Copia de seguridad de BRI ISDN con interfaz de copia de seguridad

Contenido

Introducción

Este documento proporciona una configuración de ejemplo para la copia de seguridad de ISDN y proporciona información básica de resolución de problemas para este tipo de configuración.

Para obtener información sobre las implementaciones más comunes de respaldo ISDN, y comparaciones entre ellas, consulte el siguiente documento: [Evaluación de interfaces de respaldo, rutas estáticas flotantes y vigilancia de programas dialer para el respaldo de DDR.](#)

Prerequisites

Requirements

No hay requisitos previos específicos para este documento.

Componentes Utilizados

La información que contiene este documento se basa en las versiones de software y hardware indicadas a continuación.

- Dos routers Cisco 2500 (equipos de terminal de datos de Frame Relay [DTE]) que ejecutan las versiones 12.2(3) y 12.2(5) del software Cisco IOS®.
- Un router Cisco 4500 que actúa como switch Frame Relay.

La información que se presenta en este documento se originó a partir de dispositivos dentro de un

ambiente de laboratorio específico. All of the devices used in this document started with a cleared (default) configuration. Si la red está funcionando, asegúrese de haber comprendido el impacto que puede tener un comando antes de ejecutarlo.

Convenciones

Para obtener más información sobre las convenciones del documento, consulte Convenciones de Consejos Técnicos de Cisco.
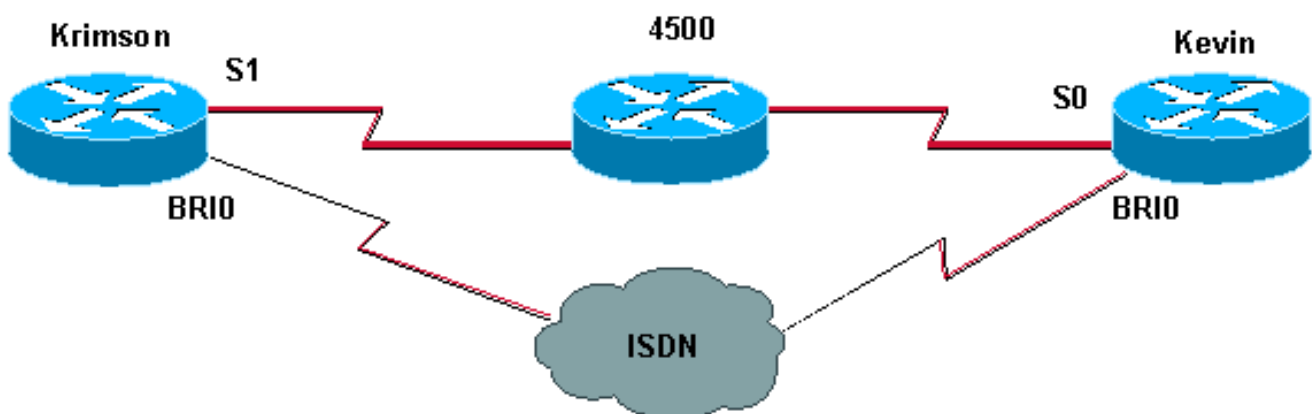
Configurar

En esta sección encontrará la información para configurar las funciones descritas en este documento.

Nota: Para encontrar información adicional sobre los comandos usados en este documento, utilice la Command Lookup Tool (sólo clientes registrados) .

Diagrama de la red

Este documento utiliza la instalación de red que se muestra en el siguiente diagrama.

Configuraciones

Este documento usa las configuraciones detalladas a continuación.

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
!</pre>

```
!
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
no ip route-cache
no ip mroute-cache
!
interface Serial1.1 point-to-point
backup interface Dialer0
ip address 10.5.5.2 255.255.255.0
no ip route-cache
frame-relay interface-dlci 20
!
interface BRI0
description Testanschluss ISDN(intern), Nr. 4420038
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-group 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
!
ip default-gateway 10.200.16.1
no ip classless
no ip http server
!
access-list 105 permit ip any host 10.7.7.1
access-list 105 permit ip any host 10.8.8.1
access-list 105 permit ip any any
```

```
dialer-list 1 protocol ip permit
!
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
!
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
!
dialer-list 1 protocol ip permit
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
!
ntp clock-period 17180102
ntp server 10.200.20.134
end
```

Verificación

En esta sección encontrará información que puede utilizar para confirmar que su configuración esté funcionando correctamente.

Utilice los siguientes comandos para verificar su configuración:

La herramienta Output Interpreter admite algunos comandos show y le permite ver un análisis de los resultados de este comando.

- **show interfaces serial** – Muestra información sobre el identificador de conexión de links de datos (DLCI) de multidifusión, los DLCI usados en la interfaz y el DLCI usado en la LMI (interfaz de gestión local).
- **show interface dialer** - Muestra información sobre la interfaz del marcador.
- **show ip route** - Muestra las entradas de la tabla de IP Routing.

```
    krimson#show interface serial 1.1
! --- The initial state before the simulated Frame Relay network failure. ! --- The primary link
is up and functional. Serial1.1 is up, line protocol is up Hardware is HD64570 Internet address
is 10.5.5.2/24 Backup interface Dialer0, failure delay 0 sec, secondary disable delay 0 sec MTU
1500 bytes, BW 64 Kbit, DLY 20000 usec, reliability 255/255, txload 1/255, rxload 1/255
Encapsulation FRAME-RELAY krimson#show int dialer 0
! --- Initial state. The backup interface is in standby mode and inactive. Dialer0 is standby
mode (spoofing), line protocol is down (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
1w6d, output never, output hang never Last clearing of "show interface" counters 6w4d 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 596 packets input, 48924 bytes 600 packets output, 49280 bytes 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
   O 10.9.9.0 [110/3347] via 10.5.5.1, 00:03:34, Serial1.1
   O 10.8.8.0 [110/1563] via 10.5.5.1, 00:03:34, Serial1.1
```
! --- The route to the tested destination network points to the ! --- still-active primary link.
```
C 10.5.5.0 is directly connected, Serial1.1 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
```
Aquí, podemos ver que la interfaz de Frame Relay está cayendo.

```
   krimson#
   *Apr 16 23:56:47.840: %LINK-3-UPDOWN: Interface Serial1,
   changed state to down
   *Apr 16 23:56:47.848: OSPF: Interface Serial1.1 going Down
```
! --- Here we have simulated a failure within the Frame Relay network. ! --- We can see what was conducted to the Frame Relay DTE router, ! --- and the subinterface going down. *Apr 16 23:56:47.852: %OSPF-5-ADJCHG: Process 10, Nbr 172.19.0.1 on Serial1.1 from FULL to DOWN, Neighbor Down: Interface down or detached *Apr 16 23:56:48.736: BACKUP(Serial1.1): event = primary went down *Apr 16 23:56:48.740: BACKUP(Serial1.1): changed state to "waiting to backup" *Apr 16 23:56:48.744: BACKUP(Serial1.1): event = timer expired *Apr 16 23:56:48.748: Di0 DDR is shutdown, could not clear interface. *Apr 16 23:56:48.752: BACKUP(Serial1.1): secondary interface (Dialer0) made active *! --- The configured backup interface is active.* *Apr 16 23:56:48.752: BACKUP(Serial1.1): changed state to "backup mode" *Apr 16 23:56:48.756: OSPF: Interface Dialer0 going Up *Apr 16 23:56:48.760: BR0 DDR: rotor dialout [priority] *Apr 16 23:56:48.764: BR0 DDR: Dialing cause ip (s=10.9.9.1, d=224.0.0.5) *! --- OSPF packets trigger the call.* *Apr 16 23:56:48.768: BR0 DDR: Attempting to dial 6120 *Apr 16 23:56:48.784: ISDN BR0: TX -> SETUP pd = 8 callref = 0x3E *Apr 16 23:56:48.792: Bearer Capability i = 0x8890 *Apr 16 23:56:48.796: Channel ID i = 0x83 *Apr 16 23:56:48.804: Called Party Number i = 0x80, '6120', Plan:Unknown, Type:Unknown *Apr 16 23:56:48.844: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1, changed state to down *Apr 16 23:56:48.884: ISDN BR0: RX <- CALL_PROC pd = 8 callref = 0xBE *Apr 16 23:56:48.892: Channel ID i = 0x89 *Apr 16 23:56:49.144: ISDN BR0: RX <- CONNECT pd = 8 callref = 0xBE *Apr 16 23:56:49.160: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up *Apr 16 23:56:49.168: %DIALER-6-BIND: Interface BR0:1 bound to profile Di0 *Apr 16 23:56:49.176: BR0:1 PPP: Treating connection as a callout *Apr 16 23:56:49.180: BR0:1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 0 load] *Apr 16 23:56:49.184: BR0:1 LCP: O CONFREQ [Closed] id 49 len 15 *Apr 16 23:56:49.188: BR0:1 LCP: AuthProto CHAP (0x0305C22305) *Apr 16 23:56:49.188: BR0:1 LCP: MagicNumber 0xF2143EDB (0x0506F2143EDB) *Apr 16 23:56:49.196: ISDN BR0: TX -> CONNECT_ACK pd = 8 callref = 0x3E *Apr 16 23:56:49.224: BR0:1 LCP: I CONFREQ [REQsent] id 83 len 15 *Apr 16 23:56:49.228: BR0:1 LCP: AuthProto CHAP (0x0305C22305) *Apr 16 23:56:49.232: BR0:1 LCP: MagicNumber 0x9ADACD69 (0x05069ADACD69) *Apr 16 23:56:49.236: BR0:1 LCP: O CONFACK [REQsent] id 83 len 15 *Apr 16 23:56:49.236: BR0:1 LCP: AuthProto CHAP (0x0305C22305) *Apr 16 23:56:49.240: BR0:1 LCP: MagicNumber 0x9ADACD69 (0x05069ADACD69) *Apr 16 23:56:49.244: BR0:1 LCP: I CONFACK [ACKsent] id 49 len 15 *Apr 16 23:56:49.248: BR0:1 LCP: AuthProto CHAP (0x0305C22305) *Apr 16 23:56:49.252: BR0:1 LCP: MagicNumber 0xF2143EDB (0x0506F2143EDB) *Apr 16 23:56:49.252: BR0:1 LCP: State is Open *Apr 16 23:56:49.256: BR0:1 PPP: Phase is AUTHENTICATING, by both [0 sess, 0 load] *Apr 16 23:56:49.260: BR0:1 CHAP: O CHALLENGE id 49 len 28 from "krimson" *Apr 16 23:56:49.276: BR0:1 CHAP: I CHALLENGE id 51 len 26 from "kevin" *Apr 16 23:56:49.284: BR0:1 CHAP: O RESPONSE id 51 len 28 from "krimson" *Apr 16 23:56:49.332: BR0:1 CHAP: I SUCCESS id 51 len 4 *Apr 16 23:56:49.344: BR0:1 CHAP: I RESPONSE id 49 len 26 from "kevin" *Apr 16 23:56:49.352: BR0:1 CHAP: O SUCCESS id 49 len 4 *Apr 16 23:56:49.356: BR0:1 PPP:

Phase is UP [0 sess, 0 load] *Apr 16 23:56:49.360: BR0:1 IPCP: O CONFREQ [Not negotiated] id 41 len 10 *Apr 16 23:56:49.364: BR0:1 IPCP: Address 10.9.9.1 (0x03060A090901) *Apr 16 23:56:49.376: BR0:1 IPCP: I CONFREQ [REQsent] id 29 len 10 *Apr 16 23:56:49.380: BR0:1 IPCP: Address 10.9.9.2 (0x03060A090902) *Apr 16 23:56:49.384: BR0:1 IPCP: O CONFACK [REQsent] id 29 len 10 *Apr 16 23:56:49.388: BR0:1 IPCP: Address 10.9.9.2 (0x03060A090902) *Apr 16 23:56:49.396: BR0:1 IPCP: I CONFACK [ACKsent] id 41 len 10 *Apr 16 23:56:49.400: BR0:1 IPCP: Address 10.9.9.1 (0x03060A090901) *Apr 16 23:56:49.400: BR0:1 IPCP: State is Open *Apr 16 23:56:49.408: BR0:1 DDR: dialer protocol up *Apr 16 23:56:49.416: Di0 IPCP: Install route to 10.9.9.2 *Apr 16 23:56:49.960: OSPF: Rcv hello from 172.19.0.1 area 0 from Dialer0 10.9.9.2 *Apr 16 23:56:49.964: OSPF: End of hello processing *Apr 16 23:56:50.356: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1, changed state to up *Apr 16 23:56:50.748: %LINK-3-UPDOWN: Interface Dialer0, changed state to up *Apr 16 23:56:50.752: Di0 LCP: Not allowed on a Dialer Profile *Apr 16 23:56:50.752: BACKUP(Dialer0): event = primary came up *Apr 16 23:56:55.176: %ISDN-6-CONNECT: Interface BRI0:1 is now connected to 6120 kevin *Apr 16 23:56:58.804: OSPF: Rcv DBD from 172.19.0.1 on Dialer0 seq 0x988 opt 0x42 flag 0x7 len 32 mtu 1500 state INIT *Apr 16 23:56:58.808: OSPF: 2 Way Communication to 172.19.0.1 on Dialer0, state 2WAY krimson#**show interface serial 1.1**
    Serial1.1 is down, line protocol is down
    ! --- The primary link is down. Hardware is HD64570 Internet address is 10.5.5.2/24 Backup interface Dialer0, failure delay 0 sec, secondary disable delay 0 sec 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**
    Dialer0 is up, line protocol is up (spoofing)
! --- The backup interface is active and bearing traffic. 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 6w4d 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 614 packets input, 50240 bytes 618 packets output, 50584 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 00:01:57 Interface is bound to Di0 (Encapsulation PPP) LCP Open Open: IPCP Last input 00:00:01, output 00:00:02, 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 3910 packets input, 394443 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 3613 packets output, 222417 bytes, 0 underruns 0 output errors, 0 collisions, 27 interface resets 0 output buffer failures, 0 output buffers swapped out 607 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, 00:00:53, Dialer0
    ! --- The route entry to the destination network is now pointing to ! --- the 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 krimson#**ping 10.8.8.1**
    Type escape sequence to abort.
    Sending 5, 100-byte ICMP Echos to 10.8.8.1, timeout is 2 seconds:

```
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 36/36/40 ms
```

Aquí podemos ver que el sistema vuelve a su estado inicial una vez que se ha borrado el fallo en la red Frame Relay:

```
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
   Backup interface Dialer0, failure delay 0 sec,
   secondary disable delay 0 sec
   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
   Dialer0 is standby mode (spoofing), line protocol is down (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 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
   665 packets input, 54008 bytes
   671 packets output, 54548 bytes

   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
   O 10.9.9.0 [110/3347] via 10.5.5.1, 00:08:39, Serial1.1
   O 10.8.8.0 [110/1563] via 10.5.5.1, 00:08:39, Serial1.1
   C 10.5.5.0 is directly connected, Serial1.1
   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
   krimson#
```

Nota: No se necesita ninguna configuración específica en el lado llamado.

El mismo resultado show registrado durante el funcionamiento normal contiene la siguiente información:

```
kevin#show interface serial 0.1
   Serial0.1 is up, line protocol is up
```
! --- The primary interface is up and running. Hardware is HD64570 Internet address is
10.5.5.1/24 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, reliability 255/255, txload 1/255,
rxload 1/255 Encapsulation FRAME-RELAY kevin#**show interface dialer 0**
```
   Dialer0 is up (spoofing), line protocol is up (spoofing)
```
! --- Note: On the called side, the dialer interface is active ! --- and not in standby mode.
Hardware is Unknown Internet address is 10.9.9.2/24 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 1w6d, output never, output hang never Last clearing of
"show interface" counters 4w2d 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 598 packets input, 49252
bytes 596 packets output, 48924 bytes kevin#**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

   172.17.0.0/32 is subnetted, 1 subnets
   S 172.17.247.195 [1/0] via 10.200.16.1
   172.19.0.0/32 is subnetted, 1 subnets
   C 172.19.0.1 is directly connected, Loopback1
   10.0.0.0/24 is subnetted, 5 subnets
   C 10.5.5.0 is directly connected, Serial0.1
   O 10.7.7.0 [110/65] via 10.5.5.2, 00:04:27, Serial0.1
   C 10.9.9.0 is directly connected, Dialer0
   C 10.8.8.0 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
```

Esta es la misma información registrada durante la falla:

```
kevin#show interface serial 0.1
   Serial0.1 is down, line protocol is down
   Hardware is HD64570
   Internet address is 10.5.5.1/24
   MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
   reliability 255/255, txload 1/255, rxload 1/255
   Encapsulation FRAME-RELAY

   kevin#show interface dialer 0
   Dialer0 is up, line protocol is up (spoofing)
   Hardware is Unknown
   Internet address is 10.9.9.2/24
   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 4w2d
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
618 packets input, 50700 bytes
616 packets output, 50384 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 set (10 sec)
DTR is pulsed for 1 seconds on reset
Time to interface disconnect: idle 00:01:57
Interface is bound to Di0 (Encapsulation PPP)
LCP Open
Open: IPCP
Last input 00:00:03, output 00:00:02, 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
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
1280 packets input, 138077 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
9789 input errors, 9789 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
1309 packets output, 138487 bytes, 0 underruns
0 output errors, 0 collisions, 15 interface resets
0 output buffer failures, 0 output buffers swapped out
351 carrier transitions

kevin#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
172.17.0.0/32 is subnetted, 1 subnets
S 172.17.247.195 [1/0] via 10.200.16.1
172.19.0.0/32 is subnetted, 1 subnets
C 172.19.0.1 is directly connected, Loopback1
10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks
O 10.7.7.0/24 [110/1786] via 10.9.9.1, 00:01:21, Dialer0
C 10.9.9.0/24 is directly connected, Dialer0
C 10.8.8.0/24 is directly connected, Loopback0
C 10.9.9.1/32 is directly connected, Dialer0
C 10.200.16.0/24 is directly connected, Ethernet0
S* 0.0.0.0/0 [1/0] via 10.200.16.1
```

Troubleshoot

En esta sección encontrará información que puede utilizar para solucionar problemas de configuración.

Las configuraciones de Frame Relay con subinterfaces punto a punto y Open Shortest Path First (OSPF) como protocolo de routing utilizado aquí son específicas para esta configuración. Sin embargo, los pasos de solución de problemas que se muestran son más generales y se pueden utilizar con diferentes configuraciones, como Frame Relay punto a multipunto o un enlace primario con encapsulación High-Level Data Link Control (HDLC) o Point-to-Point Protocol (PPP), independientemente del protocolo de routing utilizado.

Para verificar la funcionalidad de respaldo, una de las interfaces en el router Cisco 4500 que actúa como switch Frame Relay se ha colocado en estado de apagado para simular el problema dentro de la red Frame Relay. Por consiguiente, esto provoca que el estado inactivo PVC sea conducido al router DTE por medio de la red de Frame Relay y un evento de caída de la subinterfaz de Frame Relay. Esto activa la interfaz de respaldo.

Comandos para resolución de problemas

Nota: Antes de ejecutar **comandos debug**, consulte [Información Importante sobre Comandos Debug](#).

- debug isdn q931
- debug backup - Depura los eventos de respaldo.
- debug dialer – Muestra información de depuración acerca de los paquetes o eventos en una interfaz del marcador.
- debug ppp negotiation – hace que el comando debug ppp muestre los paquetes PPP transmitidos durante el inicio de PPP donde se negocian las opciones PPP
- debug ppp authentication – Hace que el comando debug ppp muestre los mensajes del protocolo de autenticación, entre ellos el intercambio de paquetes de protocolo de autenticación por desafío mutuo (CHAP) y los intercambios de protocolo de autenticación de contraseña (PAP).
- debug ip ospf events - Muestra la información en los eventos OSPF relacionados, tales como adyacencias, información de inundación, selección de router designado y cálculo del Trayecto más corto primero (SPF)
- **debug frame-relay events** - Muestra información de depuración sobre las respuestas ARP de Frame Relay en redes que soportan un canal multicast y usan direccionamiento dinámico.

Información Relacionada

- [Páginas de soporte de tecnología de marcación de acceso](#)
- [Soporte Técnico - Cisco Systems](#)