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Introduction

This document describes how to configure your Cisco Digital Subscriber Line (DSL) Customer Premise Equipment (CPE) Router for Asymmetric Digital Subscriber Line (ADSL) service. It explains how to troubleshoot ADSL related issues on the Cisco 880 Series, 890 Series, 860 Series, and Very High Bitrate Digital Subscriber Line (VDSL)/ ADSL Enhanced High Speed WAN Interface Cards (EHWICs). This document is very specific to ADSL service, though you can have either ADSL or VDSL service on these routers and modules. 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 over ATM (PPPoEoA), RFC1483 Bridging, or RFC1483 Routing
- Layer 3 - IP

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.

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.

Does your ISP use a DSLAM that supports the Broadcom chipset?

Verify the information from your ISP. Check the DSLAM interoperability for the router model or card that refers to the data sheet.

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 straight-through RJ-11 cable. This is a standard telephone cable. ADSL lines use pins 3 and 4.

What is the controller status, operating mode, and Transmission Coverage (TC) mode?

For example this sample output:

Check for these in the **show controller** command output:

1. The controller status is UP. If it is in the Down state, it indicates a Layer 1 issue (hardware issue, line issue, or interoperability issue with DSLAM). Proceed with Layer 1 troubleshoot in this case.
2. Check the operating mode, trained mode, and TC mode. Ensure you have the correct operating mode configured under the controller. Cisco recommends that you use DSL operating-mode auto if you are not sure what Discrete Multi-Tone (DMT) technology your ISP uses. These are the commands to configure operating mode autodetection.
3. Look at the trained mode and ensure you have the correct mode negotiated with the ISP.

Another important parameter to look at is the TC mode. In case the trained mode is ADSL, ADSL2, or ADSL2+, the TC mode must be ATM and all the upper layer parameters such as PPP, IP, and so on should be configured under the ATM Permanent Virtual Circuit (PVC) in this case. If the trained mode is VDSL2 or VDSL2+, the TC mode will be Packet Transfer Mode (PTM). In this case, you need to see the PTM Ethernet interface in the UP state and all the upper layer parameters should be configured under the Ethernet interface. If you change the operating mode between ADSL and VDSL, you might need to reboot the router in order to activate the corresponding ATM or Ethernet interfaces.

4. Check the noise margin and attenuation. Noise margin is the relative strength of the DSL signal to noise ratio. The higher the number the better for this measurement:

- 6dB or below is bad and will experience no synch or intermittent synch problems
- 7dB-10dB is fair, but does not leave much room for variances in conditions
- 11dB-20dB is good with little or no synch problems
- 20dB-28dB is excellent
- 29dB or above is outstanding

Attenuation is a measure of how much the signal has degraded between the DSLAM and the modem. This is largely a function of the distance from the exchange. The lower the dB the better for this measurement.

- 20dB and below is outstanding
- 20dB-30dB is excellent
- 30dB-40dB is very good
- 40dB-50dB is good
- 50dB-60dB is poor and might experience connectivity issues
- 60dB or above is bad and will experience connectivity issues

5. Ensure you have one of the latest versions of DSL firmware. The latest firmware has a fix for most of the known interoperability issues. You can download the latest firmware from CCO.

6. Verify the DSL is in sync with proper upstream and downstream speeds.

Do you have the correct router model?

Note that the ADSL/VDSL routers come in two versions; 1) DSL over Plain Old Telephone Service (Annex-A) and 2) DSL over Integrated Services Digital Network (Annex-B). In some countries, ISPs provide an Annex-B connection, while in most others it is Annex-A. An Annex-A DSL Router or card will not sync with an Annex-B line and vice versa. Hence you need to make sure that you have the right router model in place. See the router datasheet for more information.

Is the circuit tested/provisioned correctly?

Obtain this information from your ISP or telephone company.

Layer 2 Issues

Is the ATM interface up?

Once it is verified that the trained mode is ADSL, ensure the ATM interface is in the up state.

```
Router#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet0/0	unassigned	YES	NVRAM	up	up
GigabitEthernet0/0.1	unassigned	YES	unset	up	up
GigabitEthernet0/1	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet0/2	192.168.22.1	YES	NVRAM	up	up
ISM0/1	unassigned	YES	unset	up	up

```
!--Verify that ATM interface is in up state
```

ATM0/1/0	unassigned	YES	NVRAM	up	up
Ethernet0/1/0	unassigned	YES	NVRAM	administratively down	down
down	up				

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

Check with your provider for the right VPI/VCI value to be used for the DSL connection.

Is the correct upper layer transport used?

Check with your provider for the type of upper layer connection used. You could use the ADSL line for IPoA, PPPoA, PPPoEoA, Bridging and so on. Ensure that you have the correct upper layer configuration in line with your provider's configuration.

Do you receive data from your ISP?

Check the output of command **show interface atm0** and check the input and output packets.

```
Router#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet0/0	unassigned	YES	NVRAM	up	up
GigabitEthernet0/0.1	unassigned	YES	unset	up	up
GigabitEthernet0/1	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet0/2	192.168.22.1	YES	NVRAM	up	up
ISM0/1	unassigned	YES	unset	up	up

```
!--Verify that ATM interface is in up state
```

ATM0/1/0	unassigned	YES	NVRAM	up	up
Ethernet0/1/0	unassigned	YES	NVRAM	administratively down	down
down	up				

If the input packet counters increment, you must receive PPP negotiation packets from your ISP. If this is not the case, call your ISP. If the output packet counters increment, you should send PPP negotiation packets. If this is not the case, check the configuration on the router. If PPP is configured properly, PPP negotiation packets are continually sent out the ATM0 interface.

If packets increment in both directions, continue with the troubleshooting steps in this document.

Does the PPP negotiate properly?

If Layer 1 is up and you have the correct VPI/VCI settings, the next step is to make sure PPP comes up properly. In order to accomplish this, you need to run a series of **debug** commands on the Cisco DSL Router and interpret the output. The primary debug command you use is **debug ppp negotiation**. This command output is an example of a successful PPP negotiation:

```
Router#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet0/0	unassigned	YES	NVRAM	up	up
GigabitEthernet0/0.1	unassigned	YES	unset	up	up
GigabitEthernet0/1	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet0/2	192.168.22.1	YES	NVRAM	up	up
ISM0/1	unassigned	YES	unset	up	up

!--Verify that ATM interface is in up state

ATM0/1/0	unassigned	YES	NVRAM	up	up
Ethernet0/1/0	unassigned	YES	NVRAM	administratively down	down
	up				

There are four main points of failure in a PPP negotiation:

- No response from the remote device (your ISP)
- Link Control Protocol (LCP) not open
- Authentication failure
- IP Control Protocol (IPCP) failure

No Response from your ISP

Your ISP not responding should not be a problem since you already verified that packets are incrementing on the ATM0 interface in the inbound direction. However, if you see packets incrementing on ATM0 in the inbound direction, and when you run a **debug ppp negotiation** you receive this, contact your ISP in order to verify that packets are sent to the Cisco DSL Router.

Router#**show ip interface brief**

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet0/0	unassigned	YES	NVRAM	up	up
GigabitEthernet0/0.1	unassigned	YES	unset	up	up
GigabitEthernet0/1	unassigned	YES	NVRAM	administratively down	down
GigabitEthernet0/2	192.168.22.1	YES	NVRAM	up	up
ISM0/1	unassigned	YES	unset	up	up

!--Verify that ATM interface is in up state

ATM0/1/0	unassigned	YES	NVRAM	up	up
Ethernet0/1/0	unassigned	YES	NVRAM	administratively down	down
	up				

In this output there are only **O** packets, which are outbound packets. In order to successfully negotiate PPP, there should be an **I** inbound packet from your ISP for each **O** packet sent. If packets increment inbound, but you do not see **I** packets, contact your ISP in order to verify the packets that are sent to the Cisco DSL Router.

Local CTI Port (LCP) Not Open

If the LCP is not open, this is usually caused by a mismatch in PPP options. This mismatch occurs when the Cisco DSL Router has a PPP parameter configured that your ISP does not support, or when your ISP has a parameter configured that the Cisco DSL Router does not support. This output shows an example of a PPP option mismatch:

Router#**show ip interface brief**

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	NVRAM	administratively down	down

GigabitEthernet0/0	unassigned	YES	NVRAM	up	up
GigabitEthernet0/0.1	unassigned	YES	unset	up	up
GigabitEthernet0/1	unassigned	YES	NVRAM	administratively	down
GigabitEthernet0/2	192.168.22.1	YES	NVRAM	up	up
ISM0/1	unassigned	YES	unset	up	up

!---Verify that ATM interface is in up state

ATM0/1/0	unassigned	YES	NVRAM	up	up
Ethernet0/1/0	unassigned	YES	NVRAM	administratively	down
down	up				

Whether it is an I or an O packet, a Configure-Negative-Acknowledge (CONFNAK) is indicative of a PPP configuration mismatch. What this means is that one side of the PPP connection asks for a PPP option that the other side is unable or not configured to perform. If the Cisco DSL Router sends the CONFNAK (indicated by O CONFNAK), the Cisco DSL Router is not able to perform or is not configured for the option the ISP sends. If the CONFNAK is sent by your ISP (indicated by I CONFNAK), you have configured an option on the Cisco DSL router that your ISP does not want to perform.

The line after the CONFNAK describes the option that is rejected. In this example output, the option is Challenge Handshake Authentication Protocol (CHAP), but it could be any option. The only place on the Cisco DSL Router where PPP options can be configured is interface dialer 1. Enter the **show run interface dialer 1** command in order to view your interface dialer 1 configuration.

If your ISP sends the I CONFNAK, look for commands under interface dialer 1 that match the line after the CONFNAK and remove them. If the Cisco DSL Router sends the O CONFNAK, add a command to interface dialer 1 in order to properly negotiate PPP with your ISP. In the case that the router sends packets, you might need to call Cisco Support in order to determine which command(s) need to be enabled on the Cisco DSL Router.

Authentication Failure

An authentication failure occurs when your ISP is unable to authenticate your PPP username or password. There are two scenarios in which this can occur. The first scenario is an authentication type mismatch, which is caused when you do not properly configure the router. All the authentication configurations listed in this document account for both Password Authentication Protocol (PAP) and CHAP authentication types. For configuration flexibility, you should have both CHAP and PAP configured. If you do not have both configured, you might see output from a **debug ppp negotiation** command like this example:

```
Router#debug ppp negotiation
00:34:29: Vi1 LCP:O CONFREQ [REQsent] id 53 Len 15
00:34:29: Vi1 LCP: AuthProto CHAP (0x0305C22305)

!--- Sends CHAP requests

00:34:29: Vi1 LCP: MagicNumber 0x01B63483 (0x050601B63483)
00:34:29: Vi1 LCP: I CONFREQ [REQsent] id 252 Len 14
00:34:29: Vi1 LCP: AuthProto PAP (0x0304C023)

!--- Receives PAP requests from the service provider

00:34:29: Vi1 LCP: MagicNumber 0xBC5233F9 (0x0506BC5233F9)
00:34:29: Vi1 LCP: O CONFREQ [REQsent] id 252 Len 8
Router#undebug all
```

In order to correct both authentication mismatch problems, you need to reconfigure the

authentication protocol to the one requested by the ISP in the inbound **CONFREQ** packet.

How do I know if my PAP username and password are correct?

After you have confirmed that your ISP uses PAP, enter the **debug ppp negotiation** command in order to confirm that your PAP username and password are correct.

```
Router#debug ppp negotiation
*Mar 2 00:50:15.741: Vi1 PPP: Treating connection as a callout
*Mar 2 00:50:15.745: Vi1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]
*Mar 2 00:50:15.745: Vi1 PPP: No remote authentication for call-out
*Mar 2 00:50:15.745: Vi1 LCP: O CONFREQ [Closed] id 177 Len 10
*Mar 2 00:50:15.745: Vi1 LCP: MagicNumber 0x35EB5D4F (0x050635EB5D4F)
*Mar 2 00:50:15.789: Vi1 LCP: I CONFACK [REQsent] id 177 Len 10
*Mar 2 00:50:15.793: Vi1 LCP: MagicNumber 0x35EB5D4F (0x050635EB5D4F)
*Mar 2 00:50:17.241: Vi1 LCP: I CONFREQ [ACKrcvd] id 203 Len 14
*Mar 2 00:50:17.241: Vi1 LCP: AuthProto PAP (0x0304C023)
*Mar 2 00:50:17.241: Vi1 LCP: MagicNumber 0x3E1D1E5E (0x05063E1D1E5E)
*Mar 2 00:50:17.245: Vi1 LCP: O CONFACK [ACKrcvd] id 203 Len 14
*Mar 2 00:50:17.245: Vi1 LCP: AuthProto PAP (0x0304C023)
*Mar 2 00:50:17.245: Vi1 LCP: MagicNumber 0x3E1D1E5E (0x05063E1D1E5E)
*Mar 2 00:50:17.249: Vi1 LCP: State is Open
*Mar 2 00:50:17.249: Vi1 PPP: Phase is AUTHENTICATING, by the peer [0 sess, 1 load]
*Mar 2 00:50:17.249: Vi1 PAP: O AUTH-REQ id 9 Len 14 from "cisco"
```

!--- "cisco" is the PAP username configured on this DSL Router.

```
*Mar 2 00:50:17.297: Vi1 PAP: I AUTH-NAK id 9 Len 27 msg is "Authentication failure"
*Mar 2 00:50:17.301: Vi1 LCP: I TERMREQ [Open] id 204 Len 4
*Mar 2 00:50:17.301: Vi1 LCP: O TERMACK [Open] id 204 Len 4
*Mar 2 00:50:17.305: Vi1 PPP: Phase is TERMINATING [0 sess, 1 load]u
*Mar 2 00:50:19.305: Vi1 LCP: TIMEout: State TERMSent
*Mar 2 00:50:19.305: Vi1 LCP: State is Closed
*Mar 2 00:50:19.305: Vi1 PPP: Phase is DOWN [0 sess, 1 load]
```

You need to contact your ISP and get the correct credentials in order to fix this. You can reconfigure the PAP credentials with these commands:

```
Router#debug ppp negotiation
*Mar 2 00:50:15.741: Vi1 PPP: Treating connection as a callout
*Mar 2 00:50:15.745: Vi1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]
*Mar 2 00:50:15.745: Vi1 PPP: No remote authentication for call-out
*Mar 2 00:50:15.745: Vi1 LCP: O CONFREQ [Closed] id 177 Len 10
*Mar 2 00:50:15.745: Vi1 LCP: MagicNumber 0x35EB5D4F (0x050635EB5D4F)
*Mar 2 00:50:15.789: Vi1 LCP: I CONFACK [REQsent] id 177 Len 10
*Mar 2 00:50:15.793: Vi1 LCP: MagicNumber 0x35EB5D4F (0x050635EB5D4F)
*Mar 2 00:50:17.241: Vi1 LCP: I CONFREQ [ACKrcvd] id 203 Len 14
*Mar 2 00:50:17.241: Vi1 LCP: AuthProto PAP (0x0304C023)
*Mar 2 00:50:17.241: Vi1 LCP: MagicNumber 0x3E1D1E5E (0x05063E1D1E5E)
*Mar 2 00:50:17.245: Vi1 LCP: O CONFACK [ACKrcvd] id 203 Len 14
*Mar 2 00:50:17.245: Vi1 LCP: AuthProto PAP (0x0304C023)
*Mar 2 00:50:17.245: Vi1 LCP: MagicNumber 0x3E1D1E5E (0x05063E1D1E5E)
*Mar 2 00:50:17.249: Vi1 LCP: State is Open
*Mar 2 00:50:17.249: Vi1 PPP: Phase is AUTHENTICATING, by the peer [0 sess, 1 load]
*Mar 2 00:50:17.249: Vi1 PAP: O AUTH-REQ id 9 Len 14 from "cisco"
```

!--- "cisco" is the PAP username configured on this DSL Router.

```
*Mar 2 00:50:17.297: Vi1 PAP: I AUTH-NAK id 9 Len 27 msg is "Authentication failure"
*Mar 2 00:50:17.301: Vi1 LCP: I TERMREQ [Open] id 204 Len 4
*Mar 2 00:50:17.301: Vi1 LCP: O TERMACK [Open] id 204 Len 4
*Mar 2 00:50:17.305: Vi1 PPP: Phase is TERMINATING [0 sess, 1 load]u
```

```
*Mar 2 00:50:19.305: Vi1 LCP: TIMEout: State TERMSent
*Mar 2 00:50:19.305: Vi1 LCP: State is Closed
*Mar 2 00:50:19.305: Vi1 PPP: Phase is DOWN [0 sess, 1 load]
```

How do I know if my CHAP username and password are correct?

After you have confirmed that your ISP uses CHAP, enter the **debug ppp negotiation** command in order to confirm that your CHAP username and password are correct.

```
Router#debug ppp negotiation
*Mar 3 02:51:47.287: Vi1 PPP: Treating connection as a callout
*Mar 3 02:51:47.287: Vi1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]
*Mar 3 02:51:47.291: Vi1 PPP: No remote authentication for call-out
*Mar 3 02:51:47.291: Vi1 LCP: O CONFREQ [Closed] id 188 Len 10
*Mar 3 02:51:47.291: Vi1 LCP: MagicNumber 0x3B821FF1 (0x05063B821FF1)
*Mar 3 02:51:47.339: Vi1 LCP: I CONFREQ [REQsent] id 204 Len 15
*Mar 3 02:51:47.343: Vi1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 3 02:51:47.343: Vi1 LCP: MagicNumber 0x43B3F393 (0x050643B3F393)
*Mar 3 02:51:47.343: Vi1 LCP: O CONFACK [REQsent] id 204 Len 15
*Mar 3 02:51:47.347: Vi1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 3 02:51:47.347: Vi1 LCP: MagicNumber 0x43B3F393 (0x050643B3F393)
*Mar 3 02:51:47.347: Vi1 LCP: I CONFACK [ACKsent] id 188 Len 10
*Mar 3 02:51:47.351: Vi1 LCP: MagicNumber 0x3B821FF1 (0x05063B821FF1)
*Mar 3 02:51:47.351: Vi1 LCP: State is Open
*Mar 3 02:51:47.351: Vi1 PPP: Phase is AUTHENTICATING, by the peer [0 sess, 1 load]
*Mar 3 02:51:47.395: Vi1 CHAP: I CHALLENGE id 1 Len 32 from "6400-2-NRP3"
*Mar 3 02:51:47.395: Vi1 CHAP: Using alternate hostname cisco
*Mar 3 02:51:47.399: Vi1 CHAP: Username 6400-2-NRP3 not found
*Mar 3 02:51:47.399: Vi1 CHAP: Using default password
*Mar 3 02:51:47.399: Vi1 CHAP: O RESPONSE id 1 Len 26 from "cisco"
```

!--- "cisco" is the CHAP username configured on this DSL Router.

```
*Mar 3 02:51:47.447: Vi1 CHAP: I FAILURE id 1 Len 26 MSG is "Authentication failure"
*Mar 3 02:51:47.447: Vi1 LCP: I TERMREQ [Open] id 205 Len 4
*Mar 3 02:51:47.451: Vi1 LCP: O TERMACK [Open] id 205 Len 4
*Mar 3 02:51:47.451: Vi1 PPP: Phase is TERMINATING [0 sess, 0 load]
*Mar 3 02:51:49.451: Vi1 LCP: TIMEout: State TERMSent
*Mar 3 02:51:49.451: Vi1 LCP: State is Closed
*Mar 3 02:51:49.451: Vi1 PPP: Phase is DOWN [0 sess, 0 load]
```

```
Router#undebug all
```

You need to contact your ISP and get the correct credentials in order to fix this. You can reconfigure the CHAP credentials with these commands:

```
Router#debug ppp negotiation
*Mar 3 02:51:47.287: Vi1 PPP: Treating connection as a callout
*Mar 3 02:51:47.287: Vi1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]
*Mar 3 02:51:47.291: Vi1 PPP: No remote authentication for call-out
*Mar 3 02:51:47.291: Vi1 LCP: O CONFREQ [Closed] id 188 Len 10
*Mar 3 02:51:47.291: Vi1 LCP: MagicNumber 0x3B821FF1 (0x05063B821FF1)
*Mar 3 02:51:47.339: Vi1 LCP: I CONFREQ [REQsent] id 204 Len 15
*Mar 3 02:51:47.343: Vi1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 3 02:51:47.343: Vi1 LCP: MagicNumber 0x43B3F393 (0x050643B3F393)
*Mar 3 02:51:47.343: Vi1 LCP: O CONFACK [REQsent] id 204 Len 15
*Mar 3 02:51:47.347: Vi1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 3 02:51:47.347: Vi1 LCP: MagicNumber 0x43B3F393 (0x050643B3F393)
*Mar 3 02:51:47.347: Vi1 LCP: I CONFACK [ACKsent] id 188 Len 10
*Mar 3 02:51:47.351: Vi1 LCP: MagicNumber 0x3B821FF1 (0x05063B821FF1)
*Mar 3 02:51:47.351: Vi1 LCP: State is Open
*Mar 3 02:51:47.351: Vi1 PPP: Phase is AUTHENTICATING, by the peer [0 sess, 1 load]
*Mar 3 02:51:47.395: Vi1 CHAP: I CHALLENGE id 1 Len 32 from "6400-2-NRP3"
*Mar 3 02:51:47.395: Vi1 CHAP: Using alternate hostname cisco
```

```
*Mar 3 02:51:47.399: Vi1 CHAP: Username 6400-2-NRP3 not found
*Mar 3 02:51:47.399: Vi1 CHAP: Using default password
*Mar 3 02:51:47.399: Vi1 CHAP: O RESPONSE id 1 Len 26 from "cisco"
```

!--- "cisco" is the CHAP username configured on this DSL Router.

```
*Mar 3 02:51:47.447: Vi1 CHAP: I FAILURE id 1 Len 26 MSG is "Authentication failure"
*Mar 3 02:51:47.447: Vi1 LCP: I TERMREQ [Open] id 205 Len 4
*Mar 3 02:51:47.451: Vi1 LCP: O TERMACK [Open] id 205 Len 4
*Mar 3 02:51:47.451: Vi1 PPP: Phase is TERMINATING [0 sess, 0 load]
*Mar 3 02:51:49.451: Vi1 LCP: TIMEout: State TERMSent
*Mar 3 02:51:49.451: Vi1 LCP: State is Closed
*Mar 3 02:51:49.451: Vi1 PPP: Phase is DOWN [0 sess, 0 load]
Router#undebug all
```

How do I know when PPP authentication is successful?

This example shows a successful CHAP negotiation.

```
Router#debug ppp negotiation
*Mar 3 02:51:47.287: Vi1 PPP: Treating connection as a callout
*Mar 3 02:51:47.287: Vi1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]
*Mar 3 02:51:47.291: Vi1 PPP: No remote authentication for call-out
*Mar 3 02:51:47.291: Vi1 LCP: O CONFREQ [Closed] id 188 Len 10
*Mar 3 02:51:47.291: Vi1 LCP: MagicNumber 0x3B821FF1 (0x05063B821FF1)
*Mar 3 02:51:47.339: Vi1 LCP: I CONFREQ [REQsent] id 204 Len 15
*Mar 3 02:51:47.343: Vi1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 3 02:51:47.343: Vi1 LCP: MagicNumber 0x43B3F393 (0x050643B3F393)
*Mar 3 02:51:47.343: Vi1 LCP: O CONFACK [REQsent] id 204 Len 15
*Mar 3 02:51:47.347: Vi1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 3 02:51:47.347: Vi1 LCP: MagicNumber 0x43B3F393 (0x050643B3F393)
*Mar 3 02:51:47.347: Vi1 LCP: I CONFACK [ACKsent] id 188 Len 10
*Mar 3 02:51:47.351: Vi1 LCP: MagicNumber 0x3B821FF1 (0x05063B821FF1)
*Mar 3 02:51:47.351: Vi1 LCP: State is Open
*Mar 3 02:51:47.351: Vi1 PPP: Phase is AUTHENTICATING, by the peer [0 sess, 1 load]
*Mar 3 02:51:47.395: Vi1 CHAP: I CHALLENGE id 1 Len 32 from "6400-2-NRP3"
*Mar 3 02:51:47.395: Vi1 CHAP: Using alternate hostname cisco
*Mar 3 02:51:47.399: Vi1 CHAP: Username 6400-2-NRP3 not found
*Mar 3 02:51:47.399: Vi1 CHAP: Using default password
*Mar 3 02:51:47.399: Vi1 CHAP: O RESPONSE id 1 Len 26 from "cisco"
```

!--- "cisco" is the CHAP username configured on this DSL Router.

```
*Mar 3 02:51:47.447: Vi1 CHAP: I FAILURE id 1 Len 26 MSG is "Authentication failure"
*Mar 3 02:51:47.447: Vi1 LCP: I TERMREQ [Open] id 205 Len 4
*Mar 3 02:51:47.451: Vi1 LCP: O TERMACK [Open] id 205 Len 4
*Mar 3 02:51:47.451: Vi1 PPP: Phase is TERMINATING [0 sess, 0 load]
*Mar 3 02:51:49.451: Vi1 LCP: TIMEout: State TERMSent
*Mar 3 02:51:49.451: Vi1 LCP: State is Closed
*Mar 3 02:51:49.451: Vi1 PPP: Phase is DOWN [0 sess, 0 load]
Router#undebug all
```

Related Information

- [VDSL EHWIC Data sheet](#)
- [ISR G2 xDSL Interoperability](#)