

부동 고정 경로를 사용하여 ISDN 백업 구성

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소개

이 문서에서는 부동 정적 경로를 사용하여 ISDN 백업을 구현하기 위한 샘플 컨피그레이션을 제공하며 이 유형의 컨피그레이션에 대한 기본 문제 해결 정보를 제공합니다.

ISDN 백업의 가장 일반적인 구현 및 비교 방법에 대한 자세한 내용은 다음 문서를 참조하십시오. [DDR 백업을 위한 백업 인터페이스, 부동 고정 경로 및 다이얼러 감시 평가.](#)

사전 요구 사항

요구 사항

이 문서에 대한 특정 요건이 없습니다.

사용되는 구성 요소

이 문서의 정보는 아래 소프트웨어 및 하드웨어 버전을 기반으로 합니다.

- Cisco IOS® Software 릴리스 12.2(3) 및 12.2(5)를 실행하는 Cisco 2500 라우터 2개

이 문서의 정보는 특정 랩 환경의 디바이스를 토대로 작성되었습니다. 이 문서에 사용된 모든 디바이스는 초기화된(기본) 컨피그레이션으로 시작되었습니다. 라이브 네트워크에서 작업하는 경우, 사용하기 전에 모든 명령의 잠재적인 영향을 이해해야 합니다.

표기 규칙

문서 규칙에 대한 자세한 내용은 [Cisco 기술 팁 표기 규칙](#)을 참조하십시오.

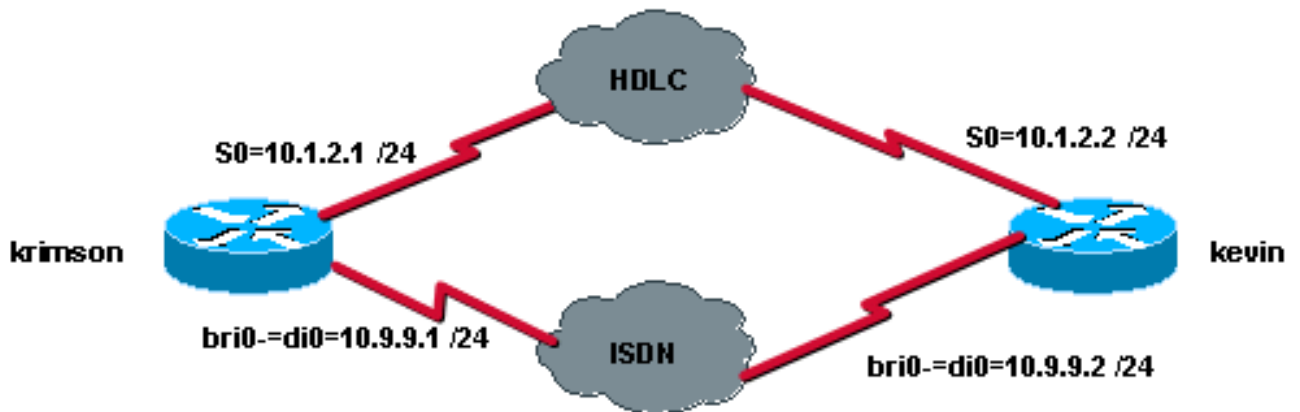
구성

이 섹션에는 이 문서에서 설명하는 기능을 구성하기 위한 정보가 표시됩니다.

참고: 이 문서에 사용된 명령에 대한 추가 정보를 찾으려면 [명령 조회 도구](#)([등록된 고객만 해당](#))를 사용합니다.

네트워크 다이어그램

이 문서에서는 아래 다이어그램에 표시된 네트워크 설정을 사용합니다.



구성

이 문서에서는 아래 표시된 구성을 사용합니다.

- [krimson\(Cisco 2500 라우터\)](#)
- [kevin\(Cisco 2500 라우터\)](#)

krimson(Cisco 2500 라우터)

```
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 라우터)

```
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

```

다음을 확인합니다.

이 섹션에서는 컨피그레이션이 제대로 작동하는지 확인하는 데 사용할 수 있는 정보를 제공합니다.

일부 **show** 명령은 [출력 인터프리터를](#) 에서 지원되는데(등록된 고객만), [이 틀을 사용하면](#) **show** 명령 출력의 분석 결과를 볼 수 있습니다.

- **show ip route** - IP 라우팅 테이블 항목을 표시합니다.
- **show interfaces** - 라우터 또는 액세스 서버에 구성된 모든 인터페이스에 대한 통계를 표시합니다.

문제 해결

이 섹션에서는 컨피그레이션 문제를 해결하는 데 사용할 수 있는 정보를 제공합니다.

문제 해결 명령

일부 **show** 명령은 [출력 인터프리터 툴](#) 에서 지원되는데(등록된 고객만), 이 툴을 사용하면 **show** 명령 출력의 분석 결과를 볼 수 있습니다.

참고: debug 명령을 실행하기 전에 [디버그 명령에 대한 중요 정보를 참조하십시오](#).

- **debug isdn q931** - 로컬 라우터(사용자측)와 네트워크 간의 ISDN 네트워크 연결(레이어 3)의 통화 설정 및 해제 정보를 표시합니다.
- **debug isdn events** - ISDN 인터페이스의 사용자 측(라우터에 있음)에서 발생하는 ISDN 이벤트를 표시합니다. 표시할 수 있는 ISDN 이벤트는 Q.931 이벤트(ISDN 네트워크 연결의 통화 설정 및 해제)입니다.
- **debug dialer** - 다이얼러 인터페이스의 패킷 또는 이벤트에 대한 디버깅 정보를 표시합니다.
- **debug ppp negotiation** - debug ppp ppp 명령이 PPP 시작 중에 전송된 PPP 패킷을 표시하도록 합니다. 여기서 PPP 옵션은 협상됩니다.
- **debug ppp authentication** - debug ppp 명령이 CHAP(Challenge Authentication Protocol) 패킷 교환 및 PAP>Password Authentication Protocol) 교환을 비롯한 인증 프로토콜 메시지를 표시하도록 합니다.

샘플 문제 해결 출력

여기서는 원격의 직렬 인터페이스에서 **shutdown** 및 **no shutdown** 명령을 사용하여 백업 기능을 테스트할 수 있습니다. 이로 인해 문제의 목적지 네트워크에 대한 기본 ip 경로가 사라집니다.

먼저 기본 인터페이스 및 ip 라우팅 테이블의 초기 상태를 살펴보겠습니다.

발신지:

```
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
```

호출 측면:

```
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#
```

이제 원격 직렬 인터페이스에서 shutdown 명령을 사용하여 링크 장애를 시뮬레이션할 수 있습니다

```
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
```

여기서는 기본 링크가 다운되었음을 확인할 수 있습니다.

```
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#
```

이제 라우팅 테이블 세부사항에 따라 라우팅 테이블에 부동 고정 경로가 설치되어 있습니다.

```
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#
```

호출된 라우터에서 로컬 시리얼 0 인터페이스에서 shutdown 명령을 사용하여 시뮬레이션된 기본 링크 오류를 시뮬레이션할 수 있습니다.

```
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
```

이제 기본 링크가 다운되는 것을 확인할 수 있습니다.

```
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
```

흥미로운 트래픽으로 정의된 ping 트래픽은 백업 다이얼러 0 인터페이스를 통해 발신 통화를 시작합니다.

```
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 upcess rate is 80 percent (4/5), round-trip min/avg/max =
36/47/76 ms
krimson#

```

동시에 호출된 측면에서 실행 중인 디버깅은 동일한 통화에 대해 다음 출력을 표시합니다.

```

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

```

백업 후의 상태는 "up"입니다.

```

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
```

수신한 측면:

백업 후의 상태가 "up"입니다.

```
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
```

여기서는 원격 직렬 인터페이스에서 no shutdown 명령을 사용하여 기본 링크 복구를 시뮬레이션합니다.

```
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
```

유휴 시간 제한 후 백업이 끊어집니다.

```
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
```

이제 초기 상태가 복원됩니다.

```
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
```

관련 정보

- [다이얼 기술 지원 페이지](#)
- [Technical Support - Cisco Systems](#)