路由器到路由器非同步多鏈路PPP

目錄

簡介

此組態說明遠端思科3640具有內部8埠類比資料機卡(NM-8AM)，撥入具有主要速率介面(PRI)的思科AS5300。 此配置描述了由遠端站點上的兩條模擬電話線組成的多鏈路連線。如果電話線路可用，則可以為MP配置更多電話線路。

必要條件

需求

本文件沒有特定先決條件。

採用元件

本檔案中的資訊是根據以下軟體和硬體版本。

- 執行Cisco IOS軟體版本12.1(3)的Cisco 3640
- 執行Cisco IOS軟體版本12.07(T)的Cisco AS5300

註：MP最初是在Cisco IOS軟體版本11.0(3)中引入的。

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。

背景理論

多鏈路PPP(MP)允許裝置通過多個點對點資料鏈路通過實施虛擬鏈路將資料傳送到同一目標。MP連線的最大頻寬等於分量鏈路頻寬的總和。MP可以配置為多路複用鏈路（如ISDN和幀中繼），也可以配置為多個非同步線路。如需MP的詳細資訊，請參閱RFC 1990。

注意：RFC 1990將多鏈路PPP稱為MP。已知MP的其他名稱包括MPPP、MLP和多鏈路。

非同步MP可用於以比單個模擬連線更高的速度連線遠端客戶端。在Async MP中，遠端客戶端使用多個數據機（因此使用多條電話線路）撥入中心路由器並訪問網路。由於多條電話線路通常比ISDN基本速率介面(BRI)服務更便宜，因此Async MP提供了一種有效的方法，可在控制成本的同時提高遠端使用者的連線速度。非同步MP也是為無法由ISDN服務的遠端區域獲取更高訪問速度的有效方式。

非同步MP將單獨的數據機連線捆綁到訪問伺服器。每個對等體上的PPP軟體將資料包分段，然後通過多個模擬連線將片段傳輸到另一端。接收端從獨立的連線中收集這些片段，並根據其中嵌入的MP資訊將這些片段重組為有效的資料包，從而提供具有更高頻寬的端到端虛擬鏈路。非同步MP可以在兩台路由器之間或路由器和客戶端PC之間配置。
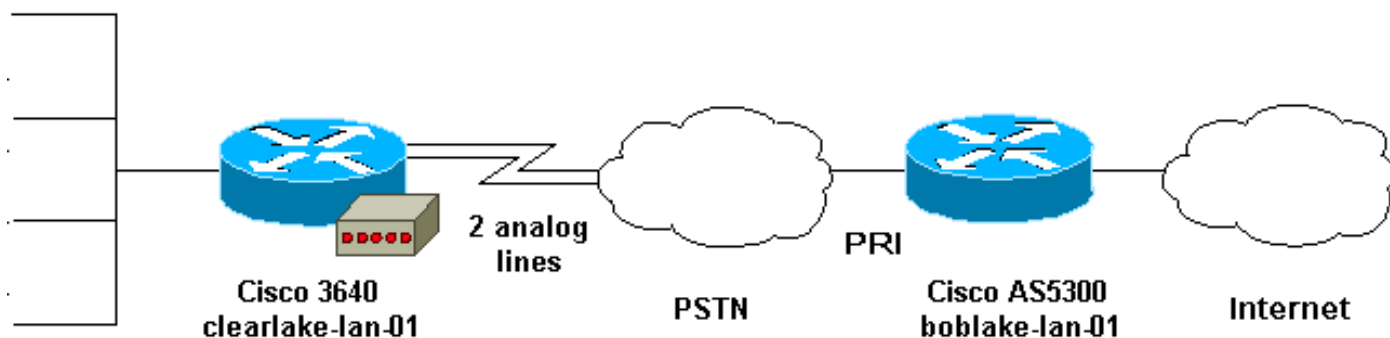
設定

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

網路圖表

本文檔使用下圖所示的網路設定。

Cisco 3640
clearlake-lan-01

2 analog
lines

PSTN

PRI

Cisco AS5300
boblake-lan-01

Internet

組態

本文檔使用如下所示的配置。

-

Cisco 3640

```
clearlake-lan-01#show runnning-config
Building configuration...

Current configuration:
!
version 12.1
service timestamps debug datetime msec localtime show-
timezone
service timestamps log datetime msec localtime show-
timezone
!
hostname clearlake-lan-01
!
aaa new-model
aaa authentication login default local
aaa authentication ppp default if-needed local
!
username bobslake-nas-01 password <deleted>
 !--- Remote router and password for CHAP
authentication. !--- Dialer interface must also be
configured to use !--- this username and password.
username admin privilege 15 password <deleted> ! no ip
domain-lookup ! chat-script async-mppp ABORT ERROR ABORT
BUSY "" "ATZ" OK "ATDT \T" TIMEOUT 30 CONNECT \c !---
Chat script used for dialing out. ! interface Loopback0
ip address 172.21.126.254 255.255.255.0 ! interface
Ethernet0/0 ip address 172.21.125.1 255.255.255.0 !
interface Group-Async1 !--- Interface to configure
modems used for dialout. no ip address encapsulation ppp
!--- Use PPP encapsulation for members of this !---
group-async interface. dialer in-band !--- Permit DDR on
this interface. dialer pool-member 10 !--- All members
of this group-async interface belong !--- to dialer pool
10. ppp multilink !--- Enable PPP multilink on physical
interface. group-range 33 34 !--- Assign async 33 and 34
to this group-async interface. !--- This can be adjusted
depending on the number of POTS lines available. !
interface Dialer1 !--- Dialer interface to dialout to
bobslake-nas-01. ip address negotiated !--- Obtain an IP
address from central site. encapsulation ppp dialer
remote-name bobslake-nas-01 !--- Identify central site
router for CHAP authentication. !--- Shared secret
password is defined above. dialer pool 10 !--- Defines
the pool of physical resources that the Dialer !---
interface may use. dialer idle-timeout 600 !---
Specifies number of seconds without interesting traffic
that !--- the connection is kept up. dialer string
5551212 !--- Number to be dialed; this number belongs to
the PRI !--- of the central router. dialer load-
threshold 15 either !--- Load level for either inbound
or outbound traffic !--- at which additional lines will
be added to the MP bundle. !--- Load level values range
from 1 (unloaded) to 255 (fully loaded). dialer-group 8
!--- Uses dialer-list 8 to determine interesting
traffic. ppp authentication chap callin !--- Use CHAP
authentication for incoming calls only !--- This router
will not challenge remote routers for outgoing calls.
```

```
ppp multilink !--- Activates the interface for MP
operation. ppp timeout multilink link remove 300 !---
Keeps the multilink connections up for 300 seconds !---
after the load drops below the threshold. !--- This
command should be used to control flapping. ! ip
classless ip route 0.0.0.0 0.0.0.0 Dialer1 !--- Use
Interface Dialer1 for all networks. no ip http server !
access-list 188 remark define interesting traffic
access-list 188 deny udp any any eq ntp access-list 188
permit ip any any dialer-list 8 protocol ip list 188 !--
- Assign access-list 188 to dialer-list 8. ! line con 0
transport input none line 33 34 !--- Async lines to be
used for dialout. !--- This number should match the
group-range in the !--- Group-Async interface. script
dialer async-mppp !--- Use chat script called async-mppp
for dialout. modem InOut modem autoconfigure discovery
transport preferred none transport input all line 35 40
transport preferred none transport input all line aux 0
line vty 0 4 ! ntp clock-period 17179871 ntp server
172.22.255.1 prefer end
```

思科AS5300

```
bobslake-nas-01#show running-config

Building configuration...

Current configuration:

version 12.0
service timestamps debug datetime msec localtime show-
timezone
service timestamps log datetime msec localtime show-
timezone
service password-encryption
service tcp-small-servers
!
hostname bobslake-nas-01
!
logging buffered 10000 debugging
aaa new-model
aaa authentication login default local
aaa authentication ppp default if-needed local
!--- Authenticate for PPP if not authenticated during
login. !--- Allows users with Terminal Window after Dial
to initiate PPP. ! username clearlake-lan-01 password
<deleted> !--- Remote router and password for Challenge
Handshake !--- Authentication Protocol (CHAP)
authentication. !--- The password must be identical on
both sides. spe 1/0 1/7 firmware location
system:/ucode/mica_port_firmware ! resource-pool disable
! ip subnet-zero ! multilink virtual-template 1 !--- Use
virtual-template 1 for multilink connections. isdn
switch-type primary-5ess isdn voice-call-failure 0 !
controller T1 0 framing esf clock source line primary
linecode b8zs pri-group timeslots 1-24 ! interface
Loopback0 ip address 172.21.10.10 255.255.255.255 no ip
directed-broadcast ! interface Loopback1 ip address
172.21.104.254 255.255.255.0 !--- Summarizes addresses
in address pool. !--- Loopback 1 is in the same subnet
as the address pool. no ip directed-broadcast !
interface Virtual-Template1 description Template for
Multilink Users ip unnumbered Loopback0 no ip directed-
```

```
broadcast peer default ip address pool addr-pool !---
Use IP pool called addr-pool for incoming calls. ppp
authentication chap !--- Authenticate using CHAP. ppp
multilink !--- Allow multilink sessions. ! !---
Configure D channel on PRI. interface Serial0:23
description Headquarters 555-1212 active PRI line no ip
address no ip directed-broadcast isdn switch-type
primary-5ess isdn incoming-voice mode fair-queue 64 256
0 no cdp enable ! interface FastEthernet0 ip address
172.21.101.23 255.255.255.0 no ip directed-broadcast
duplex auto speed auto ! interface Group-Async1 ip
unnumbered Loopback0 no ip directed-broadcast
encapsulation ppp dialer in-band dialer idle-timeout 600
either !--- Specifies number of seconds without
interesting !--- traffic that the connection is kept up.
!--- Configure the same idle-timeout on both routers.
dialer map ip 172.21.125.1 name clearlake-nas-01 dialer-
group 5 !--- Uses dialer-list 5 to determine interesting
traffic. async mode interactive peer default ip address
pool addr-pool !--- Use IP pool called addr-pool for
incoming calls. ppp authentication chap callin !---
Issue CHAP challenges for dialin users only. ppp
multilink group-range 1 48 !--- Assign modems 1-48 to
the Group-Async 1 configuration template. ! router eigrp
1 passive-interface Group-Async1 !--- To prevent routing
traffic on async lines. network 172.21.0.0 ! ip local
pool addr-pool 172.21.104.1 172.21.104.48 !--- Define IP
address pool range for dialin clients. ip classless no
ip http server ! access-list 105 permit ip any any !---
Define interesting traffic. dialer-list 5 protocol ip
list 105 !--- Assign access list 105 to dialer list 5. !
line con 0 transport input none line 1 48 autoselect
during-login !--- Permits user login prompts after
dialin. autoselect ppp !--- Automatically launches PPP
on the line. modem InOut !--- Modems can be used to
dialin and dialout. transport preferred none transport
output telnet line aux 0 line vty 0 4 ! ntp clock-period
17180374 ntp update-calendar ntp server 172.22.255.1
prefer end
```

調整和可選命令

以下命令可用於調整MP連線的行為。仔細調整此類引數可以避免浪費和不必要的資料鏈路使用，從而有助於控制成本。

- dialer load-threshold *load* [outbound |入站 |任一]可以配置MP，以便在主通道建立後立即啟動其它通道。要設定此場景，請在dialer load-thershold load命令中將負載閾值設定為1。在這種情況下，會調出其他通道並繼續保持活動狀態（即，它們不會翻動）。 如果負載閾值設定為任何其他值，則多個通道可能會隨著鏈路上的負載而擺動。如果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，如果附加通道達到50%，則閾值應設定為128(0.50*255)。 在確定閾值時，必須考慮非同步呼叫的設定時間，因為設定時間較長可能會使閾值較低。您可以根據**傳出**、**傳入**或傳入介面上的傳入或傳出流量中的較高者來計算負載。如果將負載基於入站或**兩者之一**，請確保中心站點配置了passive-interface Group-Async1，以便不會通過非同步線路傳送來自核心的路由更新。阻止路由流量通過鏈路可為線路上的其他資料提供更多頻寬。
- ppp timeout multilink link remove *seconds*此命令可用於防止在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，會啟動額外的線路。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*此命令可用於防止將多個鏈路新增到MP捆綁包，直到在指定間隔內收到高流量。這可防止突發流量不必要地增加線路。

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 ppp multilink** — 顯示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 caller** — 顯示NAS上各個使用者和消耗資源的資訊。此命令顯示大型連線池的活動呼叫統計資訊，並顯示每個使用者的絕對和空閒時間。如果您的Cisco IOS軟體版本不支援此命令，請使用show user命令。
- **show caller user** — 顯示特定使用者的引數，如使用的TTY線路、非同步介面（機架/插槽/埠）、DS0通道號、數據機號、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輸出示例

以下show命令輸出是從撥入AS5300的Cisco 3640擷取而來。顯示多重連結連線已啟動

```
clearlake-lan-01#show ppp multilink
Virtual-Access1, bundle name is bobslake-nas-01
!--- Virtualized MP bundle. Bundle name is derived from the !--- username used during
authentication. Dialer interface is Dialer1 !--- This Virtual Access Interface used Interface
Dialer1. 0 lost fragments, 0 reordered, 0 unassigned 0 discarded, 0 lost received, 1/255 load
0x4 received sequence, 0x0 sent sequence Member links: 2 (max not set, min not set) Async34
    Async33
!--- Members of the MP bundle. clearlake-lan-01#show dialer


As33 - dialer type = IN-BAND ASYNC NO-PARITY
Dialer pool 10, priority 0
!--- Member of dialer pool 10. Idle timer (120 secs), Fast idle timer (20 secs) Wait for carrier
(30 secs), Re-enable (15 secs) Dialer state is multilink member Dial reason: Multilink bundle
overloaded
!--- Interface was not the first link in the MP bundle. Interface bound to profile Di1 Current
call connected 00:00:54 !--- Current call duration Connected to <deleted>5551212 (bobslake-nas-
01) !--- Phone number that was dialed. As34 - dialer type = IN-BAND ASYNC NO-PARITY
Dialer pool 10, priority 0
!--- Member of dialer pool 10. Idle timer (600 secs), Fast idle timer (20 secs) Wait for carrier
(30 secs), Re-enable (15 secs) Dialer state is multilink member Dial reason: ip (s=172.21.125.1,
d=172.21.104.254) !--- Interface was the first link in the bundle, triggered by !--- interesting
traffic. Interface bound to profile Di1 Current call connected 00:00:54 !--- Current Call
duration. Connected to 5551212 <deleted> (bobslake-nas-01) !--- Phone number that was dialed.
Gr1 - dialer type = IN-BAND ASYNC NO-PARITY Idle timer (120 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs) Dialer state is idle Dial String Successes
Failures Last DNIS Last status Di1 - dialer type = DIALER PROFILE Load threshold for dialing
additional calls is 15 !--- Load threshold. Idle timer (600 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs) Dialer state is data link layer up Number of
```

active calls = 2 Dial String Successes Failures Last DNIS Last status 15 0 00:00:56 successful
Default clearlake-lan-01#**show caller**

```
                                          Active   Idle
  Line          User            Service   Time     Time
  con 0         tarpon          TTY       00:09:11 00:00:00
  tty 33        -               Async     -        00:00:01
  TTY 34        -               Async     -        00:00:06
  As33          bobslake-nas-01 PPP       00:00:24 00:00:00
```
!--- Second connection. **As34**   bobslake-nas-01   PPP   00:01:05 00:00:00
!--- First connection. **Vi1**   bobslake-nas-01   PPP   Bundle 00:01:05 00:01:04
!--- MP bundle !--- bobslake-nas-01 has two async lines, two TTY, and one virtual !--- interface bundle. clearlake-lan-01#**show caller user bobslake-nas-01**

  User: bobslake-nas-01, line As33, service PPP
!--- PPP setting for bobslake-nas-01. Active time 00:00:34, Idle time 00:00:00 Timeouts: Absolute Idle Limits: - - Disconnect in: - - PPP: LCP Open, **multilink Open**, CHAP (-> AAA)
 !--- Multilink is up. Dialer: Connected 00:01:09 to <deleted>, outbound *!--- Dialer interface was used to dialout.* Type is IN-BAND ASYNC, group Dialer1 **Cause: Multilink bundle overloaded**
!--- This interface was not the first member of the MP bundle. IP: Local 172.21.104.48/32 Bundle: Member of bobslake-nas-01, last input 00:00:00 Counts: 59 packets input, 3529 bytes, 0 no buffer 0 input errors, 22 CRC, 0 frame, 0 overrun 31 packets output, 1515 bytes, 0 underruns 0 output errors, 0 collisions, 4 interface resets *!--- Packets are passing through the connection.* **User: bobslake-nas-01, line As34, service PPP**
!--- PPP setting for user bobslake-nas-01. Active time 00:01:15, Idle time 00:00:00 Timeouts: Absolute Idle Limits: - - Disconnect in: - - PPP: LCP Open, **multilink Open**, CHAP (-> AAA)
 !--- MP state is open. Dialer: Connected 00:01:10 to <deleted>, outbound Type is IN-BAND ASYNC, group Dialer1 **Cause: ip (s=172.21.125.1, d=172.21.104.254)**
!--- Dialing cause was interesting traffic; this was the !--- first link in the bundle. IP: Local 172.21.104.48/32 Bundle: Member of bobslake-nas-01, last input 00:00:00 Counts: 172 packets input, 20699 bytes, 0 no buffer 0 input errors, 81 CRC, 0 frame, 0 overrun 80 packets output, 14347 bytes, 0 underruns 0 output errors, 0 collisions, 6 interface resets *!--- Packets are passing through the connection.* **User: bobslake-nas-01, line Vi1, service PPP Bundle**
!--- Bundle information for user bobslake-nas-01. Active time 00:01:16, Idle time 00:01:15 Timeouts: Absolute Idle Limits: - 00:10:00 Disconnect in: - 00:08:44 *!--- Idle-timeout is 600 seconds(10 minutes).* PPP: LCP Open, **multilink Open**, IPCP
  Dialer: Connected 00:01:10 to <deleted>, outbound
          Idle timer 600 secs, idle 75 secs
          Type is IN-BAND SYNC, group Dialer1
  IP: Local 172.21.104.48/32, remote 172.21.104.254
!--- IP address assigned to the bundle and loopback address !--- of the remote router. Bundle: First link of bobslake-nas-01, 2 links, last input 00:01:16 Counts: 23 packets input, 4758 bytes, 0 no buffer 0 input errors, 0 CRC, 0 frame, 0 overrun 7 packets output, 3734 bytes, 0 underruns 0 output errors, 0 collisions, 0 interface resets

下面顯示了AS5300的一些**show**命令輸出。有關更多輸出，請參閱[Microsoft Windows客戶端的非同步多鏈路PPP撥號](#)文檔。AS5300（中心站點）的**show**和**debug**輸出對於PC-Router Async MP和Router-Router Async MP類似。

bobslake-nas-01#**show ppp multilink**

```
Virtual-Access1, bundle name is clearlake-lan-01
  0 lost fragments, 0 reordered, 0 unassigned, sequence 0x1/0x10 rcvd/sent
  0 discarded, 0 lost received, 1/255 load
  Member links: 2 (max not set, min not set)
    Async47
    Async45
```

bobslake-nas-01#**show caller**
```
                                          Active   Idle
  Line          User              Service Time     Time
  TTY 45        clearlake-lan-01  Async   00:01:12 00:01:03
  TTY 47        clearlake-lan-01  Async   00:01:51 00:00:06
  vty 0         admin             VTY     00:11:02 00:00:00
```

```
As45          clearlake-lan-01    PPP                    00:01:02  00:00:00
As47          clearlake-lan-01    PPP                    00:01:49  00:00:00
Vi1           clearlake-lan-01    PPP      Bundle  00:01:43  00:01:10
```

疑難排解

本節提供的資訊可用於對組態進行疑難排解。

疑難排解程序

對MP連線進行故障排除時，請按照呼叫進行時的方式繼續操作：

以下提供debug輸出範例，並標有關於尋找什麼的解釋。

測試MP配置時，請確保通過鏈路生成足夠的流量以觸發負載閾值。您可以在測試過程中根據需要調整負載閾值。

1. 使用**debug dialer**和**debug chat**命令驗證撥號器是否正確撥號。
2. 確認PPP協商和身份驗證成功。請注意LCP協商，其中協商MP引數行Maximum Receive Reconstructed Unit(MRRU)和端點鑑別器(EndpointDisc)。
3. 驗證鏈路是否已正確虛擬化。Cisco IOS軟體將建立一個虛擬訪問介面來表示MP捆綁包。
4. 驗證網際網路路通訊協定控制通訊協定(IPCP)交涉是否成功。注意是否分配了正確的IP地址以及是否安裝了正確的路由。

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 vtemplate** — 顯示虛擬訪問介面的克隆資訊，從從虛擬模板克隆到斷開時為止。
- **debug ppp multilink events** — 顯示影響多鏈路捆綁的事件資訊。
- **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，包括質詢握手身份驗證協定(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。
- **debug modem** — 顯示接入伺服器上的數據機線路活動。

調試輸出示例

從Cisco 3640獲得以下輸出。它們顯示Cisco 3640正在撥打AS5300的PRI並建立MP連線。有關AS5300調試輸出的示例，請參閱Microsoft Windows客戶端非同步多鏈路PPP撥號文檔。

```
clearlake-lan-01#debug dialer
Dial on demand events debugging is on
clearlake-lan-01#debug ppp negotiation
PPP protocol negotiation debugging is on
clearlake-lan-01#debug ppp authentication
```

```
PPP authentication debugging is on
clearlake-lan-01#debug vtemplate
Virtual Template debugging is on
clearlake-lan-01#debug ppp multilink events
clearlake-lan-01#show debug
Dial on demand:
  Dial on demand events debugging is on
PPP:
  PPP authentication debugging is on
  PPP protocol negotiation debugging is on
  Multilink events debugging is on
VTEMPLATE:
  Virtual Template debugging is on
clearlake-lan-01#ping ip
Target IP address: 172.21.104.254
Repeat count [5]: 20
Datagram size [100]: 1200
Timeout in seconds [2]:
Extended commands [n]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 20, 1200-byte ICMP Echos to 172.21.104.254, timeout is 2 seconds:

Jul 25 13:20:29.047 UTC: As34 DDR: rotor dialout [priority]
Jul 25 13:20:29.047 UTC: As34 DDR: Dialing cause ip (s=172.21.125.1,
d=172.21.104.254)
!--- Dialing Reason Jul 25 13:20:29.047 UTC: As34 DDR: Attempting to dial
```

!--- Number being dialed Jul 25 13:20:29.047 UTC: CHAT34: Attempting async line dialer script
Jul 25 13:20:29.047 UTC: CHAT34: Dialing using Modem script: async-mppp & System script: none *!--- Using chat script async-mppp for dialout* Jul 25 13:20:29.051 UTC: CHAT34: process started Jul 25 13:20:29.051 UTC: CHAT34: Asserting DTR Jul 25 13:20:29.051 UTC: CHAT34: Chat script async-mppp started *!--- Call is being established; !--- note the time elapsed for call setup* Jul 25 13:20:54.831 UTC: CHAT34: Chat script async-mppp finished, status = Success. Jul 25 13:20:56.831 UTC: **%LINK-3-UPDOWN: Interface Async34, changed state to up**
Jul 25 13:20:56.831 UTC:
Async34 DDR: Dialer statechange to up
Jul 25 13:20:56.831 UTC:
%DIALER-6-BIND: Interface As34 bound to profile Di1
Jul 25 13:20:56.831 UTC:
Async34 DDR: Dialer call has been placed
!--- PPP negotiation begins Jul 25 13:20:56.831 UTC: As34 PPP: Treating connection as a callout
Jul 25 13:20:56.831 UTC: As34 PPP: Phase is ESTABLISHING, Active Open Jul 25 13:20:56.831 UTC: As34 PPP: No remote authentication for call-out *!--- CHAP challenge is configured for callin only !--- LCP negotiation begins; Multilink parameters are also negotiated* Jul 25 13:20:56.835 UTC: As34 LCP: O CONFREQ [Closed] id 43 len 43 Jul 25 13:20:56.835 UTC: As34 LCP: ACCM 0x000A0000 (0x0206000A0000) Jul 25 13:20:56.835 UTC: As34 LCP: MagicNumber 0x4395638E (0x05064395638E) Jul 25 13:20:56.835 UTC: As34 LCP: PFC (0x0702) Jul 25 13:20:56.835 UTC: As34 LCP: ACFC (0x0802) Jul 25 13:20:56.835 UTC: As34 LCP: MRRU 1524 (0x110405F4) *!--- Negotiate Maximum Receive Reconstructed Unit (MRRU) !--- MRRU is the maximum packet size this end will reconstruct* Jul 25 13:20:56.835 UTC: As34 LCP: EndpointDisc 1 Local Jul 25 13:20:56.835 UTC: As34 LCP: (0x131301636C6561726C616B652D6C616E) Jul 25 13:20:56.835 UTC: As34 LCP: (0x2D3031). Jul 25 13:20:58.831 UTC: As34 LCP: TIMEout: State REQsent Jul 25 13:20:58.831 UTC: As34 LCP: O CONFREQ [REQsent] id 44 Len 43 Jul 25 13:20:58.831 UTC: As34 LCP: ACCM 0x000A0000 (0x0206000A0000) Jul 25 13:20:58.831 UTC: As34 LCP: MagicNumber 0x4395638E (0x05064395638E) Jul 25 13:20:58.831 UTC: As34 LCP: PFC (0x0702) Jul 25 13:20:58.831 UTC: As34 LCP: ACFC (0x0802) Jul 25 13:20:58.831 UTC: As34 LCP: MRRU 1524 (0x110405F4) Jul 25 13:20:58.831 UTC: As34 LCP: EndpointDisc 1 Local Jul 25 13:20:58.831 UTC: As34 LCP: (0x131301636C6561726C616B652D6C616E) Jul 25 13:20:58.831 UTC: As34 LCP: (0x2D3031). Jul 25 13:21:00.831 UTC: As34 LCP: TIMEout: State REQsent Jul 25 13:21:00.831 UTC: As34 LCP: O CONFREQ [REQsent] id 45 Len 43 Jul 25 13:21:00.831

UTC: As34 LCP: ACCM 0x000A0000 (0x0206000A0000) Jul 25 13:21:00.831 UTC: As34 LCP: MagicNumber 0x4395638E (0x05064395638E) Jul 25 13:21:00.831 UTC: As34 LCP: PFC (0x0702) Jul 25 13:21:00.831 UTC: As34 LCP: ACFC (0x0802) Jul 25 13:21:00.831 UTC: As34 LCP: MRRU 1524 (0x110405F4) Jul 25 13:21:00.831 UTC: As34 LCP: EndpointDisc 1 Local Jul 25 13:21:00.831 UTC: As34 LCP: (0x131301636C6561726C616B652D6C616E) Jul 25 13:21:00.831 UTC: As34 LCP: (0x2D3031) Jul 25 13:21:01.135 UTC: **As34 LCP: I CONFACK [REQsent] id 45 Len 43**

Jul 25 13:21:01.135 UTC: As34 LCP: ACCM 0x000A0000 (0x0206000A0000)
Jul 25 13:21:01.135 UTC: As34 LCP: MagicNumber 0x4395638E (0x05064395638E)
Jul 25 13:21:01.135 UTC: As34 LCP: PFC (0x0702)
Jul 25 13:21:01.135 UTC: As34 LCP: ACFC (0x0802)
Jul 25 13:21:01.135 UTC: **As34 LCP: MRRU 1524 (0x110405F4)**
Jul 25 13:21:01.135 UTC: As34 LCP: EndpointDisc 1 Local
Jul 25 13:21:01.135 UTC: As34 LCP: (0x131301636C6561726C616B652D6C616E)
Jul 25 13:21:01.135 UTC: As34 LCP: (0x2D3031)
Jul 25 13:21:01.139 UTC: As34 LCP: I CONFREQ [ACKrcvd] id 6 Len 47
Jul 25 13:21:01.139 UTC: As34 LCP: ACCM 0x000A0000 (0x0206000A0000)
Jul 25 13:21:01.143 UTC: As34 LCP: AuthProto CHAP (0x0305C22305)
Jul 25 13:21:01.143 UTC: As34 LCP: MagicNumber 0xE16DFC8D (0x0506E16DFC8D)
Jul 25 13:21:01.143 UTC: As34 LCP: PFC (0x0702)
Jul 25 13:21:01.143 UTC: As34 LCP: ACFC (0x0802)
Jul 25 13:21:01.143 UTC: As34 LCP: MRRU 1524 (0x110405F4)
Jul 25 13:21:01.143 UTC: As34 LCP: EndpointDisc 1 Local
Jul 25 13:21:01.143 UTC: As34 LCP: (0x131201626F62736C616B652D6E61732D)
Jul 25 13:21:01.143 UTC: As34 LCP: (0x3031)
Jul 25 13:21:01.143 UTC: **As34 LCP: O CONFACK [ACKrcvd] id 6 Len 47**
Jul 25 13:21:01.143 UTC: As34 LCP: ACCM 0x000A0000 (0x0206000A0000)
Jul 25 13:21:01.143 UTC: As34 LCP: AuthProto CHAP (0x0305C22305)
Jul 25 13:21:01.143 UTC: As34 LCP: MagicNumber 0xE16DFC8D (0x0506E16DFC8D)
Jul 25 13:21:01.143 UTC: As34 LCP: PFC (0x0702)
Jul 25 13:21:01.143 UTC: As34 LCP: ACFC (0x0802)
Jul 25 13:21:01.143 UTC: **As34 LCP: MRRU 1524 (0x110405F4)**
Jul 25 13:21:01.143 UTC: As34 LCP: EndpointDisc 1 Local
Jul 25 13:21:01.143 UTC: As34 LCP: (0x131201626F62736C616B652D6E61732D)
Jul 25 13:21:01.143 UTC: As34 LCP: (0x3031)
!--- Both sides have CONFACKed the parameters !--- MRRU of 1524 bytes and the Endpoint Discriminator have been negotiated Jul 25 13:21:01.143 UTC: As34 LCP: State is Open *!--- LCP negotiation complete* Jul 25 13:21:01.147 UTC: As34 PPP: Phase is AUTHENTICATING, by the peer *!--- Received a challenge from the remote router* Jul 25 13:21:01.351 UTC: As34 CHAP: I CHALLENGE id 3 Len 36 from "bobslake-nas-01" Jul 25 13:21:01.351 UTC: As34 CHAP: O RESPONSE id 3 Len Jul 25 13:21:01.539 UTC: As34 CHAP: I SUCCESS id 3 Len 4 *!--- CHAP authentication successful* Jul 25 13:21:01.539 UTC: As34 PPP: Phase is VIRTUALIZED *!--- Virtualize Async 34 !--- Virtual Access interface will represent the MP bundle* Jul 25 13:21:01.543 UTC: Vi1 VTEMPLATE: Reuse Vi1, recycle queue size 0 Jul 25 13:21:01.543 UTC: Vi1 VTEMPLATE: Hardware address 0030.9401.f101 Jul 25 13:21:01.543 UTC: Vi1 PPP: Phase is DOWN, Setup Jul 25 13:21:01.543 UTC: %DIALER-6-BIND: Interface Vi1 bound to profile Di1 Jul 25 13:21:01.543 UTC: Vi1 VTEMPLATE: Has a new cloneblk dialer, now it has dialer Jul 25 13:21:01.547 UTC: %LINK-3-UPDOWN: Interface Virtual-Access1, changed state to up Jul 25 13:21:01.547 UTC: Virtual-Access1 DDR: Dialer statechange to up *!--- Virtual Access Interface is up !--- Negotiate LCP and PPP parameters for Virtual-Access Interface* Jul 25 13:21:01.547 UTC: Virtual-Access1 DDR: Dialer call has been placed Jul 25 13:21:01.547 UTC: Vi1 PPP: Treating connection as a callout Jul 25 13:21:01.547 UTC: Vi1 PPP: Phase is ESTABLISHING, Active Open Jul 25 13:21:01.547 UTC: Vi1 PPP: No remote authentication for call-out Jul 25 13:21:01.547 UTC: Vi1 LCP: O CONFREQ [Closed] id 1 Len 33 Jul 25 13:21:01.547 UTC: Vi1 LCP: MagicNumber 0x439575FC (0x0506439575FC) Jul 25 13:21:01.547 UTC: Vi1 LCP: MRRU 1524 (0x110405F4) Jul 25 13:21:01.551 UTC: Vi1 LCP: EndpointDisc 1 Local Jul 25 13:21:01.551 UTC: Vi1 LCP: (0x131301636C6561726C616B652D6C616E) Jul 25 13:21:01.551 UTC: Vi1 LCP: (0x2D3031) Jul 25 13:21:01.551 UTC: Vi1 PPP: Phase is UP Jul 25 13:21:01.551 UTC: Vi1 IPCP: O CONFREQ [Closed] id 1 Len 10 Jul 25 13:21:01.551 UTC: Vi1 IPCP: Address 0.0.0.0 (0x030600000000) Jul 25 13:21:01.551 UTC: **As34 MLP: bobslake-nas-01, multilink up, first link** *!--- First multilink connection is virtualized* Jul 25 13:21:01.651 UTC: Vi1 IPCP: I CONFREQ [REQsent] id 1 Len 10 Jul 25 13:21:01.651 UTC: Vi1 IPCP: Address 172.21.104.254 (0x0306AC1568FE) Jul 25 13:21:01.651 UTC: Vi1 IPCP: O CONFACK [REQsent] id 1 Len 10 Jul 25 13:21:01.651 UTC: Vi1 IPCP: Address 172.21.104.254 (0x0306AC1568FE) Jul 25 13:21:01.731 UTC: Vi1 IPCP: I CONFNAK [ACKsent] id 1 Len 10 Jul 25 13:21:01.731 UTC: Vi1 IPCP: Address 172.21.104.48 (0x0306AC156830) Jul 25 13:21:01.731 UTC: Vi1 IPCP: O CONFREQ [ACKsent] id 2 Len 10 Jul 25 13:21:01.731 UTC: Vi1

IPCP: Address 172.21.104.48 (0x0306AC156830) Jul 25 13:21:01.915 UTC: Vi1 IPCP: I CONFACK [ACKsent] id 2 Len 10 Jul 25 13:21:01.915 UTC: Vi1 IPCP: Address 172.21.104.48 (0x0306AC156830) Jul 25 13:21:01.915 UTC: Vi1 IPCP: State is Open Jul 25 13:21:01.915 UTC: Di1 IPCP: Install negotiated IP interface address 172.21.104.48 *!--- IP address is assigned to virtual-access interface* Jul 25 13:21:01.919 UTC: Vi1 DDR: dialer protocol up Jul 25 13:21:01.919 UTC: Di1 IPCP: Install route to 172.21.104.254 *!--- Route to loopback address of remote router* Jul 25 13:21:02.539 UTC: **%LINEPROTO-5-UPDOWN: Line protocol on Interface Async34,**
changed state to up
Jul 25 13:21:02.551 UTC:
%LINEPROTO-5-UPDOWN: Line protocol on Interface
Virtual-Access1, changed state to up
!--- Full connectivity with first async connection !--- Begin dialout using second async
interface Jul 25 13:21:08.191 UTC: As33 DDR: rotor dialout [priority] Jul 25 13:21:08.191 UTC:
As33 DDR: Attempting to dial

!--- Number to be dialed; this number is the PRI on the remote router Jul 25 13:21:08.191 UTC: CHAT33: Attempting async line dialer script Jul 25 13:21:08.191 UTC: CHAT33: Dialing using Modem script: async-mppp & System script: none *!--- Use chat script async-mppp for dialout* Jul 25 13:21:08.191 UTC: CHAT33: process started Jul 25 13:21:08.191 UTC: CHAT33: Asserting DTR Jul 25 13:21:08.191 UTC: CHAT33: Chat script async-mppp started Jul 25 13:21:33.859 UTC: CHAT33: Chat script async-mppp finished, status = Success *!--- Chat script successful* Jul 25 13:21:35.859 UTC: %LINK-3-UPDOWN: Interface Async33, changed state to up Jul 25 13:21:35.859 UTC: Async33 DDR: Dialer statechange to up Jul 25 13:21:35.859 UTC: %DIALER-6-BIND: Interface As33 bound to profile Di1 Jul 25 13:21:35.859 UTC: Async33 DDR: Dialer call has been placed *!--- PPP negotiation begins* Jul 25 13:21:35.859 UTC: As33 PPP: Treating connection as a callout Jul 25 13:21:35.859 UTC: As33 PPP: Phase is ESTABLISHING, Active Open Jul 25 13:21:35.859 UTC: As33 PPP: No remote authentication for call-out *!--- CHAP challenge is configured for callin only !--- LCP negotiation begins; Multilink parameters are also negotiated* Jul 25 13:21:35.863 UTC: As33 LCP: O CONFREQ [Closed] id 21 Len 43 Jul 25 13:21:35.863 UTC: As33 LCP: ACCM 0x000A0000 (0x0206000A0000) Jul 25 13:21:35.863 UTC: As33 LCP: MagicNumber 0x4395FC05(0x05064395FC05) Jul 25 13:21:35.863 UTC: As33 LCP: PFC (0x0702) Jul 25 13:21:35.863 UTC: As33 LCP: ACFC (0x0802) Jul 25 13:21:35.863 UTC: As33 LCP: MRRU 1524 (0x110405F4) *!--- negotiate Maximum Receive Reconstructed Unit (MRRU)* Jul 25 13:21:35.863 UTC: As33 LCP: EndpointDisc 1 Local Jul 25 13:21:35.863 UTC: As33 LCP: (0x131301636C6561726C616B652D6C616E) Jul 25 13:21:35.863 UTC: As33 LCP: (0x2D3031) Jul 25 13:21:37.859 UTC: As33 LCP: TIMEout: State REQsent Jul 25 13:21:37.859 UTC: As33 LCP: O CONFREQ [REQsent] id 22 Len 43 Jul 25 13:21:37.859 UTC: As33 LCP: ACCM 0x000A0000 (0x0206000A0000) Jul 25 13:21:37.859 UTC: As33 LCP: MagicNumber 0x4395FC05 (0x05064395FC05) Jul 25 13:21:37.859 UTC: As33 LCP: PFC (0x0702) Jul 25 13:21:37.859 UTC: As33 LCP: ACFC (0x0802) Jul 25 13:21:37.859 UTC: As33 LCP: MRRU 1524 (0x110405F4) Jul 25 13:21:37.859 UTC: As33 LCP: EndpointDisc 1 Local Jul 25 13:21:37.859 UTC: As33 LCP: (0x131301636C6561726C616B652D6C616E) Jul 25 13:21:37.859 UTC: As33 LCP: (0x2D3031) Jul 25 13:21:39.859 UTC: As33 LCP: TIMEout: State REQsent Jul 25 13:21:39.859 UTC: As33 LCP: O CONFREQ [REQsent] id 23 Len 43 Jul 25 13:21:39.859 UTC: As33 LCP: ACCM 0x000A0000 (0x0206000A0000) Jul 25 13:21:39.859 UTC: As33 LCP: MagicNumber 0x4395FC05 (0x05064395FC05) Jul 25 13:21:39.859 UTC: As33 LCP: PFC (0x0702) Jul 25 13:21:39.859 UTC: As33 LCP: ACFC (0x0802) Jul 25 13:21:39.859 UTC: As33 LCP: MRRU 1524 (0x110405F4) Jul 25 13:21:39.859 UTC: As33 LCP: EndpointDisc 1 Local Jul 25 13:21:39.859 UTC: As33 LCP: (0x131301636C6561726C616B652D6C616E) Jul 25 13:21:39.859 UTC: As33 LCP: (0x2D3031) Jul 25 13:21:40.199 UTC: As33 LCP: I CONFREQ [REQsent] id 6 Len 47 Jul 25 13:21:40.199 UTC: As33 LCP: ACCM 0x000A0000 (0x0206000A0000) Jul 25 13:21:40.203 UTC: As33 LCP: AuthProto CHAP (0x0305C22305) Jul 25 13:21:40.203 UTC: As33 LCP: MagicNumber 0xE16E950F (0x0506E16E950F) Jul 25 13:21:40.203 UTC: As33 LCP: PFC (0x0702) Jul 25 13:21:40.203 UTC: As33 LCP: ACFC (0x0802) Jul 25 13:21:40.203 UTC: As33 LCP: MRRU 1524 (0x110405F4) Jul 25 13:21:40.203 UTC: As33 LCP: EndpointDisc 1 Local Jul 25 13:21:40.203 UTC: As33 LCP: (0x131201626F62736C616B652D6E61732D) Jul 25 13:21:40.203 UTC: As33 LCP: (0x3031) Jul 25 13:21:40.203 UTC: **As33 LCP: O CONFACK [REQsent] id 6 Len 47**
!--- PPP parameters are agreed on (CONFACKed) by both sides Jul 25 13:21:40.203 UTC: As33 LCP: ACCM 0x000A0000 (0x0206000A0000) Jul 25 13:21:40.203 UTC: As33 LCP: AuthProto CHAP (0x0305C22305) Jul 25 13:21:40.203 UTC: As33 LCP: MagicNumber 0xE16E950F (0x0506E16E950F) Jul 25 13:21:40.203 UTC: As33 LCP: PFC (0x0702) Jul 25 13:21:40.203 UTC: As33 LCP: ACFC (0x0802) Jul 25 13:21:40.203 UTC: **As33 LCP: MRRU 1524 (0x110405F4)**

!--- MRRU of 1524 bytes is accepted Jul 25 13:21:40.203 UTC: As33 LCP: EndpointDisc 1 Local Jul 25 13:21:40.203 UTC: As33 LCP: (0x131201626F62736C616B652D6E61732D) Jul 25 13:21:40.203 UTC: As33 LCP: (0x3031) Jul 25 13:21:40.207 UTC: **As33 LCP: I CONFACK [ACKsent] id 23 Len 43**
!--- PPP parameters are agreed on (CONFACKed) by both sides
Jul 25 13:21:40.207 UTC: As33 LCP: ACCM 0x000A0000 (0x0206000A0000)
Jul 25 13:21:40.207 UTC: As33 LCP: MagicNumber 0x4395FC05 (0x05064395FC05)
Jul 25 13:21:40.207 UTC: As33 LCP: PFC (0x0702)
Jul 25 13:21:40.207 UTC: As33 LCP: ACFC (0x0802)
Jul 25 13:21:40.207 UTC: **As33 LCP: MRRU 1524 (0x110405F4)**
!--- MRRU of 1524 bytes is accepted Jul 25 13:21:40.207 UTC: As33 LCP: EndpointDisc 1 Local Jul 25 13:21:40.207 UTC: As33 LCP: (0x131301636C6561726C616B652D6C616E) Jul 25 13:21:40.207 UTC: As33 LCP: (0x2D3031) *!--- LCP negotiation is complete* Jul 25 13:21:40.207 UTC: As33 LCP: State is Open Jul 25 13:21:40.207 UTC: As33 PPP: Phase is AUTHENTICATING, by the peer *!--- CHAP authentication begins* Jul 25 13:21:40.419 UTC: As33 CHAP: I CHALLENGE id 3 Len 36 from "bobslake-nas-01" *!--- Received challenge from bobslake-nas-01* Jul 25 13:21:40.423 UTC: As33 CHAP: O RESPONSE id 3 Len 37 from "clearlake-lan-01" Jul 25 13:21:42.528 UTC: As33 CHAP: I SUCCESS id 3 Len 4 *!--- CHAP authentication is successful* Jul 25 13:21:42.528 UTC: As33 PPP: Phase is VIRTUALIZED *!--- Async 33 is added to Virtualized MP bundle* Jul 25 13:21:42.528 UTC: **As33 MLP: bobslake-nas-01, multilink up**
!--- Multilink connection is up Jul 25 13:21:43.528 UTC: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async33, changed state to up clearlake-lan-01# Jul 25 13:23:52.028 UTC: Vi1 MLP: Disabling particle-fastswitching in 'bobslake-nas-01' Jul 25 13:23:52.028 UTC: Vi1 MLP: Enabling particle-fastswitching on 'bobslake-nas-01' *!--- Cisco IOS adjusting fast switching strategy to keep in step !--- with delivery of packet fragments* Jul 25 13:23:53.872 UTC: Vi1 MLP: Disabling particle-fastswitching in 'bobslake-nas-01' Jul 25 13:23:53.884 UTC: Vi1 MLP: Enabling particle-fastswitching on 'bobslake-nas-01'

相關資訊

- 適用於DDR的多連結PPP — 基本組態和驗證
- 從Microsoft Windows®客戶端非同步多鏈路PPP撥號
- 跨兩個串列物理層非同步介面的多鏈路PPP
- 配置NAS以進行基本撥號訪問
- 顯示呼叫方統計資訊
- 配置虛擬模板介面
- Cisco IOS中的虛擬訪問PPP功能
- PPP支援頁面
- 技術支援 - Cisco Systems