

配置使用外部调制解调器的 PPP 拨入

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简介

本文档说明使用外部调制解调器的点对点协议(PPP)拨入配置。

先决条件

要求

您需要为要拨入的每个用户配置用户名和密码，因为此配置没有终端访问控制器访问控制器系统(TACACS+)或远程身份验证拨入用户服务(RADIUS)服务器。所有IP地址都从地址池传送到客户端。

对于此配置，您需要：

- 您希望客户端使用的用户名和密码（即使稍后要添加TACACS+或RADIUS，也需向路由器添加几个名称以测试线路）。
- 用于创建池和静态路由的IP编址方案。

使用的组件

本文档中的信息基于以下软件和硬件版本。

- 实验室环境中的Cisco 2511，配置已清除。

- 路由器上的Cisco IOS® 12.2(10b)版。
- 四个外部异步调制解调器。

本文档中的信息都是基于特定实验室环境中的设备创建的。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，请确保您在使用任何命令前已经了解其潜在影响。

相关产品

此配置还可用于以下硬件和软件版本：

- 具有异步接口和串行接口的路由器能够配置异步接口。
- 可以使用WIC-2A/S、8或16个异步端口串行接口。

规则

有关文件规则的更多信息请参见“Cisco技术提示规则”。

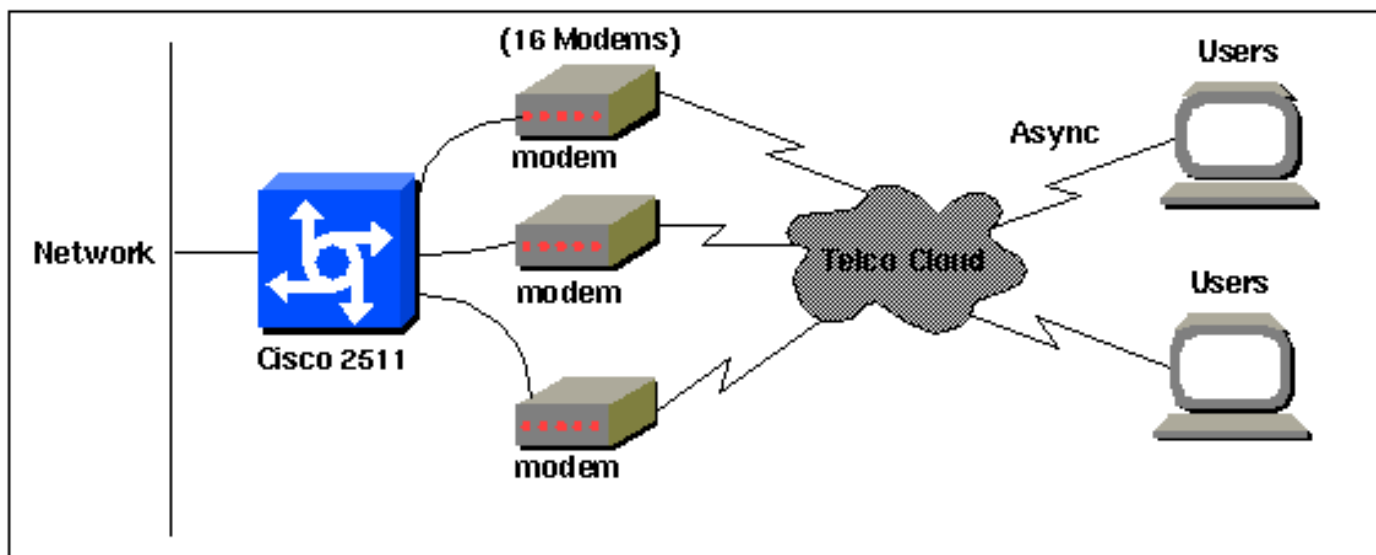
配置

本部分提供有关如何配置本文档所述功能的信息。

注：要查找有关本文档中使用的命令的其他信息，请使用命令[查找工具](#)（[仅注册客户](#)）。

网络图

本文档使用此图所示的网络设置。



配置

本文档使用如下所示的配置。

此配置已在2511系列路由器上使用Cisco IOS软件版本12.2(10b)测试。相同的配置概念适用于从11.0(3)或更高版本开始的类似路由器拓扑或其他Cisco IOS版本。

Cisco 2511

```
Current configuration:
!
version 12.2

service timestamps debug datetime msec
no service password-encryption
no service udp-small-servers
no service tcp-small-servers
!
hostname router1
!
enable secret <deleted>
!
username jason password foo
username laura password letmein
username russ password opensesame
username syed password bar
username tito password knockknock
  !--- Usernames and passwords for clients making
incoming calls. modemcap entry default !--- Modemcap
named "default" is applied to the line 2 and line 3 !---
of Serial interfaces. Refer to the Modem-Router
Connection Guide !--- and modemcap entry for more
information. ! interface Ethernet0 ip address
192.168.39.1 255.255.255.0 ! interface Serial0 no ip
address ! interface Serial11 no ip address ! interface
Group-Async1 !--- Async configuration for the external
modems. ip unnumbered ethernet0 encapsulation ppp async
mode interactive peer default ip address pool dialup !--
- Assigns ip address for incoming calls !--- from the
"dialup" pool. no cdp enable ppp authentication chap
group-range 1 16 !--- Includes lines 1 through 16 in the
group-async1 interface. ! ip local pool dialup
192.168.39.239 192.168.39.254 !--- Defines the range of
ip addresses available !--- to the "dialup" pool. ! line
con 0 login line 1 16 !--- Line configuration for the
external modems. login local !--- Authenticate incoming
calls locally with username and password !--- configured
on the router. autoselect during-login autoselect ppp !-
-- Launch PPP when PPP packets are received from the
client. modem InOut !--- Allow incoming and outgoing
calls. transport input all modem autoconfigure type
default !--- Apply the modemcap "default" (configured
previously) to initialize !--- the modem. Refer to the
link Modem-Router Connection Guide !--- for more
information. stopbits 1 flowcontrol hardware line aux 0
line vty 0 4 exec-timeout 20 0 password letmein login !
end
```

对于希望以随机间隔连接到其中心办公室、持续时间较短的远程用户，此类拨号连接可提供更便宜的解决方案。在上述配置中，用户通过调制解调器从其桌面拨号，并通过PSTN网络建立到中心办公室的PPP连接。

要实施此配置，您必须进行以下配置：

- 异步接口。
- 异步线路。

- 全局配置模式下的IP地址池。
- 调制解调器参数- [Modemcap](#)条目和[调制解调器 — 路由器连接指南](#)。
- 必须在主机中配置拨号网络。

验证

本部分所提供的信息可用于确认您的配置是否正常工作。

[命令输出解释程序工具 \(仅限注册用户 \) 支持某些 show 命令](#)，使用此工具可以查看对 show 命令输出的分析。

- show users
- show interface
- show line
- show ip route

```
router1#show users
Line      User      Host(s)      Idle      Location
*  0 con 0          idle          00:00:00
1 tty 1      jason      Async interface  00:00:34  PPP: 192.168.39.240
3 tty 3          Modem Autoconfigure  00:00:00
4 tty 4          Modem Autoconfigure  00:00:00
5 tty 5          Modem Autoconfigure  00:00:00
6 tty 6          Modem Autoconfigure  00:00:01
7 tty 7          Modem Autoconfigure  00:00:01
8 tty 8          Modem Autoconfigure  00:00:01
9 tty 9          Modem Autoconfigure  00:00:01
10 tty 10         Modem Autoconfigure  00:00:01
11 tty 11         Modem Autoconfigure  00:00:01
12 tty 12         Modem Autoconfigure  00:00:00
13 tty 13         Modem Autoconfigure  00:00:00
14 tty 14         Modem Autoconfigure  00:00:01
15 tty 15         Modem Autoconfigure  00:00:01
16 tty 16         Modem Autoconfigure  00:00:00
```

```
Interface  User  Mode  Idle  Peer  Address
```

```
router1#show interface asynchronous 1
Async1 is up, line protocol is up
Hardware is Async Serial
Interface is unnumbered. Using address of Ethernet0 (192.168.39.1)
MTU 1500 bytes, BW 115 Kbit, DLY 100000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set  Keepalive not set
DTR is pulsed for 5 seconds on reset
LCP Open
Open: IPCP
Last input 00:00:28, output 00:00:43, output hang never
Last clearing of "show interface" counters 00:29:49
Input queue: 1/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
    Conversations 0/1/16 (active/max active/max total )
    Reserved Conversations 0/0 (allocated/max allocated)
    Available Bandwidth 86 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
```

```

34 packets input, 3147 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
2 input errors, 2 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
16 packets output, 383 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions

```

router1#show line

Tty	Typ	Tx/Rx	A	Modem	Roty	AccO	AccI	Uses	Noise	Overruns	Int	
*	0	CTY	-	-	-	-	-	-	0	0	0/0	-
A	1	TTY 115200/115200-	inout	-	-	-	-	-	1	1	0/0	-
*	2	TTY 38400/38400	-	inout	-	-	-	-	0	0	0/0	-
*	3	TTY 300/300	-	inout	-	-	-	-	0	0	0/0	-
*	4	TTY 300/300	-	inout	-	-	-	-	0	0	0/0	-
*	5	TTY 1200/1200	-	inout	-	-	-	-	0	0	0/0	-
*	6	TTY 300/300	-	inout	-	-	-	-	0	0	0/0	-
*	7	TTY 300/300	-	inout	-	-	-	-	0	0	0/0	-
*	8	TTY 300/300	-	inout	-	-	-	-	0	0	0/0	-
*	9	TTY 1200/1200	-	inout	-	-	-	-	0	0	0/0	-
*	10	TTY 300/300	-	inout	-	-	-	-	0	0	0/0	-
*	11	TTY 300/300	-	inout	-	-	-	-	0	0	0/0	-
*	12	TTY 115200/115200-	inout	-	-	-	-	-	0	0	0/0	-
*	13	TTY 115200/115200-	inout	-	-	-	-	-	0	0	0/0	-
*	14	TTY 300/300	-	inout	-	-	-	-	0	0	0/0	-
*	15	TTY 300/300	-	inout	-	-	-	-	0	0	0/0	-
*	16	TTY 300/300	-	inout	-	-	-	-	0	0	0/0	-
	17	AUX 9600/9600	-	-	-	-	-	-	0	0	0/0	-
	18	VTY	-	-	-	-	-	-	0	0	0/0	-
	19	VTY	-	-	-	-	-	-	0	0	0/0	-
	20	VTY	-	-	-	-	-	-	0	0	0/0	-
	21	VTY	-	-	-	-	-	-	0	0	0/0	-

router1#show line 1

Tty	Typ	Tx/Rx	A	Modem	Roty	AccO	AccI	Uses	Noise	Overruns	Int	
A	1	TTY 115200/115200-	inout	-	-	-	-	-	1	1	0/0	-

Line 1, Location: "PPP: 192.168.39.240", Type: ""

```

Length: 24 lines, Width: 80 columns
Baud rate (TX/RX) is 115200/115200, no parity, 1 stopbits, 8 databits
Status: Ready, Active, No Exit Banner, Async Interface Active
Modem Detected, CTS Raised
Capabilities: Hardware Flowcontrol In, Hardware Flowcontrol Out
Modem Callout, Modem RI is CD, Line usable as async interface
Modem Autoconfigure
Modem state: Ready
Group codes: 0
Line is running PPP for address 192.168.39.240.
0 output packets queued, 1 input packets.
Async Escape map is 00000000000000000000000000000000
Modem hardware state: CTS DSR DTR RTS, Modem Configured
Special Chars: Escape Hold Stop Start Disconnect Activation
^^x none - - none
Timeouts: Idle EXEC Idle Session Modem Answer Session Dispatch
00:10:00 never none not set
Idle Session Disconnect Warning
never

```

router1#show ip route

```

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

```

* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.39.0/24 is directly connected, Ethernet0

在Windows 2000服务器主机上

在Windows 2000主机中设置拨号连接。配置用户名、密码和电话号码并拨打连接。



建立拨号连接后，将从路由器中配置的拨号池分配IP地址。我们可以在主机中发出命令ipconfig来验证这一点。它在主机中显示为PPP适配器。

```
C:\Documents and Settings\Administrator>ipconfig
Windows 2000 IP Configuration
Ethernet adapter Local Area Connection:
    Media State . . . . . : Cable Disconnected
PPP adapter Dial-up Connection:
    Connection-specific DNS Suffix . :
    IP Address . . . . . : 192.168.39.240
    Subnet Mask . . . . . : 255.255.255.255
    Default Gateway . . . . . : 192.168.39.240
```

要验证从Windows 2000服务器主机到Cisco 2511路由器的连接建立，可以从主机ping路由器以太网端口并验证连接建立。此处,192.168.39.1是路由器的以太网端口IP地址。

```
C:\Documents and Settings\Administrator>ping 192.168.39.1
Pinging 192.168.39.1 with 32 bytes of data:
Reply from 192.168.39.1: bytes=32 time=170ms TTL=255
    Reply from 192.168.39.1: bytes=32 time=111ms TTL=255
    Reply from 192.168.39.1: bytes=32 time=110ms TTL=255
    Reply from 192.168.39.1: bytes=32 time=100ms TTL=255
Ping statistics for 192.168.39.1:
```

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 100ms, Maximum = 170ms, Average = 122ms

故障排除

本部分提供的信息可用于对配置进行故障排除。

故障排除命令

[命令输出解释程序工具 \(仅限注册用户\)](#) 支持某些 `show` 命令，使用此工具可以查看对 `show` 命令输出的分析。

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

- `debug ppp negotiation` - 用于查看客户端是否通过 PPP 协商。这是您检查地址协商的时候。
- `debug ppp authentication` - 看见客户端是否可以认证。
- `debug ppp error` - 显示和 PPP 连接协商与操作相关的协议错误以及统计错误。
- `debug modem` - 用于查看路由器从调制解调器接收的信号是否正确。
- `show line [# tty line]` — 查找调制解调器硬件状态。

从 Cisco 2511 路由器获得以下输出。它们显示 Windows 2000 服务器拨号到 Cisco 2511 的 PSTN 链路并建立 PPP 连接。

```
router1#debug ppp negotiation
PPP protocol negotiation debugging is on
router1#debug vtemplate
Virtual Template debugging is on
router1#show debug
PPP:
  PPP protocol negotiation debugging is on
Dec 10 18:43:59.079: As1 LCP: I CONFREQ [Closed] id 1 len 50
Dec 10 18:43:59.083: As1 LCP:   ACCM 0x00000000 (0x020600000000)
Dec 10 18:43:59.087: As1 LCP:   MagicNumber 0x59F402A1 (0x050659F402A1)
Dec 10 18:43:59.087: As1 LCP:   PFC (0x0702)
Dec 10 18:43:59.091: As1 LCP:   ACFC (0x0802)
Dec 10 18:43:59.091: As1 LCP:   Callback 6 (0x0D0306)
Dec 10 18:43:59.095: As1 LCP:   MRRU 1614 (0x1104064E)
Dec 10 18:43:59.099: As1 LCP:   EndpointDisc 1 Local
Dec 10 18:43:59.099: As1 LCP:   (0x131701714C44F0EC8F45BABDC596D14B)
Dec 10 18:43:59.103: As1 LCP:   (0x79DB5300000000)
Dec 10 18:43:59.107: As1 LCP: Lower layer not up, Fast Starting
Dec 10 18:43:59.107: As1 PPP: Treating connection as a dedicated line
Dec 10 18:43:59.111: As1 PPP: Phase is ESTABLISHING,
Active Open [0 sess, 0 load]
Dec 10 18:43:59.115: As1 LCP: O CONFREQ [Closed] id 3 len 25
Dec 10 18:43:59.119: As1 LCP:   ACCM 0x000A0000 (0x0206000A0000)
Dec 10 18:43:59.123: As1 LCP:   AuthProto CHAP (0x0305C22305)
Dec 10 18:43:59.127: As1 LCP:   MagicNumber 0x002AF05C (0x0506002AF05C)
Dec 10 18:43:59.127: As1 LCP:   PFC (0x0702)
Dec 10 18:43:59.131: As1 LCP:   ACFC (0x0802)
Dec 10 18:43:59.135: As1 LCP: O CONFREQ [REQsent] id 1 len 11
Dec 10 18:43:59.139: As1 LCP:   Callback 6 (0x0D0306)
Dec 10 18:43:59.139: As1 LCP:   MRRU 1614 (0x1104064E)
Dec 10 18:43:59.155: %LINK-3-UPDOWN: Interface Async1,
changed state to up
```

Dec 10 18:43:59.263: As1 LCP: I CONFACK [REQsent] id 3 len 25
Dec 10 18:43:59.267: As1 LCP: ACCM 0x000A0000 (0x0206000A0000)
Dec 10 18:43:59.267: As1 LCP: AuthProto CHAP (0x0305C22305)
Dec 10 18:43:59.271: As1 LCP: MagicNumber 0x002AF05C (0x0506002AF05C)
Dec 10 18:43:59.275: As1 LCP: PFC (0x0702)
Dec 10 18:43:59.275: As1 LCP: ACFC (0x0802)
Dec 10 18:43:59.279: As1 LCP: I CONFREQ [ACKrcvd] id 2 len 43
Dec 10 18:43:59.283: As1 LCP: ACCM 0x00000000 (0x020600000000)
Dec 10 18:43:59.287: As1 LCP: MagicNumber 0x59F402A1 (0x050659F402A1)
Dec 10 18:43:59.287: As1 LCP: PFC (0x0702)
Dec 10 18:43:59.291: As1 LCP: ACFC (0x0802)
Dec 10 18:43:59.291: As1 LCP: EndpointDisc 1 Local
Dec 10 18:43:59.295: As1 LCP: (0x131701714C44F0EC8F45BABDC596D14B)
Dec 10 18:43:59.299: As1 LCP: (0x79DB5300000000)
Dec 10 18:43:59.303: As1 LCP: O CONFACK [ACKrcvd] id 2 len 43
Dec 10 18:43:59.307: As1 LCP: ACCM 0x00000000 (0x020600000000)
Dec 10 18:43:59.311: As1 LCP: MagicNumber 0x59F402A1 (0x050659F402A1)
Dec 10 18:43:59.311: As1 LCP: PFC (0x0702)
Dec 10 18:43:59.315: As1 LCP: ACFC (0x0802)
Dec 10 18:43:59.315: As1 LCP: EndpointDisc 1 Local
Dec 10 18:43:59.319: As1 LCP: (0x131701714C44F0EC8F45BABDC596D14B)
Dec 10 18:43:59.323: As1 LCP: (0x79DB5300000000)
Dec 10 18:43:59.327: **As1 LCP: State is Open**
Dec 10 18:43:59.327: **As1 PPP: Phase is AUTHENTICATING,**
by this end [0 sess, 1 load]
Dec 10 18:43:59.331: As1 CHAP: O CHALLENGE id 2 len 25 from "**router1**"
Dec 10 18:43:59.459: As1 LCP: I IDENTIFY [Open] id 3 len 18 magic
0x59F402A1 MSRASV5.00
Dec 10 18:43:59.463: As1 LCP: I IDENTIFY [Open] id 4 len 28 magic
0x59F402A1
MSRAS-1-LAB-WIN2K-PC
Dec 10 18:43:59.467: As1 CHAP: I RESPONSE id 2 len 26 from "**jason**"
Dec 10 18:43:59.479: As1 CHAP: O SUCCESS id 2 len 4
Dec 10 18:43:59.483: As1 PPP: Phase is UP [0 sess, 1 load]
Dec 10 18:43:59.487: As1 IPCP: O CONFREQ [Closed] id 1 len 10
Dec 10 18:43:59.491: **As1 IPCP: Address 192.168.39.1**
(0x0306C0A82701)
Dec 10 18:43:59.567: As1 CCP: I CONFREQ [Not negotiated] id 5 len 10
Dec 10 18:43:59.571: As1 CCP: MS-PPC supported bits 0x00000001
(0x120600000001)
Dec 10 18:43:59.575: As1 LCP: O PROTREJ [Open] id 4 len 16 protocol CCP
(0x80FD0105000A120600000001)
Dec 10 18:43:59.599: As1 IPCP: I CONFREQ [REQsent] id 6 len 40
Dec 10 18:43:59.603: As1 IPCP: CompressType VJ 15 slots CompressSlotID
(0x0206002D0F01)
Dec 10 18:43:59.607: As1 IPCP: Address 0.0.0.0 (0x030600000000)
Dec 10 18:43:59.611: As1 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
Dec 10 18:43:59.615: As1 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
Dec 10 18:43:59.615: As1 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
Dec 10 18:43:59.619: As1 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
Dec 10 18:43:59.623: As1 IPCP: O CONFREQ [REQsent] id 6 len 34
Dec 10 18:43:59.627: As1 IPCP: CompressType VJ 15 slots CompressSlotID
(0x0206002D0F01)
Dec 10 18:43:59.631: As1 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
Dec 10 18:43:59.635: As1 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
Dec 10 18:43:59.639: As1 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
Dec 10 18:43:59.643: As1 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
Dec 10 18:43:59.647: As1 IPCP: I CONFACK [REQsent] id 1 len 10
Dec 10 18:43:59.651: As1 IPCP: Address 192.168.39.1 (0x0306C0A82701)
Dec 10 18:43:59.735: As1 IPCP: I CONFREQ [ACKrcvd] id 7 len 10
Dec 10 18:43:59.739: As1 IPCP: Address 0.0.0.0 (0x030600000000)
Dec 10 18:43:59.743: As1 IPCP: O CONFNAK [ACKrcvd] id 7 len 10
Dec 10 18:43:59.747: **As1 IPCP: Address 192.168.39.240**
(0x0306C0A827F0)


```
Dec 10 18:43:59.835: As1 IPCP: I CONFREQ [ACKrcvd] id 8 len 10
Dec 10 18:43:59.839: As1 IPCP:   Address 192.168.39.240 (0x0306C0A827F0)
Dec 10 18:43:59.843: As1 IPCP: O CONFACK [ACKrcvd] id 8 len 10
Dec 10 18:43:59.847: As1 IPCP:   Address 192.168.39.240 (0x0306C0A827F0)
Dec 10 18:43:59.851: As1 IPCP: State is Open
Dec 10 18:43:59.863: As1 IPCP: Install route to 192.168.39.240
Dec 10 18:44:00.483: %LINEPROTO-5-UPDOWN:
Line protocol on Interface Async1, changed state to up
```

[相关信息](#)

- [接入拨号技术支持页](#)
- [modemcap条目](#)
- [调制解调器与路由器连接指南](#)
- [技术支持 - Cisco Systems](#)