

# ダイヤラウォッチを使用したBRIマルチリンクISDNバックアップ設定

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## 概要

このドキュメントでは、ダイヤラウォッチを使用したBRIマルチリンクISDNバックアップを設定するための設定例を紹介します。

設定例では基本のトラブルシューティングコマンドを説明するとともに、ダイヤラウォッチとともにバックアップシナリオに実装されているポイントツーポイント (PPP) マルチリンクを使用したトラブルシューティングの設定のための特定の手順を説明します。

この設定は、メインフレームリレーのインターフェイスまたはサブインターフェイスがダウンした場合に使用できます。

## 前提条件

### 要件

このドキュメントに関する固有の要件はありません。

### 使用するコンポーネント

このドキュメントの情報は、次のソフトウェアとハードウェアのバージョンに基づくものです。

- Cisco IOS® ソフトウェア リリース 12.2(3) および 12.2(5) を実行する 2 台の Cisco 2500 ル

ータ ( フレームリレー データ端末機器 ( DTE ) ) 。

- フレームリレー スイッチとして機能している 1 台の Cisco 4500 ルータ

このドキュメントの情報は、特定のラボ環境にあるデバイスに基づいて作成されたものです。このドキュメントで使用するすべてのデバイスは、クリアな ( デフォルト ) 設定で作業を開始しています。対象のネットワークが実稼働中である場合には、どのような作業についても、その潜在的な影響について確実に理解しておく必要があります。

## 表記法

ドキュメント表記の詳細は、『[シスコ テクニカル ティップスの表記法](#)』を参照してください。

## 設定

この項では、このドキュメントで説明する機能の設定に必要な情報を提供します。

注: この文書に使用されるコマンドに関するその他の情報を検索するには、Command Lookup ツールを使用してください。

## ネットワーク図

このドキュメントでは次の図に示すネットワーク

## 設定

このドキュメントでは次に示す設定を使用しています。

- [krimson \( Cisco 2500 ルータ \)](#)
- [kevin \( Cisco 2500 ルータ \)](#)

### krimson ( Cisco 2500 ルータ )

```
krimson#show running-config Building configuration... !
version 12.2 service timestamps debug datetime msec
service timestamps log datetime msec hostname krimson !
username kevin password 0 <password> ! isdn switch-type
basic-net3 ! interface Loopback0 ip address 10.7.7.1
255.255.255.0 ip ospf network point-to-point ! interface
Ethernet0 ip address 10.200.16.30 255.255.255.0 !
interface Serial1 bandwidth 64 no ip address
encapsulation frame-relay ! interface Serial1.1 point-
to-point ip address 10.5.5.2 255.255.255.0 no ip route-
cache frame-relay interface-dlci 20 ! interface BRI0 no
ip address encapsulation ppp no ip route-cache no ip
mroute-cache load-interval 30 no keepalive dialer pool-
member 1 isdn switch-type basic-net3 no fair-queue no
cdp enable ppp authentication chap ! interface Dialer0
ip address 10.9.9.1 255.255.255.0 encapsulation ppp no
ip route-cache no ip mroute-cache dialer pool 1 dialer
remote-name kevin dialer string 6120 dialer load-
threshold 1 either dialer watch-group 1 dialer-group 1
no cdp enable ppp authentication chap ppp multilink ! !
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 ! ip default-gateway
```

```
10.200.16.1 no ip classless ip route 0.0.0.0 0.0.0.0
10.200.16.1 no ip http server ! access-list 101 deny
ospf any any access-list 101 permit ip any any dialer
watch-list 1 ip 10.8.8.0 255.255.255.0 dialer-list 1
protocol ip list 101 ! 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 <password> login ! end
```

### kevin ( Cisco 2500 ルータ )

```
kevin#show running-config Building configuration... !
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 ip ospf network point-to-point !
interface Loopback1 ip address 172.19.0.1
255.255.255.255 ! interface Ethernet0 ip address
10.200.16.26 255.255.255.0 ! interface Serial0 no ip
address encapsulation frame-relay ! interface Serial0.1
point-to-point ip address 10.5.5.1 255.255.255.0 no cdp
enable frame-relay interface-dlci 20 ! interface BRI0 no
ip address encapsulation ppp dialer pool-member 1 isdn
switch-type basic-net3 no cdp enable ppp authentication
chap ! interface Dialer0 ip address 10.9.9.2
255.255.255.0 encapsulation ppp dialer pool 1 dialer
remote-name krimson dialer-group 1 no cdp enable ppp
authentication chap ppp multilink ! 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 network 10.9.9.0
0.0.0.255 area 0 ! ip default-gateway 10.200.16.1 ip
classless ip route 0.0.0.0 0.0.0.0 10.200.16.1 no ip
http server ! access-list 101 deny ospf any any access-
list 101 permit ip any any dialer-list 1 protocol ip
list 101 ! ! line con 0 exec-timeout 0 0 line aux 0
modem InOut line vty 0 4 exec-timeout 0 0 password
<password> login ! end
```

## 確認

このセクションでは、設定が正常に動作しているかどうかを確認する際に役立つ情報を提供しています。

特定の **show** コマンドは、アウトプット インタープリタでサポートされています。このツールを使用すると、**show** コマンド出力を分析できます。

- **show interfaces serial** : マルチキャスト データリンク接続識別子 ( DLCI )、インターフェイスで使用する DLCI、およびローカル管理インターフェイス ( LMI ) に使用する DLCI に関する情報を表示します。
- **show interface dialer** : ダイアラ インターフェイスに関する情報を表示します。
- **show ip route** : IP ルーティング テーブルのエントリを表示します。
- **show frame-relay pvc** : ルータの PVC の状態を表示します。

## show コマンドの出力例

次の **show** コマンドは、フレーム リレー リンクが起動し機能する間の、発信元のルータの初期状態を示しています。

```

krimson#show interface serial 1.1 Serial1.1 is up, line protocol is up 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 frame pvc PVC Statistics for
interface Serial1 (Frame Relay DTE) Active Inactive Deleted Static Local 1 0 0 0 Switched 0 0 0
0 Unused 0 0 0 0 DLCI = 20, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial1.1 input
pkts 53280 output pkts 62150 in bytes 3851528 out bytes 6340750 dropped pkts 0 in FECN pkts 0 in
BECN pkts 0 out FECN pkts 0 out BECN pkts 0 in DE pkts 0 out DE pkts 0 out bcast pkts 62092 out
bcast bytes 6334184 pvc create time 1w2d, last time pvc status changed 00:02:54 krimson#show
interface dialer 0 Dialer0 is up (spoofing), 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 Last input 00:01:50, output never, output hang never Last clearing of "show interface"
counters 8w0d 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 12 kilobits/sec 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute
output rate 0 bits/sec, 0 packets/sec 31010 packets input, 2101372 bytes 31036 packets output,
2100401 bytes krimson#show interface serial 1 Serial1 is up, line protocol is up Hardware is
HD64570 MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, reliability 255/255, txload 1/255, rxload
1/255 Encapsulation FRAME-RELAY, loopback not set Keepalive set (10 sec) LMI enq sent 53297, LMI
stat recvd 52975, LMI upd recvd 0, DTE LMI up LMI enq recvd 3, LMI stat sent 0, LMI upd sent 0
LMI DLCI 1023 LMI type is CISCO frame relay DTE FR SVC disabled, LAPF state down Broadcast queue
0/64, broadcasts sent/dropped 62118/1, interface broadcasts 53298 Last input 00:00:01, output
00:00:01, output hang never Last clearing of "show interface" counters 3w1d 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 0/3/16 (active/max active/max
total) Reserved Conversations 0/0 (allocated/max allocated) Available Bandwidth 48 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0 packets/sec
106412 packets input, 4626191 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 115787 packets output,
7047349 bytes, 0 underruns 0 output errors, 0 collisions, 46425 interface resets 0 output buffer
failures, 0 output buffers swapped out 76 carrier transitions DCD=up DSR=up DTR=up RTS=up CTS=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 0.0.0.0 192.168.64.0/30 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, 00:04:35, 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

```

次の出力は、フレームリレーリンクがダウンし、ISDNのリンクが起動したことを示しています  
:

```

*Apr 26 04:57:25.801: OSPF: Rcv hello from 172.19.0.1 area 0 from Serial1.1 10.5.5.1
*Apr 26 04:57:25.805: OSPF: End of hello processing

*Apr 26 04:57:36.765: %LINK-3-UPDOWN: Interface Serial1, changed state to down
*Apr 26 04:57:36.773: OSPF: Interface Serial1.1 going Down
*Apr 26 04:57:36.777: %OSPF-5-ADJCHG: Process 10, Nbr 172.19.0.1 on Serial1.1
from FULL to DOWN, Neighbor Down: Interface down or detached
*Apr 26 04:57:36.921: DDR: Dialer Watch: watch-group = 1
*Apr 26 04:57:36.925: DDR: network 10.8.8.0/255.255.255.0 DOWN,
*Apr 26 04:57:36.929: DDR: primary DOWN
*Apr 26 04:57:36.929: DDR: Dialer Watch: Dial Reason: Primary of group 1 DOWN
*Apr 26 04:57:36.933: DDR: Dialer Watch: watch-group = 1,
*Apr 26 04:57:36.933: BR0 DDR: rotor dialout [priority]
*Apr 26 04:57:36.933: DDR: dialing secondary by dialer string 6120 on Di0
*Apr 26 04:57:36.937: BR0 DDR: Attempting to dial 6120
*Apr 26 04:57:36.941: ISDN BR0: Outgoing call id = 0x818B, dsl 0
*Apr 26 04:57:37.033: ISDN BR0: Event: Call to 6120 at 64 Kb/s

```

```
*Apr 26 04:57:37.033: ISDN BR0: process_bri_call(): call id 0x818B, called_number
6120, speed 64, call type DATA
*Apr 26 04:57:37.037: CCBRI_Go Fr Host InPkgInfo (Len=20) :
*Apr 26 04:57:37.041: 1 0 1 81 8B 0 4 2 88 90 18 1 83 70 5 80 36 31 32 30
*Apr 26 04:57:37.049:
*Apr 26 04:57:37.049: CC_CHAN_GetIdleChanbri: dsl 0
*Apr 26 04:57:37.053: Found idle channel B1
*Apr 26 04:57:37.065: ISDN BR0: TX -> SETUP pd = 8 callref = 0x0E
*Apr 26 04:57:37.069: Bearer Capability i = 0x8890
*Apr 26 04:57:37.077: Channel ID i = 0x83
*Apr 26 04:57:37.081: Called Party Number i = 0x80, '6120', Plan:Unknown,
Type:Unknown
*Apr 26 04:57:37.161: ISDN BR0: RX <- CALL_PROC pd = 8 callref = 0x8E
*Apr 26 04:57:37.165: Channel ID i = 0x89
*Apr 26 04:57:37.181: CCBRI_Go Fr L3 pkt (Len=7) :
*Apr 26 04:57:37.181: 2 1 E 98 18 1 89
*Apr 26 04:57:37.185:
*Apr 26 04:57:37.189: ISDN BR0: LIF_EVENT: ces/callid 1/0x818B HOST_PROCEEDING
*Apr 26 04:57:37.189: ISDN BR0: HOST_PROCEEDING
*Apr 26 04:57:37.193: ISDN BR0: HOST_MORE_INFO
*Apr 26 04:57:37.461: ISDN BR0: RX <- CONNECT pd = 8 callref = 0x8E
*Apr 26 04:57:37.477: CCBRI_Go Fr L3 pkt (Len=4) :
*Apr 26 04:57:37.481: 7 1 E 91
*Apr 26 04:57:37.481:
*Apr 26 04:57:37.485: ISDN BR0: LIF_EVENT: ces/callid 1/0x818B HOST_CONNECT
*Apr 26 04:57:37.489: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up
*Apr 26 04:57:37.493: BR0:1 DDR: Dialer Watch: resetting call in progress
*Apr 26 04:57:37.497: %DIALER-6-BIND: Interface BR0:1 bound to profile Di0
*Apr 26 04:57:37.509: ISDN: get_isdn_service_state(): idb 0x221DA8
bchan 2 is_isdn 1 Not a Pri
*Apr 26 04:57:37.513: BR0:1 PPP: Treating connection as a callout
*Apr 26 04:57:37.513: BR0:1 PPP: Phase is ESTABLISHING, Active Open
[0 sess, 0 load]
*Apr 26 04:57:37.517: BR0:1 LCP: O CONFREQ [Closed] id 102 len 29
*Apr 26 04:57:37.521: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:37.525: BR0:1 LCP: MagicNumber 0x2180E264 (0x05062180E264)
*Apr 26 04:57:37.529: BR0:1 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:37.529: BR0:1 LCP: EndpointDisc 1 krimson (0x130A016B72696D736F6E)
*Apr 26 04:57:37.533: ISDN BR0: Event: Connected to 6120 on B1 at 64 Kb/s
*Apr 26 04:57:37.541: ISDN BR0: TX -> CONNECT_ACK pd = 8 callref = 0x0E
*Apr 26 04:57:37.581: BR0:1 LCP: I CONFREQ [REQsent] id 191 len 27
*Apr 26 04:57:37.585: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:37.589: BR0:1 LCP: MagicNumber 0xCA476259 (0x0506CA476259)
*Apr 26 04:57:37.593: BR0:1 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:37.593: BR0:1 LCP: EndpointDisc 1 kevin (0x1308016B6576696E)
*Apr 26 04:57:37.601: BR0:1 LCP: O CONFACK [REQsent] id 191 len 27
*Apr 26 04:57:37.605: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:37.605: BR0:1 LCP: MagicNumber 0xCA476259 (0x0506CA476259)
*Apr 26 04:57:37.609: BR0:1 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:37.613: BR0:1 LCP: EndpointDisc 1 kevin (0x1308016B6576696E)
*Apr 26 04:57:37.617: BR0:1 LCP: I CONFACK [ACKsent] id 102 len 29
*Apr 26 04:57:37.621: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:37.621: BR0:1 LCP: MagicNumber 0x2180E264 (0x05062180E264)
*Apr 26 04:57:37.625: BR0:1 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:37.629: BR0:1 LCP: EndpointDisc 1 krimson (0x130A016B72696D736F6E)
*Apr 26 04:57:37.633: BR0:1 LCP: State is Open
*Apr 26 04:57:37.633: BR0:1 PPP: Phase is AUTHENTICATING, by both
[0 sess, 0 load]
*Apr 26 04:57:37.637: BR0:1 CHAP: O CHALLENGE id 157 len 28 from "krimson"
*Apr 26 04:57:37.657: BR0:1 CHAP: I CHALLENGE id 159 len 26 from "kevin"
*Apr 26 04:57:37.661: BR0:1 CHAP: O RESPONSE id 159 len 28 from "krimson"
*Apr 26 04:57:37.709: BR0:1 CHAP: I SUCCESS id 159 len 4
*Apr 26 04:57:37.725: BR0:1 CHAP: I RESPONSE id 157 len 26 from "kevin"
*Apr 26 04:57:37.733: BR0:1 CHAP: O SUCCESS id 157 len 4
```

```
*Apr 26 04:57:37.737: BR0:1 PPP: Phase is VIRTUALIZED [0 sess, 0 load]
*Apr 26 04:57:37.745: Di0 PPP: Phase is UP [0 sess, 0 load]
*Apr 26 04:57:37.749: Di0 IPCP: O CONFREQ [Closed] id 103 len 10
*Apr 26 04:57:37.753: Di0 IPCP: Address 10.9.9.1 (0x03060A090901)
*Apr 26 04:57:37.757: Di0 MLP: Added first link BR0:1 to bundle kevin
*Apr 26 04:57:37.757: Di0 PPP: Treating connection as a callout
*Apr 26 04:57:37.765: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1,
changed state to down
*Apr 26 04:57:37.773: Di0 IPCP: I CONFREQ [REQsent] id 103 len 10
*Apr 26 04:57:37.777: Di0 IPCP: Address 10.9.9.2 (0x03060A090902)
*Apr 26 04:57:37.777: Di0 IPCP: O CONFACK [REQsent] id 103 len 10
*Apr 26 04:57:37.781: Di0 IPCP: Address 10.9.9.2 (0x03060A090902)
*Apr 26 04:57:37.801: Di0 IPCP: I CONFACK [ACKsent] id 103 len 10
*Apr 26 04:57:37.805: Di0 IPCP: Address 10.9.9.1 (0x03060A090901)
*Apr 26 04:57:37.805: Di0 IPCP: State is Open
*Apr 26 04:57:37.813: Di0 DDR: dialer protocol up
*Apr 26 04:57:37.821: Di0 IPCP: Install route to 10.9.9.2
*Apr 26 04:57:38.225: BR0 DDR: rotor dialout [priority]
*Apr 26 04:57:38.225: BR0 DDR: Attempting to dial 6120
*Apr 26 04:57:38.229: ISDN BR0: Outgoing call id = 0x818C, dsl 0
*Apr 26 04:57:38.233: ISDN BR0: Event: Call to 6120 at 64 Kb/s
*Apr 26 04:57:38.233: ISDN BR0: process_bri_call(): call id 0x818C, called_number
6120, speed 64, call type DATA
*Apr 26 04:57:38.237: CCBRI_Go Fr Host InPkgInfo (Len=20) :
*Apr 26 04:57:38.241: 1 0 1 81 8C 0 4 2 88 90 18 1 83 70 5 80 36 31 32 30
*Apr 26 04:57:38.249:
*Apr 26 04:57:38.249: CC_CHAN_GetIdleChanbri: dsl 0
*Apr 26 04:57:38.253: Found idle channel B2
*Apr 26 04:57:38.265: ISDN BR0: TX -> SETUP pd = 8 callref = 0x0F
*Apr 26 04:57:38.269: Bearer Capability i = 0x8890
*Apr 26 04:57:38.277: Channel ID i = 0x83
*Apr 26 04:57:38.281: Called Party Number i = 0x80, '6120', Plan:Unknown,
Type:Unknown
*Apr 26 04:57:38.377: ISDN BR0: RX <- CALL_PROC pd = 8 callref = 0x8F
*Apr 26 04:57:38.385: Channel ID i = 0x8A
*Apr 26 04:57:38.405: CCBRI_Go Fr L3 pkt (Len=7) :
*Apr 26 04:57:38.405: 2 1 F 98 18 1 8A
*Apr 26 04:57:38.409:
*Apr 26 04:57:38.413: ISDN BR0: LIF_EVENT: ces/callid 1/0x818C HOST_PROCEEDING
*Apr 26 04:57:38.413: ISDN BR0: HOST_PROCEEDING
*Apr 26 04:57:38.417: ISDN BR0: HOST_MORE_INFO
*Apr 26 04:57:38.737: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1,
changed state to up
*Apr 26 04:57:38.761: ISDN BR0: RX <- CONNECT pd = 8 callref = 0x8F
*Apr 26 04:57:38.781: CCBRI_Go Fr L3 pkt (Len=4) :
*Apr 26 04:57:38.781: 7 1 F 91
*Apr 26 04:57:38.785:
*Apr 26 04:57:38.785: ISDN BR0: LIF_EVENT: ces/callid 1/0x818C HOST_CONNECT
*Apr 26 04:57:38.789: %LINK-3-UPDOWN: Interface BRI0:2, changed state to up
*Apr 26 04:57:38.797: %DIALER-6-BIND: Interface BR0:2 bound to profile Di0
*Apr 26 04:57:38.805: %ISDN-6-CONNECT: Interface BRI0:1 is now connected
to 6120 kevin
*Apr 26 04:57:38.809: ISDN: get_isdn_service_state():
idb 0x225754 bchan 3 is_isdn 1 Not a Pri
*Apr 26 04:57:38.813: BR0:2 PPP: Treating connection as a callout
*Apr 26 04:57:38.817: BR0:2 PPP: Phase is ESTABLISHING, Active Open
[0 sess, 0 load]
*Apr 26 04:57:38.821: BR0:2 LCP: O CONFREQ [Closed] id 50 len 29
*Apr 26 04:57:38.825: BR0:2 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:38.825: BR0:2 LCP: MagicNumber 0x2180E77A (0x05062180E77A)
*Apr 26 04:57:38.829: BR0:2 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:38.833: BR0:2 LCP: EndpointDisc 1 krimson (0x130A016B72696D736F6E)
*Apr 26 04:57:38.837: ISDN BR0: Event: Connected to 6120 on B2 at 64 Kb/s
*Apr 26 04:57:38.845: ISDN BR0: TX -> CONNECT_ACK pd = 8 callref = 0x0F
```

```

*Apr 26 04:57:38.885: BR0:2 LCP: I CONFREQ [REQsent] id 102 len 27
*Apr 26 04:57:38.889: BR0:2 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:38.893: BR0:2 LCP: MagicNumber 0xCA476774 (0x0506CA476774)
*Apr 26 04:57:38.897: BR0:2 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:38.897: BR0:2 LCP: EndpointDisc 1 kevin (0x1308016B6576696E)
*Apr 26 04:57:38.905: BR0:2 LCP: O CONFACK [REQsent] id 102 len 27
*Apr 26 04:57:38.905: BR0:2 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:38.909: BR0:2 LCP: MagicNumber 0xCA476774 (0x0506CA476774)
*Apr 26 04:57:38.913: BR0:2 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:38.917: BR0:2 LCP: EndpointDisc 1 kevin (0x1308016B6576696E)
*Apr 26 04:57:38.921: BR0:2 LCP: I CONFACK [ACKsent] id 50 len 29
*Apr 26 04:57:38.925: BR0:2 LCP: AuthProto CHAP (0x0305C22305)
*Apr 26 04:57:38.925: BR0:2 LCP: MagicNumber 0x2180E77A (0x05062180E77A)
*Apr 26 04:57:38.929: BR0:2 LCP: MRRU 1524 (0x110405F4)
*Apr 26 04:57:38.933: BR0:2 LCP: EndpointDisc 1 krimson (0x130A016B72696D736F6E)
*Apr 26 04:57:38.937: BR0:2 LCP: State is Open
*Apr 26 04:57:38.937: BR0:2 PPP: Phase is AUTHENTICATING, by both
[0 sess, 0 load]
*Apr 26 04:57:38.941: BR0:2 CHAP: O CHALLENGE id 104 len 28 from "krimson"
*Apr 26 04:57:38.961: BR0:2 CHAP: I CHALLENGE id 102 len 26 from "kevin"
*Apr 26 04:57:38.969: BR0:2 CHAP: O RESPONSE id 102 len 28 from "krimson"
*Apr 26 04:57:39.017: BR0:2 CHAP: I SUCCESS id 102 len 4
*Apr 26 04:57:39.033: BR0:2 CHAP: I RESPONSE id 104 len 26 from "kevin"
*Apr 26 04:57:39.037: BR0:2 CHAP: O SUCCESS id 104 len 4
*Apr 26 04:57:39.045: BR0:2 PPP: Phase is VIRTUALIZED [0 sess, 0 load]
*Apr 26 04:57:39.049: Di0 MLP: Added link BR0:2 to bundle kevin
*Apr 26 04:57:40.045: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:2,
changed state to up
*Apr 26 04:57:40.749: OSPF: Rcv hello from 172.19.0.1 area 0 from Dialer0 10.9.9.2
*Apr 26 04:57:40.757: OSPF: 2 Way Communication to 172.19.0.1 on Dialer0, state 2WAY
*Apr 26 04:57:40.757: OSPF: Send DBD to 172.19.0.1 on Dialer0 seq 0x67F opt
0x42 flag 0x7 len 32
*Apr 26 04:57:40.765: OSPF: End of hello processing
*Apr 26 04:57:40.801: OSPF: Rcv DBD from 172.19.0.1 on Dialer0 seq 0x2175 opt
0x42 flag 0x7 len 32 mtu 1500 state EXSTART
*Apr 26 04:57:40.805: OSPF: NBR Negotiation Done. We are the SLAVE
*Apr 26 04:57:40.805: OSPF: Send DBD to 172.19.0.1 on Dialer0 seq 0x2175 opt
0x42 flag 0x2 len 72
*Apr 26 04:57:40.853: OSPF: Rcv DBD from 172.19.0.1 on Dialer0 seq 0x2176 opt
0x42 flag 0x3 len 72 mtu 1500 state EXCHANGE
*Apr 26 04:57:40.857: OSPF: Send DBD to 172.19.0.1 on Dialer0 seq 0x2176 opt
0x42 flag 0x0 len 32
*Apr 26 04:57:40.865: OSPF: Database request to 172.19.0.1
*Apr 26 04:57:40.865: OSPF: sent LS REQ packet to 10.9.9.2, length 12
*Apr 26 04:57:40.905: OSPF: Rcv DBD from 172.19.0.1 on Dialer0 seq 0x2177 opt
0x42 flag 0x1 len 32 mtu 1500 state EXCHANGE
*Apr 26 04:57:40.909: OSPF: Exchange Done with 172.19.0.1 on Dialer0
*Apr 26 04:57:40.909: OSPF: Send DBD to 172.19.0.1 on Dialer0 seq 0x2177 opt
0x42 flag 0x0 len 32
*Apr 26 04:57:40.921: OSPF: Synchronized with 172.19.0.1 on Dialer0, state FULL
*Apr 26 04:57:40.925: %OSPF-5-ADJCHG: Process 10, Nbr 172.19.0.1 on Dialer0
from LOADING to FULL, Loading Done
*Apr 26 04:57:44.917: %ISDN-6-CONNECT: Interface BRI0:2 is now connected to
6120 kevin
*Apr 26 04:58:00.753: OSPF: Rcv hello from 172.19.0.1 area 0 from Dialer0 10.9.9.2
*Apr 26 04:58:00.753: OSPF: End of hello processing
*Apr 26 04:57:50.753: OSPF: Rcv hello from 172.19.0.1 area 0 from Dialer0 10.9.9.2
*Apr 26 04:57:50.753: OSPF: End of hello processing

```

krimson#show interface serial 1 Serial1 is down, line protocol is down *!--- note that the physical Frame Relay interface is down.* due to shutdown on locally attacher port on FR switch Hardware is HD64570 MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, reliability 255/255, txload 1/255, rxload 1/255 Encapsulation FRAME-RELAY, loopback not set Keepalive set (10 sec) LMI enq sent 53316, LMI stat recvd 52994, LMI upd recvd 0, DTE LMI down LMI enq recvd 3, LMI stat sent

```

0, LMI upd sent 0 LMI DLCI 1023 LMI type is CISCO frame relay DTE FR SVC disabled, LAPF state
down Broadcast queue 0/64, broadcasts sent/dropped 62140/1, interface broadcasts 53317 Last
input 00:00:57, output 00:00:57, output hang never Last clearing of "show interface" counters
3w1d 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 0/3/16
(active/max active/max total) Reserved Conversations 0/0 (allocated/max allocated) Available
Bandwidth 48 kilobits/sec 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0
bits/sec, 0 packets/sec 106450 packets input, 4627830 bytes, 0 no buffer --More-- Received 0
broadcasts, 0 runts, 0 giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored,
0 abort 115828 packets output, 7049810 bytes, 0 underruns 0 output errors, 0 collisions, 46426
interface resets 0 output buffer failures, 0 output buffers swapped out 77 carrier transitions
DCD=down DSR=down DTR=up RTS=up CTS=down krimson#show interface serial 1.1 Serial1.1 is down,
line protocol is 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 Dialer0 is up, line protocol is up Hardware is Unknown Internet
address is 10.9.9.1/24 MTU 1500 bytes, BW 128 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
Time to interface disconnect: idle 00:00:57 Interface is bound to BR0:1 Interface is bound to
BR0:2 LCP Open, multilink Open Open: IPCP Last input 00:00:09, output never, output hang never
Last clearing of "show interface" counters 8w0d 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 66 kilobits/sec 5 minute input rate 0
bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0 packets/sec 31025 packets input,
2102400 bytes 31053 packets output, 2101523 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 Interface is bound to Di0 (Encapsulation PPP) LCP Open, multilink Open Last input
00:00:11, 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 34919 packets
input, 2419929 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 34744 packets output, 2252062 bytes, 0
underruns 0 output errors, 0 collisions, 27 interface resets 0 output buffer failures, 0 output
buffers swapped out 925 carrier transitions Bound to: BRI0:2 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
Interface is bound to Di0 (Encapsulation PPP) LCP Open, multilink Open Last input 00:00:03,
output 00:00:07, 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 2165 packets input,
87326 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 2260 packets output, 89305 bytes, 0 underruns 0
output errors, 0 collisions, 27 interface resets 0 output buffer failures, 0 output buffers
swapped out 345 carrier transitions krimson#show frame pvc PVC Statistics for interface Serial1
(Frame Relay DTE) Active Inactive Deleted Static Local 0 0 1 0 Switched 0 0 0 0 Unused 0 0 0 0
DLCI = 20, DLCI USAGE = LOCAL, PVC STATUS = DELETED, INTERFACE = Serial1.1 input pkts 53307
output pkts 62181 in bytes 3853472 out bytes 6343822 dropped pkts 0 in FECN pkts 0 in BECN pkts
0 out FECN pkts 0 out BECN pkts 0 in DE pkts 0 out DE pkts 0 out bcst pkts 62123 out bcst
bytes 6337256 pvc create time 1w2d, last time pvc status changed 00:01:12 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 [110/782] via 10.9.9.2, 00:01:03, Dialer0 !--- now route to the
destination network points to backup interface as a next hop 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

```

フレームリレー インターフェイスが起動し、バックアップ インターフェイスがダウンします。



krimson#show interface serial 1.1 Serial1.1 is up, line protocol is up 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 \*Apr 26 04:59:49.481: %LINK-3-UPDOWN:  
Interface Serial1, changed state to up \*Apr 26 04:59:50.481: %LINEPROTO-5-UPDOWN: Line protocol  
on Interface Serial1, changed state to up \*Apr 26 05:01:44.001: Di0 DDR: idle timeout !---  
*backup is going down after expiration of the idle timer* \*Apr 26 05:01:44.001: DDR: Dialer Watch:  
watch-group = 1 \*Apr 26 05:01:44.001: DDR: network 10.8.8.0/255.255.255.0 UP, \*Apr 26  
05:01:44.005: DDR: primary DOWN \*Apr 26 05:01:44.009: Di0 DDR: disconnecting call \*Apr 26  
05:01:44.013: BR0:1 PPP: Phase is TERMINATING [0 sess, 1 load] \*Apr 26 05:01:44.013: BR0:1 LCP:  
O TERMREQ [Open] id 106 len 4 \*Apr 26 05:01:44.021: BR0:2 PPP: Phase is TERMINATING [0 sess, 1  
load] \*Apr 26 05:01:44.021: BR0:2 LCP: O TERMREQ [Open] id 54 len 4 \*Apr 26 05:01:44.029: Di0  
IPCP: State is Closed \*Apr 26 05:01:44.033: Di0 PPP: Phase is TERMINATING [0 sess, 1 load] \*Apr  
26 05:01:44.033: Di0 LCP: State is Closed \*Apr 26 05:01:44.037: Di0 PPP: Phase is DOWN [0 sess,  
1 load] \*Apr 26 05:01:44.041: Di0 IPCP: Remove route to 10.9.9.2 \*Apr 26 05:01:44.045: BR0:1  
LCP: I TERMACK [TERMsent] id 106 len 4 \*Apr 26 05:01:44.049: BR0:1 LCP: State is Closed \*Apr 26  
05:01:44.049: BR0:1 PPP: Phase is DOWN [0 sess, 1 loow ad] \*Apr 26 05:01:44.053: BR0 DDR: has  
total 1 call(s), dial\_out 1, dial\_in 0 \*Apr 26 05:01:44.057: BR0:1 PPP: Treating connection as a  
callout \*Apr 26 05:01:44.057: BR0:1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load]  
\*Apr 26 05:01:44.061: BR0:1 LCP: O CONFREQ [Closed] id 107 len 15 \*Apr 26 05:01:44.065: BR0:1  
LCP: AuthProto CHAP (0x0305C22305) \*Apr 26 05:01:44.069: BR0:1 LCP: MagicNumber 0x2184A57C  
(0x05062184A57C) \*Apr 26 05:01:44.069: %DIALER-6-UNBIND: Interface BR0:1 unbound from profile  
Di0 \*Apr 26 05:01:44.077: BR0:1 DDR: disconnecting call \*Apr 26 05:01:44.077: BR0:1 DDR: Dialer  
Watch: resetting call in progress \*Apr 26 05:01:44.081: DDR: Dialer Watch: watch-group = 1 \*Apr  
26 05:01:44.081: DDR: network 10.8.8.0/255.255.255.0 UP, \*Apr 26 05:01:44.085: DDR: primary DOWN  
\*Apr 26 05:01:44.085: ISDN BR0: Event: Hangup call to call id 0x818D \*Apr 26 05:01:44.089: ISDN  
BR0: process\_disconnect(): call id 0x818D, call type is DATA, b\_idb 0x221DA8, ces 1, cause  
Normal call clearing(0x10) \*Apr 26 05:01:44.097: %ISDN-6-DISCONNECT: Interface BRI0:1  
disconnected from 6120 kevin, call lasted 120 seconds \*Apr 26 05:01:44.101: ISDN:  
get\_isdn\_service\_state(): idb 0x221DA8 bchan 2 is\_isdn 1 Not a Pri \*Apr 26 05:01:44.105:  
CCBRI\_Go Fr Host InPkgInfo (Len=13) : \*Apr 26 05:01:44.105: 5 0 1 81 8D 3 8 1 90 8 2 80 90 \*Apr  
26 05:01:44.109: \*Apr 26 05:01:44.121: ISDN BR0: TX -> DISCONNECT pd = 8 callref = 0x10 \*Apr 26  
05:01:44.129: Cause i = 0x8090 - Normal call clearing \*Apr 26 05:01:44.137: BR0:2 LCP: I TERMACK  
[TERMsent] id 54 len 4 \*Apr 26 05:01:44.141: BR0:2 LCP: State is Closed \*Apr 26 05:01:44.141:  
BR0:2 PPP: Phase is DOWN [0 sess, 1 load] \*Apr 26 05:01:44.145: BR0 DDR: has total 0 call(s),  
dial\_out 0, dial\_in 0 \*Apr 26 05:01:44.149: BR0:2 PPP: Treating connection as a callout \*Apr 26  
05:01:44.149: BR0:2 PPP: Phase is ESTABLISHING, Active Open [0 sess, 1 load] \*Apr 26  
05:01:44.153: BR0:2 LCP: O CONFREQ [Closed] id 55 len 15 \*Apr 26 05:01:44.157: BR0:2 LCP:  
AuthProto CHAP (0x0305C22305) \*Apr 26 05:01:44.161: BR0:2 LCP: MagicNumber 0x2184A5D9  
(0x05062184A5D9) \*Apr 26 05:01:44.161: %DIALER-6-UNBIND: Interface BR0:2 unbound from profile  
Di0 \*Apr 26 05:01:44.165: BR0:2 DDR: disconnecting call \*Apr 26 05:01:44.173: ISDN BR0: Event:  
Hangup call to call id 0x818E \*Apr 26 05:01:44.173: ISDN BR0: process\_disconnect(): call id  
0x818E, call type is DATA, b\_idb 0x225754, ces 1, cause Normal call clearing(0x10) \*Apr 26  
05:01:44.181: %ISDN-6-DISCONNECT: Interface BRI0:2 disconnected from 6120 kevin, call lasted 119  
seconds \*Apr 26 05:01:44.189: ISDN: get\_isdn\_service\_state(): idb 0x225754 bchan 3 is\_isdn 1 Not  
a Pri \*Apr 26 05:01:44.189: CCBRI\_Go Fr Host InPkgInfo (Len=13) : \*Apr 26 05:01:44.193: 5 0 1 81  
8E 3 8 1 90 8 2 80 90 \*Apr 26 05:01:44.197: \*Apr 26 05:01:44.205: ISDN BR0: RX <- RELEASE pd = 8  
callref = 0x90 \*Apr 26 05:01:44.221: ISDN BR0: TX -> DISCONNECT pd = 8 callref = 0x11 \*Apr 26  
05:01:44.225: Cause i = 0x8090 - Normal call clearing \*Apr 26 05:01:44.241: CCBRI\_Go Fr L3 pkt  
(Len=4) : \*Apr 26 05:01:44.241: 4D 1 10 97 \*Apr 26 05:01:44.245: \*Apr 26 05:01:44.249: ISDN BR0:  
LIF\_EVENT: ces/callid 1/0x818D HOST\_DISCONNECT\_ACK \*Apr 26 05:01:44.253: ISDN:  
get\_isdn\_service\_state(): idb 0x221DA8 bchan 2 is\_isdn 1 Not a Pri \*Apr 26 05:01:44.257: ISDN  
BR0: HOST\_DISCONNECT\_ACK: call type is DATA \*Apr 26 05:01:44.257: %LINK-3-UPDOWN: Interface  
BRI0:1, changed state to down \*Apr 26 05:01:44.265: BR0:1 LCP: State is Closed \*Apr 26  
05:01:44.265: BR0:1 PPP: Phase is DOWN [0 sess, 0 load] \*Apr 26 05:01:44.269: BR0:1 DDR:  
disconnecting call \*Apr 26 05:01:44.273: ISDN BR0: LIF\_EVENT: ces/callid 1/0x818D  
HOST\_DISCONNECT\_ACK \*Apr 26 05:01:44.277: ISDN: get\_isdn\_service\_state(): idb 0x221DA8 bchan 2  
is\_isdn 1 Not a Pri \*Apr 26 05:01:44.277: ISDN BR0: HOST\_DISCONNECT\_ACK: call type is DATA \*Apr  
26 05:01:44.289: ISDN BR0: TX -> RELEASE\_COMP pd = 8 callref = 0x10 \*Apr 26 05:01:44.305: ISDN  
BR0: RX <- RELEASE pd = 8 callref = 0x91 \*Apr 26 05:01:44.325: CCBRI\_Go Fr L3 pkt (Len=4) : \*Apr  
26 05:01:44.325: 4D 1 11 97 \*Apr 26 05:01:44.329: \*Apr 26 05:01:44.333: ISDN BR0: LIF\_EVENT:  
ces/callid 1/0x818E HOST\_DISCONNECT\_ACK \*Apr 26 05:01:44.337: ISDN: get\_isdn\_service\_state():  
idb 0x225754 bchan 3 is\_isdn 1 Not a Pri \*Apr 26 05:01:44.341: ISDN BR0: HOST\_DISCONNECT\_ACK:  
call type is DATA \*Apr 26 05:01:44.341: %LINK-3-UPDOWN: Interface BRI0:2, changed state to down  
\*Apr 26 05:01:44.345: BR0:2 LCP: State is Closed \*Apr 26 05:01:44.349: BR0:2 PPP: Phase is DOWN

```
[0 sess, 0 load] *Apr 26 05:01:44.349: BR0:2 DDR: disconnecting call *Apr 26 05:01:44.353: ISDN
BR0: LIF_EVENT: ces/callid 1/0x818E HOST_DISCONNECT_ACK *Apr 26 05:01:44.357: ISDN:
get_isdn_service_state(): idb 0x225754 bchan 3 is_isdn 1 Not a Pri *Apr 26 05:01:44.361: ISDN
BR0: HOST_DISCONNECT_ACK: call type is DATA *Apr 26 05:01:44.369: ISDN BR0: TX -> RELEASE_COMP
pd = 8 callref = 0x11 *Apr 26 05:01:45.009: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:1, changed state to down *Apr 26 05:01:45.017: %LINEPROTO-5-UPDOWN: Line protocol on
Interface BRI0:2, changed state to down
krimson#show isdn active -----
----- ISDN ACTIVE CALLS -----
----- Call Calling Called Remote Seconds Seconds
Seconds Charges Type Number Number Name Used Left Idle 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,
00:00:11, Serial1.1 !--- The monitored router again shows the primary interface as the next hop
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
```

## トラブルシューティング

ここでは、設定のトラブルシューティングに役立つ情報について説明します。

次に示すフレームリレーの設定はこの設定特有で、ポイントツーポイント サブインターフェイスがあり、ルーティング プロトコルとして Open Shortest Path First ( OSPF ) を使用しています。ただし、次に説明するトラブルシューティング手順は一般的なもので、ハイレベル データ リンク制御 ( HDLC ) および PPP カプセル化を使用するフレームリレー ポイントツーマルチポイントやプライマリ リンクなど使用するルーティング プロトコルに関係なくさまざまな設定で使用できます。

バックアップの機能性を検証するために、シャットダウン状態のフレームリレー スイッチとして機能する Cisco 4500 ルータのインターフェイスの 1 つを用意し、フレームリレー ネットワーク内の問題をシミュレートしています。この結果、フレームリレー ネットワーク経由で DTE ルータが PVC 非アクティブ状態になり、フレームリレー サブインターフェイス ダウン イベントが発生します。これによって、バックアップ インターフェイスがアクティブになっています。

## トラブルシューティングのためのコマンド

特定の show コマンドは、アウトプット インタープリタでサポートされています。このツールを使用すると、show コマンド出力を分析できます。

注: debug コマンドを使用する前に、『[debug コマンドに関する重要な情報](#)』を参照してください。

- **debug isdn q931** : ローカル ルータ ( ユーザ側 ) とネットワーク間の ISDN ネットワーク接続 ( レイヤ 3 ) のコール セットアップやティアダウンに関する情報を表示。
- **debug isdn events** : ISDN インターフェイスのユーザ側 ( ルータ上の ) で発生している ISDN イベントを表示。
- **debug dialer** : ダイアラ インターフェイス上のパケットまたはイベントに関するデバッグ情報を表示。

- **debug ppp negotiation** : PPP オプションがネゴシエートされている PPP の起動中に送信される PPP パケットを **debug ppp** コマンドで表示させる。
- **debug ppp authentication** : Challenge Authentication Protocol ( CHAP ) パケットの交換やパスワード認証プロトコル ( PAP ) 交換などの認証プロトコル メッセージを **debug ppp** コマンドで表示させる。
- **debug ip ospf events** : 隣接関係、フラッディング情報、指定ルータの選択、Shortest Path First ( SPF ) の計算などの OSPF 関連のイベントに関する情報を表示。
- **debug frame-relay events** : マルチキャスト チャネルをサポートし、ダイナミック アドレスを使用しているネットワークの場合に、フレーム リレー ARP の応答に関するデバッグ情報を表示します。

## **関連情報**

- [ダイヤル テクノロジーに関するサポート ページ \( 英語 \)](#)
- [テクニカルサポート - Cisco Systems](#)