

E1 Alarm Troubleshooting

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Introduction

This document explains common alarm types that may appear during E1 operation. It also provides troubleshooting techniques. Use this document in conjunction with E1 Error Events Troubleshooting and the Internetwork Troubleshooting Handbook.

Prerequisites

Requirements

There are no specific prerequisites for this document.

Components Used

The information in this document is based on this software version.

- Cisco IOS® Software Release 12.0

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before you use it.

Conventions

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

Identify the Alarm

The **show controller e1** command displays the controller status specific to the controller hardware. This information is useful for technical support personnel who perform diagnostic tasks. The Network Processor Module (NPM) or MultiChannel Interface Processor (MIP) can query the port adapters to determine their current status.

The **show controller e1 EXEC** command also provides:

- Statistics about the E1 link. If you specify a slot and a port number, you can see statistics for each 15-minute period.
- Information to troubleshoot physical layer and data link layer problems.
- Local or remote alarm information, if any, on the E1 line.

Issue the **show controller** command to see if there are alarms or errors displayed by the controller. To see if the frame, line code, and slip seconds error counters register increasing counts, issue the **show controller e1** command repeatedly. Note the values the counters indicate for the current interval.

Contact your service provider for frame and line code settings. HDB3 is the only defined line code for E1 lines, while CRC4 framing is most widely used. Look for "Clock Source is Line Primary" in the **show controller e1** command output to verify that the clock source is derived from the network.

Troubleshooting the Alarm

This section addresses alarms and procedures to correct them. After each step, issue the **show controller e1** command to determine if any alarms occur.

Receive Alarm Indication Signal

A receive (rx) Alarm Indication Signal (AIS) means that there is an alarm on the line upstream from the equipment connected to the port. The AIS failure is declared when an AIS defect is detected at the input and still exists after the Loss of Frame (LoF) failure is declared (caused by the unframed nature of the all "1s" signal). The AIS failure is cleared when you clear the LoF failure.

To correct rxAIS errors, complete these steps:

1. Check the **show controller e1 slot/port** command output to see if the framing format configured on the port matches the framing format of the line.

If not, change the framing format on the controller to match the line.

To change the framing format, issue the **framing {crc4 | no-crc4}** command in controller configuration mode, for example:

```
bru-nas-03#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
bru-nas-03(config)#controller e1 0
bru-nas-03(config-controller)#framing crc4
```

2. Contact your service provider to check for an incorrect configuration within the telephone company or a failure in its upstream connections.

Receive Remote Alarm Indication

A Remote Alarm Indication (RAI) means that the far-end equipment has a problem with the signal it is receiving from the local equipment.

The RAI failure is declared when the A-bit (bit three in timeslot zero of frames not containing Frame Alignment Signal [FAS]) becomes one (1). The RAI failure is not declared when a Loss of Signal (LoS) or LoF is detected.

To correct rxRAI errors, complete these steps:

1. Insert an external loopback cable into the port.

For more information, see the Hard Plug Loopback Tests for E1 Lines document.

2. Issue the **show controller e1 EXEC** command to determine if any alarms occur.

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

- a. Check the cabling. Ensure that you have correctly connected the cable between the interface port and the E1 service provider equipment or E1 terminal equipment. Ensure that you have connected the cable to the correct ports. Correct the cable connections if necessary.
- b. Check the cable integrity by looking for breaks or other physical abnormalities in the cable. Ensure the pinouts are set correctly. Replace the cable if necessary.
- c. Check the settings at the remote end and verify that they match your port settings.

If the problem persists, contact your service provider.

3. Remove the loopback plug, and reconnect your E1 line.
4. Check the cabling.
5. Power cycle the router.
6. Connect the E1 line to a different port. Configure the port with the same settings as the line.

If the problem does not persist, then the fault lies with the port. In this case, complete the following steps:

- a. Reconnect the E1 line to the original port.
- b. Perform a hardware loop test. For more information, see the Hard Plug Loopback Tests for E1 Lines document.

Transmit Remote Alarm Indication

A transmit (tx) RAI at an E1 interface means that the interface has a problem with the signal it receives from the far-end equipment.

To correct txRAI errors, complete the following steps:

1. Check the settings at the remote end to ensure that they match your port settings.
2. Another alarm accompanies the txRAI. This alarm indicates the problem that the E1 port/card has with the signal from the far-end equipment. Troubleshoot the condition to resolve the txRAI.

Transmit Alarm Indication Signal

A txAIS alarm is declared when the E1 controller is shut down. A message consisting of all "1"s is sent in an unframed E1 signal.

To correct txAIS errors, complete these steps:

1. Issue the **show controller e1 *number*** command to ensure that the E1 controller is up (*number* is the interface number).
 2. If the E1 controller is not up, issue the **no shutdown** command to bring it up.
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Related Information

- [E1 Error Events Troubleshooting](#)
 - [Internetwork Troubleshooting Handbook](#)
 - [Configuring Channelized E1 and Channelized T1](#)
 - [Hard Plug Loopback Tests for E1 Lines](#)
 - [Access Technology Support Pages](#)
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