

# Multilink via modelo virtual em duas interfaces seriais

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## [Introdução](#)

A conexão PPP multilink (MLP, Multilink PPP) equilibra a carga sobre as interfaces do discador, como interfaces ISDN, síncronas e assíncronas. A conexão MLP divide pacotes e envia os fragmentos por circuitos paralelos. Dessa forma, melhora a produtividade e reduz a latência entre sistemas. A conexão MLP fornece um método para dividir, recombinar e sequenciar datagramas entre vários links de dados lógicos. O MLP permite que os pacotes se fragmentem, e que os fragmentos sejam enviados simultaneamente por vários links ponto a ponto ao mesmo endereço remoto.

Este documento ilustra uma conexão Multilink entre interfaces seriais através da configuração de modelo virtual.

## [Pré-requisitos](#)

### [Requisitos](#)

Não existem requisitos específicos para este documento.

### [Componentes Utilizados](#)

As informações neste documento são baseadas nestas versões de software e hardware:

- Software Cisco IOS® versão 11.2 ou posterior.
- Dois roteadores Cisco 2503, cada um com duas interfaces WAN seriais. Esses roteadores executam o software Cisco IOS Release 12.2(7b).

As informações neste documento foram criadas a partir de dispositivos em um ambiente de laboratório específico. Todos os dispositivos utilizados neste documento foram iniciados com uma configuração (padrão) inicial. Se a sua rede estiver ativa, certifique-se de que entende o impacto potencial de qualquer comando.

## [Produtos Relacionados](#)

Essa configuração também pode ser usada com essas versões de hardware e software.

- Qualquer par de roteadores que tenham duas interfaces WAN seriais. É possível usar WIC-1T, WIC-2T e interfaces WAN seriais fixas.

## [Convenções](#)

Consulte as [Convenções de Dicas Técnicas da Cisco](#) para obter mais informações sobre convenções de documentos.

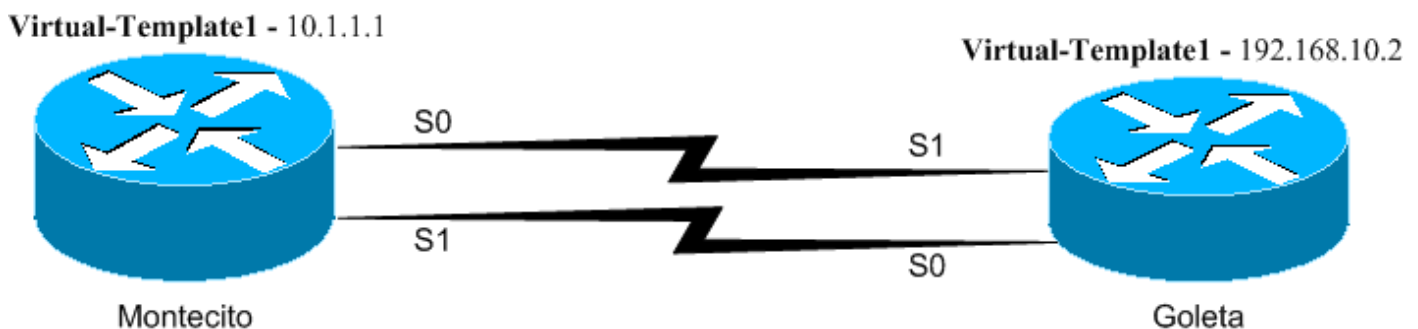
## [Configurar](#)

Nesta seção, você encontrará informações para configurar os recursos descritos neste documento.

**Nota:** Use a ferramenta [Command Lookup Tool](#) ([apenas para clientes registrados](#)) para obter mais informações sobre os comandos usados neste documento.

## [Diagrama de Rede](#)

Este documento utiliza a seguinte configuração de rede:



Os Roteadores Montecito e Goleta estão conectados back-to-back por meio das interfaces Serial0 e Serial1. Essa configuração usa um Modelo Virtual de cada lado, o Point-to-Point Protocol (PPP) Multilink e interliga e roteia o IP e o IPX entre os roteadores.

## [Configurações](#)

Este documento utiliza as seguintes configurações:

- [Montecito](#)
- [Goleta](#)

### Montecito

```
Montecito#write terminal Building configuration...
Current configuration : 945 bytes ! version 12.2 service
timestamps debug uptime service timestamps log uptime no
service password-encryption ! hostname Montecito ! boot
system flash c2500-d-1.122-7b.bin no logging buffered !
ip subnet-zero no ip domain-lookup ! ! multilink
virtual-template 1 !--- Applies the virtual interface
template to the multilink bundle. !--- All multilink
calls have virtual-access interfaces cloned !--- from
virtual-template 1. ! ipx routing 0000.0c31.aac2 !
interface Loopback0 ip address 10.1.1.1 255.0.0.0 ipx
network BEEF ! interface Ethernet0 no ip address
shutdown ! ! !--- Virtual-template is a logical
interface that creates virtual access !--- interfaces
dynamically, and applies them to physical serial
interfaces. interface Virtual-Template1 !--- Assumes the
IP & IPX address of Loopback0. ip unnumbered Loopback0
ipx ppp-client Loopback0 ppp multilink !--- Enables
Multilink PPP on the interface. bridge-group 1 !
interface Serial0 no ip address encapsulation ppp no ip
route-cache no ip mroute-cache no fair-queue !---
Enables Multilink PPP on the interface. ppp multilink !
interface Serial1 no ip address encapsulation ppp no ip
route-cache no ip mroute-cache no fair-queue !---
Enables Multilink PPP on the interface. ppp multilink !
interface BRI0 no ip address shutdown ! no ip classless
! bridge 1 protocol ieee ! line con 0 line aux 0 line
vty 0 4 login ! end
```

### Goleta

```
Goleta#write terminal Building configuration... Current
configuration : 960 bytes version 12.2 service
timestamps debug uptime service timestamps log uptime no
service password-encryption ! hostname Goleta ! ! ip
subnet-zero no ip domain-lookup ! ! !--- Applies the
virtual interface template to the multilink bundle. !---
Skip this step for ISDN or dialer interfaces. multilink
virtual-template 1 ipx routing 0000.0c47.4e9a ! ! !
interface Loopback0 ip address 192.168.10.2
255.255.255.0 ipx network BEEF ! interface Ethernet0 no
ip address shutdown ! !--- Virtual-template is a logical
interface that Creates virtual access !--- interfaces
dynamically and applies them to physical serial
interfaces. interface Virtual-Template1 !--- Assumes the
IP & IPX address of Loopback0. ip unnumbered Loopback0
ipx ppp-client Loopback0 ! !--- Enables Multilink PPP on
the interface. ppp multilink bridge-group 1 ! interface
Serial0 no ip address encapsulation ppp no fair-queue
clockrate 1000000 ! !--- Enables Multilink PPP on the
interface. ppp multilink ! interface Serial1 no ip
address encapsulation ppp no fair-queue clockrate
1000000 ! !--- Enables Multilink PPP on the interface.
ppp multilink ! interface BRI0 no ip address shutdown !
ip classless ! bridge 1 protocol ieee ! line con 0 line
aux 0 line vty 0 4 ! end
```

## Verificar

Use esta seção para confirmar se a sua configuração funciona corretamente.

A [Output Interpreter Tool \(apenas para clientes registrados\)](#) (OIT) suporta determinados comandos show. Use a OIT para exibir uma análise da saída do comando show.

- **show ppp multilink** — mostra informações sobre grupos multilink ativos. Use esse comando para verificar a conexão multilink.
- **show interface virtual-access** — mostra o status, dados do tráfego e informações de configuração sobre uma interface específica de acesso virtual.
- **show interface serial** — permite que você resolva qualquer problema com a interface serial

## Exemplo de saída de show

### Comandos show no Montecito após a Conexão ser Feita

```
Montecito#show interface virtual-access 1 Virtual-Access1 is up, line protocol is up Hardware is
Virtual Access interface Interface is unnumbered. Using address of Loopback0 (10.1.1.1) MTU 1500
bytes, BW 3088 Kbit, DLY 100000 usec, reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set Keepalive set (10 sec) DTR is pulsed for 5 seconds on reset
LCP Open, multilink Open Open: BRIDGECP, IPCP, IPXCP Last input 00:00:00, output never, output
hang never Last clearing of "show interface" counters 00:02:09 Input queue: 0/75/0/0
(size/max/drops/flushes); Total output drops: 0 Queueing strategy: fifo Output queue :0/40
(size/max) 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0
packets/sec 22 packets input, 743 bytes, 0 no buffer Received 0 broadcasts, 0 runts, 0 giants, 0
throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort 8 packets output, 124
bytes, 0 underruns 0 output errors, 0 collisions, 0 interface resets 0 output buffer failures, 0
output buffers swapped out 0 carrier transitions Montecito#show interface serial 0 Serial0 is
up, line protocol is up Hardware is HD64570 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255 Encapsulation PPP, loopback not set Keepalive
set (10 sec) LCP Open, multilink Open Last input 00:00:00, output 00:00:06, output hang never
Last clearing of "show interface" counters 02:04:30 Input queue: 0/75/0/0
(size/max/drops/flushes); Total output drops: 0 Queueing strategy: fifo Output queue :0/40
(size/max) 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0
packets/sec 3320 packets input, 107170 bytes, 0 no buffer Received 0 broadcasts, 0 runts, 0
giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort 1483 packets
output, 24622 bytes, 0 underruns 0 output errors, 0 collisions, 6 interface resets 0 output
buffer failures, 0 output buffers swapped out 8 carrier transitions DCD=up DSR=up DTR=up RTS=up
CTS=up Montecito#show interface serial 1 Serial1 is up, line protocol is up Hardware is HD64570
MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set Keepalive set (10 sec) LCP Open, multilink Open Last input
00:00:00, output 00:00:00, output hang never Last clearing of "show interface" counters 02:04:32
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0 Queueing strategy: fifo
Output queue :0/40 (size/max) 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate
0 bits/sec, 0 packets/sec 3320 packets input, 107161 bytes, 0 no buffer Received 0 broadcasts, 0
runts, 0 giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort 1482
packets output, 24646 bytes, 0 underruns 0 output errors, 0 collisions, 6 interface resets 0
output buffer failures, 0 output buffers swapped out 8 carrier transitions DCD=up DSR=up DTR=up
RTS=up CTS=up Montecito#show ppp multilink Virtual-Access1, bundle name is Goleta Bundle up for
00:01:39 0 lost fragments, 0 reordered, 0 unassigned 0 discarded, 0 lost received, 1/255 load
0x3D received sequence, 0xB sent sequence Member links: 2 (max not set, min not set) Serial1,
since 00:01:40, last rcvd seq 00003C Serial0, since 00:01:39, last rcvd seq 00003B
Montecito#show bridge group Bridge Group 1 is running the IEEE compatible Spanning Tree protocol
Port 10 (Virtual-Access1) of bridge group 1 is forwarding Port 9 (Virtual-Template1) of bridge
group 1 is down Montecito#
```

### Comandos show no Goleta após a Conexão ser Feita

```
Goleta#show interface virtual-access 1 Virtual-Access1 is up, line protocol is up Hardware is
Virtual Access interface Interface is unnumbered. Using address of Loopback0 (192.168.10.2) MTU
1500 bytes, BW 3088 Kbit, DLY 100000 usec, reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set Keepalive set (10 sec) DTR is pulsed for 5 seconds on reset
LCP Open, multilink Open Open: BRIDGECP, IPCP, IPXCP Last input 00:00:10, output never, output
hang never Last clearing of "show interface" counters 00:02:18 Input queue: 0/75/0/0
(size/max/drops/flushes); Total output drops: 0 Queueing strategy: fifo Output queue :0/40
(size/max) 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0
packets/sec 4 packets input, 52 bytes, 0 no buffer Received 0 broadcasts, 0 runts, 0 giants, 0
throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort 28 packets output, 892
bytes, 0 underruns 0 output errors, 0 collisions, 0 interface resets 0 output buffer failures, 0
output buffers swapped out 0 carrier transitions Goleta#show interface serial 0 Serial0 is up,
line protocol is up Hardware is HD64570 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255 Encapsulation PPP, loopback not set Keepalive
set (10 sec) LCP Open, multilink Open Last input 01:52:28, output 00:00:00, output hang never
Last clearing of "show interface" counters 02:55:09 Input queue: 0/75/0/0
(size/max/drops/flushes); Total output drops: 0 Queueing strategy: fifo Output queue :0/40
(size/max) 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0
packets/sec 2364 packets input, 41972 bytes, 0 no buffer Received 0 broadcasts, 0 runts, 0
giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort 4465 packets
output, 134689 bytes, 0 underruns 0 output errors, 0 collisions, 148 interface resets 0 output
buffer failures, 0 output buffers swapped out 294 carrier transitions DCD=up DSR=up DTR=up
RTS=up CTS=up Goleta#show interface serial 1 Serial1 is up, line protocol is up Hardware is
HD64570 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, reliability 255/255, txload 1/255, rxload
1/255 Encapsulation PPP, loopback not set Keepalive set (10 sec) LCP Open, multilink Open Last
input 01:52:38, output 00:00:00, output hang never Last clearing of "show interface" counters
02:55:18 Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0 Queueing
strategy: fifo Output queue :0/40 (size/max) 5 minute input rate 0 bits/sec, 0 packets/sec 5
minute output rate 0 bits/sec, 0 packets/sec 2366 packets input, 42030 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun,
0 ignored, 0 abort 4472 packets output, 134930 bytes, 0 underruns 0 output errors, 0 collisions,
147 interface resets 0 output buffer failures, 0 output buffers swapped out 289 carrier
transitions DCD=up DSR=up DTR=up RTS=up CTS=up Goleta#sh ppp multilink Virtual-Access1, bundle
name is Montecito Bundle up for 00:01:35 0 lost fragments, 0 reordered, 0 unassigned 0
discarded, 0 lost received, 1/255 load 0xB received sequence, 0x3B sent sequence Member links: 2
(max not set, min not set) Serial0, since 00:01:36, last rcvd seq 00000A Serial1, since
00:01:35, last rcvd seq 000009 Goleta#show bridge group Bridge Group 1 is running the IEEE
compatible Spanning Tree protocol Port 10 (Virtual-Access1) of bridge group 1 is forwarding Port
9 (Virtual-Template1) of bridge group 1 is down
```

## [Troubleshooting](#)

Use esta seção para resolver problemas de configuração.

### [Troubleshooting de Recursos](#)

Use estes recursos para troubleshooting quando necessário:

- [Troubleshooting Problemas de Linha Serial](#)
- [Conexões back-to-back HDLC](#)
- Resolução de problemas de linhas alugadas

### [Comandos para Troubleshooting](#)

A [Output Interpreter Tool \(apenas para clientes registrados\)](#) (OIT) suporta determinados comandos show. Use a OIT para exibir uma análise da saída do comando show.

**Nota:** Consulte [Informações Importantes sobre Comandos de Depuração](#) antes de usar

## comandos debug.

- **debug ppp negotiation** — indica se um cliente passa a negociação PPP. Também verifica a negociação de endereços.
- **debug ppp authentication** — indica se um cliente passa a autenticação. Use esse comando se você usa o software Cisco IOS Release 11.2 ou versões mais recentes.
- **debug ppp chap** — indica se um cliente passa a autenticação. Use esse comando se você usa uma release do software Cisco IOS anterior à 11.2.
- **debug ppp error** — mostra erros de protocolo e estatísticas de erros associados à negociação e à operação da conexão PPP.
- **debug vtemplate** — permite que você veja as configurações do modelo virtual que estão sendo usadas.
- **debug vprofile** — permite que você veja as opções de configuração aplicadas à interface de acesso virtual.

## Exemplo de debug

Aqui estão algumas saídas de depuração para chamadas bem-sucedidas. Preste atenção às seções com **fonte em negrito**. Compare a saída que você obtém com o resultado mostrado aqui:

## deparações de PPP em Montecito

```
Montecito#debug ppp negotiation PPP protocol negotiation debugging is on Montecito# 00:07:30:
%LINK-3-UPDOWN: Interface Serial1, changed state to up 00:07:30: Se1 PPP: Treating connection as
a dedicated line 00:07:30: Se1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 2 load]
00:07:30: Se1 LCP: O CONFREQ [Closed] id 4 len 26 00:07:30: Se1 LCP: MagicNumber 0x6063D57E
(0x05066063D57E) 00:07:30: Se1 LCP: MRRU 1524 (0x110405F4) 00:07:30: Se1 LCP: EndpointDisc 1
Montecito (0x130C014D6F6E74656369746F) 00:07:30: Se1 LCP: I CONFREQ [REQsent] id 101 len 23
00:07:30: Se1 LCP: MagicNumber 0x60944B81 (0x050660944B81) 00:07:30: Se1 LCP: MRRU 1524
(0x110405F4) 00:07:30: Se1 LCP: EndpointDisc 1 Goleta (0x130901476F6C657461) 00:07:30: Se1 LCP:
O CONFACK [REQsent] id 101 len 23 00:07:30: Se1 LCP: MagicNumber 0x60944B81 (0x050660944B81)
00:07:30: Se1 LCP: MRRU 1524 (0x110405F4) 00:07:30: Se1 LCP: EndpointDisc 1 Goleta
(0x130901476F6C657461) 00:07:30: Se1 LCP: I CONFACK [ACKsent] id 4 len 26 00:07:30: Se1 LCP:
MagicNumber 0x6063D57E (0x05066063D57E) 00:07:30: Se1 LCP: MRRU 1524 (0x110405F4) 00:07:30: Se1
LCP: EndpointDisc 1 Montecito (0x130C014D6F6E74656369746F) 00:07:30: Se1 LCP: State is Open
00:07:30: Se1 PPP: Phase is VIRTUALIZED [0 sess, 1 load] 00:07:31: Vi1 PPP: Phase is DOWN, Setup
[0 sess, 0 load] 00:07:31: Vi1 PPP: Phase is ESTABLISHING [0 sess, 0 load] 00:07:31: %LINK-3-
UPDOWN: Interface Serial0, changed state to up 00:07:31: Se0 PPP: Treating connection as a
dedicated line 00:07:31: Se0 PPP: Phase is ESTABLISHING, Active Open [0 sess, 0 load] 00:07:31:
Se0 LCP: O CONFREQ [Closed] id 4 len 26 00:07:31: Se0 LCP: MagicNumber 0x6063D8DC
(0x05066063D8DC) 00:07:31: Se0 LCP: MRRU 1524 (0x110405F4) 00:07:31: Se0 LCP: EndpointDisc 1
Montecito (0x130C014D6F6E74656369746F) 00:07:31: %LINK-3-UPDOWN: Interface Virtual-Access1,
changed state to up 00:07:31: Vi1 PPP: Treating connection as a dedicated line 00:07:31: Vi1
LCP: O CONFREQ [Closed] id 1 len 26 00:07:31: Vi1 LCP: MagicNumber 0x6063D8F9 (0x05066063D8F9)
00:07:31: Vi1 LCP: MRRU 1524 (0x110405F4) 00:07:31: Vi1 LCP: EndpointDisc 1 Montecito
(0x130C014D6F6E74656369746F) 00:07:31: Vi1 PPP: Phase is UP [0 sess, 0 load] 00:07:31: Vi1 BNCP:
O CONFREQ [Closed] id 1 len 4 00:07:31: Vi1 IPCP: O CONFREQ [Closed] id 1 len 10 00:07:31: Vi1
IPCP: Address 10.1.1.1 (0x03060A010101) 00:07:31: Vi1 IPXCP: O CONFREQ [Closed] id 1 len 18
00:07:31: Vi1 IPXCP: Network 0x0000BEEF (0x01060000BEEF) 00:07:31: Vi1 IPXCP: Node
0000.0c31.aac2 (0x020800000c31AAC2) 00:07:31: Vi1 MLP: Added first link Se1 to bundle Goleta
00:07:31: Se0 LCP: I CONFREQ [REQsent] id 101 len 23 00:07:31: Se0 LCP: MagicNumber 0x60944EF7
(0x050660944EF7) 00:07:31: Se0 LCP: MRRU 1524 (0x110405F4) 00:07:31: Se0 LCP: EndpointDisc 1
Goleta (0x130901476F6C657461) 00:07:31: Se0 LCP: O CONFACK [REQsent] id 101 len 23 00:07:31: Se0
LCP: MagicNumber 0x60944EF7 (0x050660944EF7) 00:07:31: Se0 LCP: MRRU 1524 (0x110405F4) 00:07:31:
Se0 LCP: EndpointDisc 1 Goleta (0x130901476F6C657461) 00:07:31: Se1 BNCP: MLP bundle interface
is built, process packets now 00:07:31: Se1 BNCP: Redirect packet to Vi1 00:07:31: Vi1 BNCP: I
```

```
CONFREQ [REQsent] id 1 len 4 00:07:31: Vi1 BNCP: O CONFACK [REQsent] id 1 len 4 00:07:31: Vi1
IPCP: I CONFREQ [REQsent] id 1 len 10 00:07:31: Vi1 IPCP: Address 192.168.10.2 (0x0306C0A80A02)
00:07:31: Vi1 IPCP: O CONFACK [REQsent] id 1 len 10 00:07:31: Vi1 IPCP: Address 192.168.10.2
(0x0306C0A80A02) 00:07:31: Vi1 IPXCP: I CONFREQ [REQsent] id 1 len 18 00:07:31: Vi1 IPXCP:
Network 0x0000BEEF (0x01060000BEEF) 00:07:31: Vi1 IPXCP: Node 0000.0c47.4e9a
(0x020800000C474E9A) 00:07:31: Vi1 IPXCP: O CONFACK [REQsent] id 1 len 18 00:07:31: Vi1 IPXCP:
Network 0x0000BEEF (0x01060000BEEF) 00:07:31: Vi1 IPXCP: Node 0000.0c47.4e9a
(0x020800000C474E9A) 00:07:31: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1, changed
state to up 00:07:31: Se0 LCP: I CONFACK [ACKsent] id 4 len 26 00:07:31: Se0 LCP: MagicNumber
0x6063D8DC (0x05066063D8DC) 00:07:31: Se0 LCP: MRRU 1524 (0x110405F4) 00:07:31: Se0 LCP:
EndpointDisc 1 Montecito (0x130C014D6F6E74656369746F) 00:07:31: Se0 LCP: State is Open 00:07:31:
Se0 PPP: Phase is VIRTUALIZED [0 sess, 2 load] 00:07:31: Vi1 MLP: Added link Se0 to bundle
Goleta 00:07:31: Vi1 BNCP: I CONFACK [ACKsent] id 1 len 4 00:07:31: Vi1 BNCP: State is Open
00:07:31: Vi1 IPCP: I CONFACK [ACKsent] id 1 len 10 00:07:31: Vi1 IPCP: Address 10.1.1.1
(0x03060A010101) 00:07:31: Vi1 IPCP: State is Open 00:07:31: Vi1 IPXCP: I CONFACK [ACKsent] id 1
len 18 00:07:31: Vi1 IPXCP: Network 0x0000BEEF (0x01060000BEEF) 00:07:31: Vi1 IPXCP: Node
0000.0c31.aac2 (0x020800000C31AAC2) 00:07:31: Vi1 IPXCP: State is Open 00:07:31: Vi1 IPCP:
Install route to 192.168.10.2 00:07:32: %LINEPROTO-5-UPDOWN: Line protocol on Interface Virtual-
Access1, changed state to up 00:07:32: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0,
changed state to up Montecito# Montecito#ping 192.168.10.2 Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.2, timeout is 2 seconds: !!!!! Success rate is 100
percent (5/5), round-trip min/avg/max = 8/9/12 ms Montecito#ping ipx Target IPX address:
BEEF.0000.0c47.4e9a Repeat count [5]: Datagram size [100]: Timeout in seconds [2]: Verbose [n]:
Type escape sequence to abort. Sending 5, 100-byte IPX Novell Echoes to BEEF.0000.0c47.4e9a,
timeout is 2 seconds: !!!!! Success rate is 100 percent (5/5), round-trip min/avg/max = 8/10/12
ms Montecito#
```

## Debugação de PPP no Goleta

```
Goleta#debug ppp negotiation PPP protocol negotiation debugging is on Goleta# 01:00:26: Se0 PPP:
Treating connection as a dedicated line 01:00:26: Se0 PPP: Phase is ESTABLISHING, Active Open [0
sess, 0 load] 01:00:26: Se0 LCP: O CONFREQ [Closed] id 101 len 23 01:00:26: Se0 LCP: MagicNumber
0x60944B81 (0x050660944B81) 01:00:26: Se0 LCP: MRRU 1524 (0x110405F4) 01:00:26: Se0 LCP:
EndpointDisc 1 Goleta (0x130901476F6C657461) 01:00:26: Se0 LCP: I CONFREQ [REQsent] id 4 len 26
01:00:26: Se0 LCP: MagicNumber 0x6063D57E (0x05066063D57E) 01:00:26: Se0 LCP: MRRU 1524
(0x110405F4) 01:00:26: Se0 LCP: EndpointDisc 1 Montecito (0x130C014D6F6E74656369746F) 01:00:26:
Se0 LCP: O CONFACK [REQsent] id 4 len 26 01:00:26: Se0 LCP: MagicNumber 0x6063D57E
(0x05066063D57E) 01:00:26: Se0 LCP: MRRU 1524 (0x110405F4) 01:00:26: Se0 LCP: EndpointDisc 1
Montecito (0x130C014D6F6E74656369746F) 01:00:26: Se0 LCP: I CONFACK [ACKsent] id 101 len 23
01:00:26: Se0 LCP: MagicNumber 0x60944B81 (0x050660944B81) 01:00:26: Se0 LCP: MRRU 1524
(0x110405F4) 01:00:26: Se0 LCP: EndpointDisc 1 Goleta (0x130901476F6C657461) 01:00:26: Se0 LCP:
State is Open 01:00:26: Se0 PPP: Phase is VIRTUALIZED [0 sess, 0 load] 01:00:26: Vi1 PPP: Phase
is DOWN, Setup [0 sess, 0 load] 01:00:26: Vi1 PPP: Phase is ESTABLISHING [0 sess, 0 load]
01:00:27: %LINK-3-UPDOWN: Interface Serial1, changed state to up 01:00:27: Se1 PPP: Treating
connection as a dedicated line 01:00:27: Se1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 0
load] 01:00:27: Se1 LCP: O CONFREQ [Closed] id 101 len 23 01:00:27: Se1 LCP: MagicNumber
0x60944EF7 (0x050660944EF7) 01:00:27: Se1 LCP: MRRU 1524 (0x110405F4) 01:00:27: Se1 LCP:
EndpointDisc 1 Goleta (0x130901476F6C657461) 01:00:27: %LINK-3-UPDOWN: Interface Virtual-
Access1, changed state to up 01:00:27: Vi1 PPP: Treating connection as a dedicated line
01:00:27: Vi1 LCP: O CONFREQ [Closed] id 1 len 23 01:00:27: Vi1 LCP: MagicNumber 0x60944F10
(0x050660944F10) 01:00:27: Vi1 LCP: MRRU 1524 (0x110405F4) 01:00:27: Vi1 LCP: EndpointDisc 1
Goleta (0x130901476F6C657461) 01:00:27: Vi1 PPP: Phase is UP [0 sess, 0 load] 01:00:27: Vi1
BNCP: O CONFREQ [Closed] id 1 len 4 01:00:27: Vi1 IPCP: O CONFREQ [Closed] id 1 len 10 01:00:27:
Vi1 IPCP: Address 192.168.10.2 (0x0306C0A80A02) 01:00:27: Vi1 IPXCP: O CONFREQ [Closed] id 1 len
18 01:00:27: Vi1 IPXCP: Network 0x0000BEEF (0x01060000BEEF) 01:00:27: Vi1 IPXCP: Node
0000.0c47.4e9a (0x020800000C474E9A) 01:00:27: Vi1 MLP: Added first link Se0 to bundle Montecito
01:00:27: Se1 LCP: I CONFREQ [REQsent] id 4 len 26 01:00:27: Se1 LCP: MagicNumber 0x6063D8DC
(0x05066063D8DC) 01:00:27: Se1 LCP: MRRU 1524 (0x110405F4) 01:00:27: Se1 LCP: EndpointDisc 1
Montecito (0x130C014D6F6E74656369746F) 01:00:27: Se1 LCP: O CONFACK [REQsent] id 4 len 26
01:00:27: Se1 LCP: MagicNumber 0x6063D8DC (0x05066063D8DC) 01:00:27: Se1 LCP: MRRU 1524
(0x110405F4) 01:00:27: Se1 LCP: EndpointDisc 1 Montecito (0x130C014D6F6E74656369746F) 01:00:27:
Se0 BNCP: MLP bundle interface is built, process packets now 01:00:27: Se0 BNCP: Redirect packet
to Vi1 01:00:27: Vi1 BNCP: I CONFREQ [REQsent] id 1 len 4 01:00:27: Vi1 BNCP: O CONFACK
```

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[REQsent] id 1 len 4 01:00:27: Se0 IPCP: MLP bundle interface is built, process packets now
01:00:27: Se0 IPCP: Redirect packet to Vi1 01:00:27: Vi1 IPCP: I CONFREQ [REQsent] id 1 len 10
01:00:27: Vi1 IPCP: Address 10.1.1.1 (0x03060A010101) 01:00:27: Vi1 IPCP: O CONFACK [REQsent] id
1 len 10 01:00:27: Vi1 IPCP: Address 10.1.1.1 (0x03060A010101) 01:00:27: Se0 IPXCP: MLP bundle
interface is built, process packets now 01:00:27: Se0 IPXCP: Redirect packet to Vi1 01:00:27:
Vi1 IPXCP: I CONFREQ [REQsent] id 1 len 18 01:00:27: Vi1 IPXCP: Network 0x0000BEEF
(0x01060000BEEF) 01:00:27: Vi1 IPXCP: Node 0000.0c31.aac2 (0x020800000C31AAC2) 01:00:27: Vi1
IPXCP: O CONFACK [REQsent] id 1 len 18 01:00:27: Vi1 IPXCP: Network 0x0000BEEF (0x01060000BEEF)
01:00:27: Vi1 IPXCP: Node 0000.0c31.aac2 (0x020800000C31AAC2) 01:00:27: %LINEPROTO-5-UPDOWN:
Line protocol on Interface Serial0, changed state to up 01:00:27: Se1 LCP: I CONFACK [ACKsent]
id 101 len 23 01:00:27: Se1 LCP: MagicNumber 0x60944EF7 (0x050660944EF7) 01:00:27: Se1 LCP: MRRU
1524 (0x110405F4) 01:00:27: Se1 LCP: EndpointDisc 1 Goleta (0x130901476F6C657461) 01:00:27: Se1
LCP: State is Open 01:00:27: Se1 PPP: Phase is VIRTUALIZED [0 sess, 4 load] 01:00:27: Vi1 BNCP:
I CONFACK [ACKsent] id 1 len 4 01:00:27: Vi1 BNCP: State is Open 01:00:27: Vi1 MLP: Added link
Se1 to bundle Montecito 01:00:27: Vi1 IPCP: I CONFACK [ACKsent] id 1 len 10 01:00:27: Vi1 IPCP:
Address 192.168.10.2 (0x0306C0A80A02) 01:00:27: Vi1 IPCP: State is Open 01:00:27: Vi1 IPXCP: I
CONFACK [ACKsent] id 1 len 18 01:00:27: Vi1 IPXCP: Network 0x0000BEEF (0x01060000BEEF) 01:00:27:
Vi1 IPXCP: Node 0000.0c47.4e9a (0x020800000C474E9A) 01:00:27: Vi1 IPXCP: State is Open 01:00:27:
Vi1 IPCP: Install route to 10.1.1.1 01:00:28: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Virtual-Access1, changed state to up 01:00:28: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Serial1, changed state to up Goleta# Goleta#ping 10.1.1.1 Type escape sequence to abort. Sending
5, 100-byte ICMP Echos to 10.1.1.1, timeout is 2 seconds: !!!!! Success rate is 100 percent
(5/5), round-trip min/avg/max = 8/10/12 ms Goleta#ping ipx Target IPX address:
BEEF.0000.0c31.aac2 Repeat count [5]: Datagram size [100]: Timeout in seconds [2]: Verbose [n]:
Type escape sequence to abort. Sending 5, 100-byte IPX Novell Echoes to BEEF.0000.0c31.aac2,
timeout is 2 seconds: !!!!! Success rate is 100 percent (5/5), round-trip min/avg/max = 8/10/12
ms
```

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