

进行环回呼叫以测试 BRI 电路

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简介

本文提供说明关于怎样进行环回为了测试基本速率接口(BRI)电路。

先决条件

要求

本文档的读者应掌握以下这些主题的相关知识：

- `debug isdn q931`和`debug ppp`协商的输出发出命令。
- 一般DDR拨号程序配置文件配置概念。关于拨号配置文件的更多信息，请参阅[拨号程序配置文件的配置与故障排除](#)。

在您尝试此步骤前，请从Telco得到以下信息：

- 将配置的交换类型。
- 服务配置文件标识符(SPID)和本地目录号(LDN)。SPID和LDN在美利坚合众国要求。
- 两B信道是否在搜索组中。如果他们在寻找组中我们只需要拨号一个号码到达任一B信道。
- 在BRI线路的呼叫是否需要被做在56k或64k

使用的组件

本文档中的信息基于以下软件和硬件版本：

- Cisco IOS软件版本12.0(3)T和以后。这是因为`isdn call`命令在Cisco IOS软件版本12.0(3)T介绍。

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](#)。

背景信息

在环回呼叫，路由器拨号其自己的基本速率接口(BRI) ISDN编号。呼叫进入TELCO网云，电信公司将呼叫切换到第二条BRI信道。此呼叫被路由器看作第二条信道上的入呼叫。因此，路由器既发送又接收 ISDN 呼叫。

环回呼叫测试的是路由器发起和终止 ISDN 呼叫的能力。成功的回环呼叫给予您明确的提示对 TELCO网云的ISDN电路是工作。

有您可执行测试BRI电路环回呼叫的两种类型：

- ISDN层3环回呼叫？？？哪些您能使用[isdn call interface命令](#)。此环回呼叫可帮助您验证 ISDN层1，2和3是否是工作在路由器和本地ISDN交换机之间。此测验使用D-channel，并且不在B信道间的测验数据。这不介入对路由器的配置的更改。执行此测验第一。如果它成功，请尝试数据回环呼叫测验。
- 数据回环呼叫？？？哪些测验B信道是否能实际上传递数据。这介入在路由器的一个配置更改。

这些步骤只允许您测试对本地交换机的BRI电路是否是工作。它不测试与按需拨号路由(DDR)或问题涉及的端到端ISDN连通性。关于排除故障的更多信息BRI参考以下文档：

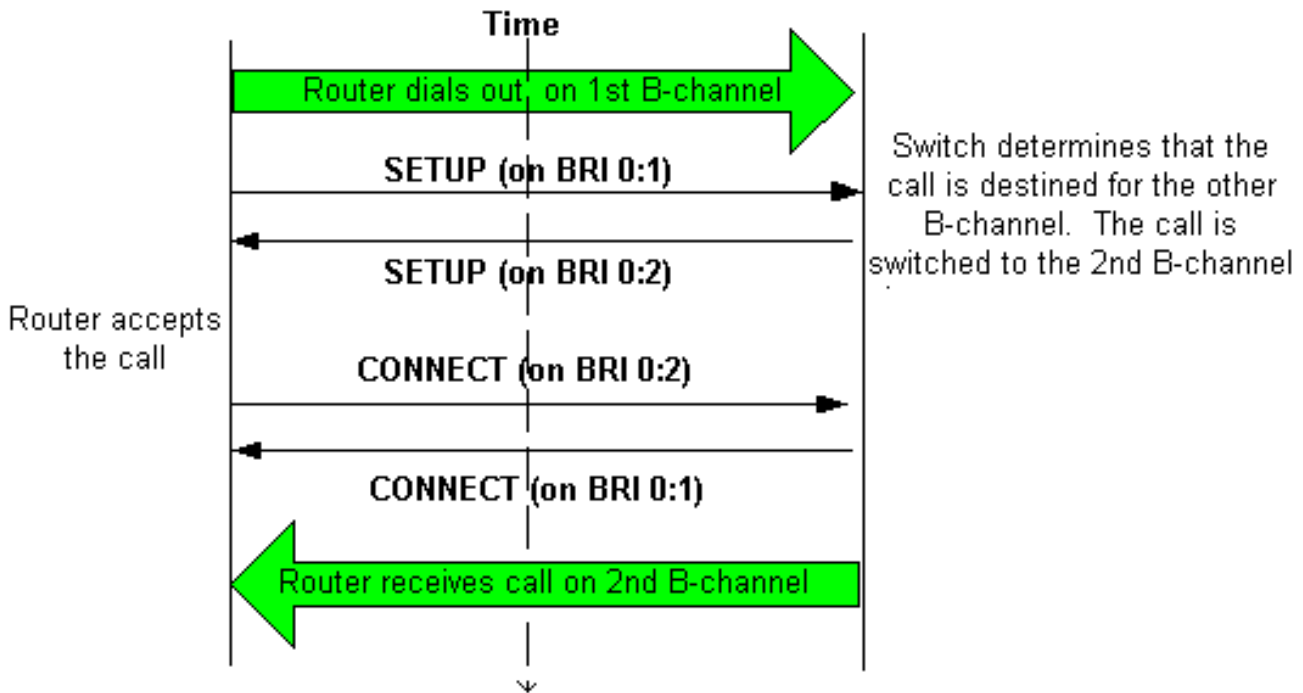
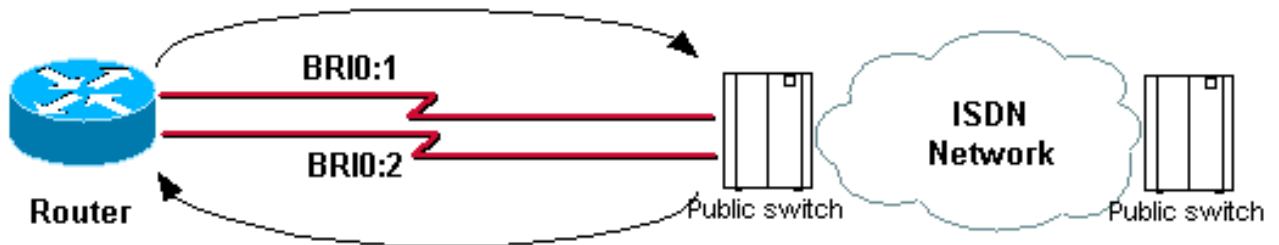
- [ISDN BRI 故障排除流程图](#)
- [排除故障ISDN BRI第3层使用debug isdn q931命令](#)

执行ISDN层3环回呼叫

此部分提供一成功的ISDN层3环回呼叫的示例。没有DDR需求的**isdn call命令enable (event)**流出的ISDN呼叫例如关注数据流和路由。此命令只用于测试ISDN电路至第3层，并且不可能使用通过流量或作为适当DDR配置的一替换法。此命令验证ISDN电路，特别是第3层，是否是工作。

[图1](#)显示呼叫流和某些**debug isdn q931**消息：

图1 -呼叫流和一些debug isdn q931消息



```

maui-soho-04#isdn call interface bri 0 5551111 !--- The router dials 5551111 (the ISDN number of
the router's own BRI). !--- If the BRI circuit has two different phone numbers for each B-
channel, !--- use the number that belongs to the second B-channel. !--- You can use this command
to make calls at 56k, with the speed 56 option . maui-soho-04# *Mar 1 17:55:08.344: ISDN BR0: TX
-> SETUP pd = 8 callref = 0x09 !--- Q931 Setup message is Transmitted (TX) to the telco switch.
*Mar 1 17:55:08.360: Bearer Capability i = 0x8890 *Mar 1 17:55:08.360: Channel ID i = 0x83 *Mar
1 17:55:08.364: Keypad Facility i = '5551111' *Mar 1 17:55:08.484: ISDN BR0: RX <- CALL_PROC pd
= 8 callref = 0x89 !--- Call Proceeding message is Received (RX) from the telco switch. !--- The
switch now processes the call. *Mar 1 17:55:08.488: Channel ID i = 0x89 *Mar 1 17:55:08.516:
ISDN BR0: RX <- SETUP pd = 8 callref = 0x12 !--- A Setup message is Received (RX) from the
switch. This message is for the !--- incoming call. Remember that the router sent a Setup
message (for the !--- outgoing call) and now receives a SETUP message for the same call. *Mar 1
17:55:08.516: Bearer Capability i = 0x8890 *Mar 1 17:55:08.520: Channel ID i = 0x8A *Mar 1
17:55:08.520: Signal i = 0x40 - Alerting on - pattern 0 *Mar 1 17:55:08.532: Called Party Number
i = 0xC1, '5551111' *Mar 1 17:55:08.532: Locking Shift to Codeset 5 *Mar 1 17:55:08.532: Codeset
5 IE 0x2A i = 0x808001038001118001, '<' *Mar 1 17:55:08.564: ISDN BR0: Event: Received a DATA
call from on B2 at 64 Kb/s *Mar 1 17:55:08.620: %DIALER-6-BIND: Interface BRI0:2 bound to
profile Dialer1 *Mar 1 17:55:08.652: ISDN BR0: TX -> CALL_PROC pd = 8 callref = 0x92 ! ---
Transmit (TX) a Call Proceeding message for the incoming call. *Mar 1 17:55:08.652: Channel ID i
= 0x8A *Mar 1 17:55:08.700: %LINK-3-UPDOWN: Interface BRI0:2, changed state to up *Mar 1
17:55:08.988: ISDN BR0: TX -> CONNECT pd = 8 callref = 0x92 ! --- Transmit (TX) a Connect
message for the incoming call. *Mar 1 17:55:08.988: Channel ID i = 0x8A *Mar 1 17:55:09.040:
ISDN BR0: RX <- CONNECT_ACK pd = 8 callref = 0x12 ! --- Receive (RX) a Connect Acknowledgment
for the incoming call. *Mar 1 17:55:09.040: Channel ID i = 0x8A *Mar 1 17:55:09.040: Signal i =
0x4F - Alerting off *Mar 1 17:55:09.064: ISDN BR0: RX <- CONNECT pd = 8 callref = 0x89 ! ---
Receive (RX) a Connect message for the outgoing call. *Mar 1 17:55:09.076: ISDN BR0: TX ->
CONNECT_ACK pd = 8 callref = 0x09 *Mar 1 17:55:09.080: %LINK-3-UPDOWN: Interface BRI0:1, changed
state to up *Mar 1 17:55:09.104: %DIALER-6-BIND: Interface BRI0:1 bound to profile BRI0 *Mar 1
17:55:09.112: %ISDN-6-CONNECT: Interface BRI0:1 is now connected to 5551111 ! --- Call is now
connected. Loopback call is successful.

```

注意：

- 在环回呼叫期间，路由器执行作为呼叫的Router和呼叫路由器不同的B信道的。重要的是您记录这些“双重角色”，当您解释debug isdn q931输出时。例如，路由器太传送设置信息(TX->设置)和接收一(RX<-设置)。当收到的SETUP消息关联与呼入呼叫时，必须关联已发送设置与呼出呼叫。
- 在上述示例中，第一B信道的号码拨号。然而，telco认为第一B信道忙碌(因为做呼叫)，并且交换呼叫到第二B信道，并且连接顺利地完成。然而，在电信公司交换机的一个不正确的配置能导致环回呼叫的失败。这能发生，当交换机尝试分配呼叫在忙碌进行呼叫)的第一个信道(。请求telco添加两B信道在寻找组中。然而，为此测验，我们能指定在isdn call interface命令的第二个B信道编号在此问题附近的的工作。
- 另一方面执行环回呼叫路由器。
- 如果环回呼叫成功，并且对远程终端的呼叫继续发生故障，您能设法数据回环呼叫测试B信道数据完整性正如下一部分所描述。

关于如何排除故障所有问题的信息，参考这些文档：

- [ISDN BRI 故障排除流程图](#)
- [排除故障ISDN BRI第3层使用debug isdn q931命令](#)

执行数据回环呼叫

数据回环呼叫是有用的测试B信道是否能适当地传送数据。在许多情况下，debug ppp协商可以不断地发生故障。此测验可以用于检查在B信道的数据完整性。

注意：此测验，不同于前次试验，介入对路由器的一个配置更改。

在数据回环呼叫，我们配置在路由器的两拨号接口。拨号接口在BRI线路配置用必要的编址、验证和DDR命令顺利地拨出，收到呼入呼叫，绑定对另一拨号接口和成功连接。

创建拨号配置文件拨号在同一路由器的另一拨号配置文件。

配置路由器

要配置环回呼叫的路由器，请完成这些步骤：

1. 在copy running-config startup-config命令帮助下保存运行的配置。当您如此时，您能重新启动和恢复running-configuration到预告测验版本，在测验完成后。
2. 配置物理接口。**注意：**此部分假设，您知道必要的相关信息例如，交换类型和SPID。

```
interface BRI0
  no ip address
  !--- Do not configure an IP address on the physical interface. !--- The IP address will be
  configured on the dialer. encapsulation ppp !--- physical interface uses PPP encapsulation
  dialer pool-member 1 !--- Assign BRI0 as member of dialer pool 1. !--- Dialer pool 1 is
  specified in interface Dialer 1, and !--- interface Dialer 2. isdn switch-type basic-ni
  isdn spid1 71355511110101 5551111 isdn spid2 71355511120101 5551112 !--- switch-type and
  SPID configuration. !--- Contact the telco for this information. ppp authentication chap
  callin !--- The physical interface uses CHAP authentication. !--- Authentication is
  required on the physical interface to bind the !--- incoming call to the right dialer
  profile.
```

3. 配置第一拨号接口：interface Dialer1


```
ip address 1.1.1.1 255.255.255.0
  !--- Assign an IP address to the dialer interface. !--- In this example, the IP addresses
  for both dialers !--- are in the same subnet. encapsulation ppp !--- The dialer interface
  uses PPP (same as the physical BRI interface). dialer pool 1 !--- his defines Dialer pool
```

1. BRI 0 is a member of this pool. dialer remote-name dialer2 !--- This name must match the name used by the other dialer interface to !--- authenticate itself. Dialer string 7135551112. !--- Phone number for the other B-channel. !--- If your connection only needs one number for both B-channels !--- (that is, they are in a hunt-group), use that number here. dialer-group 1 !--- Apply interesting traffic definition from dialer-list 1. ppp authentication chap callin !--- Use one-way CHAP authentication. This is sufficient for this test. ppp chap hostname dialer1 !--- CHAP hostname to be sent out for authentication. ppp chap password dialer1 !--- CHAP Password to be sent out for authentication.

4. 配置第二拨号接口 : interface Dialer2

```
ip address 1.1.1.2 255.255.255.0
!--- Assign an IP address to the dialer interface. !--- In this example, IP address for both dialers are in the same subnet. encapsulation ppp dialer pool 1 !--- This defines Dialer pool 1. !--- BRI 0 is a member of this pool. dialer remote-name dialer1 !--- This name must match the name used by the other dialer interface !--- (dialer1) to authenticate itself. Dialer string 7135551111. !--- Phone number for the other B-channel. !--- If your connection only has one number for both B-channels !--- (that is, they are in a hunt-group), use that number here. dialer-group 1 !--- Apply interesting traffic definition from dialer-list 1. ppp authentication chap callin ppp chap hostname dialer2 !--- CHAP hostname to be sent out for authentication. ppp chap password dialer2 !--- CHAP Password to be sent out for authentication.
```

5. 配置用户名和密码验证的 : username dialer1 password 0 dialer1

```
username dialer2 password 0 dialer2
```

用户名和密码是相同的象那些您在ppp chap hostname和ppp chap password命令帮助下配置在每拨号接口下。

6. 为了清晰配置静态路由 : ip route 1.1.1.1 255.255.255.255 Dialer1

```
!--- Note that the route for 1.1.1.1 points to dialer1. ip route 1.1.1.2 255.255.255.255 Dialer2 !--- Note that the route for 1.1.1.2 points to dialer2. !--- The routes are used to determine which dialer interface is !--- used for dialout. 提示：如果配置interface dialer 1的IP地址(步骤3)和interface dialer 2 (在独立子网的步骤4)，静态路由不是必要的。
```

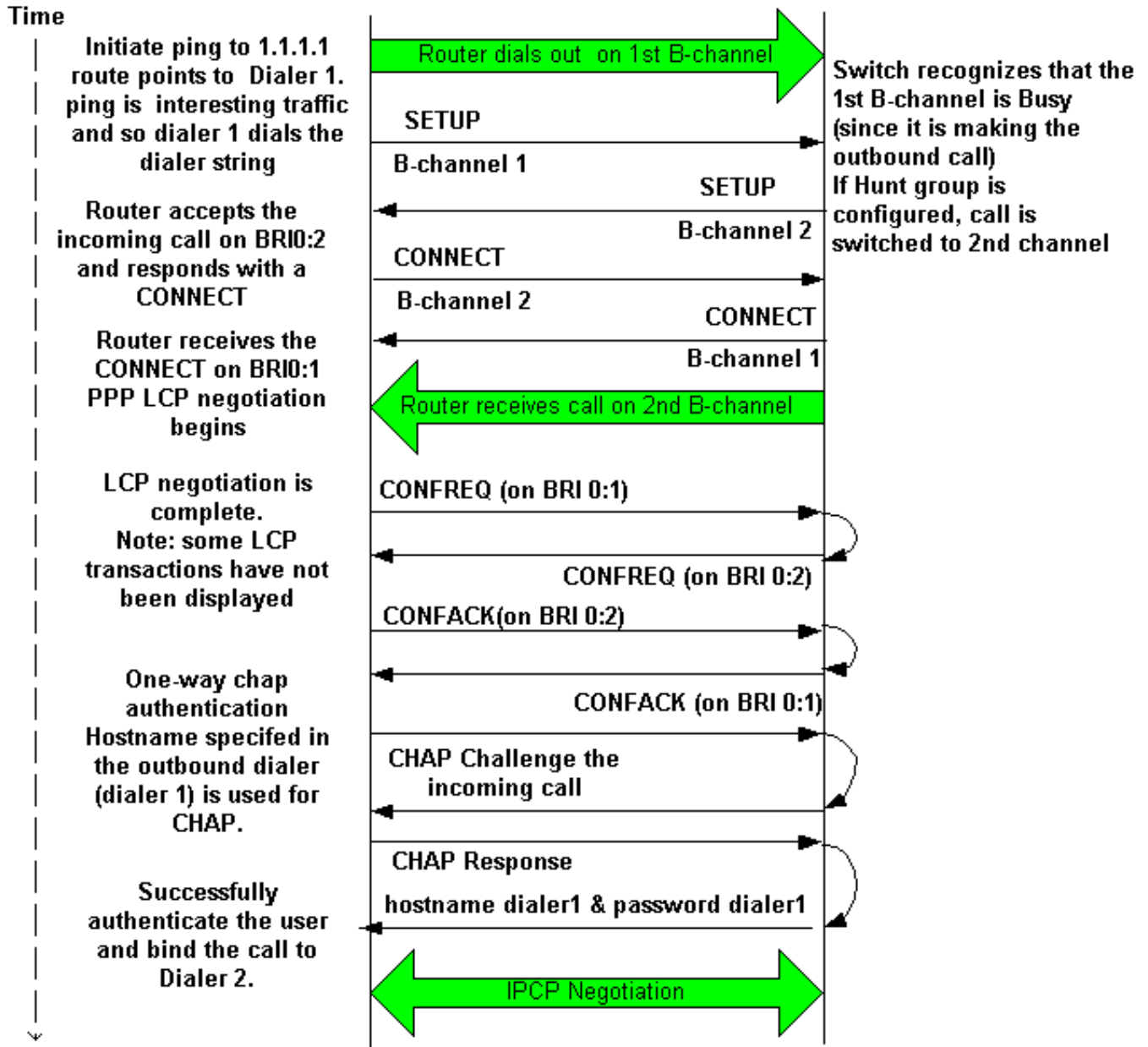
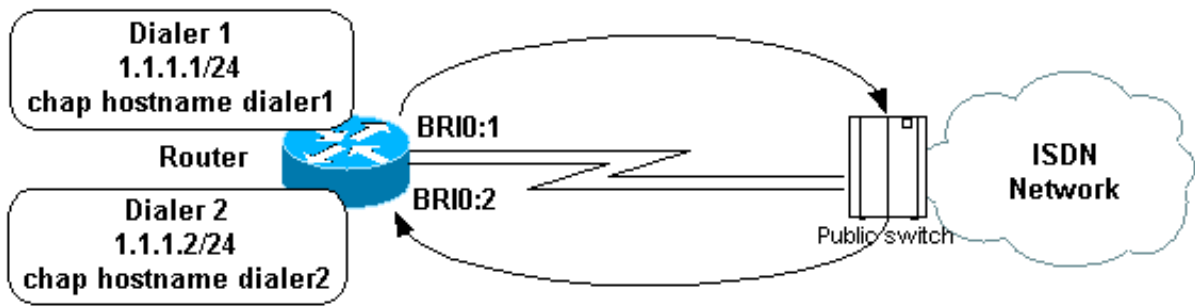
7. 配置触发数据流定义。dialer-list 1 protocol ip permit **注意：**dialer-list编号必须是相同的象在拨号组配置的那个在拨号接口下。在此示例中，请配置 dialer-list 1。

8. 当测验完成时，请重新加载路由器(请勿保存配置)返回到在测验之前使用的原始配置。

发起数据回环呼叫

我们当前将发起数据回环呼叫，并且寻找PPP协商成功的完成。成功的PPP协商表明B信道能适当地传递数据。

图2 -发起数据回环呼叫



激活这些调试：

- debug dialer
- debug isdn q931
- [debug ppp negotiation](#)
- debug ppp authentication (可选)

注意：当环回呼叫进展中时，路由器执行作为呼叫的Router和呼叫路由器不同的B信道的。重要的是您记录这些“双重角色”，当您解释debug isdn q931和debug ppp协商命令的输出时。例如，路由器太传送设置信息(TX->设置)和接收一(RX<-设置)。而收到的SETUP消息关联与呼入呼叫，必须关联已发送设置与呼出呼叫。

这是背对背ISDN呼叫的调试：

```
router#show debug Dial on demand: Dial on demand events debugging is on PPP: PPP protocol
negotiation debugging is on ISDN: ISDN Q931 packets debugging is on ISDN Q931 packets debug
DSLs. (On/Off/No DSL:1/0/-) DSL 0 --> 1 1 - router#ping 1.1.1.1 !--- Because of the static route
entry shown in step 6 above, !--- the call is made out from dialer 1. Type escape sequence to
abort. Sending 5, 100-byte ICMP Echos to 1.1.1.1, timeout is 2 seconds: 03:40:41: BR0 DDR: rotor
dialout [priority] 03:40:41: BR0 DDR: Dialing cause ip (s=1.1.1.1, d=1.1.1.1) 03:40:41: BR0 DDR:
Attempting to dial 7135551112 03:40:41: ISDN BR0: TX -> SETUP pd = 8 callref = 0x08 !---
Outgoing SETUP message. 03:40:41: Bearer Capability i = 0x8890 03:40:41: Channel ID i = 0x83
03:40:41: Keypad Facility i = '7135551112' 03:40:41: ISDN BR0: RX <- CALL_PROC pd = 8 callref =
0x88 03:40:41: Channel ID i = 0x89 03:40:41: ISDN BR0: RX <- SETUP pd = 8 callref = 0x2A !---
Incoming SETUP message on the other B-channel. 03:40:41: Bearer Capability i = 0x8890 03:40:41:
Channel ID i = 0x8A 03:40:41: Signal i = 0x40 - Alerting on - pattern 0 03:40:41: Called Party
Number i = 0xC1, '5551112', Plan:ISDN, Type:Subscriber(local) 03:40:41: Locking Shift to Codeset
5 03:40:41: Codeset 5 IE 0x2A i = 0x808001038001118001, '<' 03:40:42: ISDN BR0: Event: Received
a DATA call from on B2 at 64 Kb/s !--- Note that the call comes in on the second B-channel
(BRI0:2). !--- Hence the outgoing call must have been on BRI0:1. 03:40:42: ISDN BR0: Event:
Accepting the call id 0xB 03:40:42: %LINK-3-UPDOWN: Interface BRI0:2, changed state to up.
03:40:42: BR0:2 PPP: Treating connection as a callin 03:40:42: BR0:2 PPP: Phase is ESTABLISHING,
Passive Open [0 sess, 0 load] 03:40:42: BR0:2 LCP: State is Listen !--- PPP LCP negotiations
begin. 03:40:42: ISDN BR0: TX -> CALL_PROC pd = 8 callref = 0xAA 03:40:42: Channel ID i = 0x8A
03:40:42: ISDN BR0: TX -> CONNECT pd = 8 callref = 0xAA 03:40:42: Channel ID i = 0x8A 03:40:42:
ISDN BR0: RX <- CONNECT_ACK pd = 8 callref = 0x2A 03:40:42: Channel ID i = 0x8A 03:40:42: Signal
i = 0x4F - Alerting off 03:40:42: ISDN BR0: RX <- CONNECT pd = 8 callref = 0x88 03:40:42: %LINK-
3-UPDOWN: Interface BRI0:1, changed state to up 03:40:42: BR0:1: interface must be fifo queue,
force fifo 03:40:42: %DIALER-6-BIND: Interface BR0:1 bound to profile Di1 03:40:42: BR0:1 PPP:
Treating connection as a callout 03:40:42: BR0:1 PPP: Phase is ESTABLISHING, Active Open [0
sess, 0 load] 03:40:42: BR0:1 PPP: No remote authentication for call-out !--- One-way
authentication (configured with PPP authentication CHAP callin). 03:40:42: BR0:1 LCP: O CONFREQ
[Closed] id 11 len 10 03:40:42: BR0:1 LCP: MagicNumber 0x513D7870 (0x0506513D7870) 03:40:42:
ISDN BR0: TX -> CONNECT_ACK pd = 8 callref = 0x08 03:40:42: BR0:2 LCP: I CONFREQ [Listen] id 11
Len 10 03:40:42: BR0:2 LCP: MagicNumber 0x513D7870 (0x0506513D7870) 03:40:42: BR0:2 LCP: O
CONFREQ [Listen] id 11 Len 15 03:40:42: BR0:2 LCP: AuthProto CHAP (0x0305C22305) 03:40:42: BR0:2
LCP: MagicNumber 0x513D7A45 (0x0506513D7A45) 03:40:42: BR0:2 LCP: O CONFACK [Listen] id 11 Len
10 03:40:42: BR0:2 LCP: MagicNumber 0x513D7870 (0x0506513D7870) 03:40:42: BR0:1 LCP: I CONFREQ
[REQsent] id 11 Len 15 03:40:42: BR0:1 LCP: AuthProto CHAP (0x0305C22305) 03:40:42: BR0:1 LCP:
MagicNumber 0x513D7A45 (0x0506513D7A45) 03:40:42: BR0:1 LCP: O CONFACK [REQsent] id 11 Len 15
03:40:42: BR0:1 LCP: AuthProto CHAP (0x0305C22305) 03:40:42: BR0:1 LCP: MagicNumber 0x513D7A45
(0x0506513D7A45) 03:40:42: BR0:1 LCP: I CONFACK [ACKsent] id 11 Len 10 03:40:42: BR0:1 LCP:
MagicNumber 0x513D7870 (0x0506513D7870) 03:40:42: BR0:1 LCP: State is Open 03:40:42: BR0:1 PPP:
Phase is AUTHENTICATING, by the peer [0 sess, 1 load] 03:40:43: BR0:2 LCP: I CONFACK [ACKsent]
id 11 Len 15 03:40:43: BR0:2 LCP: AuthProto CHAP (0x0305C22305) 03:40:43: BR0:2 LCP: MagicNumber
0x513D7A45 (0x0506513D7A45) 03:40:43: BR0:2 LCP: State is Open 03:40:43: BR0:2 PPP: Phase is
AUTHENTICATING, by this end [0 sess, 1 load] !--- Authentication begins. 03:40:43: BR0:2 CHAP: O
CHALLENGE id 7 Len 26 from "router" 03:40:43: BR0:1 CHAP: I CHALLENGE id 7 Len 26 from "router"
03:40:43: BR0:1 CHAP: Using alternate hostname dialer1 !--- Use the alternate hostname specified
with PPP CHAP hostname !--- under int Dialer 1. 03:40:43: BR0:1 CHAP: Username router not found
03:40:43: BR0:1 CHAP: Using default password 03:40:43: BR0:1 CHAP: O RESPONSE id 7 Len 28 from
"dialer1" !--- Outgoing CHAP response sent on B-channel 1. 03:40:43: BR0:2 CHAP: I RESPONSE id 7
Len 28 from "dialer1" !--- Incoming CHAP response seen on B-channel 2. 03:40:43: BR0:2 CHAP: O
SUCCESS id 7 Len 4 !--- Authentication is successful 03:40:43: BR0:2: interface must be fifo
queue, force FIFO 03:40:43: %DIALER-6-BIND: Interface BR0:2 bound to profile Di2 !--- Call (from
Dialer 1) is bound to int Dialer 2. !--- This is because the dialer remote-name dialer1 command
is !--- configured under int dialer 2. Binding fails when the dialer remote-name !--- command is
omitted, or is incorrect, . 03:40:43: BR0:2 PPP: Phase is UP [0 sess, 0 load] !--- IPCP
negotiation begins. 03:40:43: BR0:2 IPCP: O CONFREQ [Not negotiated] id 1 Len 10 03:40:43: BR0:2
IPCP: Address 1.1.1.2 (0x030601010102) 03:40:43: BR0:2 CDPCP: O CONFREQ [Closed] id 1 Len 4
03:40:43: BR0:1 CHAP: I SUCCESS id 7 Len 4 03:40:43: BR0:1 PPP: Phase is UP [0 sess, 1 load]
03:40:43: BR0:1 IPCP: O CONFREQ [Not negotiated] id 1 Len 10 03:40:43: BR0:1 IPCP: Address
1.1.1.1 (0x030601010101) 03:40:43: BR0:1 CDPCP: O CONFREQ [Closed] id 1 Len 4 03:40:43: BR0:1
IPCP: I CONFREQ [REQsent] id 1 Len 10 03:40:43: BR0:1 IPCP: Address 1.1.1.2 (0x030601010102)
03:40:43: BR0:1 IPCP: O CONFACK [REQsent] id 1 Len 10 03:40:43: BR0:1 IPCP: Address 1.1.1.2
```

```
(0x030601010102) 03:40:43: BR0:1 CDPCP: I CONFREQ [REQsent] id 1 Len 4 03:40:43: BR0:1 CDPCP: O
CONFACK [REQsent] id 1 Len 4 03:40:43: BR0:2 IPCP: I CONFREQ [REQsent] id 1 Len 10 03:40:43:
BR0:2 IPCP: Address 1.1.1.1 (0x030601010101) 03:40:43: BR0:2 IPCP: O CONFACK [REQsent] id 1 Len
10 03:40:43: BR0:2 IPCP: Address 1.1.1.1 (0x030601010101) 03:40:43: BR0:2 CDPCP: I CONFREQ
[REQsent] id 1 Len 4 03:40:43: BR0:2 CDPCP: O CONFACK [REQsent] id 1 Len 4 03:40:43: BR0:2 IPCP:
I CONFACK [ACKsent] id 1 Len 10 03:40:43: BR0:2 IPCP: Address 1.1.1.2 (0x030601010102) 03:40:43:
BR0:2 IPCP: State is Open !--- IPCP on B-channel 2 is Open. 03:40:43: BR0:1 IPCP: I CONFACK
[ACKsent] id 1 Len 10 03:40:43: BR0:1 IPCP: Address 1.1.1.1 (0x030601010101) 03:40:43: BR0:1
IPCP: State is Open !--- IPCP on B-channel 1 is Open. 03:40:43: BR0:2 DDR: dialer protocol up
03:40:43: BR0:1 DDR: dialer protocol up 03:40:43: Di2 IPCP: Install route to 1.1.1.1 03:40:43:
Di1 IPCP: Install route to 1.1.1.2 03:40:44: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:2, changed state to up 03:40:44: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1,
changed state to up !--- Both B-channels are up. ... Success rate is 0 percent (0/5) router#
```

注意： ping可以发生故障由于与路由涉及的问题。您能期待此。成功的PPP协商是真正测试B信道是否能适当地传递在链路的数据。如果呼叫发生故障，欲知关于如何排除故障线路的详情，请与电话公司联系。

相关信息

- [ISDN BRI 故障排除流程图](#)
- [排除故障ISDN BRI第3层使用debug isdn q931命令](#)
- [拨号程序配置文件的配置与故障排除](#)
- [使用 ppp chap hostname 和 ppp authentication chap callin 命令的 PPP 认证](#)
- [拨号和接入技术支持](#)
- [技术支持和文档 - Cisco Systems](#)