

# Configurando o backup de ISDN com rotas flutuantes

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## [Introdução](#)

Este documento fornece uma configuração de exemplo executando um backup de ISDN as Rotas estáticas flutuantes, 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 Cisco 2500 Router que executam Software Release 12.2(3) e 12.2(5) de Cisco IOS®

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.

**Nota:** 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 \(Cisco 2500 Router\)](#)
- [kevin \(Cisco 2500 Router\)](#)

### **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 ! interface Serial0 ip address
10.1.2.1 255.255.255.0 ! interface BRI0 no ip address
encapsulation ppp no ip route-cache no ip mroute-cache
load-interval 30 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 8114 dialer-group 1 no cdp
enable ppp authentication chap ! ip classless ip route
10.8.8.0 255.255.255.0 10.1.2.2 ip route 10.8.8.0
255.255.255.0 10.9.9.2 180 no ip http server ! dialer-
list 1 protocol ip permit ! ! line con 0 exec-timeout 0
0 line aux 0 line vty 0 4 exec-timeout 0 0 password
<password> login ! end
```

### **kevin (Cisco 2500 Router)**

```
kevin#show running-config Building configuration...
Current configuration : 1205 bytes ! version 12.2
service timestamps debug datetime msec service
timestamps log datetime msec no service password-
```

```
encryption ! hostname kevin ! username krimson password
0 <password> ! isdn switch-type basic-net3 ! ! !
interface Loopback0 ip address 10.8.8.1 255.255.255.0 !
interface Serial0 ip address 10.1.2.2 255.255.255.0
clockrate 2000000 ! interface Serial1 no ip address
shutdown ! 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 string
8113 dialer-group 1 no cdp enable ppp authentication
chap ! ! dialer-list 1 protocol ip permit ! ! line con 0
exec-timeout 0 0 line aux 0 line vty 0 4 exec-timeout 0
0 password <password> login ! end
```

## Verificar

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

Os determinados comandos de exibição são apoiados pela [ferramenta Output Interpreter](#) ([clientes registrados somente](#)), que permite que você ver uma análise do emissor de comando de execução.

- show ip route - Exibe entradas de tabela de IP Routing.
- show interfaces - Exibe estatísticas para todas as interfaces configuradas no roteador ou no servidor de acesso.

## Troubleshooting

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

### Comandos para Troubleshooting

Os determinados comandos de exibição são apoiados pela [ferramenta Output Interpreter](#) ([clientes registrados somente](#)), que permite que você ver uma análise do emissor de comando de execução.

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

- **debugar o q931 de ISDN** - Informação dos indicadores sobre a configuração de chamada e desconexão das conexões de rede ISDN (camada 3) entre o roteador local (lado do usuário) e a rede.
- debug isdn events - Exibe eventos de ISDN que ocorrem no lado do usuário (no roteador) da interface ISDN. Os eventos ISDN que podem ser exibidos são eventos Q.931 (configuração de chamada e destruição de conexões de rede ISDN).
- debug dialer - Exibe informações de depuração sobre os pacotes ou eventos em uma interface de 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).

## Exemplo de Saída de Troubleshooting

Aqui, nós podemos testar o backup de funcionalidade usando os comandos **shutdown and no shutdown** na interface serial no lado remoto. Conseqüentemente, isso leva ao desaparecimento da rota ip principal para a rede de destino em questão.

Deixe-nos primeiro olhar no estado inicial da interface principal e da tabela de IP Routing:

### Lado da chamada:

```
krimson#show interface serial 0 Serial0 is up, line protocol is up Hardware is HD64570
Internet address is 10.1.2.1/24 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, reliability
255/255, txload 1/255, rxload 1/255 Encapsulation HDLC, loopback not set Keepalive set (10 sec)
Last input 00:00:07, output 00:00:07, output hang never Last clearing of "show interface"
counters never 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
0/1/256 (active/max active/max total) Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 1158 kilobits/sec 5 minute input rate 1000 bits/sec, 0 packets/sec 5 minute
output rate 0 bits/sec, 0 packets/sec 92 packets input, 7599 bytes, 0 no buffer Received 62
broadcasts, 0 runts, 0 giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored,
0 abort 99 packets output, 8991 bytes, 0 underruns 0 output errors, 0 collisions, 12 interface
resets 0 output buffer failures, 0 output buffers swapped out 4 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 10.48.74.1 to network 0.0.0.0 10.0.0.0/8 is variably subnetted,
5 subnets, 2 masks C 10.1.2.0/24 is directly connected, Serial0 S 10.8.8.0/24 [1/0] via 10.1.2.2
!--- The IP route for the destination network points to the primary link. C 10.9.9.0/24 is
directly connected, Dialer0 C 10.7.7.0/24 is directly connected, Loopback0 C 10.48.74.0/23 is
directly connected, Ethernet0 S* 0.0.0.0/0 [254/0] via 10.48.74.1
```

### Lado chamado:

```
kevin#show interface serial 0 Serial0 is up, line protocol is up Hardware is HD64570 Internet
address is 10.1.2.2/24 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, reliability 255/255, txload
1/255, rxload 1/255 Encapsulation HDLC, loopback not set Keepalive set (10 sec) Last input
00:00:00, output 00:00:08, output hang never Last clearing of "show interface" counters never
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 0/1/256
(active/max active/max total) Reserved Conversations 0/0 (allocated/max allocated) Available
Bandwidth 1158 kilobits/sec 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute output rate 0
bits/sec, 0 packets/sec 106 packets input, 9432 bytes, 0 no buffer Received 71 broadcasts, 0
runts, 0 giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort 98
packets output, 8016 bytes, 0 underruns 0 output errors, 0 collisions, 4 interface resets 0
output buffer failures, 0 output buffers swapped out 1 carrier transitions DCD=up DSR=up DTR=up
RTS=up CTS=up 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 10.48.74.1 to network 0.0.0.0 10.0.0.0/8 is variably subnetted, 4
subnets, 2 masks C 10.1.2.0/24 is directly connected, Serial0 C 10.9.9.0/24 is directly
```

connected, Dialer0 C 10.8.8.0/24 is directly connected, Loopback0 C 10.48.74.0/23 is directly connected, Ethernet0 S\* 0.0.0.0/0 [254/0] via 10.48.74.1 kevin#

**Agora nós podemos simular a falha do link usando o comando shutdown na interface serial remota:**

```
krimson#
*Mar 4 15:25:18.302: %LINK-3-UPDOWN: Interface Serial0, changed state to
down
*Mar 4 15:25:19.302: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Serial0, changed state to down
```

**Nós podemos ver aqui que o link principal foi para baixo.**

```
krimson#show interface serial 0 Serial0 is down, line protocol is down Hardware is HD64570
Internet address is 10.1.2.1/24 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, reliability
255/255, txload 1/255, rxload 1/255 Encapsulation HDLC, loopback not set Keepalive set (10 sec)
Last input 00:00:22, output 00:00:32, output hang never Last clearing of "show interface"
counters never 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
0/1/256 (active/max active/max total) Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 1158 kilobits/sec 5 minute input rate 0 bits/sec, 0 packets/sec 5 minute
output rate 0 bits/sec, 0 packets/sec 108 packets input, 8526 bytes, 0 no buffer Received 78
broadcasts, 0 runts, 0 giants, 0 throttles 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored,
0 abort 114 packets output, 9895 bytes, 0 underruns 0 output errors, 0 collisions, 12 interface
resets 0 output buffer failures, 0 output buffers swapped out 5 carrier transitions DCD=down
DSR=down DTR=up RTS=up CTS=down krimson#
```

**Os detalhes da tabela de roteamento agora mostram que a rota flutuante está instalada na tabela de roteamento:**

```
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 10.48.74.1 to network 0.0.0.0 10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks S
10.8.8.0/24 [180/0] via 10.9.9.2 C 10.9.9.0/24 is directly connected, Dialer0 C 10.7.7.0/24 is
directly connected, Loopback0 C 10.48.74.0/23 is directly connected, Ethernet0 S* 0.0.0.0/0
[254/0] via 10.48.74.1 krimson#
```

**No roteador chamado, podemos simular a falha simulada de link primário, usando o comando shutdown na interface serial 0 local:**

```
kevin#configure terminal Enter configuration commands, one per line. End with CNTL/Z.
kevin(config)#interface serial 0 kevin(config-if)#shutdown *Mar 4 15:32:00.250: %LINK-5-CHANGED:
Interface Serial0, changed state to administratively down *Mar 4 15:32:01.250: %LINEPROTO-5-
UPDOWN: Line protocol on Interface Serial0, changed state to down *Mar 4 15:32:03.742: %SYS-5-
CONFIG_I: Configured from console by console
```

**Agora nós podemos ver que o link principal vai para baixo:**

```
kevin#show interface serial 0 Serial0 is administratively down, line protocol is down
Hardware is HD64570 Internet address is 10.1.2.2/24 MTU 1500 bytes, BW 1544 Kbit, DLY 20000
usec, reliability 255/255, txload 1/255, rxload 1/255 Encapsulation HDLC, loopback not set
Keepalive set (10 sec) Last input 00:01:28, output 00:01:18, output hang never Last clearing of
"show interface" counters never 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 0/1/256 (active/max active/max total) Reserved
Conversations 0/0 (allocated/max allocated) Available Bandwidth 1158 kilobits/sec 5 minute input
rate 0 bits/sec, 0 packets/sec 5 minute output rate 0 bits/sec, 0 packets/sec 114 packets input,
9895 bytes, 0 no buffer Received 79 broadcasts, 0 runts, 0 giants, 0 throttles 0 input errors, 0
CRC, 0 frame, 0 overrun, 0 ignored, 0 abort 108 packets output, 8526 bytes, 0 underruns 0 output
errors, 0 collisions, 4 interface resets 0 output buffer failures, 0 output buffers swapped out
1 carrier transitions DCD=down DSR=down DTR=up RTS=up CTS=down
```

O tráfego de ping que é definido como o tráfego interessante inicia a chamada feita através do discador de backup 0 relações.

```
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: *Mar 4 15:27:39.618: BR0 DDR: rotor dialout [priority] *Mar 4
15:27:39.622: BR0 DDR: Dialing cause ip (s=10.9.9.1, d=10.8.8.1) *Mar 4 15:27:39.626: BR0 DDR:
Attempting to dial 8114 *Mar 4 15:27:39.642: ISDN BR0: TX -> SETUP pd = 8 callref = 0x09 *Mar 4
15:27:39.646: Bearer Capability i = 0x8890 *Mar 4 15:27:39.654: Channel ID i = 0x83 *Mar 4
15:27:39.658: Called Party Number i = 0x80, '8114', Plan:Unknown, Type:Unknown *Mar 4
15:27:39.718: ISDN BR0: RX <- CALL_PROC pd = 8 callref = 0x89 *Mar 4 15:27:39.722: Channel ID i
= 0x89 *Mar 4 15:27:39.974: ISDN BR0: RX <- CONNECT pd = 8 callref = 0x89 *Mar 4 15:27:39.990:
%LINK-3-UPDOWN: Interface BRI0:1, changed state to up *Mar 4 15:27:39.998: %DIALER-6-BIND:
Interface BR0:1 bound to profile Di0 *Mar 4 15:27:40.010: BR0:1 PPP: Treating connection as a
callout *Mar 4 15:27:40.010: BR0:1 PPP: Phase is ESTABLISHING, Active Open [0 sess, 0 load] *Mar
4 15:27:40.014: BR0:1 LCP: O .!!!CONFREQ [Closed] id 19 len 15 *Mar 4 15:27:40.018: BR0:1 LCP:
AuthProto CHAP (0x0305C22305) *Mar 4 15:27:40.022: BR0:1 LCP: MagicNumber 0x12D0A490
(0x050612D0A490) *Mar 4 15:27:40.030: ISDN BR0: TX -> CONNECT_ACK pd = 8 callref = 0x09 *Mar 4
15:27:40.054: BR0:1 LCP: I CONFREQ [REQsent] id 9 len 15 *Mar 4 15:27:40.058: BR0:1 LCP:
AuthProto CHAP (0x0305C22305) *Mar 4 15:27:40.062: BR0:1 LCP: MagicNumber 0x12D6B638
(0x050612D6B638) *Mar 4 15:27:40.066: BR0:1 LCP: O CONFACK [REQsent] id 9 len 15 *Mar 4
15:27:40.066: BR0:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 4 15:27:40.070: BR0:1 LCP:
MagicNumber 0x12D6B638 (0x050612D6B638) *Mar 4 15:27:40.074: BR0:1 LCP: I CONFACK [ACKsent] id
19 len 15 *Mar 4 15:27:40.078: BR0:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 4 15:27:40.082:
BR0:1 LCP: MagicNumber 0x12D0A490 (0x050612D0A490) *Mar 4 15:27:40.082: BR0:1 LCP: State is Open
*Mar 4 15:27:40.086: BR0:1 PPP: Phase is AUTHENTICATING, by both [0 sess, 0 load] *Mar 4 !
Suc15:27:40.090: BR0:1 CHAP: O CHALLENGE id 7 len 28 from "krimson" *Mar 4 15:27:40.106: BR0:1
CHAP: I CHALLENGE id 7 len 26 from "kevin" *Mar 4 15:27:40.110: BR0:1 CHAP: O RESPONSE id 7 len
28 from "krimson" *Mar 4 15:27:40.138: BR0:1 CHAP: I SUCCESS id 7 len 4 *Mar 4 15:27:40.150:
BR0:1 CHAP: I RESPONSE id 7 len 26 from "kevin" *Mar 4 15:27:40.158: BR0:1 CHAP: O SUCCESS id 7
len 4 *Mar 4 15:27:40.162: BR0:1 PPP: Phase is UP [0 sess, 0 load] *Mar 4 15:27:40.166: BR0:1
IPCP: O CONFREQ [Not negotiated] id 2 len 10 *Mar 4 15:27:40.170: BR0:1 IPCP: Address 10.9.9.1
(0x03060A090901) *Mar 4 15:27:40.186: BR0:1 IPCP: I CONFREQ [REQsent] id 2 len 10 *Mar 4
15:27:40.190: BR0:1 IPCP: Address 10.9.9.2 (0x03060A090902) *Mar 4 15:27:40.190: BR0:1 IPCP: O
CONFACK [REQsent] id 2 len 10 *Mar 4 15:27:40.194: BR0:1 IPCP: Address 10.9.9.2 (0x03060A090902)
*Mar 4 15:27:40.202: BR0:1 IPCP: I CONFACK [ACKsent] id 2 len 10 *Mar 4 15:27:40.206: BR0:1
IPCP: Address 10.9.9.1 (0x03060A090901) *Mar 4 15:27:40.206: BR0:1 IPCP: State is Open *Mar 4
15:27:40.214: BR0:1 DDR: dialer protocol up *Mar 4 15:27:40.218: Di0 IPCP: Install route to
10.9.9.2 *Mar 4 15:27:41.162: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1, changed
state to upcss rate is 80 percent (4/5), round-trip min/avg/max = 36/47/76 ms krimson#
```

Ao mesmo tempo, **debuga o corredor na mostra lateral** chamada a seguinte saída para esta mesma chamada:

```
kevin#
*Mar 4 15:34:21.698: ISDN BR0: RX <- SETUP pd = 8 callref = 0x07
*Mar 4 15:34:21.706: Bearer Capability i = 0x8890
*Mar 4 15:34:21.714: Channel ID i = 0x89
*Mar 4 15:34:21.718: Calling Party Number i = 0xA1, '8113',
Plan:ISDN, Type:National
*Mar 4 15:34:21.734: Called Party Number i = 0xC1, '8114',
Plan:ISDN, Type:Subscriber(local)
*Mar 4 15:34:21.762: ISDN BR0: Event: Received a DATA call from 8113 on B1
at 64 Kb/s
*Mar 4 15:34:21.762: ISDN BR0: Event: Accepting the call id 0xC
*Mar 4 15:34:21.766: BR0:1: interface must be fifo queue, force fifo
*Mar 4 15:34:21.774: %DIALER-6-BIND: Interface BR0:1 bound to profile Di0
*Mar 4 15:34:21.786: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up
*Mar 4 15:34:21.798: BR0:1 PPP: Treating connection as a callin
*Mar 4 15:34:21.802: BR0:1 PPP: Phase is ESTABLISHING, Passive Open [0 sess,
0 load]
*Mar 4 15:34:21.806: BR0:1 LCP: State is Listen
*Mar 4 15:34:21.818: ISDN BR0: TX -> CALL_PROC pd = 8 callref = 0x87
*Mar 4 15:34:21.826: Channel ID i = 0x89
```

```

*Mar 4 15:34:21.854: ISDN BR0: TX -> CONNECT pd = 8 callref = 0x87
*Mar 4 15:34:21.918: ISDN BR0: RX <- CONNECT_ACK pd = 8 callref = 0x07
*Mar 4 15:34:21.926: Channel ID i = 0x89
*Mar 4 15:34:21.978: BR0:1 LCP: I CONFREQ [Listen] id 19 len 15
*Mar 4 15:34:21.982: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 4 15:34:21.986: BR0:1 LCP: MagicNumber 0x12D0A490 (0x050612D0A490)
*Mar 4 15:34:21.990: BR0:1 LCP: O CONFREQ [Listen] id 9 len 15
*Mar 4 15:34:21.994: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 4 15:34:21.994: BR0:1 LCP: MagicNumber 0x12D6B638 (0x050612D6B638)
*Mar 4 15:34:21.998: BR0:1 LCP: O CONFACK [Listen] id 19 len 15
*Mar 4 15:34:22.002: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 4 15:34:22.006: BR0:1 LCP: MagicNumber 0x12D0A490 (0x050612D0A490)
*Mar 4 15:34:22.030: BR0:1 LCP: I CONFACK [ACKsent] id 9 len 15
*Mar 4 15:34:22.034: BR0:1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 4 15:34:22.034: BR0:1 LCP: MagicNumber 0x12D6B638 (0x050612D6B638)
*Mar 4 15:34:22.038: BR0:1 LCP: State is Open
*Mar 4 15:34:22.042: BR0:1 PPP: Phase is AUTHENTICATING, by both [0 sess, 0
load]
*Mar 4 15:34:22.046: BR0:1 CHAP: O CHALLENGE id 7 len 26 from "kevin"
*Mar 4 15:34:22.050: BR0:1 CHAP: I CHALLENGE id 7 len 28 from "krimson"
*Mar 4 15:34:22.054: BR0:1 CHAP: Waiting for peer to authenticate first
*Mar 4 15:34:22.070: BR0:1 CHAP: I RESPONSE id 7 len 28 from "krimson"
*Mar 4 15:34:22.078: BR0:1 CHAP: O SUCCESS id 7 len 4
*Mar 4 15:34:22.082: BR0:1 CHAP: Processing saved Challenge, id 7
*Mar 4 15:34:22.090: BR0:1 CHAP: O RESPONSE id 7 len 26 from "kevin"
*Mar 4 15:34:22.114: BR0:1 CHAP: I SUCCESS id 7 len 4
*Mar 4 15:34:22.118: BR0:1 PPP: Phase is UP [0 sess, 0 load]
*Mar 4 15:34:22.122: BR0:1 IPCP: O CONFREQ [Not negotiated] id 2 len 10
*Mar 4 15:34:22.126: BR0:1 IPCP: Address 10.9.9.2 (0x03060A090902)
*Mar 4 15:34:22.130: BR0:1 IPCP: I CONFREQ [REQsent] id 2 len 10
*Mar 4 15:34:22.134: BR0:1 IPCP: Address 10.9.9.1 (0x03060A090901)
*Mar 4 15:34:22.138: BR0:1 IPCP: O CONFACK [REQsent] id 2 len 10
*Mar 4 15:34:22.142: BR0:1 IPCP: Address 10.9.9.1 (0x03060A090901)
*Mar 4 15:34:22.226: BR0:1 IPCP: I CONFACK [ACKsent] id 2 len 10
*Mar 4 15:34:22.230: BR0:1 IPCP: Address 10.9.9.2 (0x03060A090902)
*Mar 4 15:34:22.230: BR0:1 IPCP: State is Open
*Mar 4 15:34:22.242: BR0:1 DDR: dialer protocol up
*Mar 4 15:34:22.250: Di0 IPCP: Install route to 10.9.9.1
*Mar 4 15:34:23.114: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1,
changed state to up
*Mar 4 15:34:27.794: %ISDN-6-CONNECT: Interface BRI0:1 is now connected to
8113 krimson

```

O estado depois do backup é "up":

```

krimson#show interface dialer 0 Dialer0 is up, line protocol is up (spoofing) Hardware is
Unknown Internet address is 10.9.9.1/24 MTU 1500 bytes, BW 56 Kbit, DLY 20000 usec, reliability
255/255, txload 1/255, rxload 1/255 Encapsulation PPP, loopback not set DTR is pulsed for 1
seconds on reset Interface is bound to BR0:1 Last input never, output never, output hang never
Last clearing of "show interface" counters 00:13:26 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 36
packets input, 2160 bytes 36 packets output, 2160 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) Time to interface
disconnect: idle 00:01:33 Interface is bound to Di0 (Encapsulation PPP) LCP Open Open: IPCP Last
input 00:00:26, 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 126 packets
input, 3664 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 131 packets output, 3777 bytes, 0
underruns 0 output errors, 0 collisions, 15 interface resets 0 output buffer failures, 0 output

```

```
buffers swapped out 28 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 10.48.74.1 to network 0.0.0.0
10.0.0.0/8 is variably subnetted, 5 subnets, 3 masks C 10.9.9.2/32 is directly connected,
Dialer0 S 10.8.8.0/24 [180/0] via 10.9.9.2 C 10.9.9.0/24 is directly connected, Dialer0 C
10.7.7.0/24 is directly connected, Loopback0 C 10.48.74.0/23 is directly connected, Ethernet0 S*
0.0.0.0/0 [254/0] via 10.48.74.1
```

## Em Lado chamado:

O estado após o backup é "ativo".

```
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 never, output never, output hang never
Last clearing of "show interface" counters 00:16:18 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 40
packets input, 2224 bytes 40 packets output, 2224 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) Time to interface
disconnect: idle 00:01:11 Interface is bound to Di0 (Encapsulation PPP) LCP Open Open: IPCP Last
input 00:00:48, output 00:00:00, 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 136 packets
input, 3857 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 131 packets output, 3744 bytes, 0
underruns 0 output errors, 0 collisions, 12 interface resets 0 output buffer failures, 0 output
buffers swapped out 35 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 10.48.74.1 to network 0.0.0.0 10.0.0.0/8 is variably
subnetted, 4 subnets, 3 masks 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 10.48.74.0/23 is
directly connected, Ethernet0 S* 0.0.0.0/0 [254/0] via 10.48.74.1
```

Aqui, nós simulamos a recuperação do link principal usando o comando no shutdown na interface serial remota:

```
krimson#
*Mar 4 15:28:58.726: %LINK-3-UPDOWN: Interface Serial0, changed state to up
*Mar 4 15:28:59.730: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Serial0, changed state to up
```

O backup é desconectado após o timeout de ociosidade.

```
krimson#show isdn active -----
----- ISDN ACTIVE CALLS -----
----- Call Calling Called Remote Seconds Seconds Seconds Charges Type Number Number
Name Used Left Idle Units/Currency -----
----- Out 8114 kevin 120 1 118 0 -----
----- krimson# *Mar 4 15:29:41.738: BR0:1 DDR: idle timeout *Mar 4
15:29:41.742: BR0 DDR: has total 0 call(s), dial_out 0, dial_in 0 *Mar 4 15:29:41.746: BR0:1
PPP: Treating connection as a callout *Mar 4 15:29:41.750: %DIALER-6-UNBIND: Interface BR0:1
unbound from profile Di0 *Mar 4 15:29:41.754: BR0:1 DDR: disconnecting call *Mar 4 15:29:41.758:
%ISDN-6-DISCONNECT: Interface BRI0:1 disconnected from 8114 kevin, call lasted 121 seconds *Mar
```



```
4 15:29:41.774: ISDN BR0: TX -> DISCONNECT pd = 8 callref = 0x09 *Mar 4 15:29:41.782: Cause i =
0x8090 - Normal call clearing *Mar 4 15:29:41.790: Di0 IPCP: Remove route to 10.9.9.2 *Mar 4
15:29:41.862: ISDN BR0: RX <- RELEASE pd = 8 callref = 0x89 *Mar 4 15:29:41.886: %LINK-3-UPDOWN:
Interface BRI0:1, changed state to down *Mar 4 15:29:41.894: BR0:1 IPCP: State is Closed *Mar 4
15:29:41.894: BR0:1 PPP: Phase is TERMINATING [0 sess, 0 load] *Mar 4 15:29:41.898: BR0:1 LCP:
State is Closed *Mar 4 15:29:41.898: BR0:1 PPP: Phase is DOWN [0 sess, 0 load] *Mar 4
15:29:41.902: BR0:1 DDR: disconnecting call *Mar 4 15:29:41.910: ISDN BR0: TX -> RELEASE_COMP pd
= 8 callref = 0x09 *Mar 4 15:29:42.886: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1,
changed state to down
```

O estado inicial é restaurado agora.

```
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 10.48.74.1 to network 0.0.0.0 10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks C
10.1.2.0/24 is directly connected, Serial0 S 10.8.8.0/24 [1/0] via 10.1.2.2 C 10.9.9.0/24 is
directly connected, Dialer0 C 10.7.7.0/24 is directly connected, Loopback0 C 10.48.74.0/23 is
directly connected, Ethernet0 S* 0.0.0.0/0 [254/0] via 10.48.74.1
```

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