

# 配置 Cisco 1700/2600/3600 ADSL WIC 作为使用 NAT 的 PPPoE 客户端

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## 简介

Cisco 1700、2600 和 3600 系列路由器支持非对称数字用户线 (ADSL) WAN 接口卡 (WIC)。全部三平台根本配置同样。然而，有差异在硬件方面和在为每一个要求的Cisco IOS软件版本。在本文中，Cisco 1700、2600及3600呼叫“Cisco ADSL WIC”。

## 先决条件

### 要求

本文档没有任何特定的要求。

### 使用的组件

本文档中的信息基于以下软件和硬件版本：

- Cisco 6400 UAC-NRP IOS软件版本12.1(3)DC1
- Cisco 6400 UAC-NSP IOS软件版本12.1(3)DB
- Cisco 6130 DSLAM-NI2 IOS软件版本12.1(5)DA

要支持在Cisco2600/3600上的ADSL WIC，需要这些硬件：

2600	3600
机箱WIC槽	NM-1FE1R2W
NM-2W	NM-1FE2W
	NM-2FE2W
	NM-2W

**重要信息：**对于Cisco3600，此硬件不支持ADSL WIC：

- NM-1E1R2W
- NM-1E2W
- NM-2E2W

为支持 ADSL WIC，至少需要以下思科 IOS 软件版本：

- Cisco IOS软件版本12.1(5)yb (仅加强版本)在Cisco2600/3600
- Cisco IOS软件版本IOS 12.1(3)XP或以上(仅加强版本或ADSL功能集)在Cisco 1700。ADSL特性集可以通过镜像名中的“y7”来识别。例如，c1700-sy7-mz.121-3.XP.bin。
- 当您下载Cisco 1700的时镜像，请确保您选择镜像名称1700。不要下载1720或1750镜像。这些功能不支持ADSL WIC。

要支持以太网点对点协议(PPPoE)，您必须有ADSL+PLUS特性组。ADSL专用属性集不支持在Cisco 1700的PPPoE。

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。

## 规则

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

## 背景信息

在Cisco IOS软件版本12.1(3)XG，PPPoE客户端功能为Cisco ADSL WIC介绍。此功能允许PPPoE功能被移动到路由器。多台PC可以在Cisco ADSL WIC后安装。在他们的流量发送给PPPoE会话前，可以加密，过滤，等等。并且，网络地址转换(NAT)能运行。

本文显示在异步传输模式(ATM)接口配置的PPPoE客户端(DSL接口) Cisco ADSL WIC。

Cisco 6400节点路由处理器(NRP)的配置也可用在作为带有ATM接口的聚集器的路由器上。

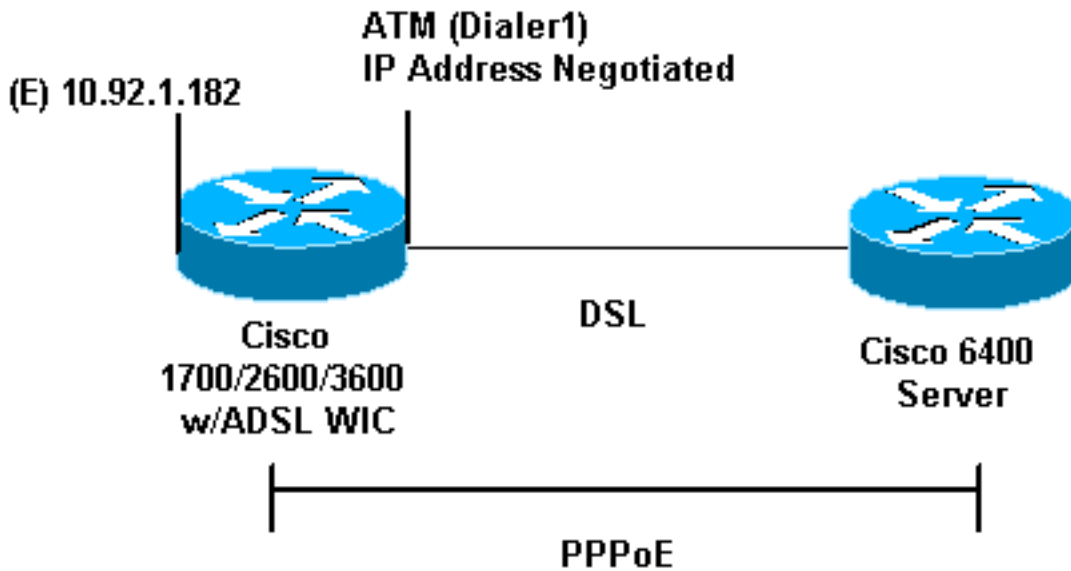
## 配置

此部分提供本文描述的功能的配置信息。

**注意：**要寻找关于本文中指令的其他信息，请使用[命令查找工具\(注册用户\)](#)。

## 网络图

本文档使用以下网络设置：



## 配置

PPPoE在Cisco ADSL WIC配置用虚拟专用拨号网络(VPDN)命令。保证您首先配置这些命令。

**注意：**关于如何更改最大传输单元(MTU)的大小的信息，参考[在PPPoE拨入连通性的故障排除MTU大小](#)。

本文档使用以下配置：

- [Cisco ADSL WIC](#)
- [Cisco 6400](#)

### Cisco ADSL WIC

```
!
vpdn enable
no vpdn logging
!
vpdn-group pppoe
  request-dialin
!--- You are the PPPoE client that asks to establish a
session !--- with the aggregation unit (6400 NRP). These
VPDN commands !--- are not needed with Cisco IOS
Software Release 12.2(13)T !--- or later. protocol pppoe
! !--- Internal Ethernet network. ! interface
FastEthernet0 ip address 10.92.1.182 255.255.255.0 ip
nat inside !--- DSL interface. ! interface ATM0 no ip
address no atm ilmi-keepalive bundle-enable dsl
operating-mode auto hold-queue 224 in !--- All defaults.
!--- PPPoE runs on top of AAL5SNAP. However, the !---
encap aal5snap command is not used.

!
interface ATM0.1 point-to-point
  pvc 1/1
    pppoe-client dial-pool-number 1
!--- pvc 1/1 is an example value that must be changed to
match !--- the value used by the ISP. ! !--- The PPPoE
client code ties into a dialer interface upon !--- which
a virtual-access interface is cloned. ! interface
```

```

Dialer1 ip address negotiated ip mtu 1492 !--- Ethernet
MTU default = 1500 (1492 + PPPoE headers = 1500) ip nat
outside encapsulation ppp dialer pool 1 !--- Ties to the
ATM interface. ppp authentication chap callin ppp chap
hostname <username> ppp chap password <password> ! !---
The ISP instructs you about the type of authentication
!--- to use. !--- To change from PPP Challenge Handshake
Authentication !--- Protocol (CHAP) to PPP Password
Authentication Protocol !--- (PAP), replace these three
lines: !--- ppp authentication chap callin !--- ppp chap
hostname <username> !--- ppp chap password <password> !-
-- with these two lines: !--- ppp authentication pap
callin !--- ppp pap sent-username <username> password
<password> !--- For NAT, overload on the Dialer1
interface and add a !--- default route out, because the
dialer IP address can !--- change.

ip nat inside source list 1 interface Dialer1 overload
ip classless
ip route 0.0.0.0 0.0.0.0 dialer1
no ip http server
!
access-list 1 permit 10.92.1.0 0.0.0.255
!--- For NAT. !

```

## Cisco 6400

```

Cisco 6400 ***
local ppp user
!--- You can also use aaa.

username <username> password <password>
!--- Begin with the VPDN commands. Notice that you bind
the !--- PPPoE here to a virtual-template, instead of on
the ATM !--- interface. You can not (at this time) use
more than one !--- virtual-template (or VPDN group) for
PPPoE beginning with !--- the VPDN commands. vpdn enable
no vpdn logging ! vpdn-group pppoe accept-dialin !---
PPPoE server mode. protocol pppoe virtual-template 1 ! !
interface ATM0/0/0 no ip address no atm ilmi-keepalive
hold-queue 500 in !--- The binding to the virtual-
template interface is !--- configured in the VPDN group.
! interface ATM0/0/0.182 point-to-point pvc 1/82
encapsulation aal5snap !--- This needs the command on
the server side. protocol pppoe ! ! !--- Virtual-
template is used instead of dialer interface. !
interface Virtual-Templat1 ip unnumbered Loopback10 ip
mtu 1492 peer default ip address pool ippool ppp
authentication chap ! ! interface Loopback10 ip address
8.8.8.1 255.255.255.0 ! ip local pool ippool 9.9.9.1
9.9.9.5

```

## 验证

当前没有可用于此配置的验证过程。

## 故障排除

使用本部分可排除配置故障。

[命令输出解释程序 \( 仅限注册用户 \)](#) (OIT) 支持某些 **show** 命令。使用 OIT 可查看对 show 命令输出的分析。

**注意：** 使用 **debug** 命令之前，请参阅[有关 Debug 命令的重要信息](#)。

## 调试PPPoE客户端

要调试Cisco ADSL WIC或Cisco 6400的PPPoE客户端，您必须考虑协议栈。您能在底部开始排除故障。

### 1. DSL物理层：确保线路是上和培训。

```
show interface atm0
ATM0 is up, line protocol is up
  Hardware is PQUICC_SAR (with Alcatel ADSL Module)

show dsl interface atm0
!--- Look for "Showtime" in the first few lines. ATU-R (DS) ATU-C (US) Modem Status:
Showtime (DMTDSL_SHOWTIME)
```

### 2. ATM层：如果ATM接口是UP，请发出**debug atm packet**命令发现任何是否自ISP进来。**注意**：您看不到输出数据包用此命令由于方式数据包处理。您需要发现输出类似于此，与同一个类型，SAP，CTL，并且显示该流入的ATM信息包的OUI字段是AAL5SNAP：

```
debug atm packet
03:21:32: ATM0(I):
VCD:0x2 VPI:0x1 VCI:0x1 Type:0x0 SAP:AAAA CTL:03 OUI:0080C2 TYPE:0007 Length:0x30
03:21:32: 0000 0050 7359 35B7 0001 96A4 84AC 8864 1100 0001 000E C021 09AB 000C 0235
03:21:32: 279F 0000 0000
03:21:32:
```

### 3. 以太网层：完整以太网帧在AAL5SNAP数据包。debug ethernet packet命令。然而，您需要执行一些VPDN调试(Cisco IOS软件版本12.2(13)T的PPPoE调试或以上)发现PPPoE帧。供参考，是的以太网帧PPPoE帧包含这两以太网类型之一：0x8863以太网类型= PPPoE控制信息包(处理PPPoE会话)0x8864以太网类型= PPPOE信息包(包含PPP数据包)一重要提示是有PPPoE的两会话。PPPoE会话，是VPDN L2TP类型会话和PPP会话。为了设立PPPoE，您有一个PPPoE会话建立阶段和一个PPP会话建立阶段。终端通常介入一个PPP终止阶段和一个PPPoE终止阶段。PPPoE建立阶段识别PPPoE客户端和服务器的(MAC地址)并且分配会话ID。在那完成后，正常PPP建立出现正如其他PPP连接。调试，使用VPDN PPPoE调试(Cisco IOS软件版本12.2(13)T的PPPoE调试或以上)确定PPPoE连接阶段是否是成功的。

```
#debug vpdn pppoe-events (debug pppoe events)
06:17:58: Sending PADI: vc=1/1
!--- A broadcast Ethernet frame (in this case encapsulated in ATM) !--- requests a PPPoE
server, "Are there any PPPoE servers out there?" 06:18:00: PPPOE: we've got our pado and
the pado timer went off !--- This is a unicast reply from a PPPoE server !--- (very similar
to a DHCP offer). 06:18:00: OUT PADR from PPPoE tunnel !--- This is a unicast reply that
accepts the offer. 06:18:00: IN PADS from PPPoE tunnel !--- This is a confirmation and
completes the establishment.
```

PPP建立开始作为其他PPP开始。在PPPoE会话建立后，请发出**show vpdn**命令(请显示Cisco IOS软件版本12.2(13)T的pppe会话或以后)得到状态。

```
# show vpdn (show pppoe session)
%No active L2TP tunnels
%No active L2F tunnels

PPPoE Tunnel and Session Information Total tunnels 1 sessions 1

PPPoE Tunnel Information
```

```
Session count: 1
```

#### PPPoE Session Information

SID	RemMAC	LocMAC	Intf	VASt	OIntf	VC
1	0050.7359.35b7	0001.96a4.84ac	Vi1	UP	AT0	11

通过show vpdn session all (请显示PPPoE会话全部)命令获得信息包计数信息。

```
show vpdn session all (show pppoe session all)
```

```
%No active L2TP tunnels
```

```
%No active L2F tunnels
```

```
PPPoE Session Information Total tunnels 1 sessions 1
```

```
session id: 1
```

```
local MAC address: 0001.96a4.84ac, remote MAC address: 0050.7359.35b7
```

```
virtual access interface: Vi1, outgoing interface: AT0, vc: 1/1
```

```
1656 packets sent, 1655 received, 24516 bytes sent, 24486 received
```

其它调试命令：**debug vpdn pppoe-data (debug pppoe数据)****debug vpdn pppoe-error (debug pppoe错误)****debug vpdn pppoe数据包(debug pppoe数据包)**

4. PPP层：在PPPoE会话建立后，PPP调试是相同的为其他PPP建立。使用同样**debug ppp negotiation**和**debug ppp authentication**指令。以下是示例输出。**注意**：在此示例，主机名是“client1”。远程Cisco 6400的名称是“nrp-b”。

```
show vpdn session all (show pppoe session all)
```

```
%No active L2TP tunnels
```

```
%No active L2F tunnels
```

```
PPPoE Session Information Total tunnels 1 sessions 1
```

```
session id: 1
```

```
local MAC address: 0001.96a4.84ac, remote MAC address: 0050.7359.35b7
```

```
virtual access interface: Vi1, outgoing interface: AT0, vc: 1/1
```

```
1656 packets sent, 1655 received, 24516 bytes sent, 24486 received
```

## [调试PPPoE服务器](#)

要调试Cisco 6400 (PPPoE服务器)，请使用使用Cisco ADSL WIC的同一个自上而上的过程(客户端)。差异在DSL物理层，您需要检查DSLAM。

1. DSL物理层：检查DSL物理层，您需要查看DSLAM上的DSL统计数据。对于Cisco DSLAMs，请发出**show dsl interface**命令。
2. ATM层：在Cisco 6400侧，您能也发出**debug atm packet**命令。启用特定PVC的Cisco 6400。

```
debug atm packet interface atm 0/0/0.182 vc 1/82
```

您需要发现输出类似于此，与同一个类型，SAP，CTL，并且显示该流入的ATM信息包的OUI字段是AAL5SNAP：

```
4d04h: ATM0/0/0.182(I):
```

```
VCD:0x3 VPI:0x1 VCI:0x52 Type:0x900 SAP:AAAA CTL:03 OUI:0080C2 TYPE:0007 Length:0x30
```

```
4d04h: 0000 0001 96A4 84AC 0050 7359 35B7 8864 1100 0001 000E C021 0A2E 000C 65E3
```

```
4d04h: 15E5 0000 0000
```

**注意**：您看不到输出数据包用此命令由于方式数据包处理。

3. 以太网层：同样VPDN显示命令，并且在Cisco ADSL WIC使用的调试在Cisco 6400可以用于查看PPPoE建立。

```
# debug vpdn pppoe-events (debug pppoe events)
4d04h: IN PADI from PPPoE tunnel

4d04h: OUT PADO from PPPoE tunnel

4d04h: IN PADR from PPPoE tunnel

4d04h: PPPoE: Create session
4d04h: PPPoE: VPN session created.

4d04h: OUT PADS from PPPoE tunnel

# show vpdn
%No active L2TP tunnels
%No active L2F tunnels

PPPoE Tunnel and Session Information Total tunnels 1 sessions 1

PPPoE Tunnel Information

Session count: 1

PPPoE Session Information
SID          RemMAC          LocMAC          Intf          VASt          OIntf          VC
1            0001.96a4.84ac  0050.7359.35b7  Vi4           UP            AT0/0/0 1      82

# show vpdn session all

nrp-b# show vpdn session all
%No active L2TP tunnels
%No active L2F tunnels

PPPoE Session Information Total tunnels 1 sessions 1

session id: 1
local MAC address: 0050.7359.35b7, remote MAC address: 0001.96a4.84ac
virtual access interface: Vi4, outgoing interface: AT0/0/0, vc: 1/82
    30 packets sent, 28 received, 422 bytes sent, 395 received
```

其它调试命令：debug vpdn pppoe-data (debug pppoe数据)debug vpdn pppoe-error (debug pppoe错误)debug vpdn pppoe数据包(debug pppoe数据包)

4. PPP层：这是对应于从Cisco ADSL WIC的更早的调试从Cisco 6400的PPP debug输出：

```
debug ppp negotiation and debug ppp authentication
4d04h: Vi2 PPP: Treating connection as a dedicated line
4d04h: Vi2 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]
4d04h: Vi2 LCP: O CONFREQ [Closed] id 1 len 15
4d04h: Vi2 LCP:   AuthProto CHAP (0x0305C22305)
4d04h: Vi2 LCP:   MagicNumber 0x65F62814 (0x050665F62814)
4d04h: Vi2 LCP: I CONFREQ [REQsent] id 1 len 10
4d04h: Vi2 LCP:   MagicNumber 0x03144FF9 (0x050603144FF9)
4d04h: Vi2 LCP: O CONFACK [REQsent] id 1 len 10
4d04h: Vi2 LCP:   MagicNumber 0x03144FF9 (0x050603144FF9)
4d04h: Vi3 LCP: I ECHOREQ [Open] id 60 len 8 magic 0xA60C0000
4d04h: Vi3 LCP: O ECHOREP [Open] id 60 len 8 magic 0x51A0BEF6
4d04h: Vi2 LCP: TIMEOUT: State ACKsent
4d04h: Vi2 LCP: O CONFREQ [ACKsent] id 2 len 15
4d04h: Vi2 LCP:   AuthProto CHAP (0x0305C22305)
4d04h: Vi2 LCP:   MagicNumber 0x65F62814 (0x050665F62814)
4d04h: Vi2 LCP: I CONFACK [ACKsent] id 2 len 15
```

```
4d04h: Vi2 LCP: AuthProto CHAP (0x0305C22305)
4d04h: Vi2 LCP: MagicNumber 0x65F62814 (0x050665F62814)
4d04h: Vi2 LCP: State is Open
4d04h: Vi2 PPP: Phase is AUTHENTICATING, by this end [0 sess, 1 load]
4d04h: Vi2 CHAP: O CHALLENGE id 10 len 26 from "nrp-b"
4d04h: Vi2 CHAP: I RESPONSE id 10 len 28 from "client1"
4d04h: Vi2 PPP: Phase is FORWARDING [0 sess, 1 load]
4d04h: Vi2 PPP: Phase is AUTHENTICATING [0 sess, 1 load]
4d04h: Vi2 CHAP: O SUCCESS id 10 len 4
4d04h: Vi2 PPP: Phase is UP [0 sess, 1 load]
4d04h: Vi2 IPCP: O CONFREQ [Closed] id 1 len 10
4d04h: Vi2 IPCP: Address 8.8.8.1 (0x030608080801)
4d04h: Vi2 IPCP: I CONFREQ [REQsent] id 1 len 10
4d04h: Vi2 IPCP: Address 0.0.0.0 (0x030600000000)
4d04h: Vi2 IPCP: Pool returned 9.9.9.2
4d04h: Vi2 IPCP: O CONFNAK [REQsent] id 1 len 10
4d04h: Vi2 IPCP: Address 9.9.9.2 (0x030609090902)
4d04h: Vi2 CDPCP: I CONFREQ [Not negotiated] id 1 len 4
4d04h: Vi2 LCP: O PROTREJ [Open] id 3 len 10 protocol CDPCP (0x820701010004)
4d04h: Vi2 IPCP: I CONFACK [REQsent] id 1 len 10
4d04h: Vi2 IPCP: Address 8.8.8.1 (0x030608080801)
4d04h: Vi2 IPCP: I CONFREQ [ACKrcvd] id 2 len 10
4d04h: Vi2 IPCP: Address 9.9.9.2 (0x030609090902)
4d04h: Vi2 IPCP: O CONFACK [ACKrcvd] id 2 len 10
4d04h: Vi2 IPCP: Address 9.9.9.2 (0x030609090902)
4d04h: Vi2 IPCP: State is Open
4d04h: Vi2 IPCP: Install route to 9.9.9.2
4d04h: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Virtual-Access2, changed state to up
```

## [相关信息](#)

- [长距离以太网\(LRE\)和数字用户线\(xDSL\)技术支持](#)
- [LRE和xDSL产品支持](#)
- [技术支持和文档 - Cisco Systems](#)