

Configuring Frame Relay Backup

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Frame Relay Backup over ISDN

You may want to back up Frame Relay circuits using ISDN. There are several ways to do this. The first, and probably the best, is to use floating static routes that route traffic to a Basic Rate Interface (BRI) IP address and use an appropriate routing metric. You can also use a backup interface on the main interface or on a per-data-link connection identifier (DLCI) basis. It may not help much to back up the main interface because you could lose permanent virtual circuits (PVCs) without the main interface going down. Remember, the protocol is being exchanged with the local Frame Relay switch, not the remote router.

Configurations

Router 1

```
ROUTER1#
!
hostname ROUTER1
!
username ROUTER2 password same
 isdn switch-type basic-dms100
!
interface Ethernet 0
 ip address 172.16.15.1 255.255.255.248
!
interface serial 0
 ip address 172.16.24.129 255.255.255.128
 encapsulation FRAME-RELAY
!
interface BRI0
 description Backup ISDN for frame-relay
 ip address 172.16.12.1 255.255.255.128
 encapsulation PPP
 dialer idle-timeout 240
 dialer wait-for-carrier-time 60
 dialer map IP 172.16.12.2 name ROUTER2 broadcast 7086639706
 ppp authentication chap
 dialer-group 1
 isdn spid1 0127280320 2728032
 isdn spid2 0127295120 2729512
!
```

```

router igrp 1
 network 172.16.0.0
!
ip route 172.16.15.16 255.255.255.248 172.16.12.2 150
!--- Floating static route.
!
access-list 101 deny igrp 0.0.0.0 255.255.255.255 0.0.0.0 255.255.255.255
access-list 101 permit ip 0.0.0.0 255.255.255.255 0.0.0.0 255.255.255.255
dialer-list 1 LIST 101
!

```

Router 2

```

ROUTER2#
!
hostname ROUTER2
!
username ROUTER1 password same
 isdn switch-type basic-dms100
!
interface Ethernet 0
 ip address 172.16.15.17 255.255.255.248
!
interface Serial 0
 ip address 172.16.24.130 255.255.255.128
 encapsulation FRAME-RELAY
!
interface BRI0
 description ISDN backup interface for frame-relay
 ip address 172.16.12.2 255.255.255.128
 encapsulation PPP
 dialer idle-timeout 240
 dialer map IP 172.16.12.1 name ROUTER1 broadcast
 ppp authentication chap
 pulse-time 1
 dialer-group 1
 isdn spid1 0191933333 4445555
 isdn spid2 0191933334 4445556
!
router igrp 1
 network 172.16.0.0
!
ip route 172.16.15.0 255.255.255.248 172.16.12.1 150
!---Floating static route.
!
access-list 101 deny igrp 0.0.0.0 255.255.255.255 0.0.0.0 255.255.255.255
access-list 101 permit ip 0.0.0.0 255.255.255.255 162.27.9.0 0.0.0.255
dialer-list 1 LIST 101
!

```

show Commands

To verify if the ISDN is working, use the following **debug** commands. Before issuing **debug** commands, please see Important Information on Debug Commands.

- **debug isdn q931**
- **debug ppp neg**

- **debug ppp auth**

Try to make an ISDN call from the calling side to the central side without the backup commands. If this is successful, add the backup commands to the calling side.

Note: To test the backup, do not use the **shutdown** command on the serial interface but emulate a real serial line problem by pulling out the cable from the serial line.

Configuration Per DLCI Backup

Now let's assume that Spicey is the central side and that Prasit is the side making connections to the central side (Spicey). Take care that you only add the backup commands to the side that is calling the central side.

Note: Backup load is not supported on subinterfaces. As we do not track traffic levels on subinterfaces, no load is calculated.

Network Diagram

Configurations

Spicey
<pre>Spicey#show running-config Building configuration... Current configuration : 1438 bytes ! version 12.1 service timestamps debug datetime msec service timestamps log datetime msec no service password-encryption ! hostname Spicey ! ! username Prasit password 0 cisco ! ! ! isdn switch-type basic-net3 ! ! ! interface Ethernet0 ip address 124.124.124.1 255.255.255.0 ! interface Serial0 no ip address encapsulation frame-relay ! interface Serial0.1 point-to-point ip address 4.0.1.1 255.255.255.0 frame-relay interface-dlci 140 ! interface BRI0 ip address 3.1.6.1 255.255.255.0 encapsulation ppp dialer map ip 3.1.6.2 name Prasit broadcast</pre>

```

dialer-group 1
 isdn switch-type basic-net3
 no peer default ip address
 no cdp enable
 ppp authentication chap
!
router igrp 2
 network 3.0.0.0
 network 4.0.0.0
 network 124.0.0.0
!
ip classless
 ip route 123.123.123.0 255.255.255.0 3.1.6.2 250
!
access-list 101 deny igrp any any
access-list 101 permit ip any any
dialer-list 1 protocol ip list 101
!
line con 0
 exec-timeout 0 0
 transport input none
line aux 0
line vty 0 4
 login
!
end

```

Prasit

```

Prasit#show running-config
Building configuration...

Current configuration : 1245 bytes
!
version 12.1
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Prasit
!
username Spicey password 0 cisco
!
!
 isdn switch-type basic-net3
!
!
!
interface Ethernet0
 ip address 123.123.123.1 255.255.255.0
!
interface Serial1
 no ip address
 encapsulation frame-relay
!
interface Serial1.1 point-to-point
 backup delay 5 10
 backup interface BRI0
 ip address 4.0.1.2 255.255.255.0
 frame-relay interface-dlci 150
!
interface BRI0
 ip address 3.1.6.2 255.255.255.0

```

```

encapsulation ppp
dialer map ip 3.1.6.1 name Spicey broadcast 6106
dialer-group 1
isdn switch-type basic-net3
ppp authentication chap
!
router igrp 2
network 3.0.0.0
network 4.0.0.0
network 123.0.0.0
!
ip route 124.124.124.0 255.255.255.0 3.1.6.1 250
!
access-list 101 deny igrp any any
access-list 101 permit ip any any
dialer-list 1 protocol ip list 101
!
line con 0
exec-timeout 0 0
transport input none
line aux 0
line vty 0 4
login
!
end

```

show Commands

- **show frame-relay map**
- **show ip route**
- **show isdn history**
- **show isdn status**
- **show interface bri 0**
- **show isdn active**

Prasit

```

Spicey#show frame-relay map
Serial0.2 (up): point-to-point dlci, dlci 130(0x82,0x2020), broadcast
status defined, active
Serial0.1 (up): point-to-point dlci, dlci 140(0x8C,0x20C0), broadcast
status defined, active

```

```

Spicey#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 not set

```

3.0.0.0/24 is subnetted, 2 subnets C

```

```

3.1.3.0 is directly connected, Serial0.2 C
3.1.6.0 is directly connected, BRI0
4.0.0.0/24 is subnetted, 1 subnets C
4.0.1.0 is directly connected, Serial0.1
124.0.0.0/24 is subnetted, 1 subnets C
124.124.124.0 is directly connected, Ethernet0
123.0.0.0/8 is variably subnetted, 2 subnets, 2 masks I
123.0.0.0/8 [100/8576] via 4.0.1.2, 00:00:00, Serial0.1 S
123.123.123.0/24 [250/0] via 3.1.6.2 I
122.0.0.0/8 [100/8576] via 3.1.3.3, 00:00:37, Serial0.2

```

Spicey#

```

*Mar  1 00:59:12.527: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up
*Mar  1 00:59:13.983: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:1, changed state to up
*Mar  1 00:59:18.547: %ISDN-6-CONNECT: Interface BRI0:1 is now connected to 6105 Prasit

```

Spicey#**show isdn history**

```

-----
                          ISDN CALL HISTORY
-----
Call History contains all active calls, and a maximum of 100 inactive calls.
Inactive call data will be retained for a maximum of 15 minutes.
-----
Call      Calling      Called      Remote  Seconds Seconds Seconds
Charges
Type      Number          Number      Name     Used   Left   Idle   Units/Currency
-----
In         6105            6106       Prasit           31    90    29
-----

```

Spicey#

```

*Mar  1 01:01:14.547: %ISDN-6-DISCONNECT: Interface BRI0:1 disconnected
from 6105 Prasit, call lasted 122 seconds
*Mar  1 01:01:14.663: %LINK-3-UPDOWN: Interface BRI0:1, changed state to down
*Mar  1 01:01:15.663: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:1, changed state to down

```

Prasit

Prasit#**show frame-relay map**

```

Serial1.1 (up): point-to-point dlci, dlci 150(0x96,0x2460), broadcast
status defined, active

```

Prasit#**ping 124.124.124.1**

```

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 36/36/40 ms

```

Prasit#**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 not set

```

I   3.0.0.0/8 [100/10476] via 4.0.1.1, 00:00:55, Serial1.1
    4.0.0.0/24 is subnetted, 1 subnets
C   4.0.1.0 is directly connected, Serial1.1
    124.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
S   124.124.124.0/24 [250/0] via 3.1.6.1
I   124.0.0.0/8 [100/8576] via 4.0.1.1, 00:00:55, Serial1.1
    123.0.0.0/24 is subnetted, 1 subnets
C   123.123.123.0 is directly connected, Ethernet0
I   122.0.0.0/8 [100/10576] via 4.0.1.1, 00:00:55, Serial1.1

```

The serial line goes down.

```

Prasit#
*Mar  1 01:23:50.531: %LINK-3-UPDOWN: Interface Serial1, changed state to down
*Mar  1 01:23:51.531: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Serial1, changed state to down
*Mar  1 01:23:53.775: %LINK-3-UPDOWN: Interface BRI0:1, changed state to down
*Mar  1 01:23:53.791: %LINK-3-UPDOWN: Interface BRI0:2, changed state to down
*Mar  1 01:23:53.827: %LINK-3-UPDOWN: Interface BRI0, changed state to up
*Mar  1 01:23:57.931: %ISDN-6-LAYER2UP: Layer 2 for Interface BR0, TEI 64 changed to up

```

Prasit#**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 not set

```

    3.0.0.0/24 is subnetted, 1 subnets
C   3.1.6.0 is directly connected, BRI0
    124.0.0.0/24 is subnetted, 1 subnets
S   124.124.124.0 [250/0] via 3.1.6.1
    123.0.0.0/24 is subnetted, 1 subnets
C   123.123.123.0 is directly connected, Ethernet0

```

Prasit#**show isdn status**

```

Global ISDN Switchtype = basic-net3
ISDN BRI0 interface
    dsl 0, interface ISDN Switchtype = basic-net3
Layer 1 Status:
    ACTIVE
Layer 2 Status:
    TEI = 64, Ces = 1, SAPI = 0, State = MULTIPLE_FRAME_ESTABLISHED
Layer 3 Status:
    0 Active Layer 3 Call(s)
Active dsl 0 CCBs = 0
The Free Channel Mask: 0x80000003
Total Allocated ISDN CCBs = 0

```

Prasit#**ping 124.124.124.1**

```

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:
!
*Mar  1 01:25:47.383: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 36/36/36 ms
Prasit#
*Mar  1 01:25:48.475: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:1, changed state to up

```

```
Prasit#
*Mar 1 01:25:53.407: %ISDN-6-CONNECT: Interface BRI0:1 is now connected
to 6106 Spicey
```

```
Prasit#show isdn status
Global ISDN Switchtype = basic-net3
ISDN BRI0 interface
    dsl 0, interface ISDN Switchtype = basic-net3
Layer 1 Status:
    ACTIVE
Layer 2 Status:
    TEI = 64, Ces = 1, SAPI = 0, State = MULTIPLE_FRAME_ESTABLISHED
Layer 3 Status:
    1 Active Layer 3 Call(s)
    CCB:callid=8003, sapi=0, ces=1, B-chan=1, calltype=DATA
Active dsl 0 CCBs = 1
The Free Channel Mask: 0x80000002
Total Allocated ISDN CCBs = 1
```

```
Prasit#show isdn active
```

```
-----
                                ISDN ACTIVE CALLS
-----
Call      Calling      Called      Remote      Seconds      Seconds      Seconds      Charges
Type      Number        Number      Name        Used         Left         Idle         Units/Currency
-----
Out              6106        Spicey      21         100         19         0
-----
```

```
Prasit#
*Mar 1 01:27:49.027: %ISDN-6-DISCONNECT: Interface BRI0:1 disconnected
from 6106 Spicey, call lasted 121 seconds
*Mar 1 01:27:49.131: %LINK-3-UPDOWN: Interface BRI0:1, changed state to down
*Mar 1 01:27:50.131: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:1, changed state to down
*Mar 1 01:28:09.215: %LINK-3-UPDOWN: Interface Serial1, changed state to up
*Mar 1 01:28:10.215: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Serial1, changed state to up
*Mar 1 01:28:30.043: %ISDN-6-LAYER2DOWN: Layer 2 for Interface BRI0,
TEI 64 changed to down
*Mar 1 01:28:30.047: %ISDN-6-LAYER2DOWN: Layer 2 for Interface BR0, TEI
64 changed to down
*Mar 1 01:28:30.371: %LINK-5-CHANGED: Interface BRI0, changed state to standby mode
*Mar 1 01:28:30.387: %LINK-3-UPDOWN: Interface BRI0:1, changed state to down
*Mar 1 01:28:30.403: %LINK-3-UPDOWN: Interface BRI0:2, changed state to down
Prasit#
```

The serial connection is back again..

```
Prasit#show isdn status
Global ISDN Switchtype = basic-net3
ISDN BRI0 interface
    dsl 0, interface      ISDN Switchtype = basic-net3
Layer 1 Status:
    DEACTIVATED
Layer 2 Status:
    Layer 2 NOT Activated
Layer 3 Status:
    0 Active Layer      3 Call(s)
Active dsl 0 CCBs = 0
The Free Channel Mask: 0x80000003
Total Allocated ISDN CCBs = 0
```

```

Prasit#show interface bri 0
BRI0 is standby mode, line protocol is down
  Hardware is BRI
  Internet address is 3.1.6.2/24
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation PPP, loopback not set
  Last input 00:01:00, output 00:01:00, output hang never
  Last clearing of "show interface" counters 01:28:16
  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)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    128 packets input, 601 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
    132 packets output, 687 bytes, 0 underruns
    0 output errors, 0 collisions, 10 interface resets
    0 output buffer failures, 0 output buffers swapped out
    14 carrier transitions

```

```
Prasit#ping 124.124.124.1
```

```

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 36/36/36 ms

```

Hub and Spoke with Dialer Profiles

Here is an example of a hub and spoke per DLCI backup configuration. The spoke routers are calling the hub router. As you can see, we allow only one B channel per side by using the max-link option on the dialer pool on the hub side.

Note: Backup load is not supported on subinterfaces. As we do not track traffic levels on subinterfaces, no load is calculated.

Network Diagram

Configurations

Aton
<pre> Aton#show running-config Building configuration... Current configuration: ! version 12.0 service timestamps debug uptime service timestamps log uptime no service password-encryption ! hostname Aton ! </pre>

```

!
username Spicey password 0 cisco
!
isdn switch-type basic-net3
!
!
!
interface Ethernet0
 ip address 122.122.122.1 255.255.255.0
!
!
interface Serial1
 no ip address
 encapsulation frame-relay
!
interface Serial1.1 point-to-point
 ip address 3.1.3.3 255.255.255.0
 backup delay 5 10
 backup interface BRI0
 frame-relay interface-dlci 160
!
interface BRI0
 ip address 155.155.155.3 255.255.255.0
 encapsulation ppp
 no ip route-cache
 no ip mroute-cache
 dialer map ip 155.155.155.2 name Spicey broadcast 6106
 dialer-group 1
 isdn switch-type basic-net3
 ppp authentication chap
!
router igrp 2
 network 3.0.0.0
 network 122.0.0.0
 network 155.155.0.0
!
ip route 124.124.124.0 255.255.255.0 155.155.155.2 250
!
access-list 101 deny igrp any any
access-list 101 permit ip any any
dialer-list 1 protocol ip list 101
!
line con 0
 exec-timeout 0 0
 transport input none
line aux 0
line vty 0 4
 login
!
end

```

Spicey

```

Spicey#show running-config
Building configuration...
Current configuration : 1887 bytes
!
version 12.1
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption

```

```

!
hostname Spicey
!
username Prasit password 0 cisco
username Aton password 0 cisco
!
isdn switch-type basic-net3
!
!
!
interface Ethernet0
 ip address 124.124.124.1 255.255.255.0
!
interface Serial0
 no ip address
 encapsulation frame-relay
!
interface Serial0.1 point-to-point
 ip address 4.0.1.1 255.255.255.0
 frame-relay interface-dlci 140
!
interface Serial0.2 point-to-point
 ip address 3.1.3.1 255.255.255.0
 frame-relay interface-dlci 130
!
interface BRI0
 no ip address
 encapsulation ppp
 no ip route-cache
 no ip mroute-cache
 dialer pool-member 2 max-link 1
 dialer pool-member 1 max-link 1
 isdn switch-type basic-net3
 no peer default ip address
 no cdp enable
 ppp authentication chap
!
interface Dialer1
 ip address 160.160.160.1 255.255.255.0
 encapsulation ppp
 no ip route-cache
 no ip mroute-cache
 dialer pool 1
 dialer remote-name Prasit
 dialer-group 1
 ppp authentication chap
!
interface Dialer2
 ip address 155.155.155.2 255.255.255.0
 encapsulation ppp
 no ip route-cache
 no ip mroute-cache
 dialer pool 2
 dialer remote-name Aton
 dialer-group 1
 ppp authentication chap
!
router igrp 2
 network 3.0.0.0
 network 4.0.0.0
 network 124.0.0.0
 network 155.155.0.0
 network 160.160.0.0
!

```

```
access-list 101 deny   igrp any any
access-list 101 permit ip any any
dialer-list 1 protocol ip list 101
!
line con 0
exec-timeout 0 0
transport input none
line aux 0
line vty 0 4
login
!
end
```

Prasit

```
Prasit#show running-config
Building configuration...

Current configuration : 1267 bytes
!
version 12.1
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Prasit
!
username Spicey password 0 cisco
!
isdn switch-type basic-net3
!
!
!
interface Ethernet0
ip address 123.123.123.1 255.255.255.0
!
interface Serial1
no ip address
encapsulation frame-relay
!
interface Serial1.1 point-to-point
backup delay 5 10
backup interface BRI0
ip address 4.0.1.2 255.255.255.0
frame-relay interface-dlci 150
!
interface BRI0
ip address 160.160.160.2 255.255.255.0
encapsulation ppp
dialer map ip 160.160.160.1 name Spicey broadcast 6106
dialer-group 1
isdn switch-type basic-net3
ppp authentication chap
!
router igrp 2
network 4.0.0.0
network 123.0.0.0
network 160.160.0.0
!
ip route 124.124.124.0 255.255.255.0 160.160.160.1 250
!
access-list 101 deny   igrp any any
access-list 101 permit ip any any
```

```

dialer-list 1 protocol ip list 101
!
line con 0
  exec-timeout 0 0
  transport input none
line aux 0
line vty 0 4
  login
!
end

```

show Commands

- **show frame-relay map**
- **show ip route**
- **show frame map**
- **show frame-relay pvc**

Aton

Aton#**show frame-relay map**

```

Serial1.1 (up): point-to-point dlci, dlci 160(0xA0,0x2800), broadcast
                status defined, active

```

Aton#**ping 124.124.124.1**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:

!!!!

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

Aton#**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, * - candidate default
       U - per-user static route, o - ODR, P - periodic downloaded static route
       T - traffic engineered route

```

Gateway of last resort is not set

```

I   155.155.0.0/16 [100/182571] via 3.1.3.1, Serial1.1
    3.0.0.0/24 is subnetted, 1 subnets
C   3.1.3.0 is directly connected, Serial1.1
I   4.0.0.0/8 [100/10476] via 3.1.3.1, Serial1.1
I   160.160.0.0/16 [100/182571] via 3.1.3.1, Serial1.1
    124.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
S   124.124.124.0/24 [250/0] via 155.155.155.2
I   124.0.0.0/8 [100/8576] via 3.1.3.1, Serial1.1
I   123.0.0.0/8 [100/10576] via 3.1.3.1, Serial1.1
    122.0.0.0/24 is subnetted, 1 subnets
C   122.122.122.0 is directly connected, Ethernet0
Aton#

```

Serial 1 is going down.

Aton#

```

01:16:33: %LINK-3-UPDOWN: Interface Serial1, changed state to down

```

```
01:16:34: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1,
changed state to down
01:16:37: %LINK-3-UPDOWN: Interface BRI0:1, changed state to down
01:16:37: %LINK-3-UPDOWN: Interface BRI0:2, changed state to down
01:16:37: %LINK-3-UPDOWN: Interface BRI0, changed state to up
01:16:41: %ISDN-6-LAYER2UP: Layer 2 for Interface BR0, TEI 64 changed to up
```

Aton#**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, * - candidate default
       U - per-user static route, o - ODR, P - periodic downloaded static route
       T - traffic engineered route
```

Gateway of last resort is not set

```
155.155.0.0/24 is subnetted, 1 subnets
C    155.155.155.0 is directly connected, BRI0
    124.0.0.0/24 is subnetted, 1 subnets
S    124.124.124.0 [250/0] via 155.155.155.2
    122.0.0.0/24 is subnetted, 1 subnets
C    122.122.122.0 is directly connected, Ethernet0
```

Aton#**ping 124.124.124.1**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:

```
01:21:33: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 36/36/36 ms
```

Aton#

```
01:21:34: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1,
changed state to up
```

```
01:21:39: %ISDN-6-CONNECT: Interface BRI0:1 is now connected to 6106
```

Spicey

Aton#**ping 124.124.124.1**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 32/123/296 ms
```

Aton#

Serial 1 becomes active again

Aton#

```
01:24:02: %ISDN-6-DISCONNECT: Interface BRI0:1 disconnected from 6106
```

Spicey, call lasted 149 seconds

```
01:24:02: %LINK-3-UPDOWN: Interface BRI0:1, changed state to down
```

```
01:24:03: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1,
changed state to down
```

Aton#**show frame map**

```
Serial1.1 (down): point-to-point dlci, dlci 160(0xA0,0x2800), broadcast
status deleted
```

Aton#

```
01:26:35: %LINK-3-UPDOWN: Interface Serial1, changed state to up
```

```
01:26:36: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1,
changed state to up
```

```
01:26:56: %ISDN-6-LAYER2DOWN: Layer 2 for Interface BRI0, TEI 64 changed
to down
```

```
01:26:56: %ISDN-6-LAYER2DOWN: Layer 2 for Interface BR0, TEI 64 changed
to down
```

```
01:26:56: %LINK-5-CHANGED: Interface BRI0, changed state to standby mode
01:26:56: %LINK-3-UPDOWN: Interface BRI0:1, changed state to down
01:26:56: %LINK-3-UPDOWN: Interface BRI0:2, changed state to down
```

```
Aton#show frame map
```

```
Serial1.1 (up): point-to-point dlci, dlci 160(0xA0,0x2800), broadcast
status defined, active
```

```
Aton#ping 124.124.124.1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:
!!!!
```

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

```
Aton#ping 124.124.124.1
```

```
Aton#show frame-relay pvc
```

```
PVC Statistics for interface Serial1 (Frame Relay DTE)
```

	Active	Inactive	Deleted	Static
Local	1	0	0	0
Switched	0	0	0	0
Unused	0	0	0	0

```
DLCI = 160, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE =
Serial1.1
```

```
input pkts 60          output pkts 69          in   bytes 9694
out bytes 10811        dropped pkts 0          in   FECN pkts 0
in BECN pkts 0        out FECN pkts 0        out BECN pkts 0
in DE pkts 0          out DE pkts 0
out bcast pkts 44     out   bcast bytes 7565
pvc create time 01:28:35, last time pvc status changed 00:02:19
```

Spicey

```
Spicey#show frame-relay map
```

```
Serial0.1 (up): point-to-point dlci, dlci 140(0x8C,0x20C0), broadcast
status defined, active
```

```
Serial0.2 (up): point-to-point dlci, dlci 130(0x82,0x2020), broadcast
status defined, active
```

```
Spicey#ping 122.122.122.1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 122.122.122.1, timeout is 2 seconds:
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 32/35/36 ms
```

```
Spicey#ping 123.123.123.1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 123.123.123.1, timeout is 2 seconds:
!!!!
```

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

```
Spicey#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 not set
155.155.0.0/24 is subnetted, 1 subnets
```

```

C 155.155.155.0 is directly connected, Dialer2
  3.0.0.0/24 is subnetted, 1 subnets
C 3.1.3.0 is directly connected, Serial0.2
  4.0.0.0/24 is subnetted, 1 subnets
C 4.0.1.0 is directly connected, Serial0.1
  160.160.0.0/24 is subnetted, 1 subnets
C 160.160.160.0 is directly connected, Dialer1
  124.0.0.0/24 is subnetted, 1 subnets
C 124.124.124.0 is directly connected, Ethernet0
I 123.0.0.0/8 [100/8576] via 4.0.1.2, 00:00:55, Serial0.1
I 122.0.0.0/8 [100/8576] via 3.1.3.3, 00:00:35, Serial0.2

```

Both serial lines from the calling sides are going down.

Spicey#

```

*Mar 1 01:21:30.171: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up
*Mar 1 01:21:30.627: %DIALER-6-BIND: Interface BR0:1 bound to profile Di2
*Mar 1 01:21:31.647: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:1, changed state to up
*Mar 1 01:21:36.191: %ISDN-6-CONNECT: Interface BRI0:1 is now connected
to 6104 Aton
*Mar 1 01:21:40.923: %LINK-3-UPDOWN: Interface BRI0:2, changed state to up
*Mar 1 01:21:41.359: %DIALER-6-BIND: Interface BR0:2 bound to profile Di1
*Mar 1 01:21:42.383: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:2, changed state to up
*Mar 1 01:21:46.943: %ISDN-6-CONNECT: Interface BRI0:2 is now connected
to 6105 Prasit
*Mar 1 01:23:59.819: %DIALER-6-UNBIND: Interface BR0:1 unbound from
profile Di2
*Mar 1 01:23:59.831: %ISDN-6-DISCONNECT: Interface BRI0:1 disconnected
from 6104 Aton, call lasted 149 seconds
*Mar 1 01:23:59.927: %LINK-3-UPDOWN: Interface BRI0:1, changed state to down
*Mar 1 01:24:00.923: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:1, changed state to down
*Mar 1 01:24:03.015: %DIALER-6-UNBIND: Interface BR0:2 unbound from
profile Di1
*Mar 1 01:24:03.023: %ISDN-6-DISCONNECT: Interface BRI0:2 disconnected
from 6105 Prasit, call lasted 142 seconds
*Mar 1 01:24:03.107: %LINK-3-UPDOWN: Interface BRI0:2, changed state to down
*Mar 1 01:24:04.107: %LINEPROTO-5-UPDOWN: Line protocol on Interface
BRI0:2, changed state to down

```

Spicey#show frame map

```

Serial0.1 (down): point-to-point dlci, dlci 140(0x8C,0x20C0), broadcast
status defined, inactive
Serial0.2 (down): point-to-point dlci, dlci 130(0x82,0x2020), broadcast
status defined, inactive

```

Spicey#

Both serial lines are available again.

Spicey#show frame pvc

PVC Statistics for interface Serial0 (Frame Relay DTE)

	Active	Inactive	Deleted	Static
Local	2	0	0	0
Switched	0	0	0	0
Unused	0	0	0	0

DLCI = 130, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0.2

input pkts 54 output pkts 61 in bytes 7014

```

out bytes 9975                dropped pkts 3                in FECN pkts 0
in BECN pkts 0                out FECN pkts 0            out BECN pkts 0
in DE pkts 0                  out DE pkts 0
out bcast pkts 40            out bcast bytes 7803
pvc create time 01:28:14, last time pvc status changed 00:02:38

```

```

DLCI = 140, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE =
Serial0.1

```

```

input pkts 56                output pkts 60                in bytes 7604
out bytes 10114              dropped pkts 2                in FECN pkts 0
in BECN pkts 0                out FECN pkts 0            out BECN pkts 0
in DE pkts 0                  out DE pkts 0
out bcast pkts 39            out bcast bytes 7928
pvc create time 01:28:15, last time pvc status changed 00:02:29

```

Prasit

```

Prasit#show frame-relay map

```

```

Serial1.1 (up): point-to-point dlci, dlci 150(0x96,0x2460), broadcast
status defined, active

```

```

Prasit#ping 124.124.124.1

```

```

Type escape sequence to abort.

```

```

Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:

```

```

!!!!

```

```

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

```

```

Prasit#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 not set

```

```

I   155.155.0.0/16 [100/182571] via 4.0.1.1, 00:00:41, Serial1.1
I   3.0.0.0/8 [100/10476] via 4.0.1.1, 00:00:41, Serial1.1
    4.0.0.0/24 is subnetted, 1 subnets
C   4.0.1.0 is directly connected, Serial1.1
I   160.160.0.0/16 [100/182571] via 4.0.1.1, 00:00:41, Serial1.1
    124.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
S   124.124.124.0/24 [250/0] via 160.160.160.1
I   124.0.0.0/8 [100/8576] via 4.0.1.1, 00:00:41, Serial1.1
    123.0.0.0/24 is subnetted, 1 subnets
C   123.123.123.0 is directly connected, Ethernet0
I   122.0.0.0/8 [100/10576] via 4.0.1.1, 00:00:42, Serial1.1
Prasit#

```

Serial 1 goes down.

```

Prasit#

```

```

*Mar  1 01:16:08.287: %LINK-3-UPDOWN: Interface Serial1, changed state to down

```

```

*Mar  1 01:16:09.287: %LINEPROTO-5-UPDOWN: Line protocol on Interface
Serial1, changed state to down

```

```

*Mar  1 01:16:11.803: %LINK-3-UPDOWN: Interface BRI0:1, changed state to down

```

```

*Mar  1 01:16:11.819: %LINK-3-UPDOWN: Interface BRI0:2, changed state to down

```

```

*Mar  1 01:16:11.855: %LINK-3-UPDOWN: Interface BRI0, changed state to up

```

```

*Mar  1 01:16:15.967: %ISDN-6-LAYER2UP: Layer 2 for Interface BR0, TEI

```

64 changed to up

Prasit#**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 not set

```
160.160.0.0/24 is subnetted, 1 subnets
C    160.160.160.0 is directly connected, BRI0
    124.0.0.0/24 is subnetted, 1 subnets
S    124.124.124.0 [250/0] via 160.160.160.1
    123.0.0.0/24 is subnetted, 1 subnets
C    123.123.123.0 is directly connected, Ethernet0
```

Prasit#**ping 124.124.124.1**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:

*Mar 1 01:21:38.967: %LINK-3-UPDOWN: Interface BRI0:1, changed state to up!!!!

Success rate is 80 percent (4/5), round-trip min/avg/max = 36/36/36 ms

Prasit#

*Mar 1 01:21:40.063: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0:1, changed state to up

*Mar 1 01:21:44.991: %ISDN-6-CONNECT: Interface BRI0:1 is now connected to 6106 Spicey

Prasit#**ping 124.124.124.1**

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:

!!!!

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

Prasit#

Serial 1 becomes active again.

Prasit#

*Mar 1 01:26:40.579: %LINK-3-UPDOWN: Interface Serial1, changed state to up

*Mar 1 01:26:41.579: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1, changed state to up

*Mar 1 01:27:01.051: %ISDN-6-LAYER2DOWN: Layer 2 for Interface BRI0, TEI 64 changed to down

*Mar 1 01:27:01.055: %ISDN-6-LAYER2DOWN: Layer 2 for Interface BR0, TEI 64 changed to down

*Mar 1 01:27:01.363: %LINK-5-CHANGED: Interface BRI0, changed state to standby mode

*Mar 1 01:27:01.379: %LINK-3-UPDOWN: Interface BRI0:1, changed state to down

*Mar 1 01:27:01.395: %LINK-3-UPDOWN: Interface BRI0:2, changed state to down

Prasit#**show frame map**

Serial1.1 (up): point-to-point dlci, dlci 150(0x96,0x2460), broadcast status defined, active

Prasit#**ping 124.124.124.1**

Type escape sequence to abort.

Cisco – Configuring and Troubleshooting Frame Relay

```
Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 36/116/432 ms
```

```
Prasit#show frame-relay pvc
```

```
PVC Statistics for interface Serial1 (Frame Relay DTE)
```

	Active	Inactive	Deleted	Static
Local	1	0	0	0
Switched	0	0	0	0
Unused	0	0	0	0

```
DLCI = 150, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE =
Serial1.1
```

```
input pkts 58          output pkts 66          in   bytes 9727
out bytes 10022        dropped pkts 0          in   FECN pkts 0
in BECN pkts 0        out FECN pkts 0        out BECN pkts 0
in DE pkts 0          out DE pkts 0
out bcast pkts 46     out   bcast bytes 7942
pvc create time 01:27:37, last time pvc status changed 00:01:59
```

Related Information

- [More Frame Relay Technical Tips](#)
- [More Information on Frame Relay Commands](#)
- [More Information on Configuring Frame Relay](#)
- [More Information on Dial-Backup Configuration](#)
- [More Information on Dial-Backup Commands](#)
- [More Information on ISDN Debug Commands](#)
- [More Information on PPP Debug Commands](#)
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