

## Chapter 26

# Locate Multichannel DS-3 Alarms and Errors

This chapter describes the most common Multichannel DS-3 alarms and errors encountered when investigating line problems on a Juniper Networks router. (See Table 54.)

Table 54: Checklist for DS-3 Alarms

Multichannel DS-3 Alarms and Errors Tasks	Command or Action
Display Alarms and Errors for Channelized DS-3 to DS-1 Interfaces on page 274	show interfaces t1-fpc/pic/port:channel extensive
Display Alarms and Errors for Channelized DS-3 to DS-0 Interfaces on page 277	show interfaces ds-fpc/pic/port:channel:channel extensive

## Display Alarms and Errors for Channelized DS-3 to DS-1 Interfaces

**Action** To display channelized DS-3 to DS-1 alarms and errors, use the following JUNOS command-line interface (CLI) operational mode command:

```
user@host> show interfaces t1-fpc/pic/port:channel extensive
```

### Sample Output

```
user@host> show interfaces t1-2/1/0:19 extensive
Physical interface: t1-2/1/0:19, Enabled, Physical link is Up
Interface index: 50, SNMP ifIndex: 59, Generation: 49
Description: Customer
Link-level type: Cisco-HDLC, MTU: 1504, Clocking: Internal, Speed: T1, Loopback: None, FCS: 16,
Mode: M23, Framing: ESF
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps
Link flags   : Keepalives
Hold-times   : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 117 (last seen 00:00:08 ago)
  Output: 121 (last sent 00:00:01 ago)
Statistics last cleared: 2002-08-01 10:14:45 UTC (00:19:38 ago)
Traffic statistics:
  Input bytes :      22459734      236888 bps
  Output bytes :    162288645    1322208 bps
  Input packets:      201233      214 pps
  Output packets:    236341      227 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Policed discards: 377, L3 incompletes: 0,
  L2 channel errors: 0, L2 mismatch timeouts: 0, HS link CRC errors: 0, SRAM errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, Aged packets: 0
DS1 alarms : None
DS3 alarms : None
DS1 defects : None
DS3 defects : None
T1 media:
  Seconds      Count State
SEF           0      0 OK
BEE           0      0 OK
AIS           0      0 OK
LOF           0      0 OK
LOS           0      0 OK
YELLOW        0      0 OK
BPV           0      0
EXZ           0      0
LCV           0      0
PCV           0      0
CS            0      0
LES           0
ES            0
SES           0
SEFS          0
BES           0
UAS           0
DS3 media:
  Seconds      Count State
PLL Lock      0      0 OK
Reframing     0      0 OK
AIS           0      0 OK
LOF           0      0 OK
LOS           0      0 OK
IDLE          0      0 OK
```

```

YELLOW          0      0 OK
BPV             0      0
EXZ             0      0
LCV             0      0
PCV             0      0
LES             0
PES             0
PSES            0
SEFS            0
UAS             0
Interface transmit queues:
      B/W WRR   Packets   Bytes   Drops   Errors
Queue0 95 95   234494 162020375      0      0
Queue1  5  5     164    5808      0      0
HDLc configuration:
Giant threshold: 1514, Runt threshold: 3
Timeslots      : All active
Line encoding: B8ZS, Byte encoding: Nx64K, Data inversion: Disabled
DS3 BERT configuration:
BERT time period: 0 seconds, Elapsed: 0 seconds
Algorithm: Unknown (0), Induced Error rate: 10e-0
DS1 BERT configuration:
BERT time period: 10 seconds, Elapsed: 0 seconds
Induced Error rate: 10e-0, Algorithm: 2^15 - 1, O.151, Pseudorandom (9)
PFE configuration:
Destination slot: 2, PLP byte: 2 (0xab)
CoS transmit queue   Bandwidth   Buffer   Priority   Limit
      %      bps %      bytes
0 best-effort        0      0 0      0    low  none
1 expedited-forwarding 0      0 0      0    low  none
2 assured-forwarding  0      0 0      0    low  none
3 network-control    0      0 0      0    low  none

Logical interface t1-2/1/0:19.0 (Index 27) (SNMP ifIndex 125) (Generation 26)
Flags: Point-To-Point SNMP-Traps Encapsulation: Cisco-HDLC
Protocol inet, MTU: 1500, Flags: None, Generation: 34 Route table: 0
Addresses, Flags: Is-Preferred Is-Primary
Destination: 192.168.140.196/30, Local: 192.168.140.197, Broadcast: Unspecified, Generation: 44

```

**What It Means** The sample output shows that there are no active alarms and active defects. When a major error (such as an alarm indication signal [AIS]) is seen for a few consecutive frames, a defect is declared within 1 second from detection. At the defect level, the interface is taken down and routing protocols are immediately notified (this is the default). In most cases, when a defect persists for 2.5 seconds plus or minus 0.5 seconds, an alarm is declared.

Notification messages are logged at the alarm level. Depending on the type of T1 alarm, you can configure the craft panel to display the red or yellow alarm LED and simultaneously have the alarm relay activate a physically connected device (such as a bell).

Table 55 shows T1 media-specific alarms or defects that can render the interface unable to pass packets.

**Table 55: T1 Media Alarms and Error Definitions**

<b>T1 Media Alarm or Error</b>	<b>Definitions</b>
AIS	Alarm indication signal (blue alarm)
BEE	Block error event
BES	Bursty errored seconds
BPV	Bipolar violation
CS	Controlled slip
ES	Errored seconds
EXZ	Excessive zeros
LCV	Line code violation
LES	Line errored seconds
LOF	Loss of frame
LOS	Loss of signal
PCV	Path code violation
SEF	Severely errored frame
SEFS	Severely errored frame seconds
SES	Severely errored seconds
UAS	Unavailable seconds
YLW	Yellow alarm

See “Locate T1 Alarms and Errors” on page 43 for more details on T1 alarms and statistics.

## Display Alarms and Errors for Channelized DS-3 to DS-0 Interfaces

**Action** To display T3 alarms and errors for channelized DS-3 to DS-0 interfaces, use the following JUNOS CLI operational mode command:

```
user@host> show interfaces ds-fpc/pic/port:channel:channel extensive
```

**Sample Output**

```
user@host> show interfaces ds-2/1/0:5:1 extensive
Physical interface: ds-2/1/0:5:1, Enabled, Physical link is Up
Interface index: 36, SNMP ifIndex: 133, Generation: 35
Description: Customer
Link-level type: Cisco-HDLC, MTU: 1504, Clocking: Internal, Speed: 64kbps, FCS: 16, Mode: M23,
Framing: ESF
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps
Link flags   : Keepalives
Hold-times   : Up 0 ms, Down 0 ms
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive statistics:
  Input : 2 (last seen 00:00:05 ago)
  Output: 2 (last sent 00:00:05 ago)
Statistics last cleared: 2002-08-01 10:14:45 UTC (00:00:16 ago)
Traffic statistics:
  Input bytes :          524          304 bps
  Output bytes :          528          304 bps
  Input packets:           8           0 pps
  Output packets:          8           0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Policed discards: 10, L3 incompletes: 0,
  L2 channel errors: 0, L2 mismatch timeouts: 0, HS link CRC errors: 0
Output errors:
  Carrier transitions: 0, Errors: 0, Drops: 0, Aged packets: 0
DS1 alarms : None
DS3 alarms : None
DS1 defects : None
DS3 defects : None
T1 media:
  Seconds  Count State
SEF        0      0 OK
BEE        0      0 OK
AIS        0      0 OK
LOF        0      0 OK
LOS        0      0 OK
YELLOW     0      0 OK
BPV        0      0
EXZ        0      0
LCV        0      0
PCV        0      0
CS         0      0
LES        0
ES         0
SES        0
SEFS       0
BES        0
UAS        0
DS3 media:
  Seconds  Count State
PLL Lock   0      0 OK
Reframing  0      0 OK
AIS        0      0 OK
LOF        0      0 OK
LOS        0      0 OK
IDLE       0      0 OK
```

```

YELLOW          0      0 OK
BPV             0      0
EXZ             0      0
LCV             0      0
PCV             0      0
LES             0
PES             0
PSES            0
SEFS            0
UAS             0
Interface transmit queues:
      B/W WRR   Packets   Bytes   Drops   Errors
Queue0 95 95     4       336     0       0
Queue1  5  5     1        22     0       0
HDLC configuration:
Giant threshold: 1514, Runt threshold: 3
Timeslots      : 1
Byte encoding: Nx64K, Data inversion: Disabled
DS3 BERT configuration:
BERT time period: 0 seconds, Elapsed: 0 seconds
Algorithm: Unknown (0), Induced Error rate: 10e-0
DS1 BERT configuration:
BERT time period: 0 seconds, Elapsed: 0 seconds
Induced Error rate: 10e-0, Algorithm: 2^15 - 1, O.151, Pseudorandom (9)
PFE configuration:
Destination slot: 2, PLP byte: 2 (0x2f)
CoS transmit queue   Bandwidth   Buffer   Priority Limit
                    %      bps %      bytes
0 best-effort        0      0 0      0    low  none
1 expedited-forwarding 0      0 0      0    low  none
2 assured-forwarding  0      0 0      0    low  none
3 network-control    0      0 0      0    low  none

Logical interface ds-2/1/0:5:1.0 (Index 14) (SNMP ifIndex 134) (Generation 13)
Flags: Point-To-Point SNMP-Traps Encapsulation: Cisco-HDLC
Protocol inet, MTU: 1500, Flags: None, Generation: 20 Route table: 0
Addresses, Flags: Is-Preferred Is-Primary
  Destination: 192.168.118.96/30, Local: 192.168.118.97, Broadcast: Unspecified,
  Generation: 22

```

**What It Means** The sample output shows that there are no active alarms and active defects. When a major error (such as an AIS) is seen for a few consecutive frames, a defect is declared within 1 second from detection. At the defect level, the interface is taken down and routing protocols are immediately notified (this is the default). In most cases, when a defect persists for 2.5 seconds plus or minus 0.5 seconds, an alarm is declared.

Notification messages are logged at the alarm level. Depending on the type of T3 alarm, you can configure the craft panel to display the red or yellow alarm LED and simultaneously have the alarm relay activate a physically connected device (such as a bell).



**NOTE:** T3 is a general term used to refer to the transmission of 44.736-Mbps digital circuits over any media. T3 can be transported over copper, fiber, or radio. DS-3 is the term for the electrical signal found at the metallic interface for this circuit where most of the testing is performed.

Table 55 shows T3 media-specific alarms or errors that can render the interface unable to pass packets.

**Table 56: T3 Interface Error Counter Definitions**

<b>T3 Alarm or Error</b>	<b>Definition</b>
AIS	Alarm indication signal
EXZ	Excessive zeros
FERF	Far-end failures
IDLE	Idle code detected
LCV	Line code violation
LOS	Loss of signal
LOF	Loss of frame
YLW	Remote defect indication (yellow alarm)
PLL	Phase locked loop

See “Locate T3 Alarms and Errors” on page 71 for more details on T3 alarms and statistics.

