Troubleshooting Layer 1 on a Cisco 827 Router

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Introduction

This document describes a procedure for troubleshooting layer 1 (physical layer) issues on the Cisco 827. This procedure includes Asymmetric Digital Subscriber Line (ADSL) cable pinout, front panel status LED descriptions, and the type of power supply used specifically for the Cisco 827 platform.

The physical layer defines the electrical, mechanical, procedural, and functional specifications for activating, maintaining, and de−activating the physical link between communicating network systems. Physical layer specifications define characteristics such as voltage levels, timing of voltage changes, physical data rates, maximum transmission distances, and physical connectors.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

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

Checking the Cable Pinouts and Power Supply Type

To troubleshoot Cisco 827 layer 1 issues, you need to check the cable pinouts.

1. Make sure the cabling is correct and the Cisco 827 front panel LEDs are functioning properly.

The Cisco 827 has an RJ−11 connector for the ADSL interface and it uses pins 3 and 4 to transfer data.

Note: More information about cabling, interface pinouts, and status LED descriptions can be found in DSL Modem/Router Interface Pinouts and Status LED Descriptions.

If the interface status is showing down, the router is not seeing a carrier on the ADSL interface. This could mean that the pins used for the cable are wrong or that your Internet Service Provider (ISP) has not turned on DSL service for you. From the router prompt issue the **show interface atm** *interface number* command.

```
Router#show interface atm 0
ATM0 is down, line protocol is down

!−−− Output suppressed.
```

2. Make sure the ADSL Interface (ATM0) is not shut down and that the RJ−11 cable from the ADSL interface of the router is securely plugged in to the wall jack.

   If the interface status is showing administratively down, in interface configuration mode under interface ATM 0, issue a **no shutdown** command.

```
Router#show interface atm 0
ATM0 is administratively down, line protocol is down

!−−− Output suppressed.


!−−− This shows that the ATM interface is administratively down
!−−− and needs to be turned on.


Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface atm 0
Router(config−if)#no shut
Router(config−if)#exit
Router(config)#exit
Router#

!−−− Issuing the no shut command turns on the ATM interface.
```

Troubleshooting the ADSL Interface Modem State

After making sure that you have the right cable pinout and that your ISP has turned on the DSL service, you can further troubleshoot the DSL connection by watching the modem state of the ADSL interface as the line retrains.

To troubleshoot the modem state, follow these steps:

1. On the router, issue **term mon** and **debug atm event** commands.

```
Router#term mon
Router#debug atm event
ATM events debugging is on

!−−− These commands enable you to see modem state messages on the screen.
```

2. Physically unplug the ADSL Cable (RJ−11) from the Cisco 827 ADSL interface, wait a few seconds, then plug the cable back in to cause the ADSL line to retrain.

   If you have access to the Digital Subscriber Line Access Multiplexer (DSLAM), you can also make the line retrain by shutting down the specific ADSL Terminating Unit − Central Office (ATU−C) interface where the subscriber is terminating the DSL connection.

   Note: Issuing the **shut** and **no shut** commands on the router will not retrain the ADSL line. Even when you administratively shut down the ATM interface, the Carrier Detect (CD) light and the ATU−C port LED are still on. That means it is still trained up. You need to unplug and plug back in the ADSL line to make the interface retrain.
3. Watch the debug messages on the screen.

   If the modem state stays at "0x8" and says "Could not establish connection," the Cisco 827 is waiting to hear from the central office (CO) and is not yet seeing an incoming signal.

```
Router#
1d01h: DSL: 1: Modem state = 0x8
1d01h: DSL: 2: Modem state = 0x8
1d01h: DSL: 3: Modem state = 0x8
1d01h: DSL: 4: Modem state = 0x8
1d01h: DSL: 5: Modem state = 0x8
1d01h: DSL: Could not establish connection

!--- Output suppressed.
```

   If the modem state changes from "0x8" to "SHOWTIME," it means that the Cisco 827 has successfully trained with the DSLAM.

```
Router#
00:24:18: DSL: 2: Modem state = 0x8
00:24:21: DSL: 3: Modem state = 0x8
00:24:23: DSL: 4: Modem state = 0x8
00:24:26: DSL: 5: Modem state = 0x8
00:24:28: DSL: 6: Modem state = 0x10
00:24:31: DSL: 7: Modem state = 0x10
00:24:33: DSL: 8: Modem state = 0x10
00:24:36: DSL: 9: Modem state = 0x10
00:24:37: DSL: Received response: 0x24
00:24:37: DSL: Showtime!

!--- Output suppressed.
```

4. After viewing the debugs, if you do not want to see any more modem state messages, at the router prompt issue the **undebug all** command and all debugging will be turned off.

```
Router#undebug all
```

5. If you have verified that the cable is good and has the correct pinouts, make sure the correct power supply is being used.

   Look at the back of the power adapter. If you see "Output +12V 0.1A, −12V 0.1A, +5V 3A, −24V 0.12A, and −71V 0.12A," the correct power supply is being used. The Cisco 827 power supply has two additional feeds at +12V and −12V that other Cisco 800 power supplies do not have.

   The part number for the Cisco 827 power supply is 34−0949−02.

   If the wrong power supply is being used, the Cisco 827 powers up but cannot train to the DSLAM. The Cisco 827 will not work properly if the power supply from a Cisco 800 router (for example, an

802 or 804) is used.

Cisco 827 Pinouts

The following table shows the Cisco 827 power connector pinouts and how each one functions.

Pin	Function
1	ROF
2	RTN
3	+12
4	−12
5	+5
6	RTN
7	−71
8	−24

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