

# Cisco DSL Router Configuration and Troubleshooting Guide – RFC1483 Routing Troubleshooting

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## Introduction

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- Is your ISP using a DSLAM that supports the Alcatel chipset?
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- Is the ATM interface in an administratively down state?
- Is the cable pinout correct?
- Do you have the correct power supply for the Cisco 827?
- Is the DSL operating-mode correct?
- Is the circuit tested/provisioned correctly?

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- Do you have the correct Permanent Virtual Circuit (PVC) values (VPI/VCI)?
- Can you ping the default gateway?

### Related Information

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## Introduction

There are many reasons why your Digital Subscriber Line (DSL) connection may not be functioning properly. The goal of this section is to isolate the cause of the failure and repair it. The first troubleshooting step is to determine which layer of your Asynchronous Digital Subscriber Line (ADSL) service is failing. There are three layers in which the failure can occur.

- Layer 1 DSL physical connectivity to your ISP's Digital Subscriber Line Access Multiplexer (DSLAM)
- Layer 2.1 ATM connectivity
- Layer 2.2 Point-to-Point Protocol over ATM (PPPoA), Point-to-Point Protocol over Ethernet (PPPoE), RFC1483 Bridging, or RFC1483 Routing
- Layer 3 IP

The easiest way to determine which layer you should begin troubleshooting is to issue the command **show ip interface brief**. The output of this command differs slightly depending on your configuration.

```
827-ESC#show ip interface brief
Interface      IP-Address      OK?    Method  Status  Protocol
ATM0           unassigned      YES    manual  up      up
ATM0.1         unassigned      YES    unset   up      up
Ethernet0     10.10.10.1     YES    manual  up      up
```

If the statuses of ATM0 and ATM0.1 are up and the protocol is up, begin troubleshooting at Layer 2.

If the ATM interfaces are down, or if they keep coming up and then going down (they don't stay up and up),

begin troubleshooting at Layer 1.

## Prerequisites

### Requirements

There are no specific requirements for this document.

### Components Used

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

### Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

## Layer 1 Issues

### Is the carrier detect (CD) light on the front panel of the Cisco DSL Router on or off?

If the CD light is on, go to the Layer 2 Issues section of this document.

If the CD light is off, continue with the next question.

### Is your ISP using a DSLAM that supports the Alcatel chipset?

Verify this information with your ISP.

### Is the DSL port on the back of the Cisco DSL Router plugged into the DSL wall jack?

If the DSL port is not plugged into the DSL wall jack, connect the port to the wall with a 4-pin or 6-pin RJ-11 cable. This is a standard telephone cable.

### Is the ATM interface in an administratively down state?

Issue this command in **enable** mode on the router in order to determine if the ATM0 interface is administratively down.

```
Router#show interface atm 0
ATM0 is administratively down, line protocol is down
<... snipped ...>
```

If the ATM0 interface status is administratively down, issue the **no shutdown** command under the ATM0 interface.

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface atm 0
Router(config-if)#no shut
Router(config-if)#end
```

```
Router#write memory
```

## Is the cable pinout correct?

If the ATM0 interface status is down and down, the router does not see a carrier on the ADSL line. This generally indicates one of two issues:

- The active pins on the DSL wall jack are incorrect.
- Your ISP has not turned up a DSL service on this wall jack.

### Cisco DSL Router xDSL Port Pinouts

The RJ-11 connector provides an xDSL connection to external media via a standard RJ-11 6-pin modular jack.

Pin	Description
3	XDSL_Tip
4	XDSL_Ring

In order to determine if the ATM0 interface is down and down, issue the **show interface atm 0** command from **enable** mode of the router:

```
Router#show interface atm 0
ATM0 is down, line protocol is down
<... snipped ...>
```

If the ATM interface is down and down not administratively down check the pinout of your DSL wall jack. The DSL Router uses a standard RJ-11 (4-pin or 6-pin) cable to provide the ADSL connection to the wall jack. The center pair of pins on the RJ-11 cable is used to carry the ADSL signal (pins 3 and 4 on a 6-pin cable, or pins 2 and 3 on a 4-pin cable).

If you are sure you have the right pins on the wall jack and the ATM0 interface is still down and down, replace the RJ-11 cable between the ADSL port and your wall jack. If the interface is still down and down after you replace the RJ-11 cable, contact your ISP and have the ISP verify that DSL service has been enabled on the wall jack you use.

If you are not sure what pins on your wall jack are active, ask your ISP.

## Do you have the correct power supply for the Cisco 827?

If you have verified that your ADSL cable is good and that you have the correct pinouts, the next step is to make sure you have the correct power supply for the 827.

**Note:** The 827 does not use the same power supply as other 800 Series Routers.

In order to determine if you have the correct power supply, on the back of the power adapter look for **Output +12V 0.1A, -12V 0.1A, +5V 3A, -24V 0.12A, and -71V 0.12A**. If your power supply is missing the +12V and -12V feeds, then it is for a different Cisco 800 Series Router and does not work on the 827. Note that if you use the wrong power supply, the Cisco 827 powers up but is unable to train up (connect) to the ISP DSLAM.

## Is the DSL operating-mode correct?

If everything up to this point in the Layer 1 troubleshooting procedure is correct, the next step is to make sure you have the correct DSL operating mode. Cisco recommends that you use **dsl operating-mode auto** if you are not sure what DMT technology your ISP uses. These are the commands to configure operating-mode autodetection:

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface atm 0
Router(config-if)#dsl operating-mode auto
Router(config-if)#end
Router#write memory
```

## Is the circuit tested/provisioned correctly?

Obtain this information from your ISP or telephone company.

## Layer 2 Issues

### Do you have the correct Permanent Virtual Circuit (PVC) values (VPI/VCI)?

Complete these steps in order to determine whether you have the correct virtual path identifier/virtual circuit identifier (VPI/VCI) values configured on the router.

1. Verify your version of Cisco IOS® software.

**Important:** This does not work with Cisco IOS Software Release 12.1(1)XB.

```
Router#show version
```

```
!--- Used to determine your Cisco IOS software release.
```

```
Cisco Internetwork Operating System Software
IOS (tm) C820 Software (C820-OSY656I-M), Version 12.1(3)XG3,
EARLY DEPLOYMENT RELEASE SOFTWARE (fc1)
```

```
!--- The two lines immediately preceding appear on one line on the router.
```

```
TAC:Home:SW:IOS:Specials for info
Copyright (c) 1986-2000 by cisco Systems, Inc.
Compiled Wed 20-Dec-00 16:44 by detang
Image text-base: 0x80013170, data-base: 0x80725044
<... snipped ...>
```

2. Configure the router for **debug** logging.

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#logging console
Router(config)#logging buffer
Router(config)#service timestamp debug datetime msec
Router(config)#service timestamp log datetime msec
Router(config)#end
Router#write memory
Building configuration...
[OK]
Router#terminal monitor
```

### 3. Enable debugging on the router.

```
Router#debug atm events
ATM events debugging is on
Router#
2d18h:
2d18h: RX interrupt: conid = 0, rxBd = 0x80C7EF74 length=52
2d18h: Data Cell received on vpi = 8 vci = 35
```

*!--- Your VPI/VCI.*

```
2d18h:
2d18h: RX interrupt: conid = 0, rxBd = 0x80C7EEC0 length=52
2d18h: Data Cell received on vpi = 8 vci = 35
2d18h:
2d18h: RX interrupt: conid = 0, rxBd = 0x80C7EECC length=52
2d18h: Data Cell received on vpi = 8 vci = 35
2d18h:
2d18h: RX interrupt: conid = 0, rxBd = 0x80C7EED8 length=52
2d18h: Data Cell received on vpi = 8 vci = 35
```

### 4. Make sure you have **debug ATM events** that run on the Cisco DSL Router, and then go to a working Internet connection and begin to ping the IP address your ISP statically assigned to you.

It does not matter whether you have configured this IP address on the Cisco DSL Router. What is important is that your ATM interface is up/up and that you ping the IP address your ISP gave you. If you do not see the expected output after the ping test, contact your ISP for support.

### 5. Disable debugging on the router.

<< wait 60 seconds >>

```
Router#undebug all
```

*!--- Used to turn off the debug events.*

All possible debugging has been turned off.

Verify your VPI/VCI values, and then make the necessary changes to your configuration. If you do not see output during the 60 seconds of debugging, contact your ISP.

## Can you ping the default gateway?

In a bridged environment, pinging the default gateway is a good test of connectivity. In general, if you can ping to your default gateway, you know that Layer 1 and Layer 2 services function properly. Issue the **ping** command:

```
Router#ping 192.168.1.1
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 44/44/48 ms
Router#
```

or

```
Router#ping 192.168.1.1
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 44/44/48 ms
Router#
```

A successful ping takes one of two forms. The first form shows an 80 percent success rate. The first ping packet that is sent is lost (.!!!!). This is a successful ping the first packet is lost while a Layer 2 to Layer 3 binding is created via address resolution protocol (ARP). The second form of the ping is a 100 percent success rate, which is indicated by five exclamation points (!!!!!).

If your success rate is 80 to 100 percent, try to ping a valid Internet address (198.133.219.25 is www.cisco.com). If you can ping the default gateway from the router but you cannot ping another Internet address, make sure you have only one static default route in the configuration (for example, ip route 0.0.0.0 0.0.0.0 192.168.1.1).

For the previous example, if you already have a correct static default route and cannot ping Internet addresses, contact your ISP to resolve the routing issue.

If the ping test fails (a ping success rate of 0 percent), you see output similar to this:

```
Router#ping 192.168.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

Router#
```

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## Related Information

- [ADSL Technology Support](#)
- [RFC1483 Routing Implementation Options](#)
- [Cisco DSL Router Configuration and Troubleshooting Guide](#)
- [Technical Support & Documentation – Cisco Systems](#)

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