

在相同的T1/E1 PRI電路上配置撥入和撥出

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簡介

本文檔介紹如何為同一T1 PRI上的傳入和傳出呼叫配置接入伺服器。傳入和傳出呼叫均基於流量並使用按需撥號路由(DDR)，但不為任何其他路由器提供備份。如果您希望僅為撥入呼叫配置接入伺服器，請參閱[為傳入非同步和ISDN呼叫配置具有PRI的接入伺服器](#)文檔。要調整此配置以包括備份，請參閱[配置和故障排除DDR備份](#)文檔。

必要條件

需求

第1步 — 配置並驗證撥入和撥出客戶端是否設定正確。由於此配置主要針對中心站點NAS配置，因此我們不包括客戶端的示例配置。下麵包含一些客戶端示例配置：

撥入客戶端 — 撥入NAS的裝置：

- 帶撥號器配置檔案的BRI:[為傳入的非同步和ISDN呼叫配置具有PRI的訪問伺服器](#) — 使用文檔中提供的客戶端1600系列路由器(hostname maui-soho-01)配置。
- 帶撥號器對映的BRI:[使用DDR撥號器對映配置BRI到BRI撥號](#) — 使用文檔中提供的客戶端1600系列路由器(hostname maui-soho-01)配置
- PRI:[AS5300使用ISDN/非同步 \(出站DDR\) 撥出](#) — 使用中心站點AS5300 (主機名 as5300) 配置。該文檔顯示了訪問伺服器上的出站DDR，使其適合作為本文檔中的撥入客戶端

Dialout Client — 此NAS撥出到的裝置：

- 帶撥號器配置檔案的BRI:[使用撥號器配置檔案配置ISDN DDR](#) — 使用文檔提供的中心站點3640系列路由器(hostname maui-nas-04)配置
- 帶撥號器對映的BRI:[使用DDR撥號器對映配置BRI到BRI撥號](#) — 使用文檔中提供的中心站點3640系列路由器(hostname maui-nas-05)配置
- PRI:[為傳入的非同步和ISDN呼叫配置帶PRI的訪問伺服器](#) — 使用文檔中提供的中心站點AS5300系列路由器(hostname maui-nas-02)配置。如果NAS撥號到的裝置是另一個具有T1/E1 PRI電路的接入伺服器，則將該裝置配置為接受撥入呼叫的常規接入伺服器。

步驟2 — 檢驗電信電路是否工作正常。您可以使用show isdn status命令驗證BRI或PRI電路是否正常工作。如需詳細資訊，請參閱使用show isdn status命令進行BRI疑難排解的檔案。您還必須為出站呼叫啟用T1/E1 PRI電路。請與您的電話公司聯絡以驗證此資訊。

採用元件

此配置是使用下面的軟體和硬體版本開發和測試的。

- NAS:具有一個T1 PRI電路的Cisco AS5300。此AS5300正在運行Cisco IOS軟體版本12.2(5)。
- 客戶端：具有一個T1 PRI電路的Cisco AS5300。不包括此配置。
- 客戶端：Cisco 1600，帶一個BRI電路。不包括此配置。
- 客戶端：帶有一個BRI電路的Cisco 804。不包括此配置。

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。

背景理論

在許多情況下，可能需要對撥入和撥出連線使用相同的T1/E1 PRI電路。網路存取伺服器(NAS)會支援來自多個ISDN使用者的傳入呼叫，且它也可以在同一PRI上對另一個裝置進行傳出呼叫。出站撥號也可用於備份方案，其中NAS將撥號並連線到丟失其主WAN鏈路的對等裝置。

相關產品

此配置可用於具有T1或PRI卡的任何路由器。因此，任何帶T1或PRI卡的AS5xxx系列路由器都可以使用此配置。Cisco 2600和3600系列路由器還可以配置為使用T1/PRI WAN介面卡(WIC)或網路模組接受ISDN呼叫。

也可以修改此配置以用於E1或PRI埠。為E1控制器配置Telco提供的線路編碼、成幀和其他物理特性。D通道配置（E1的介面Serial x:15）類似於此處所示的配置。

慣例

如需文件慣例的詳細資訊，請參閱[思科技術提示慣例](#)。

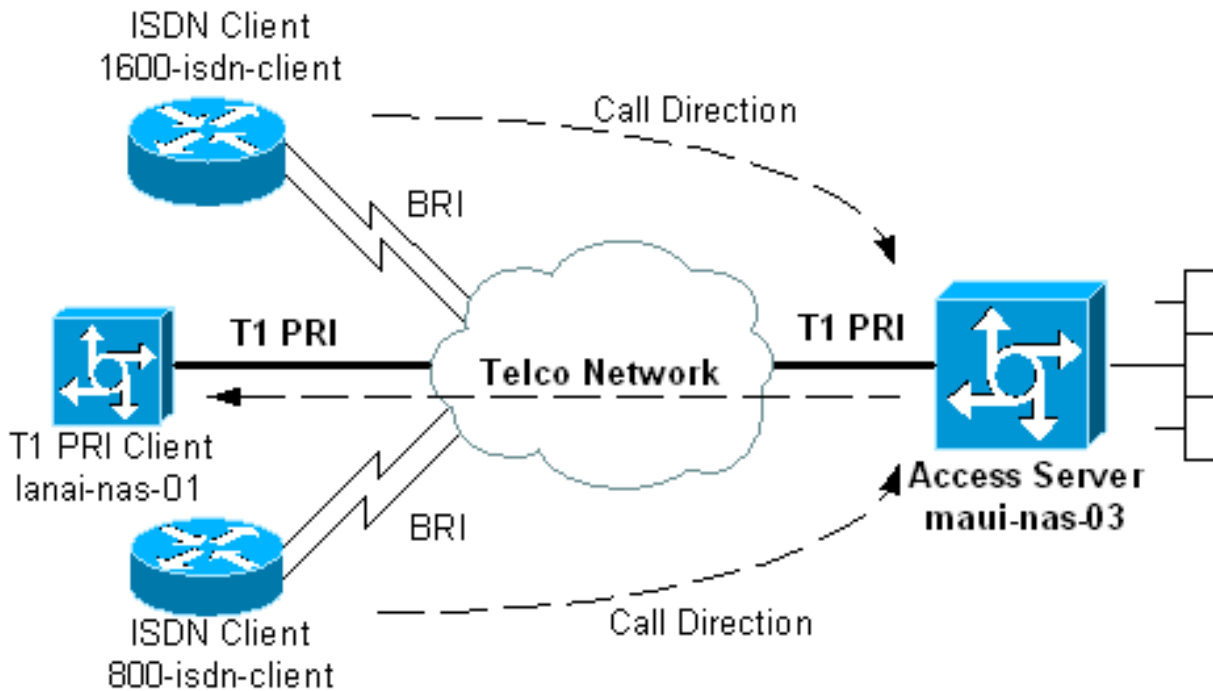
設定

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IOS命令查詢工具

網路圖表

本文檔使用下圖所示的網路設定。



組態

有兩種主要方法可配置接入伺服器，使其能夠在同一T1/E1 PRI上發出撥出呼叫並接受呼入呼叫。這些是撥號程式配置檔案和撥號程式旋轉組。每種方法都有各自的優缺點，例如：

- 撥號器旋轉組更易於配置和管理。
- 撥號程式設定檔需要為每個傳入和傳出呼叫建立獨立的撥號程式介面。如果您有許多傳入和傳出對等體，則建立和維護配置將非常複雜。
- 撥號程式設定檔允許使用者端特定組態。例如，您可以指定從地址池A為特定客戶端分配IP地址，同時從池B為另一客戶端分配地址。
- 撥號器旋轉組只允許將相同的引數應用於所有使用者。無法根據使用者進行自定義。
- 撥號器旋轉組僅允許對傳入和傳出呼叫進行單個相關流量定義。因此，不能將路由器配置為對傳入呼叫使用一個相關流量定義，對傳出呼叫使用另一個相關流量定義。
- 撥號程式設定檔允許每個對等點的單獨相關流量定義。

本文檔提供使用NAS上的撥號程式配置檔案和撥號程式旋轉組的示例。選擇適合您情況的方法。

具有撥號程式設定檔的中央存取伺服器(AS5300)

```
maui-nas-03#show running-config
Building configuration...

Current configuration : 3351 bytes
!
! Last configuration change at 07:25:39 CDT Wed Oct 24
2001
! NVRAM config last updated at 16:37:00 CDT Tue Oct 23
```

```

2001
!
version 12.2
service timestamps debug datetime msec show-timezone
service timestamps log datetime msec show-timezone
service password-encryption
!
hostname maui-nas-03
!
aaa new-model
aaa authentication login default local
aaa authentication login NO_AUTHEN none
aaa authentication ppp default local
aaa authorization network default local
enable secret 5 <deleted>
!
username admin password 7 <deleted>
username 800-isdn-client password 7 <deleted>
username 1600-isdn-client password 7 <deleted>
username 5300-client password 7 <deleted>
username lanai-nas-01 password 7 <deleted>
  ! -- Usernames for local authentication of the call. !
  -- The client presents the username/password ! -- and
  the NAS authenticates the peer. spe 2/0 2/7 firmware
  location mica-modem-pw.2.7.3.0.bin ! resource-pool
  disable ! clock timezone CST -6 clock summer-time CDT
  recurring ip subnet-zero ! isdn switch-type primary-ni !
  -- Switch-type for this NAS. Obtain this information
  from the Telco. isdn voice-call-failure 0 ! controller
  T1 0 ! -- T1 PRI physical controller configuration.
  framing esf ! -- Framing for this T1 is Extended Super
  Frame (ESF). ! -- Obtain this information from the
  telco. clock source line primary ! -- T1 0 is the
  primary clock source for this NAS. ! -- Clock source
  must be specified for the timing ! -- and
  synchronization of the T1 carrier. linecode b8zs ! --
  Linecoding for this T1. Obtain this information from the
  telco. pri-group timeslots 1-24 ! -- For T1 PRI
  scenarios, all 24 T1 timeslots are assigned ! -- as ISDN
  PRI channels. The router will now automatically create
  the ! -- corresponding D-channel: interface Serial 0:23
  ! ! -- The configurations for unused T1 controllers are
  omitted to save space. ! -- Unused T1s can be shutdown.
!
interface Ethernet0
  ip address 172.22.53.150 255.255.255.0
!
interface Serial0:23
  ! -- D-channel configuration for T1 0. no ip address
  encapsulation ppp dialer pool-member 10 ! -- Assign this
  D-channel as member of dialer pool 10. ! -- Dialer pool
  10 is used by interface Dialer 1 and Dialer 2. ! -- All
  Dialer Interfaces for incoming calls should be
  configured ! -- to use this pool. dialer pool-member 50
  max-link 10 ! -- The D-channel is also a member of
  dialer pool 50. ! -- Dialer pool 50 is used by interface
  Dialer 100. ! -- The pool can use a maximum of 10 links
  and will be used for outgoing calls. isdn switch-type
  primary-ni isdn bchan-number-order ascending ! -- B
  Channel Outgoing Call Order is ascending. ! -- Contact
  the Telco to determine whether the ISDN outbound trunk !
  -- call selection is configured for ascending or
  descending on the switch. no cdp enable ppp

```

```
authentication chap ppp multilink ! -- Allow multilink
ppp on this interface. ! interface FastEthernet0 no ip
address shutdown duplex auto speed auto ! interface
Dialer1 description For Dialin ISDN Client - austin-
soho-01 ip unnumbered Ethernet0 ! -- The interface is
unnumbered to conserve IP addresses. encapsulation ppp
dialer pool 10 ! -- Defines the pool of physical
resources from which the Dialer ! -- interface may draw
B channels as needed. Interface Dialer 2 also ! -- uses
this pool. Serial 0:23 is a member of this pool. dialer
remote-name 1600-isdn-client ! -- Specifies remote
router authenticated name and must match that used by !
-- the remote router to authenticate itself (which can
be different from ! -- the router hostname). The router
uses this remote-name to bind the ! -- incoming call to
this dialer. without this command calls from ! -- 1600-
isdn-client will fail after authentication. dialer idle-
timeout 0 ! -- Set an idle-timeout of infinity. ! -- The
"zero" option for dialer idle-timeout was introduced in
12.1(3)T.
```

```
dialer-group 1
! -- Apply interesting traffic definition from dialer-
list 1.
```

```
peer default ip address pool DIALIN
! -- Clients are assigned addresses from the ip address
pool named "DIALIN". no fair-queue ppp authentication
chap callin ppp multilink ! interface Dialer2
description For Dialin ISDN Client - travis-soho-01 ip
unnumbered Ethernet0 encapsulation ppp dialer pool 10 !
-- Defines the pool of physical resources from which the
Dialer ! -- interface may draw B channels as needed.
Interface Dialer 1 ! -- also uses this pool. Serial 0:23
is a member of this pool. dialer remote-name 800-isdn-
client ! -- Binds incoming calls from user "800-isdn-
client" to this dialer. dialer-group 1 ! -- Apply
interesting traffic definition from dialer-list 1.
```

```
peer default ip address pool DIALIN
pulse-time 0
ppp authentication chap callin
ppp multilink
!
interface Dialer100
description For Dialout Client - lanai-nas-01
ip unnumbered Ethernet0
encapsulation ppp
dialer pool 50
! -- This dialer will draw resources from dialer pool 50
! -- in which int serial 0:23 is the sole member. ! --
Since this dialer is used for dialout, ! -- the outgoing
call will be sent to interface se 0:23. dialer remote-
name lanai-nas-01 ! -- Specifies remote router
authenticated name and must match that used by ! -- the
remote router to authenticate itself ! -- (which can be
different from the router hostname). dialer idle-timeout
900 ! -- Idle timeout for incoming calls is 900 seconds
(15 mins). ! -- Users that are idle for more than 900
seconds will be dropped. dialer string 81690 class 56k
!--- Dial 81690 and use the map-class named "56k"
(defined below). dialer load-threshold 1 outbound ! --
This sets the outbound load level for traffic at which !
-- additional connections will be added to the MP bundle
```

```

load level. ! -- Values range from 1 (unloaded) to 255
(fully loaded). ! -- With a threshold of 1, additional
links will be immediately ! -- brought up and added to
the bundle. dialer-group 3 ! -- Apply interesting
traffic definition from dialer-list 3. ! -- Note: the
interesting traffic definition for outbound ! -- calls
is different than for incoming calls.

ppp authentication chap
ppp multilink
! -- Allow multilink ppp. ! router eigrp 69 network
172.22.0.0 auto-summary no eigrp log-neighbor-changes !
ip local pool DIALIN 172.22.53.151 172.22.53.159 ! -- IP
address pools for dialin clients. ip classless ip route
172.16.0.0 255.255.0.0 Dialer100 ! -- Static route for
the 172.16.0.0/16 network. ! -- Interesting Traffic for
that network ! -- will be sent to interface Dialer100
and the router ! -- will initiate the outbound call. no
ip http server ip pim bidir-enable ! ! map-class dialer
56k !-- map-class named "56k" that was used with the
dialer string in int Dialer100. dialer isdn speed 56 ! -
- Set the speed of the call to be 56k (default is 64k).
! -- This may not be necessary for your connection.
Consult your telco ! -- to find out if you need to
configure the dial speed to 56k. access-list 101 remark
Interesting traffic definition for dialin clients
access-list 101 deny eigrp any any access-list 101 deny
udp any any eq ntp access-list 101 permit ip any any ! -
- EIGRP and NTP traffic are tagged uninteresting for
dialin clients. access-list 103 remark Interesting
traffic for link lanai-nas-01 access-list 103 deny eigrp
any any access-list 103 deny udp any any eq ntp access-
list 103 permit ip any any ! -- EIGRP and NTP traffic
are tagged uninteresting for the outbound dial. ! --
Eventhough the two interesting traffic definitions here
are identical, ! -- they can be changed depending on
your traffic patterns. dialer-list 1 protocol ip list
101 !--- Interesting traffic is defined by access-list
101. !--- This is applied to interface Dialer 1 & 2
using the command dialer-group 1. !--- Note: The
specified dialer-list number must be the same !--- as
the dialer-group number; in this example, defined to be
"1".

dialer-list 3 protocol ip list 103
!
line con 0
  exec-timeout 0 0
  login authentication NO_AUTHEN
line 1 48
line aux 0
line vty 0 4
!
ntp clock-period 17180029
ntp server 172.22.53.1
end

```

上述撥號器配置檔案配置為每個呼入和撥出呼叫提供單獨的撥號器介面。撥入呼叫的撥號器介面是Dialer 1和Dialer 2，而撥出呼叫的撥號器介面是Dialer100。在撥入呼叫通過身份驗證後，路由器會根據**dialer remote-name**將呼叫繫結到適當的撥號器介面。只有撥出呼叫的撥號程式介面(Dialer100)才具有撥號程式字串，該字串帶有要撥的號碼。只有Dialer100包含dialer load-threshold命令，因為它可以撥號附加鏈路，具體取決於入站或出站負載（預設為出站）。

以下配置在此場景中使用撥號器旋轉組：

帶旋轉組的中央接入伺服器

```
maui-nas-03#show running-config
Building configuration...

Current configuration : 2436 bytes
!
! Last configuration change at 08:20:11 CDT Thu Oct 25
2001
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
service password-encryption
!
hostname maui-nas-03
!
aaa new-model
aaa authentication login default local
aaa authentication login NO_AUTHEN none
aaa authentication ppp default local
aaa authorization network default local
enable secret 5 <deleted>
!
username admin password 7 <deleted>
username lanai-nas-01 password 7 <deleted>
username 800-isdn-client password 7 <deleted>
username 1600-isdn-client password 7 <deleted>
spe 2/0 2/7
  firmware location mica-modem-pw.2.7.3.0.bin
!
resource-pool disable
!
clock timezone CST -6
clock summer-time CDT recurring
ip subnet-zero
!
isdn switch-type primary-ni
!
controller T1 0
  framing esf
  clock source line primary
  linecode b8zs
  pri-group timeslots 1-24
!
  ! -- The configuration for unused T1 controllers are
omitted to save space. ! -- Unused T1s can be shutdown.
!
interface Ethernet0
  ip address 172.22.53.150 255.255.255.0
!
interface Serial0:23
  ! -- D-channel configuration for T1 0. no ip address
encapsulation ppp dialer rotary-group 1 ! -- T1 0 is a
member of rotary group 1. ! -- The rotary group
configuration is in interface Dialer 1. ! -- Note: this
command was not included in the dialer profile
configuration.
```

```

isdn switch-type primary-ni
isdn bchan-number-order ascending
no peer default ip address
no cdp enable
ppp authentication chap
ppp multilink
!
interface FastEthernet0
no ip address
shutdown
duplex auto
speed auto
!
interface Dialer1
!--- Configuration for rotary group 1. !--- The Dialer
interface number (1) must exactly match rotary group
number !--- configured on the physical
interfaces(interface Serial 0:23). ip unnumbered
Ethernet0 ! -- This dialer is unnumbered to ethernet 0.
encapsulation ppp dialer in-band ! -- Enable this dialer
interface to be a DDR interface. dialer idle-timeout 900
! -- Idle timeout for incoming calls is 900 seconds (15
mins). ! -- Users that are idle for more than 900
seconds will be dropped. ! -- If dialer in-band is used
and a dialer idle-timeout is not defined, then ! -- the
default idle-timeout of 120 seconds (2min) will be
applied.

dialer map ip 172.16.1.1 name lanai-nas-01 speed 56
broadcast 81690
! -- Dialer map for the outbound dial. Add a dialer map
for every router ! -- that needs to be dialed. Inbound
calls do not need dialer maps. ! -- They will be
dynamically created. dialer load-threshold 1 outbound !
-- This sets the outbound load level for Multilink PPP at
1/255. dialer-group 1 !--- Apply interesting traffic
definition from dialer-list 1. ! -- Note: The specified
dialer-group number must be the same as ! -- the dialer-
list number; in this example, defined to be "1".

peer default ip address pool DIALIN
! -- clients are assigned addresses from the ip address
pool named "DIALIN". no cdp enable ppp authentication
chap ppp multilink multilink max-links 5 ! router eigrp
69 network 172.22.0.0 auto-summary no eigrp log-
neighbor-changes ! ip local pool DIALIN 172.22.53.151
172.22.53.159 ip classless ip route 172.16.0.0
255.255.0.0 172.16.1.1 ip route 172.16.1.1
255.255.255.255 Dialer1 no ip http server ip pim bidir-
enable ! ! access-list 101 remark Interesting traffic
definition access-list 101 deny eigrp any any access-
list 101 deny udp any any eq ntp access-list 101 permit
ip any any dialer-list 1 protocol ip list 101 ! --
Interesting traffic is defined by dialer-list 1. ! --
This is applied to interface Dialer 1 using dialer-group
1. ! -- The interesting traffic definition for inbound
and outbound calls ! -- is the same. If you want
different interesting traffic definition ! -- for
inbound and outbound calls use dialer profiles.

!
line con 0
login authentication NO_AUTHEN
line 1 48

```



```
line aux 0
line vty 0 4
!
ntp clock-period 17179882
ntp server 172.22.53.1
end
```

在上述撥號器旋轉組配置中，撥號器介面有一個用於撥出的撥號器對映。為需要撥號的每個對等體配置撥號器對映。

注意：傳入呼叫不需要撥號器對映，因為它們是動態建立的。可以使用**show dialer map**指令驗證這點。示例如下：

```
maui-nas-03#show dialer map
Dynamic dialer map ip 172.22.53.152 name 1600-isdn-client () on Di1
! -- Dynamic dialer map for 1600-isdn-cliet created from Dialer1 ! -- (the rotary group
interface). Dynamic dialer map ip 172.22.53.151 name 800-isdn-client () on Di1 ! -- Dynamic
dialer map for 800-isdn-cliet created from Dialer1 ! -- (the rotary group interface). Static
dialer map ip 172.16.1.1 name lanai-nas-01 (81690) on Di1 ! -- Static map configured on Dialer 1
was applied to this link ! -- connected to lanai-nas-01.
```

驗證

本節提供的資訊可用於確認您的組態是否正常運作。

輸出直譯器工具支援某些**show**命令，該工具允許您檢視**show**命令輸出的分析。

- **show isdn status** — 確保路由器與ISDN交換機正確通訊。在輸出中，驗證**1ACTIVE**，以及是否顯示**2= MULTIPLE_FRAME_ESTABLISHED**。此命令還顯示活動呼叫的數量。
- **show ppp multilink** -顯示有關處於活動狀態的多鏈路捆綁包的資訊。應使用此命令驗證多鏈路連線。
- **show dialer [interface type number]** — 顯示為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**消息將會顯示。如果出現**physical layer up**，則表示線路協定已啟動，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地址顯示在撥號原因行中。此**show**命令還會顯示計時器的配置和連線超時前的時間。
- **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軟體版本不支援此命令，請使用**show user**命令。
- **show dialer map** — 顯示已配置的動態和靜態撥號器對映。此命令可用於檢視是否建立了動態撥號器對映。如果沒有撥號器對映，則無法路由資料包。

下面是成功呼叫的一些**show**命令輸出。注意產出中的粗體部分和評論。將您獲得的輸出與下面顯示的結果進行比較。

```
maui-nas-03#show isdn status
Global ISDN Switchtype = primary-ni
ISDN Serial0:23 interface
    dsl 0, interface ISDN Switchtype = primary-ni
    Layer 1 Status:
        ACTIVE
    Layer 2 Status:
        TEI = 0, Ces = 1, SAPI = 0, State = MULTIPLE_FRAME_ESTABLISHED
! -- Layer 1 is ACTIVE and Layer 2 is MULTIPLE FRAME ESTABLISHED. Layer 3 Status: 0 Active Layer
3 Call(s) Active dsl 0 CCBs = 0 The Free Channel Mask: 0x807FFFFFFF Number of L2 Discards = 0, L2
```

```

Session ID = 0 Total Allocated ISDN CCBs = 0 maui-nas-03#show isdn service
PRI Channel Statistics:
ISDN Se0:23, Channel [1-24]
  Configured Isdn Interface (dsl) 0
  Channel State (0=Idle 1=Proposed 2=Busy 3=Reserved 4=Restart 5=Maint_Pend)
    Channel : 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4
    State   : 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 3
  Service State (0=Inservice 1=Maint 2=Outofservice)
    Channel : 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4
    State   : 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2
! -- All channels are Inservice. maui-nas-03#show user
  Line      User      Host(s)      Idle      Location
* 0 con 0           idle         00:00:00

  Interface      User      Mode      Idle      Peer Address
  Di100          lanai-nas- PPP  Bundle    00:00:35 172.16.1.1
! -- Connection to lanai-nas-01 uses int Dialer 100. Di2          800-isdn-c PPP  Bundle
00:00:22 172.22.53.154
! -- Connection to 800-isdn-client uses int Dialer 2. Di1          1600-isdn- PPP  Bundle
00:01:29 172.22.53.153
! -- Connection to 1600-isdn-client uses int Dialer 1. Se0:0 lanai-nas- Sync PPP - Bundle:
Di100 Se0:1 lanai-nas- Sync PPP - Bundle: Di100 Se0:2 1600-isdn- Sync PPP - Bundle: Di1 Se0:3
1600-isdn- Sync PPP - Bundle: Di1 Se0:4 lanai-nas- Sync PPP - Bundle: Di100 Se0:5 lanai-nas-
Sync PPP - Bundle: Di100 Se0:6 lanai-nas- Sync PPP - Bundle: Di100 Se0:7 800-isdn-c Sync PPP -
Bundle: Di2 Se0:8 800-isdn-c Sync PPP - Bundle: Di2 ! -- Two B-channels are connected to 800-
isdn-client (Se0:7-Se0:8) and ! -- 1600-isdn-client (Se0:2-Se0:3). Five other B-channels ! --
(Se0:0-Se0:1 and Se0:4-Se0:6) are connected to lanai-nas-01. maui-nas-03#show ppp multilink

Dialer2, bundle name is 800-isdn-client
! -- int Dialer 2 controls multilink bundle to 800-isdn-client. Bundle up for never 0 lost
fragments, 0 reordered, 0 unassigned 0 discarded, 0 lost received, 1/255 load 0x8 received
sequence, 0xC sent sequence Member links: 2 (max not set, min not set) Serial0:7, since
00:00:16, last rcvd seq 000006
  Serial0:8, since 00:00:15, last rcvd seq 000007
! -- B-channels Se0:7 and Se0:8 are connected. Dialer100, bundle name is lanai-nas-01
! -- int Dialer 100 controls multilink bundle to lanai-nas-01. Bundle up for never 0 lost
fragments, 0 reordered, 0 unassigned 0 discarded, 0 lost received, 1/255 load 0x33 received
sequence, 0x33 sent sequence Member links: 5 (max not set, min not set) Serial0:0, since
00:02:08, last rcvd seq 000032
  Serial0:1, since 00:02:05, last rcvd seq 00002E
  Serial0:4, since 00:01:35, last rcvd seq 00002F
  Serial0:5, since 00:01:05, last rcvd seq 000030
  Serial0:6, since 00:00:35, last rcvd seq 000031
! -- B-channels Se0:0-Se0:1 and Se0:4-Se0:6 are connected. Dialer1, bundle name is 1600-isdn-
client
! -- int Dialer 100 controls multilink bundle to 1600-isdn-client. Bundle up for never 0 lost
fragments, 1 reordered, 0 unassigned 0 discarded, 0 lost received, 1/255 load 0x28 received
sequence, 0x7B sent sequence Member links: 2 (max not set, min not set) Serial0:2, since
00:06:24, last rcvd seq 000026
  Serial0:3, since 00:06:22, last rcvd seq 000027
! -- B-channels Se0:2 and Se0:3 are connected.

```

疑難排解

本節提供的資訊可用於對組態進行疑難排解。

疑難排解資源

根據需要使用以下故障排除資源：

- [傳入ISDN呼叫故障排除](#) — 用於ISDN呼叫故障排除。

- [PRI ISDN呼入](#) — 有關疑難排解ISDN呼叫失敗的其他資訊。
- [T1故障排除流程圖](#) — 如果您懷疑T1電路工作不正常，請使用此流程圖。
- [T1 PRI故障排除](#)- ISDN PRI電路的故障排除過程。
- [T1/56K線路的環回測試](#) — 檢驗路由器上的T1埠是否正常工作。
- [使用show isdn status命令進行BRI故障排除](#) — 使用本文檔進行BRI故障排除。
- [使用debug isdn q931命令排除ISDN BRI第3層故障](#) — 使用本文檔排除ISDN第3層故障。

[疑難排解指令](#)

輸出直譯器工具支援某些show命令，該工具允許您檢視show命令輸出的分析。

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** — 顯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有趣流量。
- **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。在LCP協商期間建立諸如最大接收重建單元(MRRU)的多鏈路引數。
- **debug ppp authentication** — 顯示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** — 顯示與PPP連線協商和操作相關的協定錯誤和錯誤統計資訊。

下面是成功傳出呼叫的調試輸出。注意產出中的粗體部分和評論。將您獲得的輸出與下面顯示的結果進行比較。

```
maui-nas-03#debug dialer
Dial on demand events debugging is on
maui-nas-03#debug ppp negotiation
PPP protocol negotiation debugging is on
maui-nas-03#debug ppp authentication
PPP authentication debugging is on
maui-nas-03#debug isdn q931
ISDN Q931 packets debugging is on

maui-nas-03#ping 172.16.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

Oct 24 12:56:16.205 UTC: Se0:23 DDR: rotor dialout [priority]
Oct 24 12:56:16.205 UTC: Se0:23 DDR: Dialing cause ip
(s=172.22.53.150, d=172.16.1.1)
! -- The dialing cause is a ping for 172.16.1.1. ! -- ICMP is tagged as interesting. Oct 24
12:56:16.205 UTC: Se0:23 DDR: Attempting to dial 81690 Oct 24 12:56:16.205 UTC: ISDN Se0:23: TX
-> SETUP pd = 8 callref = 0x0063
! -- Outgoing ISDN Q.931 SETUP message. Oct 24 12:56:16.205 UTC: Bearer Capability i =
0x8890218F Oct 24 12:56:16.205 UTC: Channel ID i = 0xA98381 Oct 24 12:56:16.209 UTC: Called
Party Number i = 0x80, '81690', Plan:Unknown, Type:Unknown Oct 24 12:56:16.241 UTC: ISDN Se0:23:
RX <- CALL_PROC pd = 8 callref = 0x8063 Oct 24 12:56:16.241 UTC: Channel ID i = 0xA98381 Oct 24
12:56:16.285 UTC: ISDN Se0:23: RX <- CONNECT pd = 8 callref = 0x8063
! -- Received Q.931 CONNECT message. Oct 24 12:56:16.297 UTC: %LINK-3-UPDOWN: Interface
Serial0:0, changed state to up Oct 24 12:56:16.297 UTC: Se0:0: interface must be fifo queue,
force fifo Oct 24 12:56:16.297 UTC: %DIALER-6-BIND: Interface Se0:0 bound to profile Di100 Oct
24 12:56:16.297 UTC: Se0:0 PPP: Treating connection as a callout Oct 24 12:56:16.297 UTC: Se0:0
PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load] Oct 24 12:56:16.301 UTC: Se0:0 LCP: O
```

CONFREQ [Closed] id 12 len 33 Oct 24 12:56:16.301 UTC: Se0:0 LCP: AuthProto CHAP (0x0305C22305)
Oct 24 12:56:16.301 UTC: Se0:0 LCP: MagicNumber 0xE384A4CD (0x0506E384A4CD) Oct 24 12:56:16.301
UTC: Se0:0 LCP: MRRU 1524 (0x110405F4) Oct 24 12:56:16.301 UTC: Se0:0 LCP: EndpointDisc 1 maui-
nas-03 (0x130E016D6175692D6E61732D3033) Oct 24 12:56:16.301 UTC: ISDN Se0:23: TX -> CONNECT_ACK
pd = 8 callref = 0x0063 Oct 24 12:56:16.317 UTC: Se0:0 LCP: I CONFREQ [REQsent] id 10 len 34 Oct
24 12:56:16.317 UTC: Se0:0 LCP: AuthProto CHAP (0x0305C22305) Oct 24 12:56:16.317 UTC: Se0:0
LCP: MagicNumber 0x54F49B93 (0x050654F49B93) Oct 24 12:56:16.321 UTC: Se0:0 LCP: MRRU 1524
(0x110405F4) Oct 24 12:56:16.321 UTC: Se0:0 LCP: EndpointDisc 1 lanai-nas-01
(0x130F016C616E61692D6E61732D3031) Oct 24 12:56:16.321 UTC: Se0:0 LCP: O CONFACK [REQsent] id 10
len 34 Oct 24 12:56:16.321 UTC: Se0:0 LCP: AuthProto CHAP (0x0305C22305) Oct 24 12:56:16.321
UTC: Se0:0 LCP: MagicNumber 0x54F49B93 (0x050654F49B93) Oct 24 12:56:16.321 UTC: Se0:0 LCP: MRRU
1524 (0x110405F4) Oct 24 12:56:16.321 UTC: Se0:0 LCP: EndpointDisc 1 lanai-nas-01
(0x130F016C616E61692D6E61732D3031) Oct 24 12:56:16.325 UTC: Se0:0 LCP: I CONFACK [ACKsent] id 12
len 33 Oct 24 12:56:16.325 UTC: Se0:0 LCP: AuthProto CHAP (0x0305C22305) Oct 24 12:56:16.325
UTC: Se0:0 LCP: MagicNumber 0xE384A4CD (0x0506E384A4CD) Oct 24 12:56:16.325 UTC: Se0:0 LCP: MRRU
1524 (0x110405F4) Oct 24 12:56:16.325 UTC: Se0:0 LCP: EndpointDisc 1 maui-nas-03
(0x130E016D6175692D6E61732D3033) Oct 24 12:56:16.325 UTC: Se0:0 **LCP: State is Open**
! -- LCP negotiation is complete. Oct 24 12:56:16.325 UTC: Se0:0 PPP: Phase is AUTHENTICATING, by
both [0 sess, 1 load] Oct 24 12:56:16.325 UTC: Se0:0 CHAP: O CHALLENGE id 8 len 32 from "maui-
nas-03" Oct 24 12:56:16.337 UTC: Se0:0 CHAP: I CHALLENGE id 10 len 33 from "lanai-nas-01" Oct 24
12:56:16.341 UTC: Se0:0 CHAP: O RESPONSE id 10 len 32 from "maui-nas-03" Oct 24 12:56:16.353
UTC: Se0:0 **CHAP: I SUCCESS** id 10 len 4
Oct 24 12:56:16.357 UTC: Se0:0 CHAP: I RESPONSE id 8 len 33 from "lanai-nas-01"
Oct 24 12:56:16.361 UTC: Se0:0 **CHAP: O SUCCESS** id 8 len 4
! -- Two-way CHAP authentication is successful. Oct 24 12:56:16.361 UTC: Se0:0 PPP: Phase is
VIRTUALIZED [0 sess, 1 load] Oct 24 12:56:16.361 UTC: Di100 DDR: Authenticated host lanai-nas-01
with no matching dialer map Oct 24 12:56:16.361 UTC: Di100 PPP: Phase is UP [0 sess, 1 load] Oct
24 12:56:16.361 UTC: Di100 IPCP: O CONFREQ [Closed] id 6 len 10 Oct 24 12:56:16.361 UTC: Di100
IPCP: Address 172.22.53.150 (0x0306AC163596) Oct 24 12:56:16.361 UTC: Di100 CDPCP: O CONFREQ
[Closed] id 6 len 4 Oct 24 12:56:16.365 UTC: Di100 MLP: Added first link Se0:0 to bundle lanai-
nas-01 Oct 24 12:56:16.365 UTC: Di100 PPP: Treating connection as a callout Oct 24 12:56:16.377
UTC: Di100 IPCP: I CONFREQ [REQsent] id 1 len 10 Oct 24 12:56:16.377 UTC: Di100 IPCP: Address
172.16.1.1 (0x0306AC100101) Oct 24 12:56:16.377 UTC: Di100 IPCP: O CONFACK [REQsent] id 1 len 10
Oct 24 12:56:16.377 UTC: Di100 IPCP: Address 172.16.1.1 (0x0306AC100101) Oct 24 12:56:16.381
UTC: Di100 IPCP: I CONFACK [ACKsent] id 6 len 10 Oct 24 12:56:16.381 UTC: Di100 IPCP: Address
172.22.53.150 (0x0306AC163596) Oct 24 12:56:16.381 UTC: Di100 IPCP: State is Open Oct 24
12:56:16.381 UTC: Di100 DDR: dialer protocol up Oct 24 12:56:16.381 UTC: **Di100 IPCP: Install
route to 172.16.1.1**
! -- A route to the peer is installed. Oct 24 12:56:17.361 UTC: **%LINEPROTO-5-UPDOWN: Line
protocol on Interface Serial0:0,
changed state to up**
Oct 24 12:56:19.113 UTC: **Se0:23 DDR: rotor dialout [priority]**
! -- Second call is being dialed. Oct 24 12:56:19.113 UTC: Se0:23 DDR: Attempting to dial 81690
Oct 24 12:56:19.113 UTC: ISDN Se0:23: TX -> SETUP pd = 8 callref = 0x0064 Oct 24 12:56:19.113
UTC: Bearer Capability i = 0x8890218F Oct 24 12:56:19.113 UTC: Channel ID i = 0xA98382 Oct 24
12:56:19.113 UTC: Called Party Number i = 0x80, '81690', Plan:Unknown, Type:Unknown Oct 24
12:56:19.141 UTC: ISDN Se0:23: RX <- CALL_PROC pd = 8 callref = 0x8064 Oct 24 12:56:19.141 UTC:
Channel ID i = 0xA98382 Oct 24 12:56:19.205 UTC: ISDN Se0:23: RX <- CONNECT pd = 8 callref =
0x8064 Oct 24 12:56:19.217 UTC: **%LINK-3-UPDOWN: Interface Serial0:1, changed state to up** Oct 24
12:56:19.217 UTC: Se0:1: interface must be fifo queue, force fifo Oct 24 12:56:19.217 UTC:
%DIALER-6-BIND: Interface Se0:1 bound to profile Di100 Oct 24 12:56:19.217 UTC: **%ISDN-6-CONNECT:
Interface Serial0:0 is now connected to 81690 lanai-nas-01** Oct 24 12:56:19.221 UTC: Se0:1 PPP:
Treating connection as a callout Oct 24 12:56:19.221 UTC: Se0:1 PPP: Phase is ESTABLISHING,
Active Open [0 sess, 1 load] Oct 24 12:56:19.221 UTC: Se0:1 LCP: O CONFREQ [Closed] id 14 len 33
Oct 24 12:56:19.221 UTC: Se0:1 LCP: AuthProto CHAP (0x0305C22305) Oct 24 12:56:19.221 UTC: Se0:1
LCP: MagicNumber 0xE384B037 (0x0506E384B037) Oct 24 12:56:19.221 UTC: Se0:1 LCP: MRRU 1524
(0x110405F4) Oct 24 12:56:19.221 UTC: Se0:1 LCP: EndpointDisc 1 maui-nas-03
(0x130E016D6175692D6E61732D3033) Oct 24 12:56:19.221 UTC: ISDN Se0:23: TX -> CONNECT_ACK pd = 8
callref = 0x0064 Oct 24 12:56:19.241 UTC: Se0:1 LCP: I CONFREQ [REQsent] id 11 len 34 Oct 24
12:56:19.241 UTC: Se0:1 LCP: AuthProto CHAP (0x0305C22305) Oct 24 12:56:19.241 UTC: Se0:1 LCP:
MagicNumber 0x54F4A700 (0x050654F4A700) Oct 24 12:56:19.241 UTC: Se0:1 LCP: MRRU 1524
(0x110405F4) Oct 24 12:56:19.241 UTC: Se0:1 LCP: EndpointDisc 1 lanai-nas-01
(0x130F016C616E61692D6E61732D3031) Oct 24 12:56:19.241 UTC: Se0:1 LCP: O CONFACK [REQsent] id 11
len 34 Oct 24 12:56:19.241 UTC: Se0:1 LCP: AuthProto CHAP (0x0305C22305) Oct 24 12:56:19.241

UTC: Se0:1 LCP: MagicNumber 0x54F4A700 (0x050654F4A700) Oct 24 12:56:19.241 UTC: Se0:1 LCP: MRRU 1524 (0x110405F4) Oct 24 12:56:19.241 UTC: Se0:1 LCP: EndpointDisc 1 lanai-nas-01 (0x130F016C616E61692D6E61732D3031) Oct 24 12:56:19.245 UTC: Se0:1 LCP: I CONFACK [ACKsent] id 14 len 33 Oct 24 12:56:19.245 UTC: Se0:1 LCP: AuthProto CHAP (0x0305C22305) Oct 24 12:56:19.245 UTC: Se0:1 LCP: MagicNumber 0xE384B037 (0x0506E384B037) Oct 24 12:56:19.245 UTC: Se0:1 LCP: MRRU 1524 (0x110405F4) Oct 24 12:56:19.245 UTC: Se0:1 LCP: EndpointDisc 1 maui-nas-03 (0x130E016D6175692D6E61732D3033) Oct 24 12:56:19.245 UTC: Se0:1 LCP: State is Open Oct 24 12:56:19.245 UTC: Se0:1 PPP: Phase is AUTHENTICATING, by both [0 sess, 1 load] Oct 24 12:56:19.245 UTC: Se0:1 CHAP: O CHALLENGE id 8 len 32 from "maui-nas-03" Oct 24 12:56:19.257 UTC: Se0:1 CHAP: I CHALLENGE id 11 len 33 from "lanai-nas-01" Oct 24 12:56:19.261 UTC: Se0:1 CHAP: O RESPONSE id 11 len 32 from "maui-nas-03" Oct 24 12:56:19.273 UTC: Se0:1 CHAP: I SUCCESS id 11 len 4 Oct 24 12:56:19.281 UTC: Se0:1 CHAP: I RESPONSE id 8 len 33 from "lanai-nas-01" Oct 24 12:56:19.281 UTC: Se0:1 **CHAP: O SUCCESS** id 8 len 4
! -- Authentication is successful.
Oct 24 12:56:19.281 UTC: Se0:1 PPP: Phase is VIRTUALIZED [0 sess, 1 load]
Oct 24 12:56:19.281 UTC: **Di100 MLP: Added link Se0:1 to bundle lanai-nas-01**
! -- The link is added to the Multilink bundle. Oct 24 12:56:20.281 UTC: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0:1, changed state to up Oct 24 12:56:25.221 UTC: %ISDN-6-CONNECT: Interface Serial0:1 is now connected to 81690 lanai-nas-01 Oct 24 12:56:49.117 UTC: **Se0:23 DDR: rotor dialout [priority]**
! -- Third call is being dialed. Oct 24 12:56:49.117 UTC: Se0:23 DDR: Attempting to dial 81690 Oct 24 12:56:49.117 UTC: ISDN Se0:23: TX -> SETUP pd = 8 callref = 0x0065 Oct 24 12:56:49.117 UTC: Bearer Capability i = 0x8890218F Oct 24 12:56:49.117 UTC: Channel ID i = 0xA98385 Oct 24 12:56:49.117 UTC: Called Party Number i = 0x80, '81690', Plan:Unknown, Type:Unknown ! -- *Output Omitted.* ... Oct 24 12:56:49.261 UTC: Se0:4 PPP: Phase is VIRTUALIZED [0 sess, 1 load]
Oct 24 12:56:49.261 UTC: **Di100 MLP: Added link Se0:4 to bundle lanai-nas-01**
! -- The 3rd link is added to the bundle. Oct 24 12:56:50.261 UTC: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0:4, changed state to up Oct 24 12:56:55.198 UTC: %ISDN-6-CONNECT: Interface Serial0:4 is now connected to 81690 lanai-nas-01

相關資訊

- [AS5300使用ISDN/非同步撥出 \(出站DDR \)](#)
- [技術支援 - Cisco Systems](#)