

PPP de links múltiples a través de dos interfaces asíncronas seriales de capa física

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[Introducción](#)

En algunos entornos, puede ser necesario liar los links asíncronos múltiples para actuar como solo link con el ancho de banda agregado. Este documento describe cómo configurar un Cisco 2500 Access Server para liar dos interfaces asynchronous usando una plantilla virtual.

Esta configuración se puede utilizar para el Routers conectado por las líneas asincrónicas con los Módems externos o los módulos de red con (módems incorporados). Puede agregar funciones adicionales a esta configuración en función de sus necesidades.

[prerrequisitos](#)

[Requisitos](#)

No hay requisitos previos específicos para este documento.

[Componentes Utilizados](#)

La información que contiene este documento se basa en las versiones de software y hardware indicadas a continuación.

- Cisco 2511 y Cisco 2503 Router en un ambiente de laboratorio con las configuraciones despejadas.

- El software de Cisco IOS® Release 12.2(10b) se está ejecutando en ambos Routers.
- Cuatro Módems externos.

La información que se presenta en este documento se originó a partir de dispositivos dentro de un ambiente de laboratorio específico. Todos los dispositivos que se utilizan en este documento se pusieron en funcionamiento con una configuración verificada (predeterminada). Si la red está funcionando, asegúrese de haber comprendido el impacto que puede tener un comando antes de ejecutarlo.

Productos Relacionados

Esta configuración se puede utilizar con cualquier dos Routers que cada uno tenga dos interfaces seriales PÁLIDAS y sea capaz de configurar la interfaz asincrónica. Las interfaces seriales WIC-1T, WIC-2A/S, 8 o 16 del puerto asincrónico pueden ser utilizadas.

Convenciones

Para obtener más información sobre las convenciones del documento, consulte [Convenciones de Consejos Técnicos de Cisco](#).

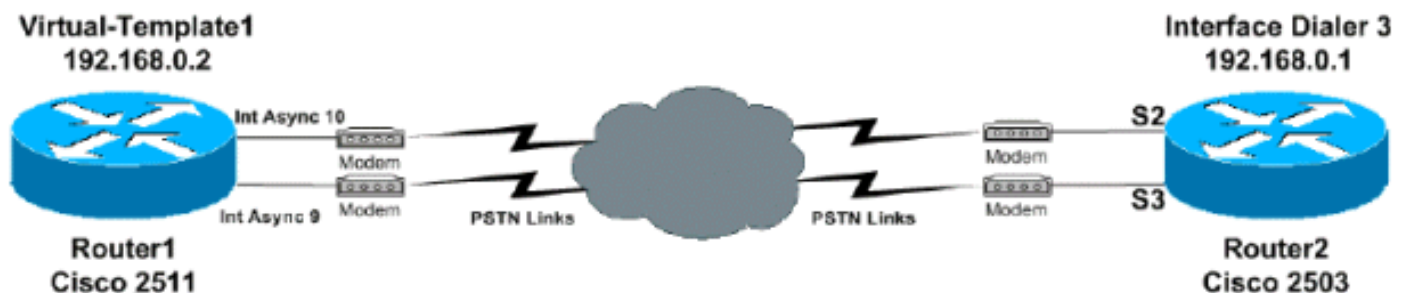
Configurar

En esta sección encontrará la información para configurar las funciones descritas en este documento.

Note: Para obtener información adicional sobre los comandos que se utilizan en este documento, use la Command Lookup Tool (solo para clientes [registrados](#)).

Diagrama de la red

Este documento utiliza la instalación de red que se muestra en el siguiente diagrama.



Configuraciones

Este documento usa las configuraciones detalladas a continuación.

Note: Esta configuración fue probada usando el Cisco IOS Software Release 12.2(10b) en los Cisco 2500 Series Router. La misma configuración se aplica a las versiones de Cisco IOS Software corrientes de una topología similar del router a partir de la versión 11.0(3).

Router1 (Cisco 2511)

```

Current configuration : 1185 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname Router1
!
username Router2 password 0 xxxxx
ip subnet-zero
!
multilink virtual-template 1
!--- Applies the virtual interface template to the
multilink bundle. ! interface Loopback0 ip address
192.168.0.2 255.255.255.0 ! interface Ethernet0 ip
address 10.0.0.1 255.255.255.0 ! !--- Interface virtual-
template is a logical interface which creates !---
virtual access interfaces dynamically and applies them
to physical !--- asynchronous interfaces. interface
Virtual-Templat1 ip unnumbered Loopback0 ppp
authentication chap !--- Enables multilink PPP on the
virtual template interface. ppp multilink ! !--- The
parameters configured in interface group-async are !---
applied to the group and range reduces the repeated
configuration !--- in asynchronous interfaces.
interface Group-Async0 ip unnumbered Loopback0
encapsulation ppp async default routing !--- Permits
routing over the async interface. !--- This is required
for a routing protocol to run across the async link.
async mode dedicated !--- Places the line into dedicated
asynchronous network mode. !--- This interface is now
automatically configured for PPP connections. ppp
authentication chap ppp multilink group-range 9 10 !---
Group-range indicates the asynchronous interfaces which
comes under !--- the Group-Async interface. ! router
ospf 1 redistribute connected subnets network
192.168.0.0 0.0.0.255 area 0 ! ip classless ! dialer-
list 1 protocol ip permit ! ! line con 0 line 1 8 flush-
at-activation line 9 10 modem InOut modem autoconfigure
type default transport input all autohangup speed 115200
line 11 16 flush-at-activation line aux 0 line vty 0 4
login ! end

```

Router2 (Cisco 2503)

```

Current configuration : 1645 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname Router2
!
username Router1 password 0 xxxxx
!--- Username for remote router (Router1) and shared
secret. !--- Shared secret(used for CHAP authentication)
must be the same on both sides. ip subnet-zero ! chat-
script test "" "ATDT\T" TIMEOUT 120 CONNECT \C !--- A
chat script is a string of text that defines the
handshaking that occurs !--- between the router and the
modem to successfully handshake with the destination. !--
- In this chat-script called "test" the expected string

```

```

"" is !--- the null from the destination. The send
string "ATDT\T" instructs the !--- modem to dial the
telephone number in the dialer string !--- command. This
is 30116 and 30114 in the Interface dialer 3 TIMEOUT 120
CONNECT \C. !--- It waits up to 120 seconds for the
input string "CONNECT". \C is an escape !--- sequence to
end the chat-script. !--- Refer to the Modem-Router
Connection Guide and Chat-script !--- for more
information ! modemcap entry default !--- Modemcap named
"default" will be applied to the line 2 and line 3 of !-
-- Serial interfaces. Refer to the Modem-Router
Connection Guide and !--- modemcap entry for more
information. ! interface Loopback0 ip address
192.168.0.1 255.255.255.0 ! interface Ethernet0 ip
address 172.16.1.1 255.255.255.0 ! ! interface Serial2
physical-layer async no ip address encapsulation ppp
dialer in-band dialer rotary-group 3 !--- Dialer rotary-
group applies the the logical interface dialer 3 !---
configuration to physical serial Interfaces 2 and 3.
This simplifies the !--- configuration, else the
commands in interface dialer has to be repeatedly !---
configured in physical interfaces. async mode dedicated
! interface Serial3 physical-layer async no ip address
encapsulation ppp dialer in-band dialer rotary-group 3
dialer-group 1 async default routing async mode
dedicated ! interface Dialer3 ! -- This is a logical
interface applied to dialer rotary-group. ip unnumbered
Loopback0 encapsulation ppp dialer in-band dialer idle-
timeout 60 dialer map ip 192.168.0.2 name Router1 modem-
script test broadcast 30116 dialer map ip 192.168.0.2
name Router1 modem-script test broadcast 30114 !---
dialer map statements for the remote router Router1 !---
The name must match the one used by the remote router to
identify itself. !--- use modem chat script "test" for
this connection dialer hold-queue 15 dialer load-
threshold 1 either dialer-group 1 no cdp enable ppp
authentication chap ppp multilink ! router ospf 1
redistribute connected subnets network 192.168.0.0
0.0.0.255 area 0 ! ip classless ! dialer-list 1 protocol
ip permit !--- All IP traffic is defined interesting. !-
-- This is applied to Async interface 2 and 3 using
dialer-group 1. ! ! line con 0 line 2 3 modem InOut
modem autoconfigure type default !--- Apply the modemcap
"default" (configured previously) to !--- initialize the
modem. Refer to the link Modem-Router Connection Guide
!--- for more information. transport input all !---
Allows all protocols to be passed to the access server
!--- through the line. autohangup !--- Disconnects the
line automatically after the connection closes. speed
115200 line aux 0 line vty 0 4 login ! end

```

Para implementar esta configuración, usted tiene que configurar el siguiente:

- Cree un número de la virtual-plantilla del multilink en el router1.
- Configure el **multilink ppp** bajo interfaces en ambo Routers.
- Configure la autenticación bajo interfaces en ambo Routers.

En la configuración usada en este documento, el router1 se ha configurado para recibir solamente las llamadas, mientras que el router2 inicia la llamada y conecta con el router1. Configuran a ambo Routers para el Multilink PPP. Cuando sube la conexión, crean a un conjunto principal y ambos links asincrónicos se lían juntos bajo interfaz de acceso virtual.

Las interfaces 9 y 10 en el router1 reciben solamente las llamadas asincrónicas. Es normal no ver que la interfaz 9 y 10 cuando son el grupo async 1. de la parte de esté segura de crear una plantilla virtual del multilink; si no, es posible conectar en el primer canal, pero no pasar el tráfico (IP Control Protocol [IPCP] cerrado). Sin una virtual-plantilla y un Multilink PPP, esta configuración trabajaría para una conexión asíncrona, pero no para ambos.

Las interfaces 2 y 3 en el router2 se configuran con el **comando physical-layer async** y validarán los comandos del Multilink PPP. Estas interfaces serán quitadas automáticamente cuando sienten bien al grupo rotativo de dialers de la parte de. Tan pronto como usted ingrese el **comando dialer rotary-group 3**, borran al **comando serial ppp multilink** de la configuración. Utilice el **comando ppp multilink** bajo el marcador 3 de la interfaz en lugar de otro.

Verificación

En esta sección encontrará información que puede utilizar para confirmar que su configuración esté funcionando correctamente.

La herramienta [Output Interpreter](#) (sólo para clientes [registrados](#)) permite utilizar algunos comandos “show” y ver un análisis del resultado de estos comandos.

```
Router1#show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route
```

```
Gateway of last resort is not set
```

```
172.16.0.0/24 is subnetted, 1 subnets
O E2 172.16.1.0 [110/20] via 192.168.0.1, 00:32:54, Virtual-Access1
10.0.0.0/24 is subnetted, 1 subnets
C 10.0.0.0 is directly connected, Ethernet0
192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.0.0/24 is directly connected, Loopback0
C 192.168.0.1/32 is directly connected, Virtual-Access1
```

```
Router1#show ppp multilink
```

```
Virtual-Access1, bundle name is Router2
```

```
! --- Virtualized MP bundle. Bundle name is derived from the username used !--- during
authentication Bundle up for 00:34:48 0 lost fragments, 0 reordered, 0 unassigned 0 discarded, 0
lost received, 1/255 load 0xC8 received sequence, 0xC8 sent sequence Member links: 2 (max not
set, min not set)
```

```
Async9, since 00:34:52, last rcvd seq 0000C6
```

```
Async10, since 00:32:11, last rcvd seq 0000C7
```

```
Router2#show ip route
```

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
        * - candidate default, U - per-user static route, o - ODR
```

P - periodic downloaded static route

Gateway of last resort is not set

```
172.16.0.0/24 is subnetted, 1 subnets
C    172.16.1.0 is directly connected, Ethernet0
10.0.0.0/24 is subnetted, 1 subnets
O E2  10.0.0.0 [110/20] via 192.168.0.2, 00:45:10, Dialer3
192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.0.0/24 is directly connected, Loopback0
C    192.168.0.2/32 is directly connected, Dialer3
```

Router2#show ppp multilink

Virtual-Access1, bundle name is Router1

```
!--- Virtualized MP bundle. Bundle name is derived from the username used !--- during
authentication. Bundle up for 00:35:10 Dialer interface is Dialer3 !--- This Virtual Access
Interface used Interface Dialer3. 0 lost fragments, 0 reordered, 0 unassigned 0 discarded, 0
lost received, 1/255 load 0xC9 received sequence, 0xCA sent sequence  Member links: 2 (max not
set, min not set)
Serial3, since 00:35:10, last rcvd seq 0000C8
Serial2, since 00:32:29, last rcvd seq 0000C7
```

Router1#show caller

Line	User	Service	Active Time	Idle Time
con 0	-	TTY	00:12:03	00:00:00
tty 2	-	TTY	1d08h	00:00:00
tty 4	-	TTY	1d08h	00:00:00
tty 9	Router2	Async	00:43:17	00:00:05
tty 10	Router2	Async	00:40:36	00:00:15

!--- First connection As9 Router2 PPP 00:43:13 - !--- Second connection As10 Router2 PPP
00:40:32 - !--- MP bundle !--- Router2 has two async lines, two TTY, and one virtual interface
bundle. Vi1 Router2 PPP Bundle 00:43:10 00:00:05 Router2#show caller

Line	User	Service	Active Time	Idle Time
con 0	-	TTY	00:11:36	00:00:00
tty 2	Router1	Async	-	00:00:07
tty 3	Router1	Async	-	00:00:18

! --- Second connection Se2 Router1 PPP 00:39:58 - ! --- First connection Se3 Router1 PPP
00:42:39 - ! --- MP bundle ! --- Router1 has two async lines, two TTY, and one virtual interface
bundle. Vi1 Router1 PPP Bundle 00:42:39 00:00:01 Router2#show caller user Router1

```
User: Router1, line tty 2, service Async
Idle time 00:00:16
Timeouts:          Absolute  Idle      Idle
                   Session    Exec
Limits:            -         -         00:10:00
Disconnect in:    -         -         -
TTY: Line 2, running PPP on Se2
Line: Baud rate (TX/RX) is 115200/115200, no parity, 2 stopbits, 8 databits
Status: Ready, Active, Async Interface Active, Modem Detected
Capabilities: Modem Callout, Modem RI is CD,
               Line is permanent async interface, Hangup on Last Close
               Modem Autoconfigure
Modem State: Ready, Modem Configured
```

```
User: Router1, line tty 3, service Async
Idle time 00:00:08
Timeouts:          Absolute  Idle      Idle
                   Session    Exec
Limits:            -         -         00:10:00
Disconnect in:    -         -         -
TTY: Line 3, running PPP on Se3
```

Line: Baud rate (TX/RX) is 115200/115200, no parity, 2 stopbits, 8 databits
Status: Ready, Active, Async Interface Active, Modem Detected
Capabilities: Modem Callout, Modem RI is CD,
Line is permanent async interface, Hangup on Last Close
Modem Autoconfigure
Modem State: Ready, Modem Configured

User: Router1, line Se2, service PPP

Active time 23:14:47, Idle time 00:00:00
Timeouts: Absolute Idle
Limits: - -
Disconnect in: - -
PPP: LCP Open, **multilink Open**, CHAP (local <--> local)
Dialer: Connected to 30116, outbound
Type is IN-BAND ASYNC, group Di3
Cause: Multilink bundle overloaded
IP: Local 192.168.0.1
Bundle: Member of Router1, last input 00:00:01
Counts: 10194 packets input, 769456 bytes, 0 no buffer
0 input errors, 0 CRC, 0 frame, 0 overrun
10247 packets output, 773761 bytes, 0 underruns
0 output errors, 0 collisions, 31 interface resets

User: Router1, line Se3, service PPP

Active time 23:17:30, Idle time 00:00:01
Timeouts: Absolute Idle
Limits: - -
Disconnect in: - -
PPP: LCP Open, **multilink Open**, CHAP (local <--> local)
Dialer: Connected to 30116, outbound
Type is IN-BAND ASYNC, group Di3
Cause: ip (s=192.168.0.1, d=224.0.0.5)
IP: Local 192.168.0.1
Bundle: Member of Router1, last input 00:00:00
Counts: 10432 packets input, 783562 bytes, 0 no buffer
0 input errors, 0 CRC, 0 frame, 0 overrun
10718 packets output, 799155 bytes, 0 underruns
0 output errors, 0 collisions, 41 interface resets

User: Router1, line Vi1, service PPP Bundle

Active time 23:17:30, Idle time 00:00:05
Timeouts: Absolute Idle
Limits: - 00:01:00
Disconnect in: - 00:00:54
!--- Idle-timeout is 60 seconds(1 Minute). PPP: LCP Open, **multilink Open**, IPCP
Dialer: Connected to 30116, outbound
Idle timer 60 secs, idle 6 secs
Type is IN-BAND SYNC, group Di3
IP: Local 192.168.0.1, remote 192.168.0.2
!--- IP address assigned to the bundle !-- and loopback address of the remote router. Bundle:
First link of Router1, 2 links, last input 00:00:07 Counts: 8622 packets input, 623202 bytes, 0
no buffer 0 input errors, 0 CRC, 0 frame, 0 overrun 8776 packets output, 618523 bytes, 0
underruns 0 output errors, 0 collisions, 0 interface resets Router2#**show dialer**

Di3 - dialer type = IN-BAND SYNC NO-PARITY

Load threshold for dialing additional calls is 1

!--- Load threshold Idle timer (60 secs), Fast idle timer (20 secs) Wait for carrier (30 secs),
Re-enable (15 secs) Number of active calls = 2 Dial String Successes Failures Last DNIS Last
status 30114 3 69 00:41:45 successful 30116 4294967293 75 00:44:00 failed Se2 - dialer type =
IN-BAND ASYNC NO-PARITY Rotary group 3, priority 0 *!--- Member of interface dialer 3* Idle timer
(60 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 Connected to 30116 (Router1) *!--- Phone
number that was dialed* Se3 - dialer type = IN-BAND ASYNC NO-PARITY Rotary group 3, priority 0 *!--*

```
-- Member of interface dialer 3 Idle timer (60 secs), Fast idle timer (20 secs) Wait for carrier (30 secs), Re-enable (15 secs) Dialer state is multilink member Dial reason: ip (s=192.168.0.1, d=224.0.0.5) !--- Interface was the first link in the bundle, triggered by OSPF ALL !--- Routers advt packet. Connected to 30116 (Router1) ! --- Phone number that was dialed
```

Troubleshooting

En esta sección encontrará información que puede utilizar para solucionar problemas de configuración.

Los productos siguientes fueron obtenidos del Cisco 2511 y de los Cisco 2503 Router. Muestran el Cisco 2503 que marca a los links PSTN del Cisco 2511 Router y que establece una conexión MP.

```
Router1#debug ppp negotiation
PPP protocol negotiation debugging is on
```

```
Router1#debug vtemplate
Virtual Template debugging is on
```

```
Router1#show debug
PPP:
  PPP protocol negotiation debugging is on
VTEMPLATE:
  Virtual Template debugging is on
```

```
Oct  1 20:15:20.463: As9 LCP: I CONFREQ [Closed] id 81 len 39
Oct  1 20:15:20.463: As9 LCP:   ACCM 0x000A0000 (0x0206000A0000)
Oct  1 20:15:20.467: As9 LCP:   AuthProto CHAP (0x0305C22305)
Oct  1 20:15:20.471: As9 LCP:   MagicNumber 0x57D7985D (0x050657D7985D)
Oct  1 20:15:20.471: As9 LCP:   PFC (0x0702)
Oct  1 20:15:20.475: As9 LCP:   ACFC (0x0802)
Oct  1 20:15:20.479: As9 LCP:   MRRU 1524 (0x110405F4)
Oct  1 20:15:20.479: As9 LCP:   EndpointDisc 1 Router2 (0x130A01526F7574657232)
Oct  1 20:15:20.483: As9 LCP: Lower layer not up, Fast Starting
Oct  1 20:15:20.487: As9 PPP: Treating connection as a dedicated line
Oct  1 20:15:20.487: As9 PPP: Phase is ESTABLISHING, Active Open [0 sess, 0 load]
Oct  1 20:15:20.495: As9 LCP: O CONFREQ [Closed] id 52 len 39
Oct  1 20:15:20.499: As9 LCP:   ACCM 0x000A0000 (0x0206000A0000)
Oct  1 20:15:20.499: As9 LCP:   AuthProto CHAP (0x0305C22305)
Oct  1 20:15:20.503: As9 LCP:   MagicNumber 0x078F2456 (0x0506078F2456)
Oct  1 20:15:20.507: As9 LCP:   PFC (0x0702)
Oct  1 20:15:20.507: As9 LCP:   ACFC (0x0802)
Oct  1 20:15:20.511: As9 LCP:   MRRU 1524 (0x110405F4)
Oct  1 20:15:20.515: As9 LCP:   EndpointDisc 1 Router1 (0x130A01526F7574657231)
Oct  1 20:15:20.519: As9 LCP: O CONFACK [REQsent] id 81 len 39
Oct  1 20:15:20.523: As9 LCP:   ACCM 0x000A0000 (0x0206000A0000)
Oct  1 20:15:20.527: As9 LCP:   AuthProto CHAP (0x0305C22305)
Oct  1 20:15:20.527: As9 LCP:   MagicNumber 0x57D7985D (0x050657D7985D)
Oct  1 20:15:20.531: As9 LCP:   PFC (0x0702)
Oct  1 20:15:20.531: As9 LCP:   ACFC (0x0802)
Oct  1 20:15:20.535: As9 LCP:   MRRU 1524 (0x110405F4)
Oct  1 20:15:20.539: As9 LCP:   EndpointDisc 1 Router2 (0x130A01526F7574657232)
Oct  1 20:15:20.547: %LINK-3-UPDOWN: Interface Async9, changed state to up
Oct  1 20:15:20.695: As9 LCP: I CONFACK [ACKsent] id 52 len 39
Oct  1 20:15:20.699: As9 LCP:   ACCM 0x000A0000 (0x0206000A0000)
Oct  1 20:15:20.703: As9 LCP:   AuthProto CHAP (0x0305C22305)
Oct  1 20:15:20.707: As9 LCP:   MagicNumber 0x078F2456 (0x0506078F2456)
Oct  1 20:15:20.707: As9 LCP:   PFC (0x0702)
Oct  1 20:15:20.711: As9 LCP:   ACFC (0x0802)
```



```
Oct 1 20:15:20.711: As9 LCP: MRRU 1524 (0x110405F4)
Oct 1 20:15:20.715: As9 LCP: EndpointDisc 1 Router1 (0x130A01526F7574657231)
Oct 1 20:15:20.719: As9 LCP: State is Open
Oct 1 20:15:20.723: As9 PPP: Phase is AUTHENTICATING, by both [0 sess, 0 load]
Oct 1 20:15:20.727: As9 CHAP: O CHALLENGE id 45 len 28 from "Router1"
Oct 1 20:15:20.739: As9 CHAP: I CHALLENGE id 40 len 28 from "Router2"
Oct 1 20:15:20.743: As9 CHAP: O RESPONSE id 40 len 28 from "Router1"
Oct 1 20:15:20.899: As9 CHAP: I RESPONSE id 45 len 28 from "Router2"
Oct 1 20:15:20.903: As9 CHAP: I SUCCESS id 40 len 4
Oct 1 20:15:20.919: As9 CHAP: O SUCCESS id 45 len 4
!--- Call is virtualized after authentication Oct 1 20:15:20.923: As9 PPP: Phase is VIRTUALIZED
[0 sess, 1 load]
!--- creation of Virtual access interface 1 Oct 1 20:15:20.935: Vi1 VTEMPLATE: Reuse Vi1,
recycle queue size 0 Oct 1 20:15:20.939: Vi1 VTEMPLATE: Set default settings with ip unnumbered
Oct 1 20:15:21.335: Vi1 VTEMPLATE: Hardware address 0000.0c47.7c6c Oct 1 20:15:21.335: Vi1 PPP:
Phase is DOWN, Setup [0 sess, 1 load] Oct 1 20:15:21.339: Vi1 VTEMPLATE: Has a new cloneblk
vtemplate, now it has vtemplate !--- Banner: Cloning is in progress on virtual access interface
1 Oct 1 20:15:21.347: Vi1 VTEMPLATE: ***** CLONE VACCESS1 ***** Oct 1 20:15:21.351:
Vi1 VTEMPLATE: Clone from Virtual-Templatel
!--- The following configuration of Virtual-template is cloned to the !--- Virtual-access
interface. interface Virtual-Access1 default ip address no ip address encaps ppp ip unnumbered
Loopback0 no ip unnumbered Loopback0 ip addr 192.168.0.2 255.255.255.0 no ip add ip unnumbered
lo 0 ip add 192.168.0.2 255.255.255.0 ip add 192.168.1.2 255.255.255.0 no ip add ip unnumbered
lo 0 end Oct 1 20:15:21.367: As9 IPCP: Packet buffered while building MLP bundle interface Oct 1
20:15:22.319: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async9, changed state to up Oct 1
20:15:23.267: As9 IPCP: Packet buffered while building MLP bundle interface Oct 1 20:15:24.447:
Vi1 VTEMPLATE: Messages from (un)cloning ... 192.168.0.0 overlaps with Loopback0 Oct 1
20:15:24.823: Vi1 VTEMPLATE: Messages from (un)cloning ... 192.168.0.0 overlaps with Loopback0
Oct 1 20:15:24.835: %LINK-3-UPDOWN: Interface Virtual-Access1,
changed state to up
Oct 1 20:15:24.843: Vi1 PPP: Treating connection as a dedicated line
Oct 1 20:15:24.847: Vi1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]
Oct 1 20:15:24.851: Vi1 LCP: O CONFREQ [Closed] id 1 len 29
Oct 1 20:15:24.855: Vi1 LCP: AuthProto CHAP (0x0305C22305)
Oct 1 20:15:24.859: Vi1 LCP: MagicNumber 0x078F3560 (0x0506078F3560)
Oct 1 20:15:24.859: Vi1 LCP: MRRU 1524 (0x110405F4)
Oct 1 20:15:24.863: Vi1 LCP: EndpointDisc 1 Router1 (0x130A01526F7574657231)

Oct 1 20:15:24.879: Vi1 PPP: Phase is UP [0 sess, 1 load]
Oct 1 20:15:24.883: Vi1 IPCP: O CONFREQ [Closed] id 1 len 10
Oct 1 20:15:24.883: Vi1 IPCP: Address 192.168.0.2 (0x0306C0A80002)
! -- Asynchronornous interface 9 is added to the Virtual access interface 1 !--- and the name of
the bundle is Router2. Oct 1 20:15:24.891: Vi1 MLP: Added first link As9 to bundle Router2
Oct 1 20:15:24.891: Vi1 PPP: Pending ncpQ size is 2
Oct 1 20:15:24.895: As9 IPCP: Redirect packet to Vi1
Oct 1 20:15:24.895: Vi1 IPCP: I CONFREQ [REQsent] id 1 len 10
Oct 1 20:15:24.899: Vi1 IPCP: Address 192.168.0.1 (0x0306C0A80001)
Oct 1 20:15:24.903: Vi1 IPCP: O CONFACK [REQsent] id 1 len 10
Oct 1 20:15:24.907: Vi1 IPCP: Address 192.168.0.1 (0x0306C0A80001)
Oct 1 20:15:24.911: As9 IPCP: Redirect packet to Vi1
Oct 1 20:15:24.915: Vi1 IPCP: I CONFREQ [ACKsent] id 2 len 10
Oct 1 20:15:24.919: Vi1 IPCP: Address 192.168.0.1 (0x0306C0A80001)
Oct 1 20:15:24.919: Vi1 IPCP: O CONFACK [ACKsent] id 2 len 10
Oct 1 20:15:24.923: Vi1 IPCP: Address 192.168.0.1 (0x0306C0A80001)
Oct 1 20:15:25.007: Vi1 IPCP: I CONFACK [ACKsent] id 1 len 10
!--- IP address of virtual bundle was previously obtained from the loopback !--- interface. Oct
1 20:15:25.011: Vi1 IPCP: Address 192.168.0.2 (0x0306C0A80002) Oct 1 20:15:25.015: Vi1 IPCP:
State is Open !--- Adds route for virtual bundle to routing table to reach the remote router.
Oct 1 20:15:25.039: Vi1 IPCP: Install route to 192.168.0.1
Oct 1 20:15:25.947: %LINEPROTO-5-UPDOWN: Line protocol on Interface Virtual-Access1,
changed state to up
Oct 1 20:15:31.199: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.0.1 on Virtual-Access1 from
LOADING to FULL, Loading Done
```

Oct 1 20:18:01.439: **As10 LCP: I CONFREQ [Closed] id 61 len 39**
Oct 1 20:18:01.443: As10 LCP: ACCM 0x000A0000 (0x0206000A0000)
Oct 1 20:18:01.447: As10 LCP: AuthProto CHAP (0x0305C22305)
Oct 1 20:18:01.451: As10 LCP: MagicNumber 0x57DA0D94 (0x050657DA0D94)
Oct 1 20:18:01.451: As10 LCP: PFC (0x0702)
Oct 1 20:18:01.455: As10 LCP: ACFC (0x0802)
Oct 1 20:18:01.455: As10 LCP: MRRU 1524 (0x110405F4)
Oct 1 20:18:01.459: As10 LCP: EndpointDisc 1 Router2 (0x130A01526F7574657232)
Oct 1 20:18:01.463: As10 LCP: Lower layer not up, Fast Starting
Oct 1 20:18:01.467: As10 PPP: Treating connection as a dedicated line
Oct 1 20:18:01.467: As10 PPP: Phase is ESTABLISHING, Active Open [0 sess, 0 load]
Oct 1 20:18:01.475: **As10 LCP: O CONFREQ [Closed] id 30 len 39**
Oct 1 20:18:01.475: As10 LCP: ACCM 0x000A0000 (0x0206000A0000)
Oct 1 20:18:01.479: As10 LCP: AuthProto CHAP (0x0305C22305)
Oct 1 20:18:01.483: As10 LCP: MagicNumber 0x0791992D (0x05060791992D)
Oct 1 20:18:01.483: As10 LCP: PFC (0x0702)
Oct 1 20:18:01.487: As10 LCP: ACFC (0x0802)
Oct 1 20:18:01.491: As10 LCP: MRRU 1524 (0x110405F4)
Oct 1 20:18:01.491: As10 LCP: EndpointDisc 1 Router1 (0x130A01526F7574657231)
Oct 1 20:18:01.499: **As10 LCP: O CONFACK [REQsent] id 61 len 39**
Oct 1 20:18:01.503: As10 LCP: ACCM 0x000A0000 (0x0206000A0000)
Oct 1 20:18:01.507: As10 LCP: AuthProto CHAP (0x0305C22305)
Oct 1 20:18:01.507: As10 LCP: MagicNumber 0x57DA0D94 (0x050657DA0D94)
Oct 1 20:18:01.511: As10 LCP: PFC (0x0702)
Oct 1 20:18:01.511: As10 LCP: ACFC (0x0802)
Oct 1 20:18:01.515: As10 LCP: MRRU 1524 (0x110405F4)
Oct 1 20:18:01.519: As10 LCP: EndpointDisc 1 Router2 (0x130A01526F7574657232)
Oct 1 20:18:01.531: %LINK-3-UPDOWN: Interface Async10, changed state to up
Oct 1 20:18:01.703: **As10 LCP: I CONFACK [ACKsent] id 30 len 39**
Oct 1 20:18:01.703: As10 LCP: ACCM 0x000A0000 (0x0206000A0000)
Oct 1 20:18:01.707: As10 LCP: AuthProto CHAP (0x0305C22305)
Oct 1 20:18:01.711: As10 LCP: MagicNumber 0x0791992D (0x05060791992D)
Oct 1 20:18:01.715: As10 LCP: PFC (0x0702)
Oct 1 20:18:01.715: As10 LCP: ACFC (0x0802)
Oct 1 20:18:01.719: As10 LCP: MRRU 1524 (0x110405F4)
Oct 1 20:18:01.723: As10 LCP: EndpointDisc 1 Router1 (0x130A01526F7574657231)
Oct 1 20:18:01.723: **As10 LCP: State is Open**
Oct 1 20:18:01.727: **As10 PPP: Phase is AUTHENTICATING, by both [0 sess, 0 load]**
Oct 1 20:18:01.731: **As10 CHAP: O CHALLENGE id 25 len 28 from "Router1"**
Oct 1 20:18:01.743: **As10 CHAP: I CHALLENGE id 30 len 28 from "Router2"**
Oct 1 20:18:01.755: **As10 CHAP: O RESPONSE id 30 len 28 from "Router1"**
Oct 1 20:18:01.851: **As10 CHAP: I RESPONSE id 25 len 28 from "Router2"**
Oct 1 20:18:01.867: **As10 CHAP: O SUCCESS id 25 len 4**
Oct 1 20:18:01.879: **As10 CHAP: I SUCCESS id 30 len 4**
Oct 1 20:18:01.879: **As10 PPP: Phase is VIRTUALIZED [0 sess, 0 load]**
Oct 1 20:18:01.891: Vi1 MLP: Added link As10 to bundle Router2
Oct 1 20:18:02.899: %LINEPROTO-5-UPDOWN: Line protocol on Interface Async10,
changed state to up
Router1#

Router2#debug ppp negotiation
PPP protocol negotiation debugging is on

Router2#debug ppp multilink events
Multilink events debugging is on

Router2#debug dialer
Dial on demand events debugging is on

Router2#show debug
Dial on demand:
Dial on demand events debugging is on
PPP:
PPP protocol negotiation debugging is on

Multilink events debugging is on

```
Oct 2 20:15:07.442: %SYS-5-CONFIG_I: Configured from console by console
Oct 2 20:15:08.038: %LINK-3-UPDOWN: Interface Dialer3, changed state to up
Oct 2 20:15:08.046: Se3 DDR: rotor dialout [priority]
!--- Dialing Reason Oct 2 20:15:08.050: Se3 DDR: Dialing cause ip (s=192.168.0.1, d=224.0.0.5)
!--- Number being dialed Oct 2 20:15:08.054: Se3 DDR: Attempting to dial 30116
Oct 2 20:15:08.058: CHAT3: Attempting async line dialer script
!--- Using chat script "test" for dialout Oct 2 20:15:08.058: CHAT3: Dialing using Modem script:
test & System script: none Oct 2 20:15:08.066: CHAT3: process started Oct 2 20:15:08.070: CHAT3:
Asserting DTR Oct 2 20:15:08.070: CHAT3: Chat script test started !--- Call being established;
note the time elapsed for call setup. Oct 2 20:15:35.814: CHAT3: Chat script test finished,
status = Success Oct 2 20:15:35.830: Di3 IPCP: Install route to 192.168.0.2 ! -- Physical Layer
(Serial Interface) is up. !--- Only now can PPP negotiation begin. Oct 2 20:15:37.818: %LINK-3-
UPDOWN: Interface Serial3, changed state to up
Oct 2 20:15:37.822: Se3 DDR: Dialer statechange to up
Oct 2 20:15:37.822: Se3 DDR: Dialer call has been placed
!--- PPP negotiation begins Oct 2 20:15:37.826: Se3 PPP: Treating connection as a callout !---
PPP Phase is ESTABLISHING. LCP negotiation will now occur Oct 2 20:15:37.826: Se3 PPP: Phase is
ESTABLISHING, Active Open [0 sess, 0 load] !--- Outgoing CONFREQ with Field ID 81 Oct 2
20:15:37.834: Se3 LCP: O CONFREQ [Closed] id 81 len 39
Oct 2 20:15:37.838: Se3 LCP: ACCM 0x000A0000 (0x0206000A0000)
!--- This router is requesting: ! -- Option: Authentication Protocol, Value: CHAP ! -- Option:
MagicNumber (used to detect loopbacks and is always sent) Oct 2 20:15:37.838: Se3 LCP:
AuthProto CHAP (0x0305C22305)
Oct 2 20:15:37.842: Se3 LCP: MagicNumber 0x57D7985D (0x050657D7985D)
Oct 2 20:15:37.846: Se3 LCP: PFC (0x0702)
Oct 2 20:15:37.846: Se3 LCP: ACFC (0x0802)
! -- Negotiate Maximum Receive Reconstructed Unit (MRRU) ! -- MRRU is the maximum packet size
this end will reconstruct Oct 2 20:15:37.850: Se3 LCP: MRRU 1524 (0x110405F4) Oct 2
20:15:37.854: Se3 LCP: EndpointDisc 1 Router2 (0x130A01526F7574657232) ! -- Incoming CONFREQ. ID
field is 52 Oct 2 20:15:38.162: Se3 LCP: I CONFREQ [REQsent] id 52 len 39 Oct 2 20:15:38.166:
Se3 LCP: ACCM 0x000A0000 (0x0206000A0000) ! -- The peer has requested: ! -- Option:
Authentication Protocol, Value: CHAP ! -- Option: MagicNumber (used to detect loopbacks and is
always sent) Oct 2 20:15:38.166: Se3 LCP: AuthProto CHAP (0x0305C22305) Oct 2 20:15:38.170: Se3
LCP: MagicNumber 0x078F2456 (0x0506078F2456) Oct 2 20:15:38.174: Se3 LCP: PFC (0x0702) Oct 2
20:15:38.174: Se3 LCP: ACFC (0x0802) Oct 2 20:15:38.178: Se3 LCP: MRRU 1524 (0x110405F4) Oct 2
20:15:38.182: Se3 LCP: EndpointDisc 1 Router1 (0x130A01526F7574657231) ! -- Outgoing CONFACK for
message with Field ID 52 Oct 2 20:15:38.186: Se3 LCP: O CONFACK [REQsent] id 52 len 39
Oct 2 20:15:38.190: Se3 LCP: ACCM 0x000A0000 (0x0206000A0000)
Oct 2 20:15:38.194: Se3 LCP: AuthProto CHAP (0x0305C22305)
Oct 2 20:15:38.198: Se3 LCP: MagicNumber 0x078F2456 (0x0506078F2456)
Oct 2 20:15:38.198: Se3 LCP: PFC (0x0702)
Oct 2 20:15:38.202: Se3 LCP: ACFC (0x0802)
Oct 2 20:15:38.202: Se3 LCP: MRRU 1524 (0x110405F4)
Oct 2 20:15:38.206: Se3 LCP: EndpointDisc 1 Router1
(0x130A01526F7574657231)
! -- Incoming CONFACK for message with Field ID 81 Oct 2 20:15:38.214: Se3 LCP: I CONFACK
[ACKsent] id 81 len 39 Oct 2 20:15:38.214: Se3 LCP: ACCM 0x000A0000 (0x0206000A0000) Oct 2
20:15:38.218: Se3 LCP: AuthProto CHAP (0x0305C22305)
Oct 2 20:15:38.222: Se3 LCP: MagicNumber 0x57D7985D (0x050657D7985D)
Oct 2 20:15:38.222: Se3 LCP: PFC (0x0702)
Oct 2 20:15:38.226: Se3 LCP: ACFC (0x0802)
! -- Both sides have CONFACKed the parameters ! -- MRRU of 1524 bytes and the Endpoint
Discriminator have been negotiated Oct 2 20:15:38.230: Se3 LCP: MRRU 1524 (0x110405F4) Oct 2
20:15:38.230: Se3 LCP: EndpointDisc 1 Router2 (0x130A01526F7574657232 ! -- LCP negotiation
complete and LCP state goes to Open Oct 2 20:15:38.234: Se3 LCP: State is Open
! -- PPP Phase is AUTHENTICATING. PPP Authentication occurs now ! -- Two-way authentication will
be performed (indicated by the both keyword) Oct 2 20:15:38.238: Se3 PPP: Phase is
AUTHENTICATING, by both [0 sess, 0 load] ! -- Outgoing CHAP Challenge. ! -- In LCP we had agreed
upon CHAP as the authentication protocol Oct 2 20:15:38.238: Se3 CHAP: O CHALLENGE id 40 len 28
from "Router2" ! -- Incoming Challenge from peer Oct 2 20:15:38.398: Se3 CHAP: I CHALLENGE id 45
len 28 from "Router1" ! -- Incoming response from peer Oct 2 20:15:38.402: Se3 CHAP: I RESPONSE
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id 40 len 28 from "Router1" ! -- Outgoing Response Oct 2 20:15:38.410: Se3 CHAP: O RESPONSE id
45 len 28 from "Router2" ! -- CHAP authentication successful Oct 2 20:15:38.418: Se3 CHAP: O
SUCCESS id 40 len 4 Oct 2 20:15:38.538: Se3 CHAP: I SUCCESS id 45 len 4 Oct 2 20:15:38.542: Se3
MLP: Request add link to bundle ! -- Virtualize Se3 ! -- Virtual Access interface will represent
the MP bundle Oct 2 20:15:38.542: Se3 PPP: Phase is VIRTUALIZED [0 sess, 1 load] Oct 2
20:15:38.546: Se3 MLP: Adding link to bundle Oct 2 20:15:38.550: Vi1 PPP: Phase is DOWN, Setup
[0 sess, 0 load] Oct 2 20:15:38.558: Vi1 PPP: No remote authentication for call-out Oct 2
20:15:38.566: Vi1 MLP: Added to huntgroup Di3 Oct 2 20:15:38.570: Vi1 MLP: Clone from Di3 Oct 2
20:15:38.574: %LINK-3-UPDOWN: Interface Virtual-Access1, changed state to up Oct 2 20:15:38.578:
Vi1 DDR: Dialer statechange to up ! -- Virtual Access Interface is up ! -- Negotiate LCP and PPP
parameters for Virtual-Access Interface Oct 2 20:15:38.582: Vi1 DDR: Dialer call has been placed
Oct 2 20:15:38.586: Vi1 PPP: Treating connection as a callout Oct 2 20:15:38.586: Vi1 PPP: Phase
is ESTABLISHING, Active Open [0 sess, 0 load] Oct 2 20:15:38.594: Vi1 LCP: O CONFREQ [Closed] id
1 len 29 Oct 2 20:15:38.594: Vi1 LCP: AuthProto CHAP (0x0305C22305) Oct 2 20:15:38.598: Vi1 LCP:
MagicNumber 0x57D79B57 (0x050657D79B57) Oct 2 20:15:38.602: Vi1 LCP: MRRU 1524 (0x110405F4) Oct
2 20:15:38.606: Vi1 LCP: EndpointDisc 1 Router2 (0x130A01526F7574657232 Oct 2 20:15:38.614: Vi1
PPP: Phase is UP [0 sess, 0 load] Oct 2 20:15:38.618: Vi1 IPCP: O CONFREQ [Closed] id 1 len 10
Oct 2 20:15:38.622: Vi1 IPCP: Address 192.168.0.1 (0x0306C0A80001) ! -- First multilink
connection is brought up in the virtual access interface Oct 2 20:15:38.626: Vi1 MLP: Added
first link Se3 to bundle Router1
Oct 2 20:15:38.630: Di3 IPCP: Remove route to 192.168.0.2
Oct 2 20:15:39.542: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3,
changed state to up
Oct 2 20:15:39.614: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Virtual-Access1, changed state to up
Oct 2 20:15:40.614: Vi1 IPCP: TIMEOUT: State REQsent
Oct 2 20:15:40.618: Vi1 IPCP: O CONFREQ [REQsent] id 2 len 10
Oct 2 20:15:40.618: Vi1 IPCP: Address 192.168.0.1 (0x0306C0A80001)
Oct 2 20:15:41.046: Vi1 MLP: Load (1) above threshold in bundle Router1
Oct 2 20:15:41.046: Se2 DDR: rotor dialout [priority]
Oct 2 20:15:41.050: Se2 DDR: Attempting to dial 30116
Oct 2 20:15:41.054: CHAT2: Attempting async line dialer script
Oct 2 20:15:41.054: CHAT2: Dialing using Modem script:
test & System script: none
Oct 2 20:15:41.062: CHAT2: process started
Oct 2 20:15:41.066: CHAT2: Asserting DTR
Oct 2 20:15:41.066: CHAT2: Chat script test started
Oct 2 20:15:42.506: Vi1 IPCP: I CONFREQ [REQsent] id 1 len 10
Oct 2 20:15:42.510: Vi1 IPCP: Address 192.168.0.2 (0x0306C0A80002)
Oct 2 20:15:42.514: Vi1 IPCP: O CONFACK [REQsent] id 1 len 10
Oct 2 20:15:42.518: Vi1 IPCP: Address 192.168.0.2 (0x0306C0A80002)
Oct 2 20:15:42.530: Vi1 IPCP: I CONFACK [ACKsent] id 1 len 10
Oct 2 20:15:42.534: Vi1 IPCP: Address 192.168.0.1 (0x0306C0A80001)
Oct 2 20:15:42.538: Vi1 IPCP: ID 1 didn't match 2, discarding packet
Oct 2 20:15:42.546: Vi1 IPCP: I CONFACK [ACKsent] id 2 len 10
Oct 2 20:15:42.550: Vi1 IPCP: Address 192.168.0.1 (0x0306C0A80001)
Oct 2 20:15:42.554: Vi1 IPCP: State is Open
Oct 2 20:15:42.562: Vi1 DDR: dialer protocol up
Oct 2 20:15:42.570: Vi1 DDR: Call connected, 4 packets unqueued,
4 transmitted 0 discarded
! -- Adds route for virtual bundle to routing table to reach the remote router Oct 2
20:15:42.582: Di3 IPCP: Install route to 192.168.0.2 Oct 2 20:15:48.714: %OSPF-5-ADJCHG:
Process 1, Nbr 192.168.0.2 on Dialer3
from LOADING to FULL, Loading Done
Oct 2 20:17:41.070: CHAT2: Chat script test finished, status = Connection timed
out; remote host not responding
Oct 2 20:17:41.074: Se2 DDR: disconnecting call
Oct 2 20:17:56.074: Se2 DDR: re-enable timeout
Oct 2 20:17:56.074: Se2 DDR: Attempting to dial 30114
Oct 2 20:17:56.078: CHAT2: Attempting async line dialer script
Oct 2 20:17:56.078: CHAT2: Dialing using Modem script: test & System script:
none
Oct 2 20:17:56.086: CHAT2: process started
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Oct  2 20:17:56.090: CHAT2: Asserting DTR
Oct  2 20:17:56.090: CHAT2: Chat script test started
! -- Call is being established; note the time elapsed for call setup Oct  2 20:18:16.890: CHAT2:
Chat script test finished, status = Success Oct  2 20:18:18.894: %LINK-3-UPDOWN: Interface
Serial2, changed state to up
Oct  2 20:18:18.898: Se2 DDR: Dialer statechange to up
Oct  2 20:18:18.898: Se2 DDR: Dialer call has been placed
! -- PPP negotiation begins Oct  2 20:18:18.902: Se2 PPP: Treating connection as a callout Oct  2
20:18:18.906: Se2 PPP: Phase is ESTABLISHING, Active Open [0 sess, 0 load] ! -- LCP negotiation
begins; Multilink parameters are also negotiated Oct  2 20:18:18.910: Se2 LCP: O CONFREQ [Closed]
id 61 len 39 Oct  2 20:18:18.914: Se2 LCP: ACCM 0x000A0000 (0x0206000A0000) Oct  2 20:18:18.918:
Se2 LCP: AuthProto CHAP (0x0305C22305) Oct  2 20:18:18.918: Se2 LCP: MagicNumber 0x57DA0D94
(0x050657DA0D94) Oct  2 20:18:18.922: Se2 LCP: PFC (0x0702) Oct  2 20:18:18.926: Se2 LCP: ACFC
(0x0802) ! -- Negotiate Maximum Receive Reconstructed Unit (MRRU) ! -- MRRU is the maximum
packet size this end will reconstruct Oct  2 20:18:18.926: Se2 LCP: MRRU 1524 (0x110405F4) Oct  2
20:18:18.930: Se2 LCP: EndpointDisc 1 Router2 (0x130A01526F7574657232) Oct  2 20:18:19.142: Se2
LCP: I CONFREQ [REQsent] id 30 len 39
Oct  2 20:18:19.146: Se2 LCP: ACCM 0x000A0000 (0x0206000A0000)
Oct  2 20:18:19.146: Se2 LCP: AuthProto CHAP (0x0305C22305)
Oct  2 20:18:19.150: Se2 LCP: MagicNumber 0x0791992D (0x05060791992D)
Oct  2 20:18:19.154: Se2 LCP: PFC (0x0702)
Oct  2 20:18:19.154: Se2 LCP: ACFC (0x0802)
Oct  2 20:18:19.158: Se2 LCP: MRRU 1524 (0x110405F4)
Oct  2 20:18:19.162: Se2 LCP: EndpointDisc 1 Router1
(0x130A01526F7574657231)
Oct  2 20:18:19.166: Se2 LCP: O CONFACK [REQsent] id 30 len 39
Oct  2 20:18:19.170: Se2 LCP: ACCM 0x000A0000 (0x0206000A0000)
Oct  2 20:18:19.174: Se2 LCP: AuthProto CHAP (0x0305C22305)
Oct  2 20:18:19.174: Se2 LCP: MagicNumber 0x0791992D (0x05060791992D)
Oct  2 20:18:19.178: Se2 LCP: PFC (0x0702)
Oct  2 20:18:19.178: Se2 LCP: ACFC (0x0802)
Oct  2 20:18:19.182: Se2 LCP: MRRU 1524 (0x110405F4)
Oct  2 20:18:19.186: Se2 LCP: EndpointDisc 1 Router1
(0x130A01526F7574657231)
Oct  2 20:18:19.194: Se2 LCP: I CONFACK [ACKsent] id 61 len 39
Oct  2 20:18:19.198: Se2 LCP: ACCM 0x000A0000 (0x0206000A0000)
Oct  2 20:18:19.198: Se2 LCP: AuthProto CHAP (0x0305C22305)
Oct  2 20:18:19.202: Se2 LCP: MagicNumber 0x57DA0D94 (0x050657DA0D94)
Oct  2 20:18:19.206: Se2 LCP: PFC (0x0702)
Oct  2 20:18:19.206: Se2 LCP: ACFC (0x0802)
Oct  2 20:18:19.210: Se2 LCP: MRRU 1524 (0x110405F4)
Oct  2 20:18:19.214: Se2 LCP: EndpointDisc 1 Router2
(0x130A01526F7574657232)
Oct  2 20:18:19.214: Se2 LCP: State is Open
Oct  2 20:18:19.218: Se2 PPP: Phase is AUTHENTICATING, by both [0 sess, 0 load]
Oct  2 20:18:19.222: Se2 CHAP: O CHALLENGE id 30 len 28 from "Router2"
Oct  2 20:18:19.358: Se2 CHAP: I CHALLENGE id 25 len 28 from "Router1"
Oct  2 20:18:19.362: Se2 CHAP: O RESPONSE id 25 len 28 from "Router2"
Oct  2 20:18:19.382: Se2 CHAP: I RESPONSE id 30 len 28 from "Router1"
Oct  2 20:18:19.390: Se2 CHAP: O SUCCESS id 30 len 4
Oct  2 20:18:19.482: Se2 CHAP: I SUCCESS id 25 len 4
Oct  2 20:18:19.486: Se2 MLP: Request add link to bundle
Oct  2 20:18:19.486: Se2 PPP: Phase is VIRTUALIZED [0 sess, 0 load]
!--- Virtualize Se2 !--- Virtual Access interface will represent the MP bundle Oct  2
20:18:19.490: Se2 MLP: Adding link to bundle
!--- Second multilink connection is virtualized and added to Virtual !--- access interface. Oct
2 20:18:19.494: Se2 IPCP: Route to 192.168.0.2 still needed by Vi1 Oct  2 20:18:19.498: DDR: MLP
bundle, 0 packets unqueued and discarded Oct  2 20:18:19.498: Vi1 MLP: Added link Se2 to bundle
Router1 Oct  2 20:18:20.482: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2,
changed state to up

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[Comandos para resolución de problemas](#)

La herramienta [Output Interpreter](#) (sólo para clientes [registrados](#)) permite utilizar algunos comandos “show” y ver un análisis del resultado de estos comandos.

Note: Antes de ejecutar un comando debug, consulte Información Importante sobre Comandos Debug.

- **haga el debug de la negociación ppp** - Para ver si un cliente está pasando la negociación PPP; este commnad se utiliza para marcar para saber si hay negociación de dirección.
- **debug ppp authentication** – Para ver si un cliente se autentica correctamente. Si usted está utilizando una versión de Cisco IOS Software antes de 11.2, utilice el comando debug ppp chap en lugar de otro.
- **debug ppp error** - Para visualizar los errores del protocolo y la estadística de errore se asoció a la negociación y a la operación de la conexión PPP.
- **debug vtemplate** – Para visualizar la clonación de plantilla virtual para formar una interfaz de acceso virtual.
- **debug ppp multilink events**: se utiliza para observar la depuración de los eventos de enlaces múltiples del PPP. Visualiza la información sobre los eventos que afectan a los grupos multilink.
- **debug dialer** – Para mostrar la información de depuración sobre los paquetes recibidos en una interfaz del marcador.
- **llamador de la demostración** - Estadísticas de las visualizaciones o información sobre las conexiones del debug.
- **show dialer** – Muestra información general de diagnóstico para interfaces configuradas para DDR.
- **caller user de la demostración** - Visualiza la lista cuyo el usuario está utilizando que puerto del módem.
- **show ppp multilink** - para ver a los miembros del agrupamiento de enlaces múltiples.

[Información Relacionada](#)

- [Configurar el NAS para el Acceso por marcación básica](#)
- [Configuración de hubs Legacy DDR](#)
- [Visualizar las estadísticas de la parte llamadora](#)
- [RFC 1717 del Multilink PPP del RFC 1717 del Multilink PPP](#)
- [Configuración de DDR par a par con perfiles del marcador](#)
- [Páginas de soporte de la tecnología de acceso](#)
- [Soporte Técnico - Cisco Systems](#)