

Backup de BRI ISDN com interface de backup

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[Introdução](#)

Este documento fornece uma configuração de exemplo para o backup de ISDN, e fornece a informação básica de solução de problemas para o este tipo de configuração.

Para obter informações sobre da maioria de Implementação comum do backup de ISDN, e das comparações entre estes, refira o seguinte documento: [Avaliando interfaces de backup, rotas flutuantes e relógio de discador para backup DDR.](#)

[Pré-requisitos](#)

[Requisitos](#)

Não existem requisitos específicos para este documento.

[Componentes Utilizados](#)

As informações neste documento são baseadas nas versões de software e hardware abaixo.

- Dois Software Release 12.2(3) e 12.2(5) sendo executado de Cisco IOS® dos Cisco 2500 Router ([DTEs] do equipamento de terminal de dados do Frame Relay).
- Um Cisco 4500 Router que atua como um Frame Relay Switch.

As informações neste documento foram criadas a partir de dispositivos em um ambiente de laboratório específico. Todos os dispositivos utilizados neste documento foram iniciados com uma configuração (padrão) inicial. Se você estiver trabalhando em uma rede ativa, certifique-se de que entende o impacto potencial de qualquer comando antes de utilizá-lo.

Convenções

Para obter mais informações sobre convenções de documento, consulte as [Convenções de dicas técnicas Cisco](#).

Configurar

Nesta seção, você encontrará informações para configurar os recursos descritos neste documento.

Note: Para localizar informações adicionais sobre os comandos usados neste documento, utilize a Ferramenta Command Lookup (somente clientes [registrados](#)).

Diagrama de Rede

Este documento utiliza a instalação de rede mostrada no diagrama abaixo.

Configurações

Este documento utiliza as configurações mostradas abaixo.

krimson (Cisco 2500 Router)

```
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
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
```

Verificar

Esta seção fornece informações que você pode usar para confirmar se sua configuração está funcionando adequadamente.

Use os comandos seguintes verificar sua configuração:

[Determinados comandos show são suportados pela Ferramenta Output Interpreter, que permite que você veja uma análise do resultado do comando show.](#)

- **mostre a relações a informação de série dos** indicadores sobre o identificador de conexão do enlace de dados de transmissão múltipla (DLCI), os DLCI usados na relação, e o DLCI usado para a interface de gerenciamento local (LMI).
- **mostre a** informação dos indicadores do **discador da relação** sobre a interface do discador.
- **mostre** entradas de tabela de IP Routing dos indicadores da **rota IP**.

```
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
```

Aqui, nós podemos ver que a interface do Frame Relay está indo para baixo.

```
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

```

Aqui nós podemos ver o sistema que revertermos de volta a seu estado inicial uma vez que a falha na rede do Frame Relay foi cancelada:

```

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#
```

Note: Nenhuma configuração específica é precisada no lado chamado.

A mesma saída da mostra gravada durante a operação normal contém a informação seguinte:

```
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

Está aqui a mesma mesma informação gravada durante a falha:

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
```

Troubleshooting

Esta seção fornece informações que podem ser usadas para o troubleshooting da sua configuração.

As configurações do Frame Relay com subinterfaces ponto a ponto e Open Shortest Path First (OSPF) como um protocolo de roteamento se usou aqui são específicas a esta instalação. Contudo, os passos de Troubleshooting mostrados são mais gerais e podem ser usados com configurações diferentes tais como o Frame Relay ponto-a-multiponto ou um link principal com o encapsulamento do High-Level Data Link Control (HDLC) ou do protocolo ponto-a-ponto (PPP), apesar do protocolo de roteamento usado.

Para verificar o backup de funcionalidade, uma das relações no Cisco 4500 Router que está atuando como um Frame Relay Switch foi colocado no estado de fechamento a fim simular o problema dentro da rede do Frame Relay. Conseqüentemente, isso leva ao estado inativo de PVC conduzido ao roteador DTE por meio da rede de frame relay e a um evento de parada de subinterface de frame relay. Isto ativa a Interface de backup.

Comandos para Troubleshooting

Note: Antes de emitir comandos debug, consulte [Informações importantes sobre comandos](#)

[debug](#).

- **debug isdn q931**
- **debugar o apoio** debuga eventos de backup.
- **debugar a** informação sobre debugging dos indicadores do **discador** sobre os pacotes ou os eventos em uma interface do discador.
- **debug ppp negotiation** - Faz com que o comando debug ppp exiba pacotes PPP transmitidos durante a inicialização de PPP, em que as opções de PPP são negociadas.
- **debug ppp authentication** – Faz com que o comando debug ppp exiba mensagens de protocolo de autenticação, incluindo alterações de pacote do Protocolo de autenticação de desafio (CHAP) e intercâmbios de Protocolo de autenticação de senha (PAP).
- **debug ip ospf events** - Indica a informação em eventos relacionados a OSPF, tais como adjacências, informação de inundação, seleção de designated router, e cálculo do caminho mais curto primeiro (SPF)
- **debug frame-relay events** - Indica a informação sobre debugging sobre respostas ARP do Frame Relay nas redes que apoiam um canal de transmissão múltipla e usam o endereçamento dinâmico.

[Informações Relacionadas](#)

- [Páginas de suporte da tecnologia de discagem de acesso](#)
- [Suporte Técnico - Cisco Systems](#)