配置路由器，以使用 ISDN BRI 拨号连接多个站点

目录

简介

在某些情况下，您需要配置路由器以拨打多个站点。例如，您可能必须要拨通路由器连接到公司网络的某部分，并拨通网络服务提供商（ISP）路由器连接互联网。

本文档提供一个配置示例，其中中央路由器访问Internet，远程办公室使用集成多业务数字网络(ISDN)。 远程办公室还可以通过中央路由器访问中央路由器和Internet。

先决条件

要求

在继续此配置之前，请确保：

- 检验ISDN第1层和第2层是否已启用。有关详细信息，请参阅使用show isdn status命令进行BRI故障排除。
- 从ISP获取必要信息，例如身份验证方法，该方法可以是质询握手身份验证协议(CHAP)或密码身份验证协议(PAP)、用户名和密码、拨号号码和拨号器接口的IP地址（除非接口使用协商的地址）。 另外，了解是否需要NAT将多台主机连接到ISP。
- 从远程路由器获取有关身份验证方法、用户名和密码、拨号号码和IP地址的信息。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- Cisco 803路由器，带Cisco IOS^{®软}件版本12.1(11)IP和**注意：**如果需要配置NAT，请确保您具有IP Plus（IOS文件名中有"is"）功能集。
- Cisco 2501路由器，是运行Cisco IOS软件版本12.2(5)的远程办公室。

注意：不包括ISP路由器的配置。有关某些示例配置，请参阅拨号和接入技术支持页。

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。如果您是在真实网络上操作，请确保您在使用任何命令前已经了解其潜在影响。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

相关产品

此配置可用于具有基本速率接口(BRI)接口的任何路由器。这包括具有内置BRI接口的路由器，例如Cisco 800（例如801、802、803、804）和Cisco 1600（例如1603-R和1604-R）系列路由器。它还包括接受BRI广域网接口卡(WIC)或网络模块（如1600、1700、2600和3600系列）的路由器。欲知关于BRI WIC或网络模块的更多信息，请参见"1600、1700、2600和3600系统路由器广域网接口卡/平台硬件兼容表"。
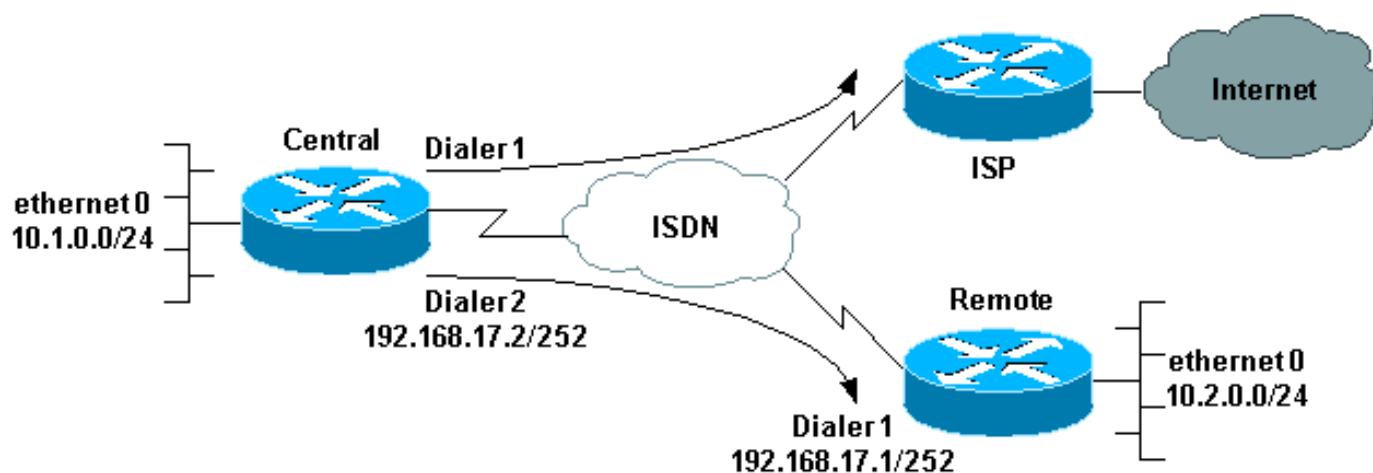
注意：使用show version命令检查路由器是否具有BRI接口。

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

本文档使用以下网络设置：

One Router Dialing Multiple Sites

配置

在此配置中，中央路由器被命名为"中央"，远程公司办公室被命名"远程"。

在中心，拨号器接口1配置为访问Internet。ISP动态分配IP地址。NAT用于使中央LAN、远程LAN和中央远程WAN的IP网络在动态分配的IP地址的帮助下访问Internet。请联系您的ISP，检查您是否需要NAT。

注意：我们同时配置了PAP和CHAP，因为这取决于ISP配置的内容（但只使用其中一个）。

中央

```
version 12.1
 no parser cache
 service timestamps debug datetime msec
 service timestamps log datetime msec
 !
 hostname central
 !
 username remote password 0 remote
 !--- Username and shared secret password for the router
(remote) !--- (used for CHAP authentication). !---
Shared secret password must be the same on both sides. !
isdn switch-type basic-net3 ! ! interface Ethernet0 ip
address 10.1.0.1 255.255.255.0 ip nat inside !---
Ethernet 0 is an inside NAT interface. !--- All traffic
from this network will be translated. no cdp enable !
interface BRI0 !--- If you have additional BRIs, copy
this BRI 0 configuration to the other BRIs. no ip
address encapsulation ppp dialer pool-member 1 !---
Assign BRI0 as member of dialer pool 1. !--- Dialer pool
1 is specified in interface Dialer 1. dialer pool-member
2 !--- Assign BRI0 as member of dialer pool 2. !---
Dialer pool 2 is specified in interface Dialer 2. isdn
switch-type basic-net3 !--- This depends on the country.
no cdp enable ppp authentication chap pap callin !---
Permit one-way CHAP and PAP authentication. !---
Configure authentication on both the physical and dialer
interface. ! interface Dialer1 !--- Create a dialer
interface for every device to which you need to connect.
description CONNECTION TO INTERNET ip address negotiated
!--- This IP address is obtained from the ISP. If the
```

```
ISP permits a static !--- address, configure that
address instead. ip nat outside !--- The Outside NAT
interface. Because this interface only has one IP
address, !--- all traffic from the inside network will
be Port Address Translated (PAT). encapsulation ppp
dialer pool 1 !--- Dialer profile 1. Remember that
interface BRI 0 is a member of this profile. dialer
remote-name ISP dialer idle-timeout 180 dialer string
6122 !--- The number used to dial the ISP. dialer-group
1 !--- Apply interesting traffic definition from dialer-
list 1. no cdp enable ppp authentication chap pap callin
ppp chap hostname XXXXX !--- XXXXX is the username the
ISP expects in order to authenticate this router. !---
For more information, refer to the document on ppp chap
hostname. ppp chap password YYYYY !--- YYYYY is the
password the ISP expects in order to authenticate this
router. ppp pap sent-username XXXXX password YYYYY !---
PAP username and password. !--- This is required only if
the ISP does not support CHAP. ! interface Dialer2
description CONNECTION TO REMOTE OFFICE ip address
192.168.17.2 255.255.255.252 !--- IP address for the
connection to the remote office. !--- The remote office
BRI interface is in the same subnet. ip nat inside !---
Dialer 2 is an inside NAT interface. !--- With this
configuration, traffic from remote office is translated
!--- before it is sent to the ISP. encapsulation ppp
dialer pool 2 !--- Dialer profile 2. Remember that
interface BRI 0 is a member of this profile. dialer
remote-name remote !--- Specifies the remote router name
(remote). !--- This name must match that used by the
remote router to authenticate itself. !--- Remember that
we configured the router username and password earlier.
dialer idle-timeout 180 dialer string 6121 !--- Number
used to dial the remote office router. dialer-group 1 !-
-- Apply interesting traffic definition from dialer-list
1. no cdp enable ppp authentication chap callin ! ip nat
inside source list 101 interface Dialer1 overload !---
Establishes dynamic source translation (with PAT) for
addresses that are !--- identified by the access list
101. no ip http server ip classless ip route 0.0.0.0
0.0.0.0 Dialer1 !--- Default route. Such traffic will
use dialer 1 to the ISP. ip route 10.2.0.0 255.255.255.0
Dialer2 !--- Route to remote router network. Traffic for
10.2.0.0/24 uses Dialer2. ! access-list 101 permit ip
10.1.0.0 0.0.0.255 any access-list 101 permit ip
10.2.0.0 0.0.0.255 any access-list 101 permit ip
192.168.17.0 0.0.0.3 any !--- Defines an access list
that permits the addresses to be translated. !--- Note
that the Ethernet 0 network, the remote router network
and the !--- BRI network (between this router and the
remote one) will be translated. dialer-list 1 protocol
ip permit !--- Interesting traffic definition. !--- This
definition is applied to both connections. !--- If you
need to define different interesting traffic for each
connection, !--- create two dialer-lists and apply one
to each dialer profile with dialer-group. no cdp run !
line con 0 exec-timeout 3 0 line vty 0 4 exec-timeout 3
0 ! ! end
```

远程

```
version 12.2
  service timestamps debug datetime msec
```

```
  service timestamps log datetime msec
  !
  hostname remote
  !
  username central password 0 remote
```
!--- Username and shared secret password for the router (central) !--- (used for CHAP authentication). !--- Shared secret must be the same on both sides. ! isdn switch-type basic-net3 ! interface Ethernet0 ip address 10.2.0.1 255.255.255.0 *!--- Remember that this network is included in the NAT statements on central.* no cdp enable ! interface BRI0 no ip address encapsulation ppp dialer pool-member 1 *!--- Assign BRI0 as member of dialer pool 1. !--- Dialer pool 1 is specified in interface Dialer 1.* isdn switch-type basic-net3 no cdp enable ppp authentication chap ! interface Dialer1 ip address 192.168.17.1 255.255.255.252 encapsulation ppp dialer pool 1 *!--- Dialer profile 1. Remember that interface BRI 0 is a member of this profile.* dialer remote-name central *!--- Specifies the name of the other router (central). !--- This name must match that used by the remote router to authenticate itself. !--- Remember that we configured the router username and password earlier.* dialer string 6131 *!--- The number used to dial the central router.* dialer-group 1 *!--- Apply interesting traffic definition from dialer-list 1.* pulse-time 0 no cdp enable ppp authentication chap callin ! ip classless ip route 0.0.0.0 0.0.0.0 Dialer1 *!--- Default route. Such traffic will use dialer 1 to the central router.* no ip http server ! dialer-list 1 protocol ip permit *!--- All IP traffic is interesting.* ! line con 0 exec-timeout 3 0 line aux 0 line vty 0 4 exec-timeout 3 0 ! end

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 isdn active** — 显示您用于发出呼叫的ISDN号码，并指示呼叫是入站还是出站。
- **show caller ip** - 显示您提供的 IP 地址的呼叫方信息概要。
- **show ip interface dialer 1 | include Internet** — 列出拨号器接口的IP信息和状态摘要。
- **show dialer [interface type number]** - 显示为按需拨号路由 (DDR) 配置的接口的一般诊断信息。 如果拨号器正常启动，则显示以下消息：
  ```
  Dialer state is data link layer up
  ```
  如果显示物理层，则表明线路协议已建立，但网络控制协议(NCP)没有。启动拨号的数据包的源地址和目标地址显示在 Dial reason line 中。**此show命令也显示计时器的配置和连接超时前的时间。**

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 dialer** — 显示有关拨号器接口上的数据包或事件的调试信息。
- **debug isdn q931** — 显示有关本地路由器（用户端）和网络之间ISDN网络连接（第3层）的呼叫建立和拆卸的信息。
- **debug ppp negotiation** — 显示有关点对点协议(PPP)流量和在PPP组件协商期间交换的信息，包括有关链路控制协议(LCP)、身份验证和NCP的信息。成功的PPP协商将首先开放LCP状态，然后进行验证，最后进行NCP协商。
- **debug ppp authentication** — 使debug **ppp命**令显示身份验证协议消息，包括CHAP数据包交换和PAP交换。
- **debug ip peer** — 包含有关对等体的信息。

调试输出

要排除配置故障，请使用以下调试：

```
central#debug isdn q931
ISDN Q931 packets debugging is on

central#debug dialer
Dial on demand events debugging is on

central#debug ppp negotiation
PPP protocol negotiation debugging is on

central#debug ppp authentication
PPP authentication debugging is on

central#debug ip peer
IP peer address activity debugging is on
```
名为central的路由器发起对Internet的呼叫：198.133.219.25是Internet上的IP地址。

```
central#ping 198.133.219.25

:.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 40/41/44 ms

*Mar 1 00:06:12.984: BR0 DDR: rotor dialout [priority]
*Mar 1 00:06:12.988: BR0 DDR: Dialing cause ip (s=172.17.243.115,
 d=198.133.219.25)
*Mar 1 00:06:12.988: BR0 DDR: Attempting to dial 6122
*Mar 1 00:06:12.996: ISDN BR0: TX -> SETUP pd = 8 callref = 0x01
```
!--- central initiates the call to ISDN number 6122. *Mar 1 00:06:13.000: Bearer Capability i = 0x8890 *Mar 1 00:06:13.008: Channel ID i = 0x83 *Mar 1 00:06:13.008: Called Party Number i = 0x80, '6122', Plan:Unknown, Type:Unknown *Mar 1 00:06:13.088: ISDN BR0: RX <- CALL_PROC pd = 8 callref = 0x81 *Mar 1 00:06:13.092: Channel ID i = 0x89 *Mar 1 00:06:13.244: ISDN BR0: RX <- CONNECT pd = 8 callref = 0x81 *!--- central receives a connect message : the ISDN B channel is established.* *Mar 1 00:06:13.252: ISDN BR0: TX -> CONNECT_ACK pd = 8 callref = 0x01 *Mar 1 00:06:13.260: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up *Mar 1 00:06:13.268: BR0:1:

interface must be fifo queue, force FIFO *Mar 1 00:06:13.272: %DIALER-6-BIND: Interface BR0:1 bound to profile Di1 *Mar 1 00:06:13.280: BR0:1 PPP: Treating connection as a callout *Mar 1 00:06:13.280: BR0:1 PPP: Phase is ESTABLISHING, Active Open *Mar 1 00:06:13.284: BR0:1 PPP: No remote authentication for call-out *Mar 1 00:06:13.284: BR0:1 LCP: O CONFREQ [Closed] id 1 len 10 *Mar 1 00:06:13.284: BR0:1 LCP: MagicNumber 0x108130DD (0x0506108130DD) *Mar 1 00:06:13.300: BR0:1 LCP: I CONFREQ [REQsent] id 132 Len 15 *Mar 1 00:06:13.300: BR0:1 LCP: AuthProto CHAP (0x0305C22305) *!--- The ISP wants to use CHAP authentication.* *Mar 1 00:06:13.304: BR0:1 LCP: MagicNumber 0xE4225290 (0x0506E4225290) *Mar 1 00:06:13.304: BR0:1 LCP: O CONFACK [REQsent] id 132 Len 15 *Mar 1 00:06:13.308: BR0:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 00:06:13.308: BR0:1 LCP: MagicNumber 0xE4225290 (0x0506E4225290) *Mar 1 00:06:13.308: BR0:1 LCP: I CONFACK [ACKsent] id 1 Len 10 *Mar 1 00:06:13.312: BR0:1 LCP: MagicNumber 0x108130DD (0x0506108130DD) *Mar 1 00:06:13.312: BR0:1 LCP: State is Open *Mar 1 00:06:13.320: BR0:1 PPP: Phase is AUTHENTICATING, by the peer *Mar 1 00:06:13.328: BR0:1 AUTH: Started process 0 pid 22 *Mar 1 00:06:13.328: BR0:1 CHAP: I CHALLENGE id 118 Len 27 from "posets" *Mar 1 00:06:13.332: BR0:1 CHAP: Using alternate hostname XXXXX *Mar 1 00:06:13.332: BR0:1 CHAP: Username posets not found *Mar 1 00:06:13.336: BR0:1 CHAP: Using default password *Mar 1 00:06:13.336: BR0:1 CHAP: O RESPONSE id 118 Len 26 from "XXXXX" *Mar 1 00:06:13.360: BR0:1 CHAP: I SUCCESS id 118 Len 4 *!--- central receives a CHAP SUCCESS from ISP.* *Mar 1 00:06:13.360: BR0:1 PPP: Phase is UP *Mar 1 00:06:13.364: BR0:1 IPCP: O CONFREQ [Not negotiated] id 1 Len 10 *Mar 1 00:06:13.364: BR0:1 IPCP: Address 0.0.0.0 (0x030600000000) *Mar 1 00:06:13.368: BR0:1 IPCP: I CONFREQ [REQsent] id 108 Len 10 *Mar 1 00:06:13.368: BR0:1 IPCP: Address 194.183.201.1 (0x0306C2B7C901) *Mar 1 00:06:13.368: BR0:1: IPPOOL: validate address = 194.183.201.1 *Mar 1 00:06:13.372: BR0:1 set_ip_peer(3): new address 194.183.201.1 *Mar 1 00:06:13.372: BR0:1 IPCP: O CONFACK [REQsent] id 108 Len 10 *Mar 1 00:06:13.376: BR0:1 IPCP: Address 194.183.201.1 (0x0306C2B7C901) *Mar 1 00:06:13.380: BR0:1 IPCP: I CONFNAK [ACKsent] id 1 Len 10 *Mar 1 00:06:13.380: BR0:1 IPCP: Address 194.183.201.3 (0x0306C2B7C903) *!--- 194.183.201.3 is assigned by ISP to dialer 1 of central.* *Mar 1 00:06:13.384: BR0:1 IPCP: O CONFREQ [ACKsent] id 2 Len 10 *Mar 1 00:06:13.384: BR0:1 IPCP: Address 194.183.201.3 (0x0306C2B7C903) *Mar 1 00:06:13.396: BR0:1 IPCP: I CONFACK [ACKsent] id 2 Len 10 *Mar 1 00:06:13.400: BR0:1 IPCP: Address 194.183.201.3 (0x0306C2B7C903) *Mar 1 00:06:13.400: BR0:1 IPCP: State is Open *Mar 1 00:06:13.400: Di1 IPCP: Install negotiated IP interface address 194.183.201.3 *Mar 1 00:06:13.412: BR0:1 DDR: dialer protocol up *Mar 1 00:06:13.416: Di1 IPCP: Install route to 194.183.201.1 *Mar 1 00:06:14.360: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1, changed state to up *Mar 1 00:06:19.276: %ISDN-6-CONNECT: Interface BRI0:1 is now connected to 6122 unknown

相关信息

- 拨号和接入技术支持
- 技术支持和文档 - Cisco Systems