

Cisco – T1 Layer 1 Troubleshooting

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T1 Layer 1 Troubleshooting

Introduction

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Introduction

This document describes the techniques and procedures to troubleshoot T1 Layer 1 problems. If T1 problems persist after following the procedures in this document, refer to T1 Error Events Troubleshooting and T1 Alarm Troubleshooting documents to isolate and correct your problem.

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

Troubleshooting with the `show controller t1` Command

The `show controller t1` 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 t1 EXEC` command also provides the following:

- Statistics about the T1 link. If you specify a slot and a port number, statistics for each 15 minute period will be displayed.
- Information to troubleshoot physical layer and data link layer problems.
- Local or remote alarm information, if any, on the T1 line.

Most T1 errors are caused by incorrectly configured lines. Ensure that line coding, framing, and clock source are configured according to the recommendations of your Service Provider.

The T1 controller can be in three states:

- Administratively down
- Down
- Up

Administratively Down T1 Controller

The controller is administratively down when it has been manually shut down. Follow these steps to restart the controller to correct this error:

1. Enter enable mode. For example:

```
maui-nas-03>en
Password:
maui-nas-03#
```

2. Enter global configuration mode. For example:

```
maui-nas-03#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
maui-nas-03(config)#
```

3. Enter controller configuration mode. For example:

```
maui-nas-03(config)#controller t1 0
maui-nas-03(config-controller)#
```

4. Restart the controller.

```
maui-nas-03(config-controller)#no shutdown
```

Ensuring the Line is Up

If the T1 controller and line are not up, ensure one of the following messages appears in the **show controller t1 EXEC** output:

```
Receiver has loss of frame.
or
Receiver has loss of signal.
```

Loss of Frame

Complete the following steps if the receiver has loss of frame:

1. Ensure the framing format configured on the port matches the framing format of the line. Check the framing format of the controller from the running configuration or the **show controller t1** command output.

To change the framing format, use the **framing {SF | ESF}** command in controller configuration mode. For example:

```
maui-nas-03#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
maui-nas-03(config)#controller t1 0
maui-nas-03(config-controller)#framing esf
```

2. Try the other framing format to see if the alarm clears.
3. Change the line build-out setting using the **cablelength long** or **cablelength short** command.

Line build-out (LBO) compensates for the loss in decibels based on the distance from the device to the first repeater in the circuit. A longer distance from the device to the repeater requires that the signal strength on the circuit be boosted to compensate for loss over that distance.

To configure transmit and receive levels for a cable length (line build-out) longer than 655 feet for a T1 trunk with a channel service unit (CSU) interface, use the **cablelength long** controller configuration command. To configure transmit attenuation for a cable length (line build-out) of 655 feet or shorter for a T1 trunk with a DSX-1 interface, use the **cablelength short** controller configuration command.

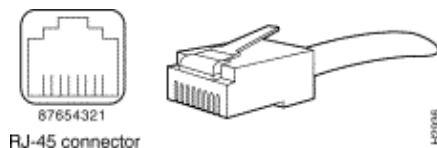
Contact your Service Provider and consult the Configuring Serial Interfaces document for details on build-out settings.

If this does not fix the problem, see the Loss of Signal section.

Loss of Signal

1. Ensure the cable between the interface port and the T1 Service Provider's equipment or T1 terminal equipment is connected correctly. Ensure the cable is hooked up to the correct ports. Correct the cable connections if necessary.
2. 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.
3. Check the cable connectors. A reversal of the transmit and receive pairs or an open receive pair can cause errors. The receive pair should be on lines 1 and 2, and the transmit pair should be on lines 4 and 5.

The pins on a RJ-45/48 jack are numbered from 1 through 8. With the metal pins facing toward you, pin 1 is the left-most pin. Following is a figure showing the pin numbering on an RJ-45 jack.



4. If you have completed all of the steps above and you are still experiencing problems, try using a rollover cable.

Use the **show controller t1 EXEC** command after each step to see if the controller exhibits any errors.

Loopback Mode

Ensure the line is in loopback mode from the **show controller t1** output. The line should be in loopback mode only for testing purposes.

To turn off loopback use the **no loopback** command in controller configuration mode. For example:

```
maui-nas-03(config-controller)#no loopback
```

Refer to the Hard Plug Loopback Tests for T1/56K Lines document to perform a hard plug loopback test to verify that the T1 controller and card are operating correctly.

If the steps above do not solve the T1 problem, refer to the T1 Error Events Troubleshooting, T1 Alarm Troubleshooting, and T1 PRI Troubleshooting documents.

Related Information

- T1 Error Events Troubleshooting

- T1 Alarm Troubleshooting
 - T1 PRI Troubleshooting
 - T1/E1 Controller Commands
 - Serial Port and T1/E1 Trunk Configuration
 - Configuring Channelized E1 and Channelized T1
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