E1 Error Events Troubleshooting

Contents

Introduction

This document describes various error events that occur on E1 lines and provides troubleshooting information to fix these errors. Most common E1 problems can be solved by using this document in conjunction with the [E1 Layer 1 Troubleshooting](#), [E1 Alarm Troubleshooting](#), and [E1 PRI Troubleshooting](#) documents.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on Cisco IOS® Software Release 12.0(7)T.

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 using it.

Conventions

For more information on document conventions, see the [Cisco Technical Tips Conventions](#).

Using the Counters

The **show controller e1** command displays the controller status specific to the controller hardware. This information is useful for diagnostic tasks performed by technical support personnel. 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 the following:

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

Use the **show controller** command to see if there are alarms or errors displayed by the controller. To see if the framing, line coding, and slip seconds error counters are increasing, use the **show controller e1** command repeatedly. Note the values of the counters for the current interval.

Contact your Service Provider for framing and line coding settings. HDB3 is the only defined line code for E1 lines, while CRC4 framing is most widely used.

Slip Secs Counter Increasing

If slips are present on the E1 line, there is a clocking problem. The Customer Premises Equipment (CPE) will need to synchronize to the clocking from the E1 provider (telco). Complete the following steps to correct this problem:

1. Ensure the clock source is derived from the network. In the **show controller e1** EXEC command output, look for Clock Source is Line Primary.**Note:** If there are multiple E1s into an access server, only one can be the primary source. The other E1s derive the clock from the primary source. If there are multiple E1s, ensure the E1 line designated as the primary clock source is configured correctly. You may also configure a second E1 line to provide clocking in case the primary source goes down. To do this, use the **clock source line secondary** command from controller configuration mode.
2. Set the E1 clock source from controller configuration mode. For example:
   ```
   bru-nas-03(config-controller)#clock source line
   ```

Framing Loss Seconds Increasing

Follow these instructions when dealing with a framing loss seconds increase.

1. Ensure the framing format configured on the port matches the framing format of the line. Look for `Framing is {crc4|no-crc4}` in the **show controller e1** output.
2. To change the framing format, use the **framing {crc4|no-crc4}** command in the controller configuration mode. For example:
   ```
   bru-nas-03(config-controller)#framing crc4
   ```

Contact your Service Provider and consult the [T1/E1 Controller Commands](#) documentation for details on build-out settings.

Line Code Violations Increasing

Ensure the line coding configured on the port matches the line coding of the line. Look for Line Code is HDB3 in the **show controller e1** output.

If Line Code Violations keep increasing, contact your Service Provider to check the E1 line as Line Code Violations can also be caused by physical line problems.

Path Code Violations Increasing

Ensure the framing format configured on the port matches the framig format of the line. Look for Framing is {crc4|no-crc4} in the **show controller e1** output.

If Path Code Violations keep increasing, contact your Service Provider to check the E1 line as Path Code Violations can also be caused by physical line problems.

Verifying the isdn switch-type and pri-group timeslots Configuration

Use the **show running-config** command to ensure that **isdn switch-type** and **pri-group timeslots** are configured correctly. To specify the central office switch type on the ISDN interface, use the **isdn switch-type** global configuration command. Options for this command include **primary-net5**. Contact your Service Provider for the correct values to use.

Note: If you have defined ISDN pri-groups and channel groups on the same controller, ensure that you do not overlap time slots or use the ISDN D-channel timeslot in a channel group. Refer to [Channelized E1 and Channelized T1 Setup Commands](#) for more information regarding channel groups. When configuring a Primary Rate Interface (PRI), use the **isdn switch-type** global configuration command to configure the switch type.

To configure the **isdn switch-type** and **pri-group**:

```
bru-nas-03#configure terminal
bru-nas-03(config)#isdn switch-type primary-net5
bru-nas-03(config)#controller e1 0
bru-nas-03(config-controlle)#pri-group timeslots 1-31
```

Note: In some countries, service providers offer Fractional PRI lines. This means that fewer than 30 B-channels may be used for ISDN connections. For fractional PRI lines, the timeslots range must include the operational B-channels, plus the D-channel (this is fixed on timeslot 16). For example:

- **Pri-group timeslots 1-10, 16** for the first ten B-channels.
- Timeslots 1-21 for the first 20 B-channels.

Verifying the Signaling Channel

If the error counters do not increase, but the problem persists, complete the following steps to verify that the signaling channel is up and configured correctly

1. Run the **show interfaces serial** *<number>*:**15** command, where the number is the interface *number* .
2. Ensure the interface is up. If the interface is not up, use the no **shutdown** command to bring the interface up. For example:
   ```
   bru-nas-03#config terminal
   Enter configuration commands, one per line. End with CNTL/Z.
   bru-nas-03(config)#interface serial 0:15
   bru-nas-03(config-if)#no shutdown
   ```

3. Ensure encapsulation is PPP. If not, use the **encapsulation ppp** command to set encapsulation. For example:
   ```
   bru-nas-03(config-if)#encapsulation ppp
   ```

4. Ensure the interface is not in loopback mode. Loopback should be set only for testing purposes. Use the **no loopback** command to remove loopbacks. For example:
   ```
   bru-nas-03(config-if)#no loopback
   ```

5. Power cycle the router.

If the problem persists, refer to some of the documents shown below then contact your Service Provider or the Cisco Technical Assistance Center (TAC).

Related Information

- E1 Layer 1 Troubleshooting
- E1 Alarm Troubleshooting
- E1 PRI Troubleshooting
- Hard Plug Loopback Tests for E1 Lines
- T1/E1 Controller Commands
- Serial Port and T1/E1 Trunk Configuration
- Configuring Channelized E1 and Channelized T1
- Configuring Serial Interfaces
- Technical Support - Cisco Systems