示例配置 - 使用多链路 PPP 的反向 MUX 应用程序

目录

简介

在某些环境中，可能需要将多个串行链路进行捆绑以作为具有聚合带宽的单个链路。本文档介绍如何配置 Cisco 4500 路由器，以使用一个虚拟模板接口对四个串行接口进行链路捆绑。

此配置可用于通过租用线路连接的路由器，或用于具有信道服务单元/数据服务单元 (CSU/DSU) 的路由器。您可以根据需要向此配置中添加其他功能。

先决条件

要求

本文档没有任何特定的要求。

使用的组件

本文档中的信息基于以下软件和硬件版本。

- 实验室环境中带有原始配置的 Cisco 4500 路由器。
- Cisco IOS® 版本 12.2(10b) 在两台路由器上都运行。

本文档中的信息都是基于特定实验室环境中的设备创建的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您是在真实网络上操作，请确保您在使用任何命令前已经了解其潜在影响。

相关产品

此配置也可用于下列硬件和软件版本。

- 任意两台路由器，其中每台服务器带有四个串行接口。
- 可使用 WIC-1T 和 WIC-2T 串行接口。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

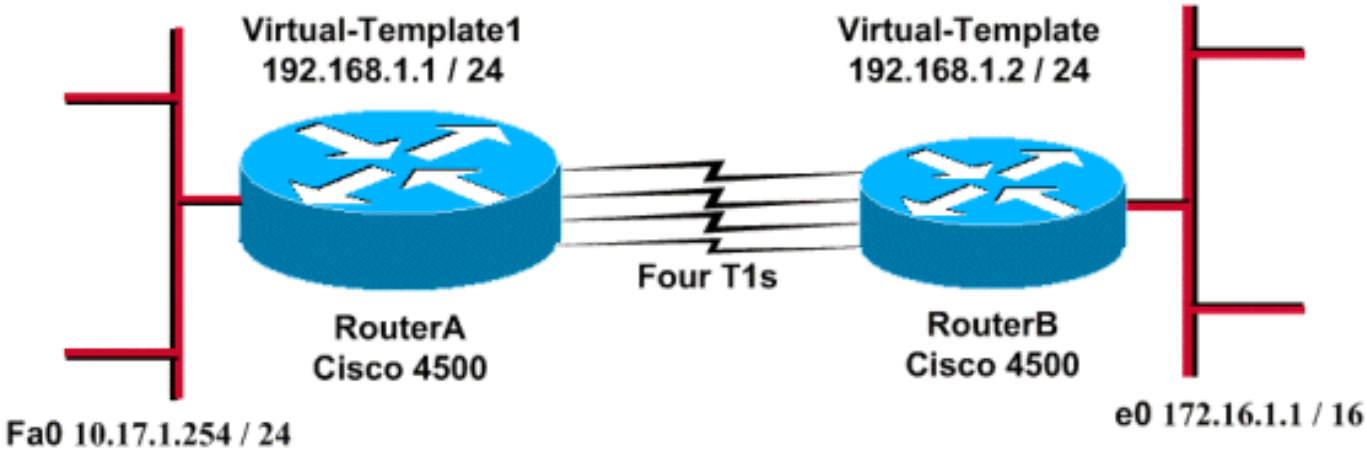
配置

本部分提供有关如何配置本文档所述功能的信息。

注意： 要查找本文档所用命令的其他信息，请使用命令查找工具（仅限注册用户）。

网络图

本文档使用下图所示的网络设置。



配置

曾在 4500 系列路由器上使用 Cisco IOS 软件版本 12.2(10b) 对此配置进行过测试。相同的配置概念同样适用于类似的路由器拓扑或其他 Cisco IOS 版本。

本文档使用如下所示的配置。

路由器A

`version 12.2`
`!`
`hostname RouterA`
`!`
`!`
`username RouterB password xxx`

```
ip subnet-zero
multilink virtual-template 1
!
interface loopback 0
ip address 192.168.1.1 255.255.255.0
!
interface Virtual-Template1
 ip unnumbered loopback0
 ppp authentication chap
 ppp multilink
!
interface Serial0
 no ip address
 encapsulation ppp
 no fair-queue
 ppp multilink
 pulse-time 3
!
interface Serial1
 no ip address
 encapsulation ppp
 no fair-queue
 ppp multilink
 pulse-time 3
!
interface Serial2
 no ip address
 encapsulation ppp
 no fair-queue
 ppp multilink
 pulse-time 3
!
interface Serial3
 no ip address
 encapsulation ppp
 no fair-queue
 ppp multilink
 pulse-time 3
!
interface FastEthernet0
 ip address 10.17.1.254 255.255.255.0
!
router rip
network 10.0.0.0
network 192.168.1.0
!
end
```

路由器B

```
version 12.2
!
hostname RouterB
!
username RouterA password xxx
ip subnet-zero
multilink virtual-template 1
!
interface loopback 0
ip address 192.168.1.2 255.255.255.0
!
!
interface Virtual-Template1
 ip unnumbered loopback0
 ppp authentication chap
```

```
 ppp multilink
!
interface Serial0
 no ip address
 encapsulation ppp
 no fair-queue
 ppp multilink
 pulse-time 3
!
interface Serial1
 no ip address
 encapsulation ppp
 no fair-queue
 ppp multilink
 pulse-time 3
!
interface Serial2
 no ip address
 encapsulation ppp
 no fair-queue
 ppp multilink
 pulse-time 3
!
interface Serial3
 no ip address
 encapsulation ppp
 no fair-queue
 ppp multilink
 pulse-time 3
!
interface Ethernet0
 ip address 172.16.1.1 255.255.0.0
!
router rip
network 172.16.0.0
network 192.168.1.0
!
end
```

配置以下内容以实施上面的配置：

- 多链路虚拟模板
- 接口虚拟模板
- 必须进行捆绑的每个串行接口中的 PPP 多链路。
- RIP 作为 IP 路由协议

配置 interface loopback 0 以确保绝不会发生故障，并且 **ip unnumbered loopback 0** 通过同一 IP 地址来增强 5 个以上串行接口的捆绑。

当所有串行接口都运行时，将会发送用户流量，多链路 PPP 创建一个虚拟访问接口，并发生 PPP 协商。将从虚拟模板来克隆此虚拟访问接口的配置。在此虚拟访问接口中对正在运行的串行接口进行捆绑，并生成一个聚合带宽。

验证

本部分所提供的信息可用于确认您的配置是否正常工作。

命令输出解释程序工具（仅限注册用户）支持某些 **show** 命令，使用此工具可以查看对 show 命令输出的分析。

- show ip route
- show ip rip database
- show ppp multilink
- show interface virtual-access 1

RouterA#**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 R 172.16.0.0/16 [120/1] via 192.168.1.2, 00:00:19, Virtual-Access1 10.0.0.0/24 is subnetted, 1 subnets C 10.17.1.0 is directly connected, FastEthernet0 192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks C 192.168.1.0/24 is directly connected, Loopback0 **C 192.168.1.2/32 is directly connected, Virtual-Access1** RouterA#**show ip route connected** 10.0.0.0/24 is subnetted, 1 subnets C 10.17.1.0 is directly connected, FastEthernet0 192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks C 192.168.1.0/24 is directly connected, Loopback0 **C 192.168.1.2/32 is directly connected, Virtual-Access1** RouterB#**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 C 172.16.0.0/16 is directly connected, Ethernet0 R 10.0.0.0/8 [120/1] via 192.168.1.1, 00:00:18, Virtual-Access1 192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks **C 192.168.1.1/32 is directly connected, Virtual-Access1** C 192.168.1.0/24 is directly connected, Loopback0 RouterB#**show ip route connected** C 172.16.0.0/16 is directly connected, Ethernet0 192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks **C 192.168.1.1/32 is directly connected, Virtual-Access1** C 192.168.1.0/24 is directly connected, Loopback0 RouterA#**show ip rip database** 10.0.0.0/8 auto-summary 10.17.1.0/24 directly connected, FastEthernet0 172.16.0.0/16 auto-summary **172.16.0.0/16 [1] via 192.168.1.2, 00:00:34, Virtual-Access1** 192.168.1.0/24 auto-summary 192.168.1.0/24 directly connected, Loopback0 192.168.1.2/32 directly connected, Virtual-Access1 RouterB#**show ip rip database** 10.0.0.0/8 auto-summary **10.0.0.0/8 [1] via 192.168.1.1, 00:00:13, Virtual-Access** 1172.16.0.0/16 auto-summary 172.16.0.0/16 directly connected, Ethernet0 192.168.1.0/24 auto-summary 192.168.1.0/24 directly connected, Loopback0 192.168.1.1/32 directly connected, Virtual-Access1 RouterA#**show ppp multilink** Virtual-Access1, bundle name is RouterB Bundle up for 17:01:59 0 lost fragments, 0 reordered, 0 unassigned 0 discarded, 0 lost received, 1/255 load 0xD3C received sequence, 0x1180 sent sequence **Member links: 4 (max not set, min not set) Serial0, since 17:01:59, last rcvd seq 000D38 Serial1, since 17:01:50, last rcvd seq 000D39 Serial2, since 17:01:46, last rcvd seq 000D3A Serial3, since 17:01:41, last rcvd seq 000D3B** RouterB#**show ppp multilink** Virtual-Access1, bundle name is RouterA Bundle up for 12:47:33 0 lost fragments, 0 reordered, 0 unassigned 0 discarded, 0 lost received, 1/255 load 0x1186 received sequence, 0xD40 sent sequence **Member links: 4 (max not set, min not set) Serial0, since 12:47:33, last rcvd seq 001184 Serial1, since 12:47:27, last rcvd seq 001185 Serial2, since 12:47:23, last rcvd seq 001182 Serial3, since 12:47:20, last rcvd seq 001183** RouterA#**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 (192.168.1.1) MTU 1500 bytes, BW 6176 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: IPCP** Last input 00:00:00, output never, output hang never Last clearing of "show interface" counters 17:05:41 Queueing strategy: fifo Output queue 0/40, 0 drops; input queue 0/75, 0 drops 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0 packets/sec 1711 packets input, 163898 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 2256 packets output, 211897 bytes, 0 underruns 0 output errors, 0 collisions, 0 interface resets 0 output buffer failures, 0 output buffers swapped out 0 carrier transitions RouterB#**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 (192.168.1.2) MTU 1500 bytes, BW 6176 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: IPCP** Last input 00:00:20, output never, output hang never Last clearing of "show interface" counters 12:54:17 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 2256 packets input, 216460 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 1714 packets
output, 160624 bytes, 0 underruns 0 output errors, 0 collisions, 0 interface resets 0 output
buffer failures, 0 output buffers swapped out 0 carrier transitions
```

故障排除

本部分提供的信息可用于对配置进行故障排除。

故障排除命令

命令输出解释程序工具（仅限注册用户）支持某些 **show** 命令，使用此工具可以查看对 show 命令输出的分析。

注意： 在发出 **debug** 命令之前，请参阅有关 Debug 命令的重要信息。

- **debug ppp negotiation** - 用于查看客户端是否正在传递 PPP 协商；此命令用于检查地址协商。
- **debug ppp authentication** -看见客户端可以是否通过认证。如果您使用的是 11.2 之前的 Cisco IOS 软件版本，请改用 **debug ppp chap** 命令。
- **debug ppp error** - 显示和PPP连接协商与操作相关的协议错误以及统计错误。
- **debug vtemplate** - 用于显示虚拟模板克隆以形成虚拟访问接口。
- **debug ppp multilink events** - 用于查看 PPP 多链路事件调试。显示与影响多链路组的事件有关的信息。
- **show ppp multilink** - 用于查看多链路捆绑的成员。

以下输出是从 Cisco 4500 路由器获得的。这些输出显示路由器正在建立多链路 PPP 连接。

```
RouterA#debug vtemplate Virtual Template debugging is on *Dec 1 17:24:16.519: Vi1 VTEMPLATE:
Reuse Vi1, recycle queue size 0 *Dec 1 17:24:16.519: Vi1 VTEMPLATE: Set default settings with ip
unnumbered *Dec 1 17:24:16.539: Vi1 VTEMPLATE: Hardware address 00d0.bbfa.f579 *Dec 1
17:24:16.543: Vi1 VTEMPLATE: Has a new cloneblk vtemplate, now it has vtemplate *Dec 1
17:24:16.543: Vi1 VTEMPLATE: ********** CLONE VACCESS1 ********** *Dec 1 17:24:16.543: Vi1
VTEMPLATE: Clone from Virtual-Template1 interface Virtual-Access1 default ip address no ip
address encap ppp ip unnumbered loopback0 end *Dec 1 17:24:16.595: %LINK-3-UPDOWN: Interface
Virtual-Access1, changed state to up *Dec 1 17:24:17.515: %LINEPROTO-5-UPDOWN: Line protocol on
Interface Serial0, changed state to up *Dec 1 17:24:17.595: %LINEPROTO-5-UPDOWN: Line protocol
on Interface Virtual-Access1, changed state to up RouterA#debug ppp negotiation PPP protocol
negotiation debugging is on Dec 11 19:39:14.523: %LINK-5-CHANGED: Interface Serial0, changed
state to reset Dec 11 19:39:14.523: Se0 LCP: State is Closed Dec 11 19:39:14.627: %SYS-5-
CONFIG_I: Configured from console by console Dec 11 19:39:16.523: %LINK-3-UPDOWN: Interface
Serial0, changed state to up Dec 11 19:39:16.523: Se0 PPP: Treating connection as a dedicated
line Dec 11 19:39:16.523: Se0 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load] Dec 11
19:39:16.523: Se0 LCP: O CONFREQ [Closed] id 25 len 24 Dec 11 19:39:16.523: Se0 LCP: MagicNumber
0xD4CBA693 (0x0506D4CBA693) Dec 11 19:39:16.523: Se0 LCP: MRRU 1524 (0x110405F4) Dec 11
19:39:16.523: Se0 LCP: EndpointDisc 1 RouterA (0x130A01506F6D65726F6C) Dec 11 19:39:16.535: Se0
LCP: I CONFREQ [REQsent] id 33 len 25 Dec 11 19:39:16.535: Se0 LCP: MagicNumber 0x03200E36
(0x050603200E36) Dec 11 19:39:16.535: Se0 LCP: MRRU 1524 (0x110405F4) Dec 11 19:39:16.539: Se0
LCP: EndpointDisc 1 RouterB (0x130B0150756C6C69676E79) Dec 11 19:39:16.539: Se0 LCP: O CONFACK
[REQsent] id 33 len 25 Dec 11 19:39:16.539: Se0 LCP: MagicNumber 0x03200E36 (0x050603200E36) Dec
11 19:39:16.539: Se0 LCP: MRRU 1524 (0x110405F4) Dec 11 19:39:16.539: Se0 LCP: EndpointDisc 1
RouterB (0x130B0150756C6C69676E79) Dec 11 19:39:16.539: Se0 LCP: I CONFACK [ACKsent] id 25 len
24 Dec 11 19:39:16.539: Se0 LCP: MagicNumber 0xD4CBA693 (0x0506D4CBA693) Dec 11 19:39:16.539:
Se0 LCP: MRRU 1524 (0x110405F4) Dec 11 19:39:16.543: Se0 LCP: EndpointDisc 1 RouterA
(0x130A01506F6D65726F6C) Dec 11 19:39:16.543: Se0 LCP: State is Open Dec 11 19:39:16.543: Se0
PPP: Phase is VIRTUALIZED [0 sess, 1 load] Dec 11 19:39:16.555: Vi1 PPP: Phase is DOWN, Setup [0
sess, 1 load] Dec 11 19:39:16.587: %LINK-3-UPDOWN: Interface Virtual-Access1, changed state to
up Dec 11 19:39:16.587: Vi1 PPP: Treating connection as a dedicated line Dec 11 19:39:16.587:
Vi1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load] Dec 11 19:39:16.587: Vi1 LCP: O
```

CONFREQ [Closed] id 1 len 29 Dec 11 19:39:16.587: Vi1 LCP: AuthProto CHAP (0x0305C22305) Dec 11 19:39:16.587: Vi1 LCP: MagicNumber 0xD4CBA6D4 (0x0506D4CBA6D4) Dec 11 19:39:16.587: Vi1 LCP: MRRU 1524 (0x110405F4) Dec 11 19:39:16.587: Vi1 LCP: EndpointDisc 1 RouterA (0x130A01506F6D65726F6C) Dec 11 19:39:16.587: **Vi1 PPP: Phase is UP [0 sess, 1 load]** Dec 11 19:39:16.591: Vi1 IPCP: O CONFREQ [Closed] id 1 len 10 Dec 11 19:39:16.591: Vi1 IPCP: Address 192.168.1.1 (0x0306C0A80101) Dec 11 19:39:16.591: **Vi1 MLP: Added first link Se0 to bundle RouterB** Dec 11 19:39:16.623: Vi1 IPCP: I CONFREQ [REQsent] id 1 len 10 Dec 11 19:39:16.623: Vi1 IPCP: Address 192.168.1.2 (0x0306C0A80102) Dec 11 19:39:16.623: Vi1 IPCP: O CONFACK [REQsent] id 1 len 10 Dec 11 19:39:16.623: Vi1 IPCP: Address 192.168.1.2 (0x0306C0A80102) Dec 11 19:39:16.623: Vi1 IPCP: I CONFACK [ACKsent] id 1 len 10 Dec 11 19:39:16.627: Vi1 IPCP: Address 192.168.1.1 (0x0306C0A80101) Dec 11 19:39:16.627: **Vi1 IPCP: State is Open** Dec 11 19:39:16.627: **Vi1 IPCP: Install route to 192.168.1.2** Dec 11 19:39:17.543: **%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed state to up** Dec 11 19:39:17.587: **%LINEPROTO-5-UPDOWN: Line protocol on Interface Virtual-Access1, changed state to up** RouterB#**debug ppp negotiation PPP protocol negotiation debugging is on** Dec 11 19:38:08.975: **Se0 LCP: I CONFREQ [Closed] id 25 len 24** Dec 11 19:38:08.975: Se0 LCP: MagicNumber 0xD4CBA693 (0x0506D4CBA693) Dec 11 19:38:08.975: Se0 LCP: MRRU 1524 (0x110405F4) Dec 11 19:38:08.975: Se0 LCP: EndpointDisc 1 RouterA (0x130A01506F6D65726F6C) Dec 11 19:38:08.975: Se0 LCP: Lower layer not up, Fast Starting Dec 11 19:38:08.975: Se0 PPP: Treating connection as a dedicated line Dec 11 19:38:08.979: **Se0 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]** Dec 11 19:38:08.979: **Se0 LCP: O CONFREQ [Closed] id 33 len 25** Dec 11 19:38:08.979: Se0 LCP: MagicNumber 0x03200E36 (0x050603200E36) Dec 11 19:38:08.979: Se0 LCP: MRRU 1524 (0x110405F4) Dec 11 19:38:08.979: Se0 LCP: EndpointDisc 1 RouterB (0x130B0150756C6C69676E79) Dec 11 19:38:08.979: **Se0 LCP: O CONFACK [REQsent] id 25 len 24** Dec 11 19:38:08.979: Se0 LCP: MagicNumber 0xD4CBA693 (0x0506D4CBA693) Dec 11 19:38:08.979: Se0 LCP: MRRU 1524 (0x110405F4) Dec 11 19:38:08.979: Se0 LCP: EndpointDisc 1 RouterA (0x130A01506F6D65726F6C) Dec 11 19:38:08.979: **%LINK-3-UPDOWN: Interface Serial0, changed state to up** Dec 11 19:38:08.987: **Se0 LCP: I CONFACK [ACKsent] id 33 len 25** Dec 11 19:38:08.987: Se0 LCP: MagicNumber 0x03200E36 (0x050603200E36) Dec 11 19:38:08.987: Se0 LCP: MRRU 1524 (0x110405F4) Dec 11 19:38:08.987: Se0 LCP: EndpointDisc 1 RouterB (0x130B0150756C6C69676E79) Dec 11 19:38:08.987: **Se0 LCP: State is Open** Dec 11 19:38:08.987: Se0 PPP: Phase is VIRTUALIZED [0 sess, 1 load] Dec 11 19:38:08.999: Vi1 PPP: Phase is DOWN, Setup [0 sess, 1 load] Dec 11 19:38:09.039: Se0 IPCP: Packet buffered while building MLP bundle interface Dec 11 19:38:09.043: **%LINK-3-UPDOWN: Interface Virtual-Access1, changed state to up** Dec 11 19:38:09.043: Vi1 PPP: Treating connection as a dedicated line Dec 11 19:38:09.043: Vi1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load] Dec 11 19:38:09.043: Vi1 LCP: O CONFREQ [Closed] id 1 len 30 Dec 11 19:38:09.043: Vi1 LCP: AuthProto CHAP (0x0305C22305) Dec 11 19:38:09.043: Vi1 LCP: MagicNumber 0x03200E78 (0x050603200E78) Dec 11 19:38:09.043: Vi1 LCP: MRRU 1524 (0x110405F4) Dec 11 19:38:09.043: Vi1 LCP: EndpointDisc 1 RouterB (0x130B0150756C6C69676E79) Dec 11 19:38:09.043: **Vi1 PPP: Phase is UP [0 sess, 1 load]** Dec 11 19:38:09.043: Vi1 IPCP: O CONFREQ [Closed] id 1 len 10 Dec 11 19:38:09.043: Vi1 IPCP: Address 192.168.1.2 (0x0306C0A80102) Dec 11 19:38:09.047: **Vi1 MLP: Added first link Se0 to bundle RouterA** Dec 11 19:38:09.047: Vi1 PPP: Pending ncpQ size is 1 Dec 11 19:38:09.047: Se0 IPCP: Redirect packet to Vi1 Dec 11 19:38:09.047: Vi1 IPCP: I CONFREQ [REQsent] id 1 len 10 Dec 11 19:38:09.047: Vi1 IPCP: Address 192.168.1.1 (0x0306C0A80101) Dec 11 19:38:09.047: Vi1 IPCP: O CONFACK [REQsent] id 1 len 10 Dec 11 19:38:09.047: Vi1 IPCP: Address 192.168.1.1 (0x0306C0A80101) Dec 11 19:38:09.051: Vi1 IPCP: I CONFACK [ACKsent] id 1 len 10 Dec 11 19:38:09.051: Vi1 IPCP: Address 192.168.1.2 (0x0306C0A80102) Dec 11 19:38:09.051: **Vi1 IPCP: State is Open** Dec 11 19:38:09.051: **Vi1 IPCP: Install route to 192.168.1.1** Dec 11 19:38:09.987: **%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed state to up** Dec 11 19:38:10.043: **%LINEPROTO-5-UPDOWN: Line protocol on Interface Virtual-Access1, changed state to up** RouterB#**debug ppp multilink events** Multilink events debugging is on Dec 11 19:41:30.239: **%LINK-3-UPDOWN: Interface Serial0, changed state to up** Dec 11 19:41:30.243: Se0 MLP: Request add link to bundle Dec 11 19:41:30.243: **Se0 MLP: Adding link to bundle** Dec 11 19:41:30.255: **Vi1 MLP: VP: Clone from Vtemplate 1 block=1** Dec 11 19:41:30.299: **%LINK-3-UPDOWN: Interface Virtual-Access1, changed state to up** Dec 11 19:41:30.299: **Vi1 MLP: Added first link Se0 to bundle RouterA** Dec 11 19:41:31.243: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed state to up Dec 11 19:41:31.243: Se0 MLP: cdp packet forwarded to wrong interface Dec 11 19:41:31.299: %LINEPROTO-5-UPDOWN: **Line protocol on Interface Virtual-Access1, changed state to up**

相关信息

- 显示呼叫方统计信息

- 多链路 PPP RFC 1717
- 配置带有拨号配置文件的点到点DDR
- WAN 技术支持页
- 技术支持 - Cisco Systems