E3 Alarm Troubleshooting

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Introduction

This document describes how to interpret and troubleshoot the different alarms on an E3 line.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

Identify the Alarm

Based on the type of port adapter used, these Cisco IOS® Software commands display the E3 interface status specific to the controller hardware:

- PA–E3: **show interfaces serial**

```
dodi# show interfaces serial 5/0
Serial5/0 is down, line protocol is down
...
rxLOS active, rxLOF inactive, rxAIS inactive
txAIS inactive, rxRAI inactive, txRAI active
```

- PA–MC–E3: **show controllers e3**

```
dodi# show controllers e3 4/0
E3 4/0 is down.
...
Transmitter is sending remote alarm.
Receiver has loss of signal. Line Code is HDB3, Clock Source is Line.
...
```

This information is useful for diagnostic tasks that technical support personnel perform.

Troubleshoot the Alarm

This section addresses the types of alarms and procedures to correct the alarms.

rxLoS (Receiver has loss of signal)

A receive (rx) Loss of Signal (LoS) alarm means that the rx port on the port adapter does not receive a valid physical E3 signal.

To clear the rxLoS alarm, complete these steps:

1. Ensure that the cable between the interface port and the E3 service provider equipment or remote E3 terminal equipment connects correctly.

   Ensure that the cable hooks up to the correct ports. Correct the cable connections if necessary.
2. Check the 75 ohms coax cable integrity.

   Look for breaks or other physical abnormalities in the cable. Replace the cable if necessary.

rxLoF (Receiver has loss of frame)

An rx Loss of Framing (LoF) alarm means that the input port does not receive G.751 framing or has lost synchronization on the received G.751 framing.

To clear the rxLoF alarm, complete these steps:

1. Ensure that the remote E3 terminal equipment sends G.751 framing.

   Enable G.751 framing if necessary.
2. Ensure that the service provider passes G.751 framing from the remote E3 terminal equipment transparently.

   Ask the service provider to provide a clear–channel E3 circuit if necessary.

If this procedure does not fix the problem, refer to the rxLoS (Receiver has loss of signal) section of this document.

rxAIS (Receiver is getting AIS)

An rx Alarm Indication Signal (AIS) indicates the occurrence of an error on the E3 line upstream from the equipment that connects to the port.

The AIS alarm is declared at the detection of an AIS signal (all "1"s) at the input. The AIS alarm still exists after the LoF alarm is declared active. (The unframed nature of the all "1"s signal causes the signal to remain.) The AIS alarm clears when the LoF alarm clears.

To clear the rxAIS alarm, contact your service provider to check for an incorrect internal configuration (within the telephone company) or a failure in the upstream connections.

rxRAI (Receiver has remote alarm)

An rx Remote Alarm Indication (RAI) means that the far–end equipment has a problem with the signal that the far–end equipment receives from the local equipment.

The RAI alarm is declared when the A–bit (bit 11 in the G.751 frame) is set to one. The RAI alarm is not declared at the detection of an LoS or LoF alarm.

To clear the rxRAI alarm, complete these steps:

1. Insert an external loopback cable into the port.

   For more information, refer to the *Hard Plug Loopback Tests for E3 Lines* section of E3 Error Events Troubleshooting.
2. Determine if there are any alarms.

   If you do not see any alarms, the local hardware is probably in good condition. In that case, complete these steps:

   a. Check the cables to ensure that the coax cable between the interface port and the E3 service provider equipment or E3 terminal equipment connects correctly.

      Ensure that the cable connects to the correct ports. Correct the cable connections if necessary.
   b. To check the cable integrity, look for breaks or other physical abnormalities in the coax cable.

      Replace the cable if necessary.
   c. Check the settings at the remote end and verify that the settings match your port settings.
   If the problem persists, contact your service provider.
3. Remove the loopback cable and reconnect your E3 line.
4. Check the coax cable setup.
5. Power cycle the router.
6. Connect the E3 line to a different port.

   Configure the port with the same settings as the E3 line. If the problem stops, then the fault lies with the original port.

txRAI (Transmitter is sending remote alarm)

A transmit (tx) Remote Alarm Indication (RAI) at an E3 interface means that the interface has a problem with the signal that the interface receives from the remote equipment.

To clear the txRAI alarm, complete these steps:

1. Check the settings at the remote end to ensure that the settings match your port settings.
2. Troubleshoot any signal problem that occurs from the far–end equipment.

An active receiver alarm causes a txRAI alarm. The active receiver alarm indicates that the E3 port/card has a problem with the signal from the far−end equipment.

txAIS

A tx Alarm Indication Signal (AIS) is declared when the E3 serial interface or controller shuts down (PA−E3 only). A message that consists of all ones ("1"s) is sent in an unframed E3 signal.

To clear the txAIS alarm, issue the **no shutdown** command to bring the E3 serial interface or controller up.

Note: When the E3 controller on PA−MC−E3 shuts down, the **show controllers e3** command **does not** display a "Transmitter is sending AIS" message.

Related Information

- **E3 Troubleshooting Flowchart**
- **E3 Error Events Troubleshooting**
- *Hard Plug Loopback Tests for E3 Lines* **E3 Error Events Troubleshooting**
- **Access Technology Support Pages**
- **WAN Technical Support**
- **Tools and Utilities**
- **Technical Support − Cisco Systems**

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