

# 使用Dialer Watch配置BRI ISDN 备份

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## 简介

本文档演示如何使用ISDN基本速率接口(BRI)线路使用拨号器监视功能备份租用线路、WAN或串行连接。有关Dialer Watch的功能和操作的详细信息，请参阅[评估备份接口、浮动静态路由和DDR备份的Dialer Watch](#)。

## 开始使用前

### 规则

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

### 先决条件

配置DDR备份介入二不同步骤：

1. 配置DDR以传统DDR或拨号配置文件。在实施备份配置前验证您的DDR连接正常工作。这允许您在配置备份之前验证所使用的拨号方法、点对点协议(PPP)协商和身份验证是否成功。
2. 当主链路发生故障时，请配置路由器首次备份DDR连接。此配置使用拨号器监视功能来触发拨出。

有关配置备份所需步骤的详细信息，请参阅文档[配置DDR备份并排除故障](#)。

## 使用的组件

本文档中的信息基于以下软件和硬件版本。

- 两台运行Cisco IOS的Cisco 2500路由器（帧中继DTE）？软件版本12.2(3)和12.2(5)。
- 一台Cisco 4500路由器，充当帧中继交换机（未显示配置）。

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。

## 背景理论

本示例使用拨号程序配置文件作为备用BRI链路。您还可以使用传统按需拨号路由(DDR)，该路由使用dialer map命令进行备份BRI连接。有关使用拨号器映射配置拨号器监视的详细信息，请[参阅使用BRI和拨号器监视配置DDR备份](#)。

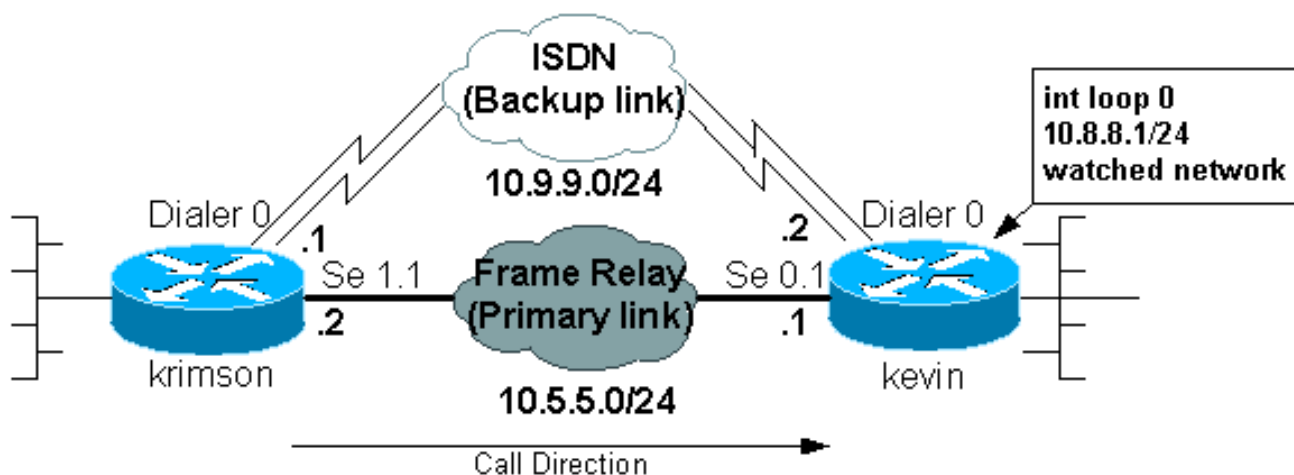
## 配置

本部分提供有关如何配置本文档所述功能的信息。

**注意：**要查找有关本文档中使用的命令的其他信息，请使用命令查找工具

## 网络图

本文档使用下图所示的网络设置。



## 配置

本文档使用如下所示的配置。

- [krimson \(Cisco 2500 路由器\)](#)
- [kevin\(2500\)](#)

krimson (Cisco 2500 路由器)

```

krimson#show running-config
Building configuration...

Current configuration : 5055 bytes
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname krimson
!
logging buffered 500000 debugging
no logging console
enable password <deleted>
!
username kevin password 0 <deleted>
ip subnet-zero
no ip domain-lookup
!
isdn switch-type basic-net3
!
interface Ethernet0
 ip address 10.200.16.30 255.255.255.0
 no ip route-cache
 no ip mroute-cache
 no cdp enable

! <<- Unused interface configuration omitted
!
interface Serial1
 !--- Primary Link (Frame Relay) bandwidth 64 no ip
address encapsulation frame-relay no ip route-cache no
ip mroute-cache ! interface Serial1.1 point-to-point !--
- Point-to-point Frame Relay subinterface ip address
10.5.5.2 255.255.255.0 no ip route-cache frame-relay
interface-dlci 20 ! interface BRI0 !--- Backup physical
interface description Backup ISDN, Nr. 4420038 no ip
address encapsulation ppp no ip route-cache no ip
mroute-cache load-interval 30 no keepalive dialer pool-
member 1 !--- BRI 0 is a member of dialer pool 1 isdn
switch-type basic-net3 no fair-queue no cdp enable ppp
authentication chap ! interface Dialer0 !--- Logical
interface for the backup ip address 10.9.9.1
255.255.255.0 !--- The dialer is in the same network as
the remote dialer interface encapsulation ppp no ip
route-cache no ip mroute-cache dialer pool 1 !--- Dialer
pool 1. BRI 0 is a member of this pool dialer remote-
name kevin !--- Authenticated remote name of the peer.
!--- Verify that this name exactly matches the
authenticated name !--- of the remote dialer dialer
string 6120 !--- Number for outbound call. For inbound
calls this is not needed dialer watch-group 1 !---
Enable dialer watch on this backup interface. !--- Watch
the route specified with dialer watch-list 1

 dialer-group 1
 !--- Apply interesting traffic defined in dialer-list 1

 no cdp enable
 ppp authentication chap
!
!
router ospf 10

```

```

log-adjacency-changes
network 10.5.5.0 0.0.0.255 area 0
network 10.7.7.0 0.0.0.255 area 0
network 10.9.9.0 0.0.0.255 area 0
!
no ip classless
ip route 0.0.0.0 0.0.0.0 10.200.16.1
!--- Default route through ethernet 0 no ip http server
! access-list 101 deny ospf any any !--- Mark OSPF as
uninteresting. !--- This will prevent OSPF hellos from
keeping the link up access-list 101 permit ip any any !-
-- All other IP traffic is interesting dialer watch-list
1 ip 10.8.8.0 255.255.255.0 !--- This defines the
route(s) to be watched. !--- This exact route(including
subnet mask) must exist in the routing table. !--- Use
the dialer watch-group 1 command to apply this list to
the backup !--- interface (interface dialer 0)

dialer-list 1 protocol ip list 101
!--- Interesting traffic is defined by access-list 101.
!--- This is applied to BRI0 using dialer-group 1

!
line con 0
  exec-timeout 0 0
  privilege level 15
line aux 0
  transport input all
line vty 0 4
  exec-timeout 0 0
  password <deleted>
  login
!
end

```

## kevin(2500)

```

kevin#show running-config
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname kevin
!
username krimson password 0 <password>
!
isdn switch-type basic-net3
!
!
interface Loopback0
  ip address 10.8.8.1 255.255.255.0
  !--- This is the network the remote side is watching
ip ospf network point-to-point ! interface Loopback1 ip
address 172.19.0.1 255.255.255.255 ! interface Ethernet0
ip address 10.200.17.26 255.255.255.0 ! interface
Serial0 no ip address encapsulation frame-relay !
interface Serial0.1 point-to-point !--- Primary link
(Frame Relay sub-interface) ip address 10.5.5.1
255.255.255.0 frame-relay interface-dlci 20 ! interface
BRI0 !--- Physical interface no ip address encapsulation
ppp dialer pool-member 1 !--- Member of dialer pool 1
isdn switch-type basic-net3 no cdp enable ppp
authentication chap ! interface Dialer0 !--- Logical

```

```

interface for incoming call ip address 10.9.9.2
255.255.255.0 !--- The dialer is in the same network as
the remote dialer interface encapsulation ppp dialer
pool 1 !--- Dialer pool 1. BRI 0 is a member of this
pool dialer remote-name krimson !--- Authenticated
remote name of the peer. !--- Verify that this name
exactly matches the authenticated name !--- of the
remote dialer. dialer-group 1 !--- Apply interesting
traffic defined in dialer-list 1 no cdp enable ppp
authentication chap ! router ospf 10 log-adjacency-
changes network 10.5.5.0 0.0.0.255 area 0 network
10.8.8.0 0.0.0.255 area 0 !--- Advertise the network the
remote router is watching network 10.9.9.0 0.0.0.255
area 0 ! ip classless ip route 0.0.0.0 0.0.0.0
10.200.17.1 no ip http server ! dialer-list 1 protocol
ip permit !--- Interesting traffic definition. All IP
traffic is interesting. !--- This is applied to BRI0
using dialer-group 1. !--- Since the remote router
activates and deactivates the backup, this router !---
does not need to restrict interesting traffic no cdp run
! line con 0 exec-timeout 0 0 line aux 0 modem InOut
line vty 0 4 exec-timeout 0 0 password <password> login
! end

```

**注意：** maui-nas-05的配置不包含任何与备份相关的命令。对于maui-nas-05，备份链路只是另一个拨入客户端。这样，在许多设备建立到同一中心站点的备份链路的情况下，可以简化中心站点的配置。在备份场景中，最好只让一端启动拨号，而另一端只接受呼叫。

## 拨号监视 ( Dialer Watch ) 命令

以下是可用于拨号器监视的命令列表。上述配置中包含了其中一些命令，而其他命令则供参考。

- **dialer watch-list group-number ip ip-address address-mask** :定义要监视的IP地址或网络。配置的地址或网络 ( 使用正确的掩码 ) 必须存在于路由表中。您还可以使用dialer watch-list命令观察多条路由。示例显示 :  

```

dialer watch-list 1 ip 10.1.1.0 255.255.255.0
dialer watch-list 1 ip 10.1.2.0 255.255.255.0
dialer watch-list 1 ip 10.1.3.0 255.255.255.0

```
- **dialer watch-group group-number** :在备份接口上启用拨号器监视。此处使用的组编号与定义要监视的路由的dialer watch-list命令的组编号匹配。只能在一个接口上配置具有特定组编号的dialer watch-group命令。这意味着路由器不能使用多个接口为特定路由提供备份。但是，一个接口可以有多个dialer watch-group命令，并且组号不同。因此，一个接口可用于为多条路由提供备份。
- **dialer watch-disable秒** :对接口应用禁用延迟时间。在主接口恢复后，此延迟会阻止在指定时间段内断开备份接口。当空闲计时器到期时，此延迟计时器启动，并检查主路由的状态，发现主路由处于工作状态。这种延迟可以确保稳定性，特别是对于出现频繁路由更改的抖动接口或接口。
- **dialer watch-list group-number delay route-check初始秒** :此命令可使路由器检查在路由器的初始启动完成且计时器 ( 以秒为单位 ) 过期后，主路由是否在运行。若不使用此命令，则只有在从路由表中删除该主路由时才会触发 Dialer Watch。如果在路由器的初始启动期间无法建立主链路，则该路由从不会添加到路由表中，从而无法被监视。因此，使用此命令，在路由器初始启动期间主链路发生故障时，拨号器监视将拨打备用链路。

## 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。

输出解释器工具支持某些 show 命令 ( 只限于注册用户 ) ，通过它可以查看 show 命令输出的分析。

- **show interfaces serial** -显示关于组播数据链路连接标识符(DLCI)、接口上使用的DLCI、用于本地管理接口(LMI)的DLCI的信息。使用此命令可验证主接口是打开还是关闭。
- **show interface dialer** — 显示拨号器接口的状态。
- **show ip route** - 显示IP路由表条目。检验路由表中是否存在受监视的网络 ( 当主链路处于打开状态时 ) 。当主链路断开并拨打备份时，路由表应重新收敛，并且受监视的网络应重新出现 ( 下一跳作为拨号器接口 ) 。

## 故障排除

本部分提供的信息可用于对配置进行故障排除。

此处使用的帧中继配置(使用点对点接口并使用开放最短路径优先(OSPF)作为路由协议)特定于此设置。但是，下面给出的故障排除步骤更为一般，可用于不同的配置，如帧中继点对多点或采用高级数据链路控制(HDLC)和点对点协议(PPP)封装的主链路，而不管所使用的路由协议如何。

为验证备份功能，我们将作为帧中继交换机的 Cisco 4500 路由器上的一个接口置于关闭状态，以模拟帧中继网络中的问题。因此，这会导致PVC非活动状态通过帧中继网络传导到DTE路由器上，帧中继子接口中断事件。监视的路由因此消失，备用链路被激活。

有关Dialer Watch故障排除的信息，请参阅文档[配置DDR备份并排除故障](#)。

## 故障排除命令

输出解释器工具支持某些 show 命令 ( 只限于注册用户 ) ，通过它可以查看 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 isdn q931** - 显示关于呼叫建立及拆线、本地路由器(用户端)和网络之间的ISDN网络连接(第三层)断开的信息。
- **debug backup** — 调试备份事件。
- **debug dialer** - 显示拨号程序接口上数据包或事件的相关调试信息。
- **debug ppp negotiation** - 导致debug ppp命令显示PPP启动期间传输的PPP信息包，其中PPP选项需要协商。
- **debug ppp authentication** - 致使debug ppp命令显示认证协议消息，包括质询验证协议(CHAP)信息包交换和密码验证协议(PAP)交换。
- **debug ip ospf events** — 显示有关OSPF相关事件的信息，如邻接、泛洪信息、指定路由器选择和最短路径优先(SPF)计算。
- **debug frame-relay events** — 显示支持组播信道并使用动态寻址的网络上有关帧中继地址解析协议(ARP)应答的调试信息。

## 故障排除输出示例

在以下输出中，帧中继接口处于打开状态。

krimson#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 10.200.16.1 to network 0.0.0.0

10.0.0.0/24 is subnetted, 6 subnets

C 10.5.5.0 is directly connected, Serial1.1

O 10.8.8.0 [110/1563] via 10.5.5.1, 00:01:31, Serial1.1

*!--- Initial state through the primary Frame Relay interface, !--- before line failure occurred* C 10.9.9.0 is directly connected, Dialer0 C 10.7.7.0 is directly connected, Loopback0 C 10.200.16.0 is directly connected, Ethernet0 S\* 0.0.0.0/0 [1/0] via 10.200.16.1 krimson# \*Apr 17 01:00:50.591: OSPF: Rcv hello from 172.19.0.1 area 0 from Serial1.1 10.5.5.1 \*Apr 17 01:00:50.595: OSPF: End of hello processing \*Apr 17 01:00:51.127: %SYS-5-CONFIG\_I: Configured from console by console \*Apr 17 01:01:00.591: OSPF: Rcv hello from 172.19.0.1 area 0 from Serial1.1 10.5.5.1 \*Apr 17 01:01:00.595: OSPF: End of hello processing \*Apr 17 01:01:05.243: %LINK-3-UPDOWN: Interface Serial1, changed state to down *!--- Frame Relay failure simulated by shutting down the interface on !--- the Cisco 4500 router(acting as switch)* \*Apr 17 01:01:05.251: OSPF: Interface Serial1.1 going Down \*Apr 17 01:01:05.255: %OSPF-5-ADJCHG: Process 10, Nbr 172.19.0.1 on Serial1.1 from FULL to DOWN, Neighbor Down: Interface down or detached \*Apr 17 01:01:05.399: DDR: Dialer Watch: watch-group = 1 \*Apr 17 01:01:05.403: DDR: **network 10.8.8.0/255.255.255.0 DOWN,**

*!--- Watched network is down* \*Apr 17 01:01:05.407: DDR: primary DOWN \*Apr 17 01:01:05.407: DDR: Dialer Watch: Dial Reason: Primary of group 1 DOWN \*Apr 17 01:01:05.411: DDR: Dialer Watch: **watch-group = 1,**

\*Apr 17 01:01:05.411: BR0 DDR: rotor dialout [priority]

\*Apr 17 01:01:05.411: DDR: **dialing secondary by dialer string 6120 on Di0**

*!--- router dials 6120 on interface Dialer 1* \*Apr 17 01:01:05.415: BR0 DDR: Attempting to dial 6120 \*Apr 17 01:01:05.523: ISDN BR0: TX -> SETUP pd = 8 callref = 0x43 \*Apr 17 01:01:05.531: Bearer Capability i = 0x8890 \*Apr 17 01:01:05.535: Channel ID i = 0x83 \*Apr 17 01:01:05.543: Called Party Number i = 0x80, '6120', Plan:Unknown, Type:Unknown \*Apr 17 01:01:05.599: ISDN BR0: RX <- CALL\_PROC pd = 8 callref = 0xC3 \*Apr 17 01:01:05.603: Channel ID i = 0x89 \*Apr 17 01:01:05.855: ISDN BR0: RX <- CONNECT pd = 8 callref = 0xC3 \*Apr 17 01:01:05.875: %LINK-3-UPDOWN: Interface BR10:1, changed state to up \*Apr 17 01:01:05.875: BR0:1 DDR: Dialer Watch: resetting call in progress \*Apr 17 01:01:05.883: %DIALER-6-BIND: Interface BR0:1 bound to profile Di0 \*Apr 17 01:01:05.891: BR0:1 PPP: Treating connection as a callout \*Apr 17 01:01:05.895: BR0:1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 0 load] \*Apr 17 01:01:05.899: BR0:1 LCP: O CONFREQ [Closed] id 54 len 15 \*Apr 17 01:01:05.903: BR0:1 LCP: AuthProto CHAP (0x0305C22305) \*Apr 17 01:01:05.903: BR0:1 LCP: MagicNumber 0xF24F182E (0x0506F24F182E) \*Apr 17 01:01:05.911: ISDN BR0: TX -> CONNECT\_ACK pd = 8 callref = 0x43 \*Apr 17 01:01:05.939: BR0:1 LCP: I CONFREQ [REQsent] id 88 len 15 \*Apr 17 01:01:05.943: BR0:1 LCP: AuthProto CHAP (0x0305C22305) \*Apr 17 01:01:05.943: BR0:1 LCP: MagicNumber 0x9B15A6B0 (0x05069B15A6B0) \*Apr 17 01:01:05.947: BR0:1 LCP: O CONFACK [REQsent] id 88 len 15 \*Apr 17 01:01:05.951: BR0:1 LCP: AuthProto CHAP (0x0305C22305) \*Apr 17 01:01:05.955: BR0:1 LCP: MagicNumber 0x9B15A6B0 (0x05069B15A6B0) \*Apr 17 01:01:05.959: BR0:1 LCP: I CONFACK [ACKsent] id 54 len 15 \*Apr 17 01:01:05.963: BR0:1 LCP: AuthProto CHAP (0x0305C22305) \*Apr 17 01:01:05.963: BR0:1 LCP: MagicNumber 0xF24F182E (0x0506F24F182E) \*Apr 17 01:01:05.967: BR0:1 LCP: State is Open \*Apr 17 01:01:05.967: BR0:1 PPP: Phase is AUTHENTICATING, by both [0 sess, 0 load] \*Apr 17 01:01:05.971: BR0:1 CHAP: O CHALLENGE id 54 len 28 from "krimson" \*Apr 17 01:01:06.051: BR0:1 CHAP: I CHALLENGE id 56 len 26 from "kevin" \*Apr 17 01:01:06.055: BR0:1 CHAP: O RESPONSE id 56 len 28 from "krimson" \*Apr 17 01:01:06.151: BR0:1 CHAP: I SUCCESS id 56 len 4 \*Apr 17 01:01:06.167: BR0:1 CHAP: I RESPONSE id 54 len 26 from "kevin" \*Apr 17 01:01:06.175: BR0:1 CHAP: O SUCCESS id 54 len 4 \*Apr 17 01:01:06.179: BR0:1 PPP: Phase is UP [0 sess, 0 load] \*Apr 17 01:01:06.183: BR0:1 IPCP: O CONFREQ [Not negotiated] id 46 len 10 \*Apr 17 01:01:06.187: BR0:1 IPCP: Address 10.9.9.1 (0x03060A090901) \*Apr 17 01:01:06.279: BR0:1 IPCP: I CONFREQ [REQsent] id 34 len 10 \*Apr 17 01:01:06.283: BR0:1 IPCP: Address 10.9.9.2 (0x03060A090902) \*Apr 17 01:01:06.287: BR0:1 IPCP: O CONFACK [REQsent] id 34 len 10 \*Apr 17 01:01:06.291: BR0:1 IPCP:

Address 10.9.9.2 (0x03060A090902) \*Apr 17 01:01:06.295: BR0:1 IPCP: I CONFACK [ACKsent] id 46  
len 10 \*Apr 17 01:01:06.299: BR0:1 IPCP: Address 10.9.9.1 (0x03060A090901) \*Apr 17 01:01:06.303:  
BR0:1 IPCP: State is Open \*Apr 17 01:01:06.315: %LINEPROTO-5-UPDOWN: Line protocol on Interface  
Serial1, changed state to down \*Apr 17 01:01:06.319: BR0:1 DDR: dialer protocol up \*Apr 17  
01:01:06.327: Di0 IPCP: Install route to 10.9.9.2 \*Apr 17 01:01:07.175: %LINEPROTO-5-UPDOWN:

**Line protocol on Interface BRI0:1,  
changed state to up**

**!--- Call connects** \*Apr 17 01:01:10.775: OSPF: **Rcv hello from 172.19.0.1 area 0 from Dialer0  
10.9.9.2**

**!--- OSPF hello from the peer** \*Apr 17 01:01:10.779: OSPF: End of hello processing \*Apr 17  
01:01:11.891: %ISDN-6-CONNECT: Interface BRI0:1 is now connected to 6120 kevin#**show interface  
serial 1.1**

**Serial1.1 is down**, line protocol is down

**!--- Primary link is still down** Hardware is HD64570 Internet address is 10.5.5.2/24 MTU 1500  
bytes, BW 64 Kbit, DLY 20000 usec, reliability 255/255, txload 1/255, rxload 1/255 Encapsulation  
FRAME-RELAY krimson#**show interface dialer 0**

**!--- Backup interface is up and active Dialer0 is up**, line protocol is up (spoofing)

Hardware is Unknown

Internet address is 10.9.9.1/24

MTU 1500 bytes, BW 56 Kbit, DLY 20000 usec,  
reliability 255/255, txload 1/255, rxload 1/255

Encapsulation PPP, loopback not set

DTR is pulsed for 1 seconds on reset

Interface is bound to BR0:1

Last input 1w6d, output never, output hang never

Last clearing of "show interface" counters 6w5d

Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0

Queueing strategy: weighted fair

Output queue: 0/1000/64/0 (size/max total/threshold/drops)

Conversations 0/1/16 (active/max active/max total)

Reserved Conversations 0/0 (allocated/max allocated)

Available Bandwidth 42 kilobits/sec

5 minute input rate 0 bits/sec, 0 packets/sec

5 minute output rate 0 bits/sec, 0 packets/sec

882 packets input, 69656 bytes

892 packets output, 70436 bytes

Bound to:

BRI0:1 is up, line protocol is up

Hardware is BRI

MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,

reliability 255/255, txload 1/255, rxload 1/255

Encapsulation PPP, loopback not set

Keepalive not set

DTR is pulsed for 1 seconds on reset

Time to interface disconnect: idle 00:01:38

Interface is bound to Di0 (Encapsulation PPP)

LCP Open

Open: IPCP

Last input 00:00:03, output 00:00:01, output hang never

Last clearing of "show interface" counters never

Queueing strategy: fifo

Output queue 0/40, 0 drops; input queue 0/75, 0 drops

30 second input rate 0 bits/sec, 0 packets/sec

30 second output rate 0 bits/sec, 0 packets/sec

4213 packets input, 414529 bytes, 0 no buffer

Received 0 broadcasts, 0 runts, 0 giants, 0 throttles

29 input errors, 18 CRC, 0 frame, 0 overrun, 0 ignored, 11 abort

3922 packets output, 242959 bytes, 0 underruns

0 output errors, 0 collisions, 27 interface resets

0 output buffer failures, 0 output buffers swapped out

622 carrier transitions

krimson#**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 10.200.16.1 to network 0.0.0.0

192.168.64.0/30 is subnetted, 1 subnets  
C 192.168.64.0 is directly connected, Dialer4  
10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks  
C 10.9.9.2/32 is directly connected, Dialer0

**O 10.8.8.0/24 [110/1786] via 10.9.9.2, 00:00:25, Dialer0**

*!--- New route to the same destination (through dialer 0). !--- Network now points to backup interface* C 10.9.9.0/24 is directly connected, Dialer0 C 10.7.7.0/24 is directly connected, Loopback0 C 10.9.8.0/24 is directly connected, Dialer1 C 10.200.16.0/24 is directly connected, Ethernet0 S\* 0.0.0.0/0 [1/0] via 10.200.16.1

在以下输出中，帧中继接口即将启动。

\*Apr 17 01:02:50.631: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1, changed state to up

*!--- Primary is UP again* \*Apr 17 01:02:50.975: OSPF: Rcv hello from 172.19.0.1 area 0 from Dialer0 10.9.9.2 \*Apr 17 01:02:50.979: OSPF: End of hello processing \*Apr 17 01:03:00.975: OSPF: Rcv hello from 172.19.0.1 area 0 from Dialer0 10.9.9.2 \*Apr 17 01:03:00.979: OSPF: End of hello processing \*Apr 17 01:03:05.887: BR0:1 DDR: idle timeout \*Apr 17 01:03:05.887: DDR: Dialer Watch: watch-group = 1 \*Apr 17 01:03:05.887: DDR: network 10.8.8.0/255.255.255.0 UP, *!--- Watched route is UP* \*Apr 17 01:03:05.891: DDR: primary DOWN \*Apr 17 01:03:10.551: OSPF: Rcv hello from 172.19.0.1 area 0 from Serial1.1 10.5.5.1 \*Apr 17 01:03:10.555: OSPF: End of hello processing \*Apr 17 01:03:10.975: OSPF: Rcv hello from 172.19.0.1 area 0 from Dialer0 10.9.9.2 \*Apr 17 01:03:10.979: OSPF: End of hello processing krimson#**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 10.200.16.1 to network 0.0.0.0

10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks  
C 10.9.9.2/32 is directly connected, Dialer0  
C 10.5.5.0/24 is directly connected, Serial1.1

**O 10.8.8.0/24 [110/1563] via 10.5.5.1, 00:00:01, Serial1.1**

*! -- Route entry to destination network via primary has been installed again.* C 10.9.9.0/24 is directly connected, Dialer0 C 10.7.7.0/24 is directly connected, Loopback0 C 10.9.8.0/24 is directly connected, Dialer1 C 10.200.16.0/24 is directly connected, Ethernet0 S\* 0.0.0.0/0 [1/0] via 10.200.16.1 krimson#**show isdn active**

-----  
ISDN ACTIVE CALLS  
-----

Call Type	Calling Number	Called Number	Remote Name	Seconds Used	Seconds Left	Seconds Idle	Charges Units/Currency
Out	6120		kevin	149	90	29	0

-----

秒空闲字段指出没有更多流量通过备份接口，空闲时间增加。

```
krimson# show isdn active
```

```
-----  
ISDN ACTIVE CALLS  
-----
```

Call Type	Calling Number	Called Number	Remote Name	Seconds Used	Seconds Left	Seconds Idle	Charges Units/Currency
-----------	----------------	---------------	-------------	--------------	--------------	--------------	------------------------

Out	6120	kevin		165	74	45	0
-----	------	-------	--	-----	----	----	---

```
-----  
krimson# show isdn active
```

```
-----  
ISDN ACTIVE CALLS  
-----
```

Call Type	Calling Number	Called Number	Remote Name	Seconds Used	Seconds Left	Seconds Idle	Charges Units/Currency
-----------	----------------	---------------	-------------	--------------	--------------	--------------	------------------------

Out	6120	kevin		224	15	104	0
-----	------	-------	--	-----	----	-----	---

```
-----  
krimson#show isdn active
```

```
-----  
ISDN ACTIVE CALLS  
-----
```

Call Type	Calling Number	Called Number	Remote Name	Seconds Used	Seconds Left	Seconds Idle	Charges Units/Currency
-----------	----------------	---------------	-------------	--------------	--------------	--------------	------------------------

```
-----  
krimson#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  
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E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP  
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P - periodic downloaded static route

Gateway of last resort is 10.200.16.1 to network 0.0.0.0

192.168.64.0/30 is subnetted, 1 subnets  
C 192.168.64.0 is directly connected, Dialer4  
10.0.0.0/24 is subnetted, 6 subnets  
C 10.5.5.0 is directly connected, Serial1.1  
**O 10.8.8.0 [110/1563] via 10.5.5.1, 00:01:52, Serial1.1**  
C 10.9.9.0 is directly connected, Dialer0  
C 10.7.7.0 is directly connected, Loopback0  
C 10.9.8.0 is directly connected, Dialer1  
C 10.200.16.0 is directly connected, Ethernet0  
S\* 0.0.0.0/0 [1/0] via 10.200.16.1

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