使用多個BRI介面配置多鏈路PPP

目錄

簡介

本文檔提供了具有多個BRI介面的路由器的配置示例，該路由器撥打具有多個BRI介面的路由器，並建立多鏈路PPP(MPPP)連線。撥號的路由器必須確定遠端BRI上不再有可用通道，然後撥打下一個遠端BRI電話號碼以建立其他通道。

兩台路由器都使用撥號器配置檔案繫結物理BRI介面。您還可以使用撥號器旋轉組配置此設定，如使用旋轉組為多個BRI配置MPPP中所述。

有關撥號程式設定檔的詳細資訊，請參閱設定和疑難排解撥號程式設定檔。

必要條件

需求

本文件沒有特定需求。

採用元件

本文中的資訊係根據以下軟體和硬體版本：

- Cisco 3640，帶運行Cisco IOS??的四埠BRI模組軟體版本12.1(4)。
- Cisco 4000，具有四個執行Cisco IOS軟體版本12.1(4)的BRI介面。
- 兩端BRI電路。這些BRI未在尋線組中配置。

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您在即時網路中工作，請確保在使用任何命令之前瞭解其潛在影響。

慣例

如需文件慣例的詳細資訊，請參閱思科技術提示慣例。

設定

本節提供用於設定本文件中所述功能的資訊。

注意：要查詢有關本文檔中使用的命令的其他資訊，請使用命令查詢工具(僅限註冊客戶)

網路圖表

本檔案會使用以下網路設定：

組態

本檔案會使用以下設定：

- melanie（思科3640）
- torito(Cisco 4000)

melanie（思科3640）

```
Current configuration:

version 12.1
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname melanie
!
enable password ww
!
username torito password 0 ww
!--- Username for remote router (torito) and shared
```

```
secret (used for !--- Challenge Handshake Authentication
Protocol (CHAP) authentication). !--- Shared secret must
be the same on both sides. isdn switch-type basic-net3 !
interface Loopback0 ip address 10.10.10.1 255.255.255.0
! interface BRI0/0 no ip address shutdown ! interface
BRI2/0 no ip address shutdown ! interface BRI2/1 !---
First BRI interface. description ISDN number 6104 !---
Phone number of this BRI. no ip address encapsulation
ppp dialer pool-member 1 !--- Member of dialer pool 1.
isdn switch-type basic-net3 no cdp enable ppp
authentication chap !--- Use CHAP authentication. ppp
multilink !--- Enable multilink on the physical
interface. ! interface BRI2/2 !--- Second BRI interface.
description ISDN number 6103 !--- Phone number of this
BRI. no ip address encapsulation ppp dialer pool-member
1 !--- Member of dialer pool 1. isdn switch-type basic-
net3 no cdp enable ppp authentication chap !--- Use CHAP
authentication. ppp multilink !--- Enable multilink on
the physical interface. ! interface BRI2/3 no ip address
shutdown ! interface Dialer2 !--- Dialer interface used
for dialout. ip unnumbered Loopback0 !--- Use the
loopback0 address. !--- Static route on remote router
points to this Loopback0 address. encapsulation ppp
dialer pool 1 !--- Defines dialer pool 1. !--- BRI 2/1
and BRI 2/2 are members of this pool. dialer string 6113
!--- Dial 6113 first . dialer string 6114 !--- If 6113
fails, dial 6114 . !--- Both numbers are required.
Otherwise, the third call encounters a busy signal.
dialer load-threshold 1 either !--- Load level (in
either direction) for traffic at which additional !---
connections will be added to the MPPP bundle. !--- Load
level values range from 1 (unloaded) to 255 (fully
loaded). dialer-group 1 !--- Apply interesting traffic
definition from dialer-list 1. no cdp enable ppp
authentication chap !--- Use CHAP authentication. ppp
multilink !--- Allow MPPP for the four BRI channels. !
ip route 10.10.12.1 255.255.255.255 Dialer2 !--- Static
route to remote router. !--- All traffic destined for
the remote router must use int Dialer2 ! dialer-list 1
protocol ip permit !--- All IP traffic is designated as
interesting. !--- This is applied to interface dialer2
with the help of dialer-group 1. line con 0 transport
input none line 97 114 modem InOut transport input all
line aux 0 line vty 0 4 login ! end
```

請注意Cisco 3640(melanie)配置中的以下幾點：

- 該配置使用撥號器配置檔案。BRI介面是撥號器池的成員。特定於目標的所有配置設定均在介面撥號器2配置中配置。
- 撥號器介面有兩個撥號器字串。請記住，遠端路由器上有兩個BRI介面(torito)。 由於這些BRI未在Telco的尋線組中配置，因此路由器melanie必須單獨撥打每個BRI。使用多個撥號器串時，第一個電話號碼總是被撥打。只有當呼叫失敗時，撥號器介面才會嘗試第二個撥號器字串。我們可以根據需要定義許多按順序使用的撥號器字串。
- MPPP的撥號器負載閾值設定為1，這是最小值。該值可根據您的流量模式和要求更改。但是，如果定義更高的負載閾值，則只有在負載超過該定義時才新增其他連結。有關如何控制將通道新增到多重連結套件組合中的詳細資訊，請參閱調節和可選命令一節。
- 遠端路由器的靜態主機路由指向介面撥號器2。然後將流量從池的物理成員（BRI 2/1和BRI 2/2）轉發出去。 為應使用多鏈路連線的目標流量建立靜態路由（或使用路由協定）。

torito(Cisco 4000)

```
Current configuration:
 !
 version 12.1
 service timestamps debug datetime msec
 service timestamps log datetime msec
 no service password-encryption
 !
 hostname torito
 !
 username melanie password 0 ww
```
!--- Username for remote router (melanie) and shared
secret !--- (used for CHAP authentication). !--- Shared
secret must be the same on both sides. ! isdn switch-
type basic-net3 interface Loopback0 ip address
10.10.12.1 255.255.255.0 ! interface BRI0 no ip address
shutdown ! interface BRI1 *!--- Phone number is 6113.* no
ip address encapsulation ppp dialer pool-member 1 *!---*
Member of dialer pool 1. isdn switch-type basic-net3 ppp
authentication chap *!--- Use CHAP authentication.* ppp
multilink *!--- Enable multilink on the physical*
interface. !--- Unless you use CLID/DNIS based binding,
this command is required. !--- See <u>*Configuring and*</u>
<u>*Troubleshooting Dialer Profiles*</u> *for more information.* !
interface BRI2 *!--- Phone number is 6114.* no ip address
encapsulation ppp dialer pool-member 1 *!--- Member of*
dialer pool 1. isdn switch-type basic-net3 ppp
authentication chap *!--- Use CHAP authentication.* ppp
multilink *!--- Enable multilink on the physical*
interface. !--- Unless you use CLID/DNIS based binding,
this command is required. !--- See <u>*Configuring and*</u>
<u>*Troubleshooting Dialer Profiles*</u> *for more information.* !
interface BRI3 no ip address shutdown ! interface
Dialer1 ip unnumbered Loopback0 *!--- Use the Loopback0*
address. !--- The static route on remote router points
to this Loopback0 address. encapsulation ppp dialer pool
1 *!--- Defines Dialer pool 1. !--- BRI 1 and BRI 2 are*
members of this pool. dialer remote-name melanie *!---*
Specifies the name of the remote router. !--- This name
matches the name used by the remote router to
authenticate itself. dialer-group 1 *!--- Apply*
interesting traffic definition from dialer-list 1. ppp
authentication chap *!--- Use CHAP authentication.* ppp
multilink *!--- Allow MPPP for the 4 BRI channels.* ! ip
route 10.10.10.1 255.255.255.255 Dialer1 *!--- Static*
route to remote router. !--- All traffic destined for
the remote router must use int Dialer1. dialer-list 1
protocol ip permit *!--- All IP traffic is designated as*
interesting. !--- This is applied to interface dialer2
using dialer-group 1. line con 0 exec-timeout 0 0
transport input none line aux 0 exec-timeout 0 0
transport input all line vty 0 4 password ww login ! end

調整和可選命令

您可以使用本節中的命令調整MPPP連線的行為。您可以通過仔細調整此類引數來控制成本,這樣
有助於避免資料鏈路的浪費和不必要的使用。這些命令必須在發起撥號的一側實施。

- dialer load-threshold *load* [outbound |入站 |任一]???您可以配置MPPP,以便在主通道建立後
  立即啟動其他通道。在這種情況下,請在dialer load-threshold load命令中將load threshold設定
  為1。因此,會調出其他通道,這些通道將繼續保持(即,它們不會翻動)。 如果負載閾值設

定為較高值，則多個通道可能會基於鏈路上的負載翻動。如果您希望根據需要新增其他通道，請根據流量將負載閾值設定為介於1和255之間的適當值。例如，如果附加通道將達到總容量的50%，則閾值應設定為128(0.50*255)。

- ppp timeout multilink link remove *seconds???使用此命令可防止負載變化時多鏈路連線抖動。* 例如，當負載閾值設定為15（即，15/255 = 6%）且流量超過閾值時，就會出現額外的線路。當流量低於閾值時，會丟棄額外的線路。在資料速率具有高度可變性的情況下，有利的是多通道保持運行指定時間段，即使負載閾值低於指定值。將此多鏈路超時分配給小於**dialer idle-timeout**指定的時間，該時間控制所有鏈路的超時。
- ppp timeout multilink link add *seconds???使用此命令可防止向MP捆綁包新增多個鏈路，直到在指定間隔內接收到高流量。* 這可防止突發流量不必要地增加線路。
- dialer max-link *number* ???要指定撥號程式配置檔案可以隨時啟動的遠端目標的最大鏈路數，請在介面配置模式下使用**dialer max-link**命令。在本例中，我們在melanie上為撥出配置了兩個BRI（或四個B通道）。因此，預設情況下，所有四個通道都在MPPP連線中啟動。但是，如果只想建立三個B通道，則可以使用**dialer max-link**命令限制鏈路數。

驗證

本節提供的資訊可用於確認您的組態是否正常運作。

show命令

使用以下命令驗證連線：

輸出直譯器工具(僅供註冊客戶使用)支援某些show命令，此工具可讓您檢視show命令輸出的分析。

- **show isdn status**-???示路由器是否與ISDN交換機正確通訊。在輸出中，您需要驗證1 `ACTIVE`，並顯示2`MULTIPLE_FRAME_ESTABLISHED`。此命令還顯示活動呼叫的數量。有關詳細資訊，請參閱使用show isdn status命令進行BRI故障排除。
- **show ppp multilink** -???示有關處於活動狀態的多鏈路捆綁包的資訊。使用此命令驗證多鏈路連線。
- **show dialer [interface *type number*]顯**???為DDR配置的介面的常規診斷資訊。如果撥號器正常啟動，`Dialer state is data link layer up`消息必須出現。如果顯示，則表示線路通訊協定已啟動，但網路控制通訊協定(NCP)未啟動。發起撥號的資料包的源地址和目的地址顯示在行中。此**show**命令還會顯示計時器的配置以及連線超時之前的時間。
- show caller user *username detail???顯示特定使用者的引數，例如分配的IP地址、PPP和PPP捆綁引數等。* 如果您的Cisco IOS版本不支援此命令，請使用**show user**命令。

show命令輸出

show ppp multilink命令會顯示連結連線後每台路由器上多重連結套件組合的成員。請注意，在路由器melanie上，套件組合名稱是torito，而在路由器torito上，套件組合名稱是melanie。還指出了屬於該捆綁的BRI介面和B通道。

```
melanie#show ppp multilink

  Dialer2, bundle name is torito
  0 lost fragments, 0 reordered, 0 unassigned
  0 discarded, 0 lost received, 1/255 load
```

```
0x8 received sequence, 0x8 sent sequence
Member links: 4 (max not set, min not set)
BRI2/1:1
BRI2/1:2
BRI2/2:1
BRI2/2:2

torito#show ppp multilink
Dialer1, bundle name is melanie
0 lost fragments, 0 reordered, 0 unassigned
0 discarded, 0 lost received, 1/255 load
0x8 received sequence, 0x8 sent sequence
Member links: 4 (max not set, min not set)
BRI1:1
BRI1:2
BRI2:1
BRI2:2
```

疑難排解

本節提供的資訊可用於對組態進行疑難排解。

疑難排解指令

注意：發出debug指令之前，請先參閱有關Debug指令的重要資訊。

- debug dialer -???示有關撥號器介面上接收的資料包的DDR調試資訊。此資訊有助於確儲存在可以使用撥號器介面的相關流量。
- debug isdn q931???顯示ISDN網路連線（第3層）的呼叫建立和斷開。
- debug ppp negotiation???在協商鏈路控制協定(LCP)、身份驗證和網路控制協定(NCP)時顯示有關PPP流量和交換的資訊。成功的PPP協商將首先開啟LCP狀態，然後進行身份驗證，最後協商NCP。進行LCP協商時，會建立諸如最大接收重建單元(MRRU)等多鏈路引數。
- debug ppp authentication -???示PPP身份驗證協定消息，包括CHAP資料包交換和口令身份驗證協定(PAP)交換。
- debug ppp error — 顯???與PPP連線協商和操作相關的協定錯誤和錯誤統計資訊。

debug指令輸出

有關如何對每個BRI的多鏈路進行故障排除的資訊，請參閱排除ISDN BRI鏈路上的第二個B通道呼叫故障。當您在1個BRI（2個b通道）上擁有多鏈路功能時，可以將BRI新增到捆綁包中。

啟用疑難排解命令一節中描述的調試，然後ping遠端路由器的地址。ping必須啟動撥號並連線到遠端路由器。每個附加鏈路啟動後，都會將其新增到MPPP捆綁包中。

```
melanie#show debug
   Dial on demand:
   Dial on demand events debugging is on
   PPP:
   PPP authentication debugging is on
   PPP protocol negotiation debugging is on
   ISDN:
   ISDN Q931 packets debugging is on
   ISDN Q931 packets debug DSLs. (On/Off/No DSL:1/0/-)

   melanie#ping 10.10.12.1
```

```
    Type escape sequence to abort.
    Sending 5, 100-byte ICMP Echos to 10.10.12.1, timeout is 2 seconds:
    *Mar 1 05:30:45.502: BR2/1 DDR: rotor dialout [priority]
```
!--- Use BRI 2/1 to dial out. `*Mar 1 05:30:45.502: BR2/1 DDR:` **Dialing cause ip (s=10.10.10.1, d=10.10.12.1)**

!--- DDR dialing cause is a ping to the remote router. `*Mar 1 05:30:45.502: BR2/1 DDR:` **Attempting to dial 6113**

!--- Dial the first number (6113) configured with dialer string command. !--- This number corresponds to the first BRI on torito. `*Mar 1 05:30:45.506: ISDN BR2/1: TX -> SETUP pd = 8 callref = 0x77 *Mar 1 05:30:45.506: Bearer Capability i = 0x8890 *Mar 1 05:30:45.506: Channel ID i = 0x83 *Mar 1 05:30:45.506: Called Party Number i = 0x80, '6113', Plan:Unknown, Type:Unknown *Mar 1 05:30:45.574: ISDN BR2/1: RX <- CALL_PROC pd = 8 callref = 0xF7 *Mar 1 05:30:45.574: Channel ID i = 0x89 *Mar 1 05:30:46.026: ISDN BR2/1: RX <- CONNECT pd = 8 callref = 0xF7 *Mar 1 05:30:46.030:` **ISDN BR2/1: TX -> CONNECT_ACK** `pd = 8 callref = 0x77`

!--- Call connects. `*Mar 1 05:30:46.030: %LINK-3-UPDOWN: Interface BRI2/1:1, changed state to up *Mar 1 05:30:46.034: BR2/1:1: interface must be fifo queue, force fifo *Mar 1 05:30:46.034: %DIALER-6-BIND: Interface BR2/1:1 bound to profile Di2` *!--- Call is bound to interface Dialer 2.* `*Mar 1 05:30:46.034: BR2/1:1 PPP: Treating connection as a callout *Mar 1 05:30:46.034: BR2/1:1 PPP: Phase is ESTABLISHING, Active Open` *!--- LCP negotiation begins.* `*Mar 1 05:30:46.034: BR2/1:1 LCP: O CONFREQ [Closed] id 116 len 29 *Mar 1 05:30:46.034: BR2/1:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.034: BR2/1:1 LCP: MagicNumber 0x513DE606 (0x0506513DE606) *Mar 1 05:30:46.034: BR2/1:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.034: BR2/1:1 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:30:46.074: BR2/1:1 LCP: I CONFREQ [REQsent] id 11 len 28 *Mar 1 05:30:46.074: BR2/1:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.074: BR2/1:1 LCP: MagicNumber 0x00B3729B (0x050600B3729B) *Mar 1 05:30:46.074: BR2/1:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.074: BR2/1:1 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:30:46.074: BR2/1:1 LCP: O CONFACK [REQsent] id 11 len 28 *Mar 1 05:30:46.074: BR2/1:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.074: BR2/1:1 LCP: MagicNumber 0x00B3729B (0x050600B3729B) *Mar 1 05:30:46.074: BR2/1:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.074: BR2/1:1 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:30:46.086: BR2/1:1 LCP: I CONFACK [ACKsent] id 116 len 29 *Mar 1 05:30:46.086: BR2/1:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.086: BR2/1:1 LCP: MagicNumber 0x513DE606 (0x0506513DE606) *Mar 1 05:30:46.086: BR2/1:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.086: BR2/1:1 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:30:46.086: BR2/1:1` **LCP: State is Open**

!--- LCP negotiation is complete. `*Mar 1 05:30:46.090: BR2/1:1` **PPP: Phase is AUTHENTICATING, by both**

!--- PPP authentication by both sides begins. `*Mar 1 05:30:46.090: BR2/1:1 CHAP: O CHALLENGE id 39 len 28 from "melanie" *Mar 1 05:30:46.110: BR2/1:1 CHAP: I CHALLENGE id 7 len 27 from "torito" *Mar 1 05:30:46.110: BR2/1:1 CHAP: O RESPONSE id 7 len 28 from "melanie" *Mar 1 05:30:46.126: BR2/1:1` **CHAP: I SUCCESS** `id 7 len 4`

```
    *Mar 1 05:30:46.134: BR2/1:1 CHAP: I RESPONSE id 39 len 27 from "torito"
```

```
    *Mar 1 05:30:46.138: BR2/1:1
```
CHAP: O SUCCESS `id 39 len 4`

!--- CHAP authentication is successful `*Mar 1 05:30:46.138: BR2/1:1 PPP: Phase is VIRTUALIZED *Mar 1 05:30:46.138: Di2 PPP: Phase is UP *Mar 1 05:30:46.138: Di2 IPCP: O CONFREQ [Closed] id 14 len 10 *Mar 1 05:30:46.138: Di2 IPCP: Address 10.10.10.1 (0x03060A0A0A01) *Mar 1 05:30:46.142: BR2/1:1 MLP: torito, multilink up, first link *Mar 1 05:30:46.162: Di2 IPCP: I CONFREQ [REQsent] id 7 len 10 *Mar 1 05:30:46.162: Di2 IPCP: Address 10.10.12.1 (0x03060A0A0C01) *Mar 1 05:30:46.162: Di2 IPCP: O CONFACK [REQsent] id 7 len 10 *Mar 1 05:30:46.162: Di2 IPCP: Address 10.10.12.1 (0x03060A0A0C01) *Mar 1 05:30:46.166: Di2 CDPCP: I CONFREQ [Not negotiated] id 7 len 4 *Mar 1 05:30:46.166: Di2 LCP: O PROTREJ [Open] id 14 len 10 protocol CDPCP (0x820701070004) *Mar 1 05:30:46.182: Di2 IPCP: I CONFACK [ACKsent] id 14 len 10 *Mar 1 05:30:46.182: Di2 IPCP: Address 10.10.10.1 (0x03060A0A0A01) *Mar 1 05:30:46.182: Di2 IPCP: State is Open *Mar 1 05:30:46.182: Di2 DDR: dialer protocol up *Mar 1 05:30:46.182: Di2 IPCP: Install route to 10.10.12.1 *Mar 1 05:30:46.186: BR2/1 DDR: rotor dialout [priority] *Mar 1 05:30:46.186: BR2/1 DDR:` **Attempting to dial 6113**

!--- Dial the first number (6113) configured with dialer string command. !--- This number corresponds to the first BRI on torito. !--- Remember there is one B-channel available on the remote BRI. `*Mar 1 05:30:46.186: ISDN BR2/1: TX -> SETUP pd = 8 callref = 0x78 *Mar 1 05:30:46.186: Bearer Capability i = 0x8890 *Mar 1 05:30:46.190: Channel ID i = 0x83 *Mar 1 05:30:46.190: Called Party Number i = 0x80, '6113', Plan:Unknown, Type:Unknown *Mar 1 05:30:46.274: ISDN BR2/1: RX <- CALL_PROC pd = 8 callref = 0xF8 *Mar 1 05:30:46.274: Channel ID i = 0x8A *Mar 1 05:30:46.726: ISDN BR2/1: RX <- CONNECT pd = 8 callref = 0xF8 *Mar 1 05:30:46.730: ISDN BR2/1: TX -> CONNECT_ACK pd = 8 callref = 0x78 *Mar 1 05:30:46.730: %LINK-3-UPDOWN: Interface` **BRI2/1:2, changed state to up**

!--- Second B-channel is connected. *Mar 1 05:30:46.730: BR2/1:2: interface must be fifo queue, force fifo *Mar 1 05:30:46.734: %DIALER-6-BIND: Interface BR2/1:2 bound to profile Di2 *Mar 1 05:30:46.734: %ISDN-6-CONNECT: Interface BRI2/1:1 is now connected to 6113 torito *Mar 1 05:30:46.734: BR2/1:2 PPP: Treating connection as a callout *Mar 1 05:30:46.734: BR2/1:2 PPP: Phase is ESTABLISHING, Active Open *Mar 1 05:30:46.734: BR2/1:2 LCP: O CONFREQ [Closed] id 31 len 29 *Mar 1 05:30:46.734: BR2/1:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.734: BR2/1:2 LCP: MagicNumber 0x513DE8C4 (0x0506513DE8C4) *Mar 1 05:30:46.734: BR2/1:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.734: BR2/1:2 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:30:46.774: BR2/1:2 LCP: I CONFREQ [REQsent] id 12 len 28 *Mar 1 05:30:46.774: BR2/1:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.774: BR2/1:2 LCP: MagicNumber 0x00B37556 (0x050600B37556) *Mar 1 05:30:46.774: BR2/1:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.774: BR2/1:2 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:30:46.774: BR2/1:2 LCP: O CONFACK [REQsent] id 12 len 28 *Mar 1 05:30:46.774: BR2/1:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.774: BR2/1:2 LCP: MagicNumber 0x00B37556 (0x050600B37556) *Mar 1 05:30:46.774: BR2/1:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.774: BR2/1:2 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:30:46.786: BR2/1:2 LCP: I CONFACK [ACKsent] id 31 len 29 *Mar 1 05:30:46.786: BR2/1:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.786: BR2/1:2 LCP: MagicNumber 0x513DE8C4 (0x0506513DE8C4) *Mar 1 05:30:46.786: BR2/1:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.786: BR2/1:2 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:30:46.786: BR2/1:2 LCP: State is Open *Mar 1 05:30:46.786: BR2/1:2 PPP: Phase is AUTHENTICATING, by both *Mar 1 05:30:46.786: BR2/1:2 CHAP: O CHALLENGE id 14 len 28 from "melanie" *Mar 1 05:30:46.806: BR2/1:2 CHAP: I CHALLENGE id 7 len 27 from "torito" *Mar 1 05:30:46.806: BR2/1:2 CHAP: O RESPONSE id 7 len 28 from "melanie" *Mar 1 05:30:46.822: BR2/1:2 **CHAP: I SUCCESS** id 7 len 4

 *Mar 1 05:30:46.834: BR2/1:2 CHAP: I RESPONSE id 14 len 27 from "torito"
 *Mar 1 05:30:46.834: BR2/1:2 **CHAP: O SUCCESS** id 14 len 4

!--- PPP authentication is complete. *Mar 1 05:30:46.834: BR2/1:2 PPP: Phase is VIRTUALIZED *Mar 1 05:30:46.834: BR2/1:2 MLP: torito, multilink up *Mar 1 05:30:47.138: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI2/1:1, changed state to up *Mar 1 05:30:47.834: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI2/1:2, changed state to up *Mar 1 05:30:52.734: %ISDN-6-CONNECT: Interface BRI2/1:2 is now connected to 6113 torito *!--- Both B-channels are up.* melanie# *Mar 1 05:31:16.186: BR2/2 DDR: rotor dialout [priority] *!--- Dialout using BRI 2/2.* *Mar 1 05:31:16.186: BR2/2 DDR: Attempting to dial 6113 *!--- Dial the first number (6113) configured with dialer string command. !--- This number corresponds to the first BRI on torito. !--- Remember there are no B-channels available on the remote BRI.* *Mar 1 05:31:16.186: ISDN BR2/2: TX -> SETUP pd = 8 callref = 0x79 *Mar 1 05:31:16.186: Bearer Capability i = 0x8890 *Mar 1 05:31:16.186: Channel ID i = 0x83 *Mar 1 05:31:16.190: Called Party Number i = 0x80, '6113', Plan:Unknown, Type:Unknown *Mar 1 05:31:16.274: ISDN BR2/2: RX <- CALL_PROC pd = 8 callref = 0xF9 *Mar 1 05:31:16.274: Channel ID i = 0x89 *Mar 1 05:31:16.298: ISDN BR2/2: RX <- PROGRESS pd = 8 callref = 0xF9 *Mar 1 05:31:16.302: Progress Ind i = 0x8188 - In-band info or appropriate now available *Mar 1 05:31:16.318: **ISDN BR2/2: RX <- DISCONNECT** pd = 8 callref = 0xF9

 *Mar 1 05:31:16.318: **Cause i = 0x8191 - User busy**

!--- We receive a user busy signal, because there are no available !--- B-channels on that BRI, and melanie must dial the next BRI on torito. *Mar 1 05:31:16.322: BRI2/2: wait for isdn carrier timeout, call id=0x8079 *Mar 1 05:31:16.322: BR2/2 DDR: Attempting to dial 6114 *!--- Dial the second number (6114) configured with dialer string command. !--- This number corresponds to the second BRI on torito. !--- Remember both B-channels are available on that remote BRI.* *Mar 1 05:31:16.326: ISDN BR2/2: TX -> RELEASE pd = 8 callref = 0x79 *Mar 1 05:31:16.326: Cause i = 0x8091 - User busy *!--- Release message from the previous failed call.* *Mar 1 05:31:16.346: ISDN BR2/2: TX -> SETUP pd = 8 callref = 0x7A *!--- Setup message for next call.* *Mar 1 05:31:16.346: Bearer Capability i = 0x8890 *Mar 1 05:31:16.346: Channel ID i = 0x83 *Mar 1 05:31:16.346: Called Party Number i = 0x80, '6114', Plan:Unknown, Type:Unknown *Mar 1 05:31:16.362: ISDN BR2/2: RX <- RELEASE_COMP pd = 8 callref = 0xF9 *!--- Release acknowledgement for previous failed call.* *Mar 1 05:31:16.422: ISDN BR2/2: RX <- CALL_PROC pd = 8 callref = 0xFA *!--- ISDN call progress message.* *Mar 1 05:31:16.426: Channel ID i = 0x89 *Mar 1 05:31:16.878: ISDN BR2/2: RX <- CONNECT pd = 8 callref = 0xFA *Mar 1 05:31:16.882: ISDN BR2/2: TX -> CONNECT_ACK pd = 8 callref = 0x7A *Mar 1 05:31:16.882: %LINK-3-UPDOWN: **Interface BRI2/2:1, changed state to up** *!--- Call is connected on BRI 2/2 B-channel 1.* *Mar 1 05:31:16.882: BR2/2:1: interface must be fifo queue, force fifo *Mar 1 05:31:16.882: %DIALER-6-BIND: Interface BR2/2:1 bound to profile Di2 *!--- Call is bound to interface Dialer 2.* *Mar 1 05:31:16.886: BR2/2:1 PPP: Treating connection as a callout *Mar 1 05:31:16.886: BR2/2:1 PPP: Phase is ESTABLISHING, Active Open *Mar 1 05:31:16.886: BR2/2:1 LCP: O CONFREQ [Closed] id 31 len 29 *Mar 1 05:31:16.886: BR2/2:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:16.886: BR2/2:1 LCP: MagicNumber 0x513E5E8D (0x0506513E5E8D) *Mar 1 05:31:16.886: BR2/2:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:16.886:

BR2/2:1 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:31:16.926: BR2/2:1 LCP: I CONFREQ [REQsent] id 11 len 28 *Mar 1 05:31:16.926: BR2/2:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:16.926: BR2/2:1 LCP: MagicNumber 0x00B3EB20 (0x050600B3EB20) *Mar 1 05:31:16.926: BR2/2:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:16.926: BR2/2:1 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:31:16.926: BR2/2:1 LCP: O CONFACK [REQsent] id 11 len 28 *Mar 1 05:31:16.926: BR2/2:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:16.926: BR2/2:1 LCP: MagicNumber 0x00B3EB20 (0x050600B3EB20) *Mar 1 05:31:16.926: BR2/2:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:16.926: BR2/2:1 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:31:16.938: BR2/2:1 LCP: I CONFACK [ACKsent] id 31 len 29 *Mar 1 05:31:16.938: BR2/2:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:16.938: BR2/2:1 LCP: MagicNumber 0x513E5E8D (0x0506513E5E8D) *Mar 1 05:31:16.938: BR2/2:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:16.938: BR2/2:1 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:31:16.938: BR2/2:1 LCP: State is Open *Mar 1 05:31:16.938: BR2/2:1 PPP: Phase is AUTHENTICATING, by both *Mar 1 05:31:16.938: BR2/2:1 CHAP: O CHALLENGE id 14 len 28 from "melanie" *Mar 1 05:31:16.958: BR2/2:1 CHAP: I CHALLENGE id 6 len 27 from "torito" *Mar 1 05:31:16.958: BR2/2:1 CHAP: O RESPONSE id 6 len 28 from "melanie" *Mar 1 05:31:16.974: BR2/2:1 **CHAP: I SUCCESS** id 6 len 4

   *Mar 1 05:31:16.986: BR2/2:1 CHAP: I RESPONSE id 14 len 27 from "torito"

   *Mar 1 05:31:16.986: BR2/2:1 **CHAP: O SUCCESS** id 14 len 4

!--- CHAP authentication is successful. *Mar 1 05:31:16.986: BR2/2:1 PPP: Phase is VIRTUALIZED *Mar 1 05:31:16.990: BR2/2:1 MLP: torito, multilink up *Mar 1 05:31:17.986: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI2/2:1, changed state to up *Mar 1 05:31:22.886: %ISDN-6-CONNECT: **Interface BRI2/2:1 is now connected to**

   6114 torito

!--- Call connection is complete. melanie# *Mar 1 05:31:46.186: BR2/2 DDR: rotor dialout [priority] *Mar 1 05:31:46.186: BR2/2 DDR: **Attempting to dial 6113**

!--- Dial the first number (6113) configured with dialer string command. !--- This number corresponds to the first BRI on torito. !--- Remember there are no B-channels available on the remote BRI. *Mar 1 05:31:46.186: ISDN BR2/2: TX -> SETUP pd = 8 callref = 0x7B *Mar 1 05:31:46.186: Bearer Capability i = 0x8890 *Mar 1 05:31:46.186: Channel ID i = 0x83 *Mar 1 05:31:46.190: Called Party Number i = 0x80, '6113', Plan:Unknown, Type:Unknown *Mar 1 05:31:46.274: Channel ID i = 0x8A *Mar 1 05:31:46.302: ISDN BR2/2: RX <- PROGRESS pd = 8 callref = 0xFB *Mar 1 05:31:46.302: Progress Ind i = 0x8188 - In-band info or appropriate now available *Mar 1 05:31:46.318: **ISDN BR2/2: RX <- DISCONNECT** pd = 8 callref = 0xFB

   *Mar 1 05:31:46.322: **Cause i = 0x8191 - User busy**

!--- We receive a user busy signal, since there are no available B-channels. !--- on that BRI melanie must dial the next BRI on torito. *Mar 1 05:31:46.322: BRI2/2: wait for isdn carrier timeout, call id=0x807B *Mar 1 05:31:46.326: **BR2/2 DDR: Attempting to dial 6114**

   !--- Dial the second number (6114) configured with dialer string command. !--- This number corresponds to the second BRI on torito. !--- Remember there is one B-channels available on that remote BRI. *Mar 1 05:31:46.326: ISDN BR2/2: **TX -> RELEASE** pd = 8 callref = 0x7B

   *Mar 1 05:31:46.326: Cause i = 0x8091 - User busy

!--- Release message from the previous failed call. *Mar 1 05:31:46.346: ISDN BR2/2: TX -> SETUP pd = 8 callref = 0x7C *!--- Setup message for next call.* *Mar 1 05:31:46.346: Bearer Capability i = 0x8890 *Mar 1 05:31:46.346: Channel ID i = 0x83 *Mar 1 05:31:46.346: Called Party Number i = 0x80, '6114', Plan:Unknown, Type:Unknown *Mar 1 05:31:46.362: ISDN BR2/2: **RX <- RELEASE_COMP** pd = 8 callref = 0xFB

!--- Release acknowledgement for previous failed call. *Mar 1 05:31:46.422: ISDN BR2/2: RX <- CALL_PROC pd = 8 callref = 0xFC *Mar 1 05:31:46.426: Channel ID i = 0x8A *Mar 1 05:31:46.878: ISDN BR2/2: RX <- CONNECT pd = 8 callref = 0xFC *Mar 1 05:31:46.882: ISDN BR2/2: TX -> CONNECT_ACK pd = 8 callref = 0x7C *Mar 1 05:31:46.882: %LINK-3-UPDOWN: Interface **BRI2/2:2, changed state to up**

!--- Call is connected on BRI 2/2 B-channel 2. *Mar 1 05:31:46.882: BR2/2:2: interface must be fifo queue, force fifo *Mar 1 05:31:46.882: %DIALER-6-BIND: **Interface BR2/2:2 bound to profile Di2**

!--- Call is bound to interface Dialer 2. *Mar 1 05:31:46.886: BR2/2:2 PPP: Treating connection as a callout *Mar 1 05:31:46.886: BR2/2:2 PPP: Phase is ESTABLISHING, Active Open *Mar 1 05:31:46.886: BR2/2:2 LCP: O CONFREQ [Closed] id 24 len 29 *Mar 1 05:31:46.886: BR2/2:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:46.886: BR2/2:2 LCP: MagicNumber 0x513ED3BF (0x0506513ED3BF) *Mar 1 05:31:46.886: BR2/2:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:46.886: BR2/2:2 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:31:46.922: BR2/2:2 LCP: I CONFREQ [REQsent] id 10 len 28 *Mar 1 05:31:46.922: BR2/2:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:46.926: BR2/2:2 LCP: MagicNumber 0x00B46053 (0x050600B46053) *Mar 1 05:31:46.926: BR2/2:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:46.926: BR2/2:2 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:31:46.926: BR2/2:2 LCP: O CONFACK [REQsent] id 10 len 28 *Mar 1

05:31:46.926: BR2/2:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:46.926: BR2/2:2 LCP: MagicNumber 0x00B46053 (0x050600B46053) *Mar 1 05:31:46.926: BR2/2:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:46.926: BR2/2:2 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:31:46.938: BR2/2:2 LCP: I CONFACK [ACKsent] id 24 len 29 *Mar 1 05:31:46.938: BR2/2:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:46.938: BR2/2:2 LCP: MagicNumber 0x513ED3BF (0x0506513ED3BF) *Mar 1 05:31:46.938: BR2/2:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:46.938: BR2/2:2 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:31:46.938: BR2/2:2 LCP: State is Open *Mar 1 05:31:46.938: BR2/2:2 PPP: Phase is AUTHENTICATING, by both *Mar 1 05:31:46.938: BR2/2:2 CHAP: O CHALLENGE id 11 len 28 from "melanie" *Mar 1 05:31:46.958: BR2/2:2 CHAP: I CHALLENGE id 6 len 27 from "torito" *Mar 1 05:31:46.958: BR2/2:2 CHAP: O RESPONSE id 6 len 28 from "melanie" *Mar 1 05:31:46.974: BR2/2:2 **CHAP: I SUCCESS** id 6 len 4
   *Mar 1 05:31:46.982: BR2/2:2 CHAP: I RESPONSE id 11 len 27 from "torito"
   *Mar 1 05:31:46.986: BR2/2:2 **CHAP: O SUCCESS** id 11 len 4
   !--- CHAP authentication is successful. *Mar 1 05:31:46.986: BR2/2:2 PPP: Phase is VIRTUALIZED *Mar 1 05:31:46.986: BR2/2:2 MLP: torito, multilink up *Mar 1 05:31:47.986: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI2/2:2, changed state to up *Mar 1 05:31:52.886: %ISDN-6-CONNECT: Interface BRI2/2:2 is now connected to 6114 torito *!--- Call connection is complete.* melanie#**ping 10.10.12.1**

   Type escape sequence to abort.
   Sending 5, 100-byte ICMP Echos to 10.10.12.1, timeout is 2 seconds:
   !!!!!
   Success rate is 100 percent (5/5), round-trip min/avg/max = 24/24/24 ms
   !--- Successful ping. melanie#

相關資訊

- [適用於DDR的多連結PPP — 基本組態和驗證](#)
- [使用旋轉組為多個BRI配置MPPP](#)
- [撥號器設定檔的設定和疑難排解](#)
- [排除ISDN BRI鏈路上的第二次B通道呼叫故障](#)
- [存取產品支援頁面](#)
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