

Chapter 5

Locate T1 Alarms and Errors

This chapter describes the most common T1 alarms and errors encountered when investigating line problems on a Juniper Networks router. (See Table 10.)

Table 10: Checklist for T1 Alarms and Errors

T1 Alarms and Errors Tasks	Command or Action
Display T1 Alarms and Errors on page 44	<code>show interfaces t1-fpc/pic/port extensive</code>
Locate Most Common T1 Alarms and Errors on page 46	
1. Locate Loss of Signal and Loss of Frame Alarms on page 46	Check the connection between the router port and the first T1 network element.
2. Locate Alarm Indication Signal Alarms on page 47	Check the T1 network element connected to the T1 interface.
3. Locate an Incoming Yellow Alarm on page 47	Check the cable between the T1 interface and the directly connected T1 network element.

Display T1 Alarms and Errors

Action To display T1 alarms and errors, use the following JUNOS command-line interface (CLI) operational mode command:

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

Sample Output

```
user@host> show interfaces t1-1/1/0 extensive
Physical interface: t1-1/1/0, Enabled, Physical link is Down
Interface index: 24, SNMP ifIndex: 20, Generation: 27
Link-level type: PPP, MTU: 1504, Clocking: Internal, Speed: T1, Loopback: None, FCS: 16, Framing: ESF
Device flags : Present Running Down
Interface flags: Hardware-Down Point-To-Point SNMP-Traps
Link flags : Keepalives
Hold-times : Up 0 ms, Down 0 ms
Last flapped : 2002-01-01 00:00:35 UTC (00:01:00 ago)
Statistics last cleared: 2002-01-01 00:01:03 UTC (00:00:32 ago)
Traffic statistics:
Input bytes :          0          0 bps
Output bytes :          0          0 bps
Input packets:         0          0 pps
Output packets:        0          0 pps
Input errors:
  Errors: 0, Drops: 0, Framing errors: 0, Policed discards: 0, 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 : LOF, LOS
DS1 defects : LOF, LOS
T1 media:
  Seconds  Count State
SEF        32    0 Defect Active
BEE         0    0 OK
AIS         0    0 OK
LOF        32    0 Defect Active
LOS        32    0 Defect Active
YELLOW     0    0 OK
BPV         0    0
EXZ         0    0
LCV         0    0
PCV        32  10667
CS          0    0
LES         0
ES          32
SES         32
SEFS        32
BES         0
UAS         32
HDLC configuration:
  Policing bucket: Disabled
  Shaping bucket : Disabled
  Giant threshold: 1514, Runt threshold: 3
  Timeslots : All active
  Line encoding: B8ZS, Byte encoding: Nx64K, Data inversion: Disabled
  Buildout : 0 to 132 feet
DS1 BERT configuration:
  BERT time period: 10 seconds, Elapsed: 0 seconds
  Induced Error rate: 10e-0, Algorithm: Unknown (0)
Packet Forwarding Engine configuration:
  Destination slot: 1, PLP byte: 1 (0x00)
  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

```

What It Means The sample output shows 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 11 lists the T1 media-specific alarms or defects that can render the interface unable to pass packets.

Table 11: T1 Interface Alarms and Error Definitions

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

Locate Most Common T1 Alarms and Errors

Steps To Take To locate common alarms and errors, follow these steps:

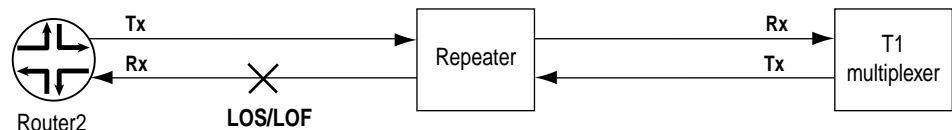
1. Locate Loss of Signal and Loss of Frame Alarms on page 46
2. Locate Alarm Indication Signal Alarms on page 47
3. Locate an Incoming Yellow Alarm on page 47

Step 1: Locate Loss of Signal and Loss of Frame Alarms

Purpose A loss of signal (LOS) or loss of frame (LOF) alarm indicates that a signal could not be detected at the T1 interface.

Action To locate the LOS or LOF alarm, check the connection between the router port and the first T1 network element. In the example network in Figure 3, the X indicates that there is a connection problem between Router2 and the nearest T1 network element.

Figure 3: Location of an LOS or LOF Alarm in a T1 Network



1797



NOTE: Tx represents the transmit port and Rx represents the receive port.

Sample Output user@router2> show interfaces t1-1/1/1 extensive

```
[... Output truncated...]
DS1 alarms : LOF, LOS
DS1 defects : LOF, LOS
T1 media:
Seconds      Count State
SEF          32     0 Defect Active
BEE           0     0 OK
AIS           0     0 OK
LOF          32     0 Defect Active
LOS          32     0 Defect Active
YELLOW       0     0 OK
BPV           0     0
EXZ           0     0
```

```

LCV      0      0
PCV      32     10667
CS        0      0
LES       0
ES        32
SES       32
SEFS     32
BES       0
UAS      32
[...Output truncated...]

```

What It Means The sample output shows that Router2 (Rx) detected a cumulative LOS and LOF alarm for 32 seconds.

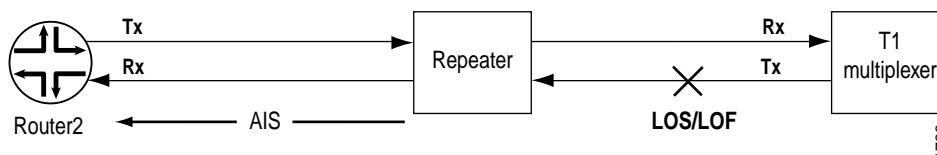
Step 2: Locate Alarm Indication Signal Alarms

Purpose An alarm indication signal (AIS) is a valid framed signal with payload containing a repeating 1010 pattern. An AIS alarm indicates a problem with the line upstream from the T1 network element connected to the T1 interface.

Action To locate the AIS alarm, have the carrier check the T1 network element connected to the T1 interface and trace the problem.

All diagnostics are from the perspective of Router2 (the Juniper Networks router). Figure 4 illustrates the location of an AIS alarm in a T1 network.

Figure 4: Location of an AIS Alarm in a T1 Network



What It Means In Figure 4, the X indicates that there is an LOS or LOF alarm between the repeater and the Tx T1 multiplexer. An AIS alarm is sent from the repeater to Router2.

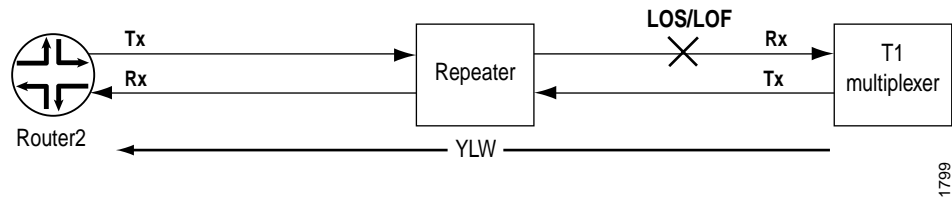
Step 3: Locate an Incoming Yellow Alarm

Purpose An incoming yellow alarm indicates that the T1 network element connected to the T1 interface has a problem with the signal it is receiving from the T1 interface.

Action To locate the yellow alarm, check the cable between the T1 interface and the directly connected T1 network element.

All diagnostics are from the perspective of Router2. Figure 5 illustrates the location of a yellow alarm in a T1 network.

Figure 5: Location of a Yellow Alarm in a T1 Network



1799

What It Means In Figure 5, the T1 multiplexer detects an LOS or LOF alarm on its connection from Router2 and sends a yellow (YLW) alarm to Router2.