field shows Incomplete when the Ethernet interface has the speed or link mode configured.
Negotiation status: No autonegotiation	The Negotiation status field shows No autonegotiation when the remote Ethernet interface has the speed or link mode configured, or does not perform autonegotiation.
Negotiation status: Complete Link partner status: OK	The Negotiation status field shows Complete and the Link partner field shows OK when the Ethernet interface is connected to a device that performs autonegotiation and the autonegotiation process completes successfully.
Link partner: Half-duplex	The Link partner field can be Full-duplex or Half-duplex depending on the capability of the attached Ethernet device.
Flow control: Symmetric/asymmetric	The Flow control field displays the types of flow control supported by the remote Ethernet device.

Step 4: Monitor Statistics for a Fast Ethernet or Gigabit Ethernet Interface

Action To monitor statistics for a Fast Ethernet or Gigabit Ethernet interface, use the following JUNOS CLI operational mode command:

```
user@host> monitor interface (fe-fpc/pic/port | ge-fpc/pic/port)
```



CAUTION: We recommend that you use the monitor interface *fe-fpc/pic/port* or monitor interface *ge-fpc/pic/port* command only for diagnostic purposes. Do not leave these commands on during normal router operations because real-time monitoring of traffic consumes additional CPU and memory resources.

Sample Output The following sample output is for a Fast Ethernet interface:

```
user@host> monitor interface fe-2/1/0
Interface: fe-2/1/0, Enabled, Link is Up
Encapsulation: Ethernet, Speed: 100mbps
Traffic statistics:
Input bytes:      282556864218 (14208 bps)      [40815]
Output bytes:     42320313078 (384 bps)         [890]
Input packets:    739373897 (11 pps)           [145]
Output packets:   124798688 (1 pps)            [14]
Error statistics:
Input errors:     0                           [0]
Input drops:     0                           [0]
Input framing errors: 0                       [0]
Policed discards: 6625892                     [6]
L3 incompletes:   75                         [0]
L2 channel errors: 0                         [0]
L2 mismatch timeouts: 0                     [0]
Carrier transitions: 1                       [0]
Output errors:    0                         [0]
Output drops:     0                         [0]
Aged packets:     0                         [0]
Active alarms : None
Active defects: None
Input MAC/Filter statistics:
Unicast packets   464751787                   [154]
Packet error count 0                         [0]
```

What It Means Use the information from this command to help narrow down possible causes of an interface problem.



NOTE: If you are accessing the router from the console connection, make sure you set the CLI terminal type using the *set cli terminal* command.

The statistics in the second column are the cumulative statistics since the last time they were cleared using the *clear interfaces statistics interface-name* command. The statistics in the third column are the cumulative statistics since the monitor interface *interface-name* command was executed.

If the input errors are increasing, verify the following:

1. Check the cabling to the router and have the carrier verify the integrity of the line. To verify the integrity of the cabling, make sure that you have the correct cables for the interface port. Make sure you have single-mode fiber cable for a single-mode interface and multimode fiber cable for a multimode interface.
2. For a fiber-optic connection, measure the received light level at the receiver end and make sure that it is within the receiver specification of the Ethernet interface. See Table 42 for the fiber-optic Ethernet interface specifications.
3. Measure the transmit light level on the Tx port to verify that it is within specification. See Table 42 for the optical specifications.

Fiber-Optic Ethernet Interface Specifications

Table 42 shows the specifications for fiber-optic interfaces for Juniper Networks routers.

Table 42: Fiber-Optic Ethernet Interface Specifications

Fiber-Optic Ethernet Interface	Length	Wavelength	Average Launch Power	Receiver Saturation	Receiver Sensitivity
Gigabit Ethernet					
Duplex SC connector					
LH optical interface	49.5-mile 70-km reach on 8.2-micrometer SMF	1480 to 1580 nm	-3 to + 2 dBm	-3 dBm	-23 dBm (BER 10 ⁻¹²) for SMF
LX optical interface	6.2-mile 10-km reach on 9/125-micrometer SMF 1804.5-ft 550-m reach on 62.5/125- and 50/125-micrometer MMF	1270 to 1355 nm	-11 to -3 dBm	-3 dBm	-19 dBm
SX optical interface	656-ft 200-m reach on 62.5/125-micrometer MMF 1640-ft 500-m reach on 50/125-micrometer MMF	830 to 860 nm	-9.5 to -4 dBm	-3 dBm	-17 dBm
Fast Ethernet 8-Port					
FX optical interface with MT-RJ connector	1.24-mile 2-km reach on 62.5/125-micrometer MMF	1270 to 1380 nm	-20 to -14 dBm	-14 dBm	-34 dBm

