

Configuring BRI Multilink ISDN Backup With Dialer Watch

Document ID: 11049

Introduction

Prerequisites

- Requirements
- Components Used
- Conventions

Configure

- Network Diagram
- Configurations

Verify

- Sample show Command Output

Troubleshoot

- Troubleshooting Commands

Related Information

Introduction

This document provides a sample configuration for configuring a BRI multilink ISDN backup using dialer watch.

It provides basic troubleshooting commands, as well as specific instructions for troubleshooting configurations with point-to-point (PPP) multilink implemented in a backup scenario in conjunction with dialer watch.

This configuration can be used when either the main Frame Relay interface or subinterfaces go down.

Prerequisites

Requirements

There are no specific prerequisites for this document.

Components Used

The information in this document is based on the software and hardware versions below.

- Two Cisco 2500 routers (Frame Relay data terminal equipment [DTEs]) running Cisco IOS® Software Releases 12.2(3) and 12.2(5).
- One Cisco 4500 router acting as a Frame Relay switch.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

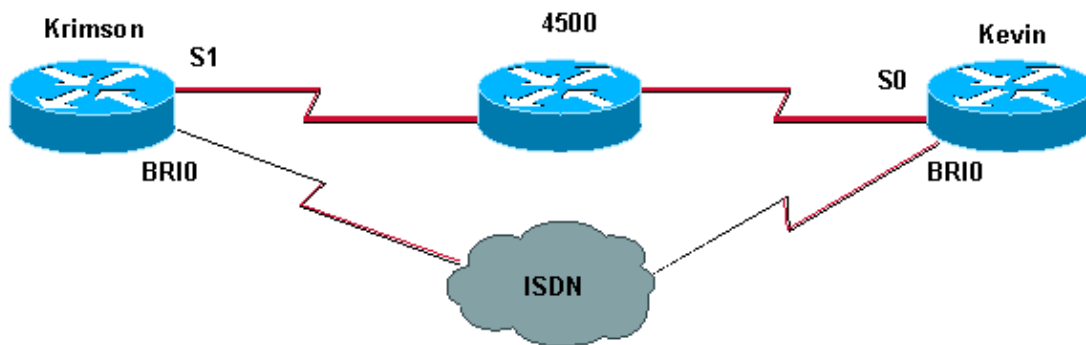
Configure

In this section, you are presented with the information to configure the features described in this document.

Note: To find additional information on the commands used in this document, use the Command Lookup tool

Network Diagram

This document uses the network setup shown in the diagram below.



Configurations

This document uses the configurations shown below.

- krimson (Cisco 2500 Router)
- kevin (Cisco 2500 Router)

krimson (Cisco 2500 Router)
<pre>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</pre>

```
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 Router)

```
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

```

Verify

This section provides information you can use to confirm your configuration is working properly.

Certain **show** commands are supported by the Output Interpreter tool, which allows you to view an analysis of **show** command output.

- **show interfaces serial** – Displays information about the multicast data-link connection identifier (DLCI), the DLCIs used on the interface, and the DLCI used for the Local Management Interface (LMI).
- **show interface dialer** – Displays information about the dialer interface.
- **show ip route** – Displays IP routing table entries.
- **show frame-relay pvc** – Displays the status of PVCs on the router.

Sample show Command Output

The following **show** commands show the initial state on the calling router while the Frame Relay link is up and functional:

```

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
```

The following output shows that the Frame Relay link is going down and the ISDN link comes up:

```
*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 bcast pkts 62123 out bcast 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
```

The Frame Relay interface comes up, and the backup interface goes down.

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 Type	Calling Number	Called Number	Remote Name	Seconds Used	Seconds Left	Seconds Idle	Seconds	Charges
-----------	----------------	---------------	-------------	--------------	--------------	--------------	---------	---------

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

```

Troubleshoot

This section provides information you can use to troubleshoot your configuration.

The Frame Relay configuration shown here, which has point-to-point subinterfaces and uses Open Shortest Path First (OSPF) as a routing protocol, is specific to this setup. However, the troubleshooting steps given below are more general and can be used with different configurations such as Frame Relay point-to-multipoint or primary link with High-Level Data Link Control (HDLC) and PPP encapsulation, regardless of the routing protocol used.

To verify the backup functionality, we have placed one of the interfaces on the Cisco 4500 router that is acting as a Frame Relay switch in shutdown state, in order to simulate problems within the Frame Relay network. Consequently, this leads to the PVC inactive state being conducted to the DTE router via the Frame Relay network, and a Frame Relay subinterface down event. This activates the backup interface.

Troubleshooting Commands

Certain **show** commands are supported by the Output Interpreter tool, which allows you to view an analysis of **show** command output.

Note: Before issuing **debug** commands, please see Important Information on Debug Commands.

- **debug isdn q931** – Displays information about call setup and teardown of ISDN network connections (Layer 3) between the local router (user side) and the network.
- **debug isdn events** – Displays ISDN events occurring on the user side (on the router) of the ISDN interface.
- **debug dialer** – Displays debugging information about the packets or events on a dialer interface.
- **debug ppp negotiation** – Causes the **debug ppp** command to display PPP packets transmitted during PPP startup, where PPP options are negotiated.
- **debug ppp authentication** – Causes the **debug ppp** command to display authentication protocol messages, including Challenge Authentication Protocol (CHAP) packet exchanges and Password Authentication Protocol (PAP) exchanges.
- **debug ip ospf events** – Displays information on OSPF-related events, such as adjacencies, flooding information, designated router selection, and shortest path first (SPF) calculation
- **debug frame-relay events** – Displays debugging information about Frame Relay ARP replies on networks that support a multicast channel and use dynamic addressing.

Related Information

- [Dial Technology Support Pages](#)
- [Technical Support – Cisco Systems](#)

[Contacts & Feedback](#) | [Help](#) | [Site Map](#)

© 2008 – 2009 Cisco Systems, Inc. All rights reserved. [Terms & Conditions](#) | [Privacy Statement](#) | [Cookie Policy](#) | [Trademarks of Cisco Systems, Inc.](#)

Updated: Nov 15, 2007

Document ID: 11049
