

使用Dialer Watch配置BRI ISDN 备份

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简介

本文展示使用ISDN基本速率接口(BRI)线路备份一条租用的线路、广域网或者串行连接使用拨号监视功能。关于Dialer Watch的功能和操作的更多信息，参考[评估备份接口、浮动静态路由和Dialer Watch DDR备份的](#)。

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。这允许您验证拨号使用的方法，点对点协议(PPP)协商，并且验证在配置备份前是成功的。
2. 当主链路发生故障时，请配置路由器首次备份DDR连接。此配置使用拨号监视功能触发拨出。关于必要步骤的更多信息配置备份参考[配置和故障排除DDR备份文件](#)。

使用的组件

本文档中的信息基于以下软件和硬件版本。

- 运行Cisco IOS软件版本的两Cisco 2500路由器(帧中继DTE) 12.2(3)和12.2(5)。
- 一Cisco 4500路由器，作为帧中继交换机(没显示的配置)。

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

此示例使用拨号配置文件备份BRI链路。您能也使用传统按需拨号路由(DDR)，使用dialer map命令备份BRI连接。关于配置有拨号图的Dialer Watch的更多信息，参考[使用BRI与Dialer Watch配置DDR备份](#)。

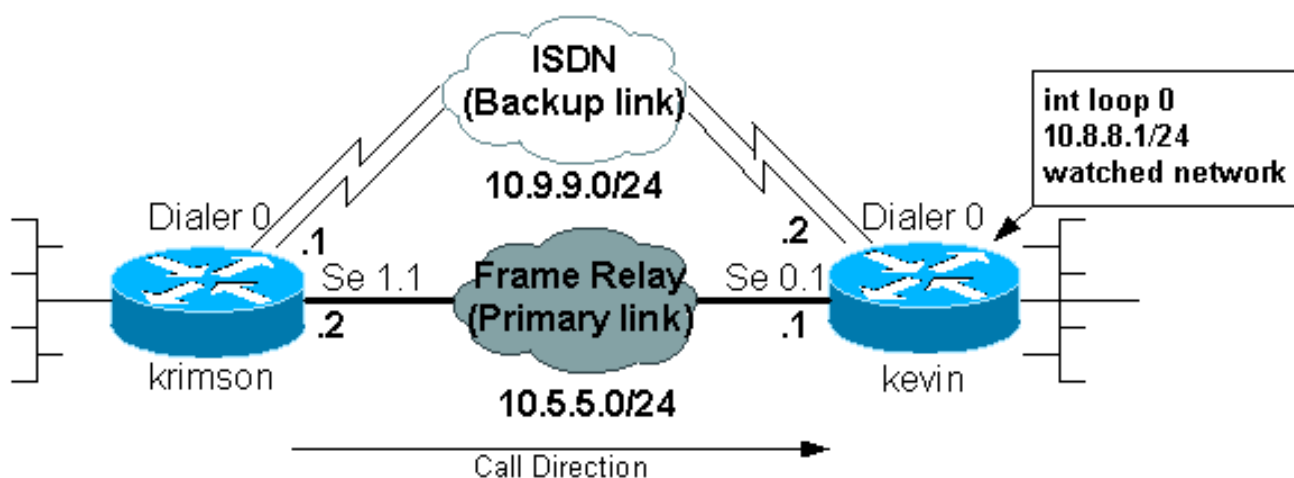
配置

本部分提供有关如何配置本文档所述功能的信息。

注意： 要寻找关于用于本文的指令的其他信息，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的配置不包括任何备份相关的命令。对于maui-nas-05，备份链路是另一个拨入客户端。这能简单化许多设备建立一条备份链路到同一个中心站点中心站点的配置情况的。在备份方案中，而另一侧只接受呼叫，有一端启动拨号只是理想的。

拨号监视 (Dialer Watch) 命令

下列是可以使用的命令的列表Dialer Watch的。而其他提供供参考，其中一些命令在以上配置包括

o

- **dialer watch-list group-number ip ip-address address-mask**：定义了将观看的IP地址或网络。地址或网络(与正确掩码)配置在路由表里必须存在。您能也注意多个路由用**dialer watch-list**命令。示例显示：

```

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
```

- **dialer watch-group group-number** : 在备份接口的Enable (event) Dialer Watch。使用的组编号这里匹配组编号**dialer watch-list**命令定义将观看的路由。**dialer watch-group**命令与特定组编号在一个接口可能只配置。这意味着路由器不能使用多个接口为特定路由提供备份。然而，一个接口能有多个拨号**watch-group**命令，用不同的组号。所以，一个接口可以用于为多个路由提供备份。
- **dialer watch-disable seconds** : 运用禁用延迟时间对接口。在主要接口恢复后，此延迟防止断开指定的时间段的备份接口。此延迟计时器开始，当空闲计时器超时，并且主路由的状况被检查并且被发现。此延迟能保证稳定性，特别是体验频繁路由更改的振荡的接口或接口的。
- **dialer watch-list group-number delay route-check initial seconds** : 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。所以，用此命令，Dialer Watch将拨号备份链路在主链路故障情形下在最初期间启动路由器。

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。请使用此验证主要接口上上下下是。
- **show interface dialer** -显示拨号接口的状况。
- **show ip route** - 显示IP 路由表条目。验证监视的网络在路由表里存在(当主链路是UP)。当主链路断开，并且时备份拨号路由表应该再聚合，并且监视的网络应该再现(与下一跳作为拨号接口)。

故障排除

本部分提供的信息可用于对配置进行故障排除。

使用的帧中继配置这里(与点对点接口和使用开放最短路径优先(OSPF)作为路由协议)是特定对此设置。然而，下面给的故障排除步骤是更多常规，并且可以与不同的配置一起使用类似帧中继单点对多点或主链路与高级数据链路控制(HDLC)和点对点协议(PPP)封装，不管使用的路由协议。

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。监视路由因而消失，并且备份链路被激活。

关于故障排除的信息Dialer Watch参考[配置和故障排除DDR备份文件](#)。

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** -显示关于OSPF相关的事件的信息，例如邻接、溢出信息、指定路由器选择和Shortest Path First (SPF)计算。
- **debug frame-relay events** -显示关于帧中继地址解析服务(ARP)回复的调试信息在支持组播信道并且使用动态寻址的网络。

故障排除输出示例

在下面的输出中，帧中继接口是UP。

```
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 BRI0:1, 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
```

在下面的输出中，帧中继接口出来。

```
*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

```
-----
```

秒钟Idle字段指出没有其他流量虽则不通过备份接口，并且空闲时间增加的那。

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
 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
10.0.0.0/24 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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