

排除VDSL故障

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简介

本文档介绍如何配置您的思科数字用户线路(DSL)用户驻地设备(CPE)路由器，以实现极高比特率数字用户线路(VDSL)服务。它说明了如何排除Cisco 880系列、890系列、860系列和VDSL/异步数字用户线(ADSL)增强型高速广域网接口卡(EHWIC)上与VDSL相关的问题。本文档非常特定于VDSL服务，但您可以在上述路由器和模块上使用ADSL或VDSL服务。故障可能发生在三层：

- 第1层 — DSL物理连接到ISP的数字用户线路接入复用器(DSLAM)
- 第2.1层 — 以太网端到端连接
- 第2.2层 — 以太网点对点协议(PPPoE)、以太网IP(IPoE)、RFC1483桥接或RFC1483路由
- 第3层 — IP

先决条件

要求

本文档没有任何特定的要求。

使用的组件

本文档不限于特定的软件和硬件版本。

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

第1层问题

在Cisco DSL路由器的前面板的载波检测(CD)灯是开/关？

如果CD指示灯亮起，请转至本文档的第2层问题部分。

如果CD灯是关闭的，请继续下一个问题。

您的ISP是否使用支持Broadcom芯片组的DSLAM？

从ISP检验信息。检查DSLAM互操作性，查找引用数据表的路由器型号或卡。

Cisco DSL路由器背面的DSL端口是否插入到DSL墙上插座？

如果DSL端口未插入DSL墙壁插孔，请使用直通RJ-11电缆将端口连接到墙壁。这是标准电话电缆。VDSL线路使用引脚3和4。

控制器状态、操作模式和传输覆盖(TC)模式是什么？

看此输出示例：

```
Router#show controller vdsl 0/1/0
```

```
!--- Make sure the controller is in UP state. In case you see it in down state,
it indicates a Layer 1 issue (Hardware issue, Line issue, Interoperability
issue with DSLAM etc.)
```

```
Controller VDSL 0/1/0 is UP
```

```
Daemon Status:          Up
```

```
!--- XTU-R and XTU-C shows local (Cisco Router) and remote (DSLAM) DSL related
details like chipset vendor, Vendor ID etc.
```

| | XTU-R (DS) | XTU-C (US) |
|------------------------|------------|------------|
| Chip Vendor ID: | 'BDCM' | 'BDCM' |
| Chip Vendor Specific: | 0x0000 | 0xA1AA |
| Chip Vendor Country: | 0xB500 | 0xB500 |
| Modem Vendor ID: | 'CSCO' | ' ' |
| Modem Vendor Specific: | 0x4602 | 0x0000 |

Modem Vendor Country: 0xB500 0x0000
Serial Number Near: FOC15163V2Q 2911/K9 15.5(1)T
Serial Number Far:
Modem Version Near: 15.5(1)T
Modem Version Far: 0xa1aa

Modem Status: TC Sync (Showtime!)

!--- Below shows the configured DSL operating mode, trained mode and TC mode.

DSL Config Mode: AUTO
Trained Mode: G.993.2 (VDSL2) Profile 17a
TC Mode: PTM
Selftest Result: 0x00
DELT configuration: disabled
DELT state: not running

Full inits: 1
Failed full inits: 0
Short inits: 0
Failed short inits: 0

!--- DSL firmware related details

| Firmware | Source | File Name |
|----------|----------|-------------------------|
| VDSL | embedded | VDSL_LINUX_DEV_01212008 |

Modem FW Version: 130205_1433-4.02L.03.B2pvC035j.d23j
Modem PHY Version: B2pvC035j.d23j

Trellis: ON ON
SRA: disabled disabled
SRA count: 0 0
Bit swap: enabled enabled
Bit swap count: 0 0

!--- Attenuation and Noise margin are two important parameters which points to the line quality and intern the stability of the DSL connection

| | | |
|-------------------------|------------------------------|--------------|
| Line Attenuation: | 0.0 dB | 0.0 dB |
| Signal Attenuation: | 0.0 dB | 0.0 dB |
| Noise Margin: | 11.1 dB | 6.0 dB |
| Attainable Rate: | 40440 kbits/s | 3280 kbits/s |
| Actual Power: | 14.5 dBm | 4.9 dBm |
| Per Band Status: | D1 D2 D3 U0 U1 U2 U3 | |
| Line Attenuation(dB): | 20.0 48.3 73.7 9.4 37.9 56.2 | N/A |
| Signal Attenuation(dB): | 20.0 48.3 N/A 10.2 36.2 53.3 | N/A |
| Noise Margin(dB): | 10.9 11.3 N/A 5.9 6.0 6.0 | N/A |
| Total FECC: | 97252 0 | |
| Total ES: | 7 0 | |
| Total SES: | 0 0 | |
| Total LOSS: | 0 0 | |
| Total UAS: | 24 24 | |
| Total LPRS: | 0 0 | |
| Total LOFS: | 0 0 | |
| Total LOLS: | 0 0 | |

!--- DSL trained speed can be found below

| DSChannel1 | DSChannel0 | US Channel1 | US Channel0 | |
|---------------------|------------|-------------|-------------|------|
| Speed (kbps): | 0 | 25087 | 0 | 3192 |
| SRA Previous Speed: | 0 | 0 | 0 | 0 |
| Previous Speed: | 0 | 0 | 0 | 0 |
| Reed-Solomon EC: | 0 | 97252 | 0 | 0 |
| CRC Errors: | 0 | 15 | 0 | 0 |
| Header Errors: | 0 | 62 | 0 | 0 |

| | | | | |
|------------------|------|------|------|------|
| Interleave (ms): | 0.00 | 8.00 | 0.00 | 8.00 |
| Actual INP: | 0.00 | 3.01 | 0.00 | 2.00 |

Training Log : Stopped
Training Log Filename : flash:vdsllog.bin

Router#

在show controller命令输出中**检查**以下内容：

- 控制器状态为“UP”。如果它处于“关闭”状态，则表示第1层问题（硬件问题、线路问题或与DSLAM的互操作性问题）。在这种情况下，请继续进行第1层故障排除。
- 检查操作模式、训练模式和TC模式。确保在控制器下配置了正确的操作模式。如果您不确定ISP使用的离散多音(DMT)技术，思科建议您使用DSL操作模式自动。以下是用于配置操作模式自动检测的命令：

```
Router#configure terminal
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#controller vdsl 0
```

```
Router(config-controller)#operating-mode auto
```

```
Router(config-controller)#end
```

```
Router#write memory
```

查看培训模式，确保您与ISP协商的模式正确。另一个需要考虑的重要参数是TC模式。如果培训模式为VDSL2或VDSL2+，则TC模式为数据包传输模式(PTM)。在这种情况下，您需要看到PTM以太网接口处于“up”状态，所有上层参数（如PPP、IP等）都应在以太网接口下配置。如果训练模式是ADSL、ADSL2或ADSL2+，则TC模式应是ATM，在本例中，所有上层参数都应配置在ATM永久虚电路(PVC)下。如果更改ADSL和VDSL之间的操作模式，则可能无需重新启动路由器来激活相应的以太网或ATM接口。

检查噪声裕度和衰减。噪声裕度是DSL信噪比的相对强度。数值越高，此测量值越好：

- 6dB或更低版本不良，不会出现同步或间歇同步问题
- 7dB-10dB是公平的，但条件差异不会留下太大空间
- 11dB-20dB性能良好，同步问题很少或没有
- 20dB-28dB非常好
- 29dB或以上

衰减是DSLAM和调制解调器之间信号衰减程度的衡量指标。这在很大程度上是交换距离的函数。dB越低，这种测量越好。

- 20dB及以下是未处理
- 20dB-30dB非常出色
- 30dB-40dB非常好
- 40dB-50dB正常
- 50dB-60dB较差，可能遇到连接问题
- 60dB或更高版本是不良的，将会遇到连接问题

确保您拥有VDSL固件的最新版本。最新固件可解决大多数已知的互操作性问题。您可以从CCO下载最新固件。

验证DSL是否与正确的上行和下行速度同步。

您的路由器型号是否正确？

请注意，ADSL/VDSL路由器有两个版本；1)基于普通老式电话服务(Annex-A)的DSL;2)基于综合业务数字网络(Annex-B)的DSL。在某些国家/地区，ISP提供Annex-B连接，而在大多数国家/地区，ISP提供Annex-A连接。Annex-A DSL路由器或卡不会与Annex-B线路同步，反之亦然。因此，您需要确保您拥有合适的路由器型号。有关详细信息，请参阅路由器产品手册。

电路是否被正确地测试/供应？

从您的ISP或电话公司得到此信息。

第 2 层问题

PTM以太网是否已打开？

一旦验证已培训的模式为VDSL，请确保以太网接口处于“up”状态。

```
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
ATM0/1/0                                 unassigned      YES NVRAM    administratively down down
!--- Verify that the Ethernet interface is in up state
Ethernet0/1/0                            unassigned      YES NVRAM    up              up
```

提供商是否期望有标记流量？如果是，虚拟LAN标识符(VLAN ID)是什么？

大多数提供商期望来自客户驻地设备(CPE)的有标记流量。从ISP获取VLAN ID后，可以配置VLAN标记，如下所示。

```
Router(config)#interface Ethernet0.835
Router(config-subif)#encapsulation dot1Q 835
Router(config-subif)#end
Router#
```

地址解析协议(ARP)条目是否已填充？

确定远程设备的MAC地址是否在show arp命令输出中。

您是否从ISP接收数据？

如果您的VLAN ID正确，下一步是检验您与ISP协商点对点协议(PPP)的尝试。为此，请输入命令show interface Ethernet0并检查输入和输出数据包。

```
Router#show interface ethernet0
Ethernet0/1/0 is up, line protocol is up
Hardware is VDSL_ETHERNET, address is 30f7.0d7e.3408 (bia 30f7.0d7e.3408)
```

```

MTU 1500 bytes, BW 3261 Kbit/sec, DLY 3000 usec,
    reliability 255/255, txload 19/255, rxload 1/255
Encapsulation 802.1Q Virtual LAN, Vlan ID 1., loopback not set
Keepalive set (10 sec)
ARP type: ARPA, ARP Timeout 04:00:00
Last input 00:00:19, output 00:00:00, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/1024 (size/max)
5 minute input rate 23000 bits/sec, 19 packets/sec
5 minute output rate 244000 bits/sec, 29 packets/sec
    3096276 packets input, 3672318911 bytes, 0 no buffer
    Received 0 broadcasts (1517324 IP multicasts)
    0 runts, 0 giants, 1 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 input packets with dribble condition detected
    1287646 packets output, 240862302 bytes, 0 underruns
    0 output errors, 0 collisions, 2 interface resets
    0 unknown protocol drops
    0 babbles, 0 late collision, 0 deferred
    1 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out

```

```
Router#show controller vdsl 0 datapath
```

```

ptm0          Link encap:Ethernet  HWaddr 02:10:18:01:00:02
              UP BROADCAST RUNNING MULTICAST  MTU:1600  Metric:1
              RX packets:3111732 errors:0 dropped:0 overruns:0 frame:0
              TX packets:1311107 errors:0 dropped:0 overruns:0 carrier:0
              collisions:0 txqueuelen:1000
              RX bytes:3677814427 (3.4 GiB)  TX bytes:265796876 (253.4 MiB)

```

```
atm/ptm interface statistics for port 0
```

```

in octets          4983267
out octets         27636440
in packets         16376
out packets        26024
in OAM cells          0
out OAM cells         0
in ASM cells          0
out ASM cells         0
in packet errors     0
in cell errors       0

```

如果数据包计数器增加，您应从ISP接收PPP协商数据包。如果情况并非如此，请致电您的ISP。

如果输出绑定计数器增加，您应发送PPP协商数据包。如果不是这样，请检查路由器上的配置。如果PPP配置正确，PPP协商数据包会持续从Ethernet0接口发出。

PPP是否正确协商？

如果第1层已启用，并且您有正确的VLAN ID，则下一步是确保PPP正常启动。为此，您需要在Cisco DSL路由器上运行一系列debug命令并解释输出。您使用的主要debug命令是debug ppp negotiation。以下命令输出是成功PPP协商的示例：

```
Router#debug ppp negotiation
```

```
PPP protocol negotiation debugging is on
```

```
Router#
```

```

2w3d: Vi1 PPP: No remote authentication for call-out
2w3d: Vi1 PPP: Phase is ESTABLISHING
2w3d: Vi1 LCP: O CONFREQ [Open] id 146 len 10
2w3d: Vi1 LCP: MagicNumber 0x8CCF0E1E (0x05068CCF0E1E)
2w3d: Vi1 LCP: O CONFACK [Open] id 102 Len 15
2w3d: Vi1 LCP: AuthProto CHAP (0x0305C22305)
2w3d: Vi1 LCP: MagicNumber 0xD945AD0A (0x0506D945AD0A)
2w3d: Di1 IPCP: Remove route to 10.10.10.1
2w3d: Vi1 LCP: I CONFACK [ACKsent] id 146 Len 10
2w3d: Vi1 LCP: MagicNumber 0x8CCF0E1E (0x05068CCF0E1E)
2w3d: Vi1 LCP: State is Open
2w3d: Vi1 PPP: Phase is AUTHENTICATING, by the peer
2w3d: Vi1 CHAP: I CHALLENGE id 79 Len 33 from "6400-2-NRP-2"
2w3d: Vi1 CHAP: O RESPONSE id 79 Len 28 from "John"
2w3d: Vi1 CHAP: I SUCCESS id 79 Len 4
2w3d: Vi1 PPP: Phase is UP
2w3d: Vi1 IPCP: O CONFREQ [Closed] id 7 Len 10
2w3d: Vi1 IPCP: Address 0.0.0.0 (0x030600000000)
2w3d: Vi1 IPCP: I CONFREQ [REQsent] id 4 Len 10
2w3d: Vi1 IPCP: Address 10.10.10.1 (0x030614140201)
2w3d: Vi1 IPCP: O CONFACK [REQsent] id 4 Len 10
2w3d: Vi1 IPCP: Address 10.10.10.1 (0x030614140201)
2w3d: Vi1 IPCP: I CONFNAK [ACKsent] id 7 Len 10
2w3d: Vi1 IPCP: Address 10.1.1.1 (0x030628010102)
2w3d: Vi1 IPCP: O CONFREQ [ACKsent] id 8 Len 10
2w3d: Vi1 IPCP: Address 10.1.1.1 (0x030628010102)
2w3d: Vi1 IPCP: I CONFACK [ACKsent] id 8 Len 10
2w3d: Vi1 IPCP: Address 10.1.1.1 (0x030628010102)
2w3d: Vi1 IPCP: State is Open
2w3d: Di1 IPCP: Install negotiated IP interface address 10.1.1.1
2w3d: Di1 IPCP: Install route to 10.10.10.1
Router#

```

PPP协商有四个主要故障点：

- 远程设备 (您的ISP) 没有响应
- 链路控制协议(LCP)未打开
- 身份验证失败
- IP控制协议(IPCP)故障

您的ISP没有响应

如果您的ISP没有响应，这应该不是问题，因为您已经验证Ethernet0接口上的数据包在入站方向上是递增的。但是，如果数据包在Ethernet0的入站方向上递增，并且您在运行**debug ppp negotiation**时收到此消息，请与ISP联系，以验证数据包是否已发送到Cisco DSL路由器。

```

Router#debug ppp negotiation
*Mar 1 04:04:50.718: Vi1 PPP: Treating connection as a callout
*Mar 1 04:04:50.718: Vi1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 0 load]
*Mar 1 04:04:50.718: Vi1 PPP: No remote authentication for call-out
*Mar 1 04:04:50.722: Vi1 LCP: O CONFREQ [Closed] id 1 Len 10

!--- "O" specifies an outbound packet

*Mar 1 04:04:50.722: Vi1 LCP: MagicNumber 0x317722F4 (0x0506317722F4)
*Mar 1 04:04:52.722: Vi1 LCP: TIMEOUT: State REQsent
*Mar 1 04:04:52.722: Vi1 LCP: O CONFREQ [REQsent] id 2 Len 10

!--- "O" specifies an outbound packet

```

```

*Mar 1 04:04:52.722: Vi1 LCP: MagicNumber 0x317722F4 (0x0506317722F4)
*Mar 1 04:04:54.722: Vi1 LCP: TIMEOUT: State REQsent
*Mar 1 04:04:54.722: Vi1 LCP: O CONFREQ [REQsent] id 3 Len 10
*Mar 1 04:04:54.722: Vi1 LCP: MagicNumber 0x317722F4 (0x0506317722F4)
*Mar 1 04:04:56.722: Vi1 LCP: TIMEOUT: State REQsent
*Mar 1 04:04:56.722: Vi1 LCP: O CONFREQ [REQsent] id 4 Len 10
*Mar 1 04:04:56.722: Vi1 LCP: MagicNumber 0x317722F4 (0x0506317722F4)
*Mar 1 04:04:58.722: Vi1 LCP: TIMEOUT: State REQsent
*Mar 1 04:04:58.722: Vi1 LCP: O CONFREQ [REQsent] id 5 Len 10
*Mar 1 04:04:58.722: Vi1 LCP: MagicNumber 0x317722F4 (0x0506317722F4)
*Mar 1 04:05:00.722: Vi1 LCP: TIMEOUT: State REQsent
*Mar 1 04:05:00.722: Vi1 LCP: O CONFREQ [REQsent] id 6 Len 10
*Mar 1 04:05:00.722: Vi1 LCP: MagicNumber 0x317722F4 (0x0506317722F4)
*Mar 1 04:05:02.722: Vi1 LCP: TIMEOUT: State REQsent
*Mar 1 04:05:02.722: Vi1 LCP: O CONFREQ [REQsent] id 7 Len 10

```

!--- "O" specifies an outbound packet

```
*Mar 1 04:05:02.722: Vi1 LCP: MagicNumber 0x317722F4 (0x0506317722F4)
```

Router#**undebug all**

在此输出中，只有O数据包是出站数据包。为了成功协商PPP，您的ISP应为发送的每个O数据包提供一个I入站数据包。如果数据包增加入站，但您看不到I数据包，请联系您的ISP以验证发送到Cisco DSL路由器的数据包。

LCP未打开

如果LCP未打开，这通常是由PPP选项不匹配引起的。当Cisco DSL路由器配置了ISP不支持的PPP参数，或者当ISP配置了Cisco DSL路由器不支持的参数时，会发生这种不匹配。此输出显示PPP选项不匹配的示例：

Router#**debug ppp negotiation**

```

*Mar 1 04:52:43.254: Vi1 PPP: Treating connection as a callout
*Mar 1 04:52:43.258: Vi1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]
*Mar 1 04:52:43.258: Vi1 PPP: No remote authentication for call-out
*Mar 1 04:52:43.258: Vi1 LCP: O CONFREQ [Closed] id 3 len 10
*Mar 1 04:52:43.262: Vi1 LCP: MagicNumber 0x31A2F808 (0x050631A2F808)
*Mar 1 04:52:43.310: Vi1 LCP: I CONFREQ [REQsent] id 180 Len 14
*Mar 1 04:52:43.310: Vi1 LCP: AuthProto PAP (0x0304C023)
*Mar 1 04:52:43.310: Vi1 LCP: MagicNumber 0x39D50E9B (0x050639D50E9B)
*Mar 1 04:52:43.314: Vi1 LCP: O CONFNAK [REQsent] id 180 Len 9

```

!--- PPP option reject

```
*Mar 1 04:52:43.314: Vi1 LCP: AuthProto CHAP (0x0305C22305)
```

!--- PPP option that is rejected

```

*Mar 1 04:52:43.314: Vi1 LCP: I CONFACK [REQsent] id 3 Len 10
*Mar 1 04:52:43.318: Vi1 LCP: MagicNumber 0x31A2F808 (0x050631A2F808)
*Mar 1 04:52:43.366: Vi1 LCP: I CONFREQ [ACKrcvd] id 181 Len 14
*Mar 1 04:52:43.366: Vi1 LCP: AuthProto PAP (0x0304C023)
*Mar 1 04:52:43.366: Vi1 LCP: MagicNumber 0x39D50E9B (0x050639D50E9B)
*Mar 1 04:52:43.370: Vi1 LCP: O CONFNAK [ACKrcvd] id 181 Len 9

```

!--- PPP option reject

```
*Mar 1 04:52:43.370: Vi1 LCP: AuthProto CHAP (0x0305C22305)
```

!--- PPP option that is rejected


```
*Mar 1 04:52:43.418: Vi1 LCP: I CONFREQ [ACKrcvd] id 182 Len 14
*Mar 1 04:52:43.418: Vi1 LCP: AuthProto PAP (0x0304C023)
*Mar 1 04:52:43.418: Vi1 LCP: MagicNumber 0x39D50E9B (0x050639D50E9B)
```

```
Router#undebg all
```

无论是I还是O数据包，Configure-Negative-Acknowledge(CONFNAK)都表示PPP配置不匹配。这意味着PPP连接的一端请求PPP选项，而另一端无法或未配置为执行该选项。如果Cisco DSL路由器发送CONFNAK(以“O CONFNAK”表示)，则Cisco DSL路由器无法执行或未为ISP发送的选项配置。如果ISP发送CONFNAK(以“I CONFNAK”表示)，则您已在Cisco DSL路由器上配置了ISP不想执行的选项。

CONFNAK后的行描述被拒绝的选项。在本示例输出中，选项是质询握手身份验证协议(CHAP)，但它可以是任何选项。在Cisco DSL路由器上，唯一可以配置PPP选项的位置是interface dialer 1。输入命令**show run interface dialer 1**以查看接口拨号器1的配置。

如果ISP发送I CONFNAK，请在接口拨号器1下查找与CONFNAK后的线路匹配的命令，并将其删除。如果Cisco DSL路由器发送O CONFNAK，请向接口拨号器1添加命令，以便与ISP正确协商PPP。如果路由器发送数据包，您可能需要呼叫Cisco Support，以确定需要在Cisco DSL路由器上启用哪条命令。

身份验证失败

当您的ISP无法对您的PPP用户名或密码进行身份验证时，会发生身份验证失败。有两种情况可能发生这种情况。第一种情况是身份验证类型不匹配，这是在您未正确配置路由器时导致的。本文档中列出的所有身份验证配置都说明了密码身份验证协议(PAP)和CHAP身份验证类型。为了配置灵活性，您应同时配置CHAP和PAP。如果未同时配置两个，则可能会看到debug ppp negotiation命令的输出，如以下示例：

```
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#undebg all
```

为了纠正两个身份验证不匹配问题，您需要将身份验证协议重新配置为入站CONFREQ数据包中ISP请求的协议。

如何确定我的PAP用户名和密码是否正确？

在您确认ISP使用PAP后，输入**debug ppp negotiation**命令以确认您的PAP用户名和密码正确。

```
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]

```

您需要联系ISP并获取正确的凭证才能解决此问题。您可以使用以下命令重新配置PAP凭证：

```

Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface dialer 1
Router(config-if)#ppp pap sent-username <username> password <password>
Router(config-if)#end
Router#write memory

```

如何确定我的CHAP用户名和密码是否正确？

确认ISP使用CHAP后，输入debug ppp negotiation命令以确认CHAP用户名和密码正确。

```

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
```

您需要联系ISP并获取正确的凭证才能解决此问题。您可以使用以下命令重新配置CHAP凭据：

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface dialer 1
Router(config-if)#ppp chap hostname <username>
Router(config-if)#ppp chap password <password>
Router(config-if)#end
Router#write memory
```

如何知道PPP身份验证何时成功？

此示例显示成功的CHAP协商。

```
Router#debug ppp negotiation
<... snipped ...>
*Mar 3 03:30:09.335: Vi1 LCP: State is Open
*Mar 3 03:30:09.335: Vi1 PPP: Phase is AUTHENTICATING, by the peer [0 sess, 1 load]
*Mar 3 03:30:09.379: Vi1 CHAP: I CHALLENGE id 41 len 32 from "6400-2-NRP3"
*Mar 3 03:30:09.379: Vi1 CHAP: Using alternate hostname cisco
*Mar 3 03:30:09.379: Vi1 CHAP: Username 6400-2-NRP3 not found
*Mar 3 03:30:09.383: Vi1 CHAP: Using default password
*Mar 3 03:30:09.383: Vi1 CHAP: O RESPONSE id 41 Len 26 from "cisco"
*Mar 3 03:30:09.431: Vi1 CHAP: I SUCCESS id 41 Len 4
```

```
!--- CHAP negotiation was a success.
```

```
*Mar 3 03:30:09.431: Vi1 PPP: Phase is UP [0 sess, 1 load]
```

```
<... snipped ...>
```

```
Router#undebug all
```

This example shows a successful PAP negotiation.

```
Router#debug ppp negotiation
```

```
<... snipped ...>
```

```
*Mar 3 03:33:19.491: Vi1 LCP: State is Open
*Mar 3 03:33:19.491: Vi1 PPP: Phase is AUTHENTICATING, by the peer [0 sess, 0 load]
*Mar 3 03:33:19.495: Vi1 PAP: O AUTH-REQ id 255 Len 16 from "cisco"
*Mar 3 03:33:19.539: Vi1 PAP: I AUTH-ACK id 255 Len 5
*Mar 3 03:33:19.539: Vi1 PPP: Phase is UP [0 sess, 0 load]
```

```
!--- PAP negotiation was a success.
```

```
<... snipped ...>
```

```
Router#undebug all
```

PPPoE的性能问题

本部分特定于PPPoE连接。当您在拨号器接口上使用默认最大传输单位(MTU)大小时，PPPoE连接预计会出现吞吐量、浏览速度慢等问题。您需要将PPPoE拨号器上的MTU设置为1492，以便考虑PPPoE报头使用的八个字节。输入以下命令以配置正确的MTU：

```
Router#configure terminal
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#interface dialer 1
```

```
Router(config-if)#mtu 1492
```