

Configuring IPsec Redundancy over ISDN Using Dialer Watch

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Introduction

This document provides a sample configuration how to encrypt traffic from the network behind Router 1 to the network behind Router 2 (the Loopback 0s are used as networks in this example). If the primary link (Ethernet) between Router 1 and Router 2 goes down, IP Security (IPsec) traffic continues to flow through the secondary link (ISDN). There are several ways to achieve this objective; you can use dialer watch, backup interface, demand circuit, and floating static. This sample configuration demonstrates the dialer watch mechanism. For more information on other features, refer to Evaluating Backup Interfaces, Floating Static Routes, and Dialer Watch for DDR Backup.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on these software and hardware versions:

- Cisco 2621 and 3640 Routers
- Cisco IOS® Software Release 12.3(3)

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command before you use it.

Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

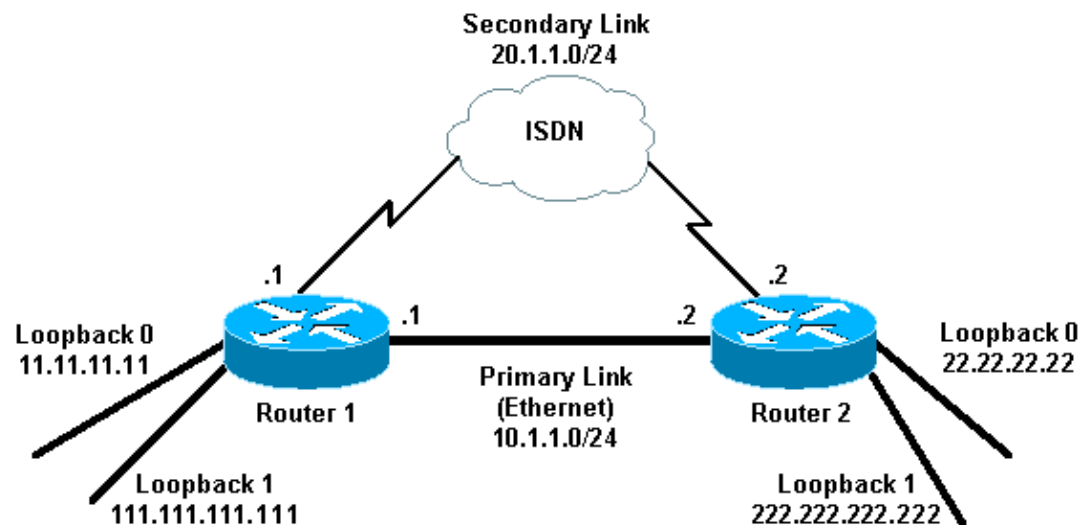
Configure

In this section, you are presented with the information to configure the features described in this document.

Note: To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only).

Network Diagram

This document uses the network setup shown in the diagram here:



Configurations

This document uses the configurations shown here:

- Router 1 (2621)
- Router 2 (3640)

```
Router 1 (2621)
r1#show running-config
Building configuration...

Current configuration : 2244 bytes
!
version 12.3
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname r1
!
boot-start-marker
boot-end-marker
!
!
username r2 password 0 cisco

!--- This is the username for remote router (Router 2)
!--- and shared secret. Shared secret (used for Challenge Handshake
!--- Authentication Protocol [CHAP]) must be the same on both sides.
```

```
no aaa new-model
ip subnet-zero
ip tcp synwait-time 5
!
!
no ip domain lookup
!
ip audit notify log
ip audit po max-events 100
ip ssh break-string
no ftp-server write-enable
!
!
!
crypto isakmp policy 10
  hash md5
  authentication pre-share
crypto isakmp key cisco address 222.222.222.222
!
!
  crypto ipsec transform-set abc esp-des esp-md5-hmac
!
crypto map cisco local-address Loopback1
crypto map cisco 10 ipsec-isakmp
  set peer 222.222.222.222

!--- Peer address, Loopback 1 of Router 2

set transform-set abc
match address 101

!--- Networks to encrypt (Loopback 0 on both ends)

!
isdn switch-type basic-ts013
!
!
!
!
!
!
!
!
!
no voice hpi capture buffer
no voice hpi capture destination
!
!
!
!
!
interface Loopback0

!--- Network to encrypt

  ip address 11.11.11.11 255.255.255.0
!
interface Loopback1

!--- Used for peer address for IPSec

  ip address 111.111.111.111 255.255.255.0
!
interface FastEthernet0/0
```

```
!--- Primary link

ip address 10.1.1.1 255.255.255.0
no ip route-cache

!--- Enable process switching

no ip mroute-cache
duplex auto
speed auto
crypto map cisco

!--- Apply crypto map on primary interface

!
interface BRI0/0
no ip address
encapsulation ppp
no ip route-cache
no ip mroute-cache
dialer pool-member 1
isdn switch-type basic-ts013
no cdp enable
!
interface Dialer1

!--- Backup link

ip address 20.1.1.1 255.255.255.0
encapsulation ppp
no ip route-cache

!--- Enable process switching

ip ospf cost 9999

!--- Increase the cost so that when primary comes up again,
!--- Open Shortest Path First (OSPF) routes are
!--- preferred using the primary link (due to better cost).

no ip mroute-cache
dialer idle-timeout 180
dialer pool 1
dialer string 94134028
dialer watch-group 1

!--- Enable dialer watch on this backup interface.
!--- Watch the route specified with the dialer watch-list 1 command.

dialer-group 1

!--- Apply interesting traffic defined in dialer list 1.

no peer neighbor-route
ppp authentication chap
crypto map cisco

!--- Apply crypto map on backup interface.

!
router ospf 1

!--- OSPF advertising Loopback 0, Loopback 1,
!--- primary, and secondary links.
```

```

log-adjacency-changes
network 10.1.1.0 0.0.0.255 area 0
network 11.11.11.0 0.0.0.255 area 0
network 20.1.1.0 0.0.0.255 area 0
network 111.111.111.0 0.0.0.255 area 0
!
ip http server
no ip http secure-server
ip classless
!
!
access-list 101 permit ip host 11.11.11.11 host 22.22.22.22

!--- Access control list (ACL) 101 is the
!--- IPSec traffic used in match address.

access-list 110 deny ip any any

!--- ACL 110 is for the dialer list to mark
!--- all IP traffic uninteresting. The dialer watch will
!--- trigger the ISDN backup when the route is lost.

dialer watch-list 1 ip 222.222.222.222 255.255.255.255

!--- This defines the route(s) to be watched.
!--- This exact route (including subnet mask)
!--- must exist in the routing table.
!--- Use the dialer watch-group 1 command to apply this
!--- list to the backup interface.

dialer watch-list 1 delay route-check initial 10
dialer-list 1 protocol ip list 110

!--- Interesting traffic is defined by ACL 110.
!--- This is applied to Dialer1 using dialer group 1.

!
!
!
dial-peer cor custom
!
!
!
!
!
line con 0
exec-timeout 0 0
logging synchronous
escape-character 27
line aux 0
line vty 0 4
login
!
end

```

Router 2 (3640)

```

r2#show running-config
Building configuration...

Current configuration : 2311 bytes
!
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec

```

```
no service password-encryption
!
hostname r2
!
boot-start-marker
boot-end-marker
!
username r1 password 0 cisco

!--- This is the username for remote router (Router 1)
!--- and shared secret. Shared secret (used for CHAP)
!--- must be the same on both sides.

no aaa new-model
ip subnet-zero
ip tcp synwait-time 5
!
!
no ip domain lookup
!
ip audit notify log
ip audit po max-events 100
ip ssh break-string
no ftp-server write-enable
!
!
!
crypto isakmp policy 10
  hash md5
  authentication pre-share
crypto isakmp key cisco address 111.111.111.111
!
!
  crypto ipsec transform-set abc esp-des esp-md5-hmac
!
!
crypto map cisco local-address Loopback1
crypto map cisco 10 ipsec-isakmp
  set peer 111.111.111.111

!--- Peer address, Loopback 1 of Router 1

  set transform-set abc
  match address 101

!--- Networks to encrypt (Loopback 0 on both ends)

!
isdn switch-type basic-ts013
!
!
!
!
!
!
!
!
!
no voice hpi capture buffer
no voice hpi capture destination
!
!
!
!
!
```

```
interface Loopback0
 ip address 22.22.22.22 255.255.255.0

!--- Network to encrypt

!
interface Loopback1
 ip address 222.222.222.222 255.255.255.0

!--- Used for peer address for IPSec.

!
interface BRI0/0
 no ip address
 encapsulation ppp
 no ip route-cache
 no ip mroute-cache
 dialer pool-member 1
 isdn switch-type basic-ts013
!
interface Ethernet0/0

!--- Primary link

 ip address 10.1.1.2 255.255.255.0
 no ip route-cache

!--- Enable process switching.

 no ip mroute-cache
 half-duplex
 crypto map cisco

!--- Apply crypto map on primary interface.

!
interface Dialer1
 ip address 20.1.1.2 255.255.255.0
 encapsulation ppp
 no ip route-cache
 ip ospf cost 9999
 no ip mroute-cache
 dialer pool 1
 dialer idle-timeout 600
 dialer remote-name r1

!--- Dialer for the BRI interface of the remote router
!--- without a dial string.

 dialer-group 1

!--- Apply interesting traffic defined in dialer list 1.

 ppp authentication chap
 crypto map cisco

!--- Apply crypto map on backup interface.

!
router ospf 1
 log-adjacency-changes
 network 10.1.1.0 0.0.0.255 area 0
 network 20.1.1.0 0.0.0.255 area 0
 network 22.22.22.0 0.0.0.255 area 0
 network 222.222.222.0 0.0.0.255 area 0
!
```

```

no ip http server
no ip http secure-server
ip classless
!
!
access-list 101 permit ip host 22.22.22.22 host 11.11.11.11
access-list 110 deny  ospf any any

!--- Mark OSPF as uninteresting.
!--- This will not allow OSPF hellos
!--- to try to bring the link up.

access-list 110 permit ip any any
dialer-list 1 protocol ip list 110

!--- Interesting traffic is defined by ACL 110.
!--- This is applied to Dialer1 using dialer group 1.

!
line con 0
  exec-timeout 0 0
  logging synchronous
  escape-character 27
line aux 0
line vty 0 4
  login
!
end

```

Verify

This section provides information you can use to confirm whether your configuration functions properly.

Sample Command Output

Certain **show** commands are supported by the Output Interpreter Tool (registered customers only) , which allows you to view an analysis of **show** command output.

- Routing table of Router 1 (2621) primary link up

```
r1#show ip route
```

```

Codes: C - connected, S - static, 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
       I - IS-IS, su - IS-IS summary, 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
```

```

      222.222.222.0/32 is subnetted, 1 subnets
O       222.222.222.222 [110/2] via 10.1.1.2, 00:00:25, FastEthernet0/0
      20.0.0.0/24 is subnetted, 1 subnets
C       20.1.1.0 is directly connected, Dialer1
      22.0.0.0/32 is subnetted, 1 subnets
O       22.22.22.22 [110/2] via 10.1.1.2, 00:00:25, FastEthernet0/0
      111.0.0.0/24 is subnetted, 1 subnets
C       111.111.111.0 is directly connected, Loopback1
      10.0.0.0/24 is subnetted, 1 subnets

```

```
C      10.1.1.0 is directly connected, FastEthernet0/0
      11.0.0.0/24 is subnetted, 1 subnets
C      11.11.11.0 is directly connected, Loopback0
```

• Routing table of Router 2 (3640) primary link up

```
r2#show ip route
```

```
Codes: C - connected, S - static, 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
       I - IS-IS, su - IS-IS summary, 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.

```
C      222.222.222.0/24 is directly connected, Loopback1
      20.0.0.0/24 is subnetted, 1 subnets
C      20.1.1.0 is directly connected, Dialer1
      22.0.0.0/24 is subnetted, 1 subnets
C      22.22.22.0 is directly connected, Loopback0
111.0.0.0/32 is subnetted, 1 subnets
O      111.111.111.111 [110/11] via 10.1.1.1, 00:06:22, Ethernet0/0
      10.0.0.0/24 is subnetted, 1 subnets
C      10.1.1.0 is directly connected, Ethernet0/0
11.0.0.0/32 is subnetted, 1 subnets
O      11.11.11.11 [110/11] via 10.1.1.1, 00:06:23, Ethernet0/0
```

• OSPF neighbor of Router 1 (2621) primary link up

```
r1#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
222.222.222.222	1	FULL/DR	00:00:33	10.1.1.2	FastEthernet0/0

• OSPF neighbor of Router 2 (3640) primary link up

```
r2#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
111.111.111.111	1	FULL/BDR	00:00:31	10.1.1.1	Ethernet0/0

• Routing table of Router 1 (2621) primary link down

```
r1#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.

```
      222.222.222.0/32 is subnetted, 1 subnets
O      222.222.222.222 [110/10000] via 20.1.1.2, 00:00:09, Dialer1
      20.0.0.0/24 is subnetted, 1 subnets
C      20.1.1.0 is directly connected, BRI0/0
      20.0.0.0/24 is subnetted, 1 subnets
C      20.1.1.0 is directly connected, Dialer1
22.0.0.0/32 is subnetted, 1 subnets
O      22.22.22.22 [110/10000] via 20.1.1.2, 00:00:09, Dialer1
      111.0.0.0/24 is subnetted, 1 subnets
C      111.111.111.0 is directly connected, Loopback1
      10.0.0.0/24 is subnetted, 1 subnets
O      10.1.1.0 [110/10009] via 20.1.1.2, 00:00:09, Dialer1
```

- 11.0.0.0/24 is subnetted, 1 subnets
- C 11.11.11.0 is directly connected, Loopback0
- Routing table of Router 2 (3640) primary link down

```
r2#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.
```

```
C 222.222.222.0/24 is directly connected, Loopback1
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.1.1.0/24 is directly connected, Dialer1
C 20.1.1.1/32 is directly connected, Dialer1
22.0.0.0/24 is subnetted, 1 subnets
C 22.22.22.0 is directly connected, Loopback0
111.0.0.0/32 is subnetted, 1 subnets
O 111.111.111.111 [110/10000] via 20.1.1.1, 00:00:07, Dialer1
10.0.0.0/24 is subnetted, 1 subnets
C 10.1.1.0 is directly connected, Ethernet0/0
11.0.0.0/32 is subnetted, 1 subnets
O 11.11.11.11 [110/10000] via 20.1.1.1, 00:00:08, Dialer1
```

- OSPF neighbor of Router 1 (2621) primary link down

```
r1#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
222.222.222.222	0	FULL/ -	00:00:32	20.1.1.2	Dialer1

- OSPF neighbor of Router 2 (3640) primary link down

```
r2#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
111.111.111.111	0	FULL/ -	00:00:31	20.1.1.1	Dialer1

The **debug dialer** and several **show** command outputs displayed here show the primary link as failed, and dialer watch recognizes the lost route. The router then initiates the backup link and OSPF converges through the secondary link. Each time the idle timeout expires, the router checks whether the primary link is down. If the primary link is found to be up, dialer watch disconnects the backup link after the disable timer expires and tears down the call, and OSPF converges by way of the primary link as usual.

These are the **debug** and **show** command outputs of Router one (2621), when the primary link goes down and is brought up again.

```
r1#show debug
```

```
Dial on demand:
```

```
Dial on demand events debugging is on
```

```
r1#
```

```
03:00:21: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0,  
changed state to down
```

```
!--- Primary link was brought down manually when you disable the switch ports.
```

```
03:00:21: %OSPF-5-ADJCHG: Process 1, Nbr 222.222.222.222 on FastEthernet0/0  
from FULL to DOWN, Neighbor Down: Interface down or detached
```

```
!--- Primary link goes down.
```

```

!--- OSPF loses neighbor adjacency.

r1#

!--- Dialer watch kicks in.

03:00:21: DDR: Dialer Watch: watch-group = 1
03:00:21: DDR: network 222.222.222.222/255.255.255.255 DOWN,
03:00:21: DDR: primary DOWN
03:00:21: DDR: Dialer Watch: Dial Reason: Primary of group 1 DOWN
03:00:21: DDR: Dialer Watch: watch-group = 1,
03:00:21: BR0/0 DDR: rotor dialout [best]
    least recent failure is also most recent failure
03:00:21: BR0/0 DDR: rotor dialout [best] also has most recent failure
03:00:21: BR0/0 DDR: rotor dialout [best]
03:00:21: DDR: dialing secondary by dialer string 94134028 on Di1
03:00:21: BR0/0 DDR: Attempting to dial 94134028
03:00:21: DDR: Dialer Watch: watch-group = 1
r1#
03:00:21: DDR: network 222.222.222.222/255.255.255.255 DOWN,
03:00:21: DDR: primary DOWN
03:00:21: DDR: Dialer Watch: Dial Reason: Secondary of group 1 AVAILABLE
03:00:21: DDR: Dialer Watch: watch-group = 1,
03:00:21: DDR: Dialer Watch: watch-group = 1
03:00:21: DDR: network 222.222.222.222/255.255.255.255 DOWN,
03:00:21: DDR: primary DOWN
03:00:21: DDR: Dialer Watch: Dial Reason: Secondary of group 1 AVAILABLE
03:00:21: DDR: Dialer Watch: watch-group = 1,
03:00:21: %ISDN-6-LAYER2UP: Layer 2 for Interface BR0/0, TEI 82 changed to up
03:00:94489280514: %LINK-3-UPDOWN: Interface BRI0/0:1, changed state to up
03:00:94489280516: BR0/0:1 DDR: Dialer Watch: resetting call in progress
03:00:94489280512: BR0/0:1: interface must be fifo queue, force fifo
03:00:94489280512: %DIALER-6-BIND: Interface BR0/0:1 bound to profile Di1
r1#
03:00:22: BR0/0:1 DDR: Remote name for r2
03:00:22: BR0/0:1 DDR: dialer protocol up
03:00:23: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0/0:1,
    changed state to up
r1#
03:00:28: %ISDN-6-CONNECT: Interface BRI0/0:1 is now connected to 94134028 r2

!--- Backup link is now connected to Router 2.

r1#
03:00:31: %OSPF-5-ADJCHG: Process 1, Nbr 222.222.222.222 on Dialer1
    from LOADING to FULL, Loading Done

!--- OSPF converges over the backup link.

r1#
r1#show dialer

BRI0/0 - dialer type = ISDN

Dial String    Successes    Failures    Last DNIS    Last status
0 incoming call(s) have been screened.
0 incoming call(s) rejected for callback.

BRI0/0:1 - dialer type = ISDN
Idle timer (180 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is data link layer up
Dial reason: Dialing on watched route loss

!--- Dial reason is the lost route.

```

Interface bound to profile Dil
Time until disconnect 154 secs

!--- Idle timeout is ticking.

Current call connected 00:00:25
Connected to 94134028 (r2)

BRI0/0:2 - dialer type = ISDN
Idle timer (120 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is idle

Dil - dialer type = DIALER PROFILE
Idle timer (180 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is data link layer up
Number of active calls = 1

Dial String	Successes	Failures	Last DNIS	Last status	Default
94134028	45	24	00:00:27	successful	Default

r1#show isdn active

ISDN ACTIVE CALLS

Call Type	Calling Number	Called Number	Remote Name	Seconds Used	Seconds Left	Seconds Idle	Charges Units/Currency
Out	---N/A---	94134028	r2	37	142	37	0

r1#show dialer

BRI0/0 - dialer type = ISDN

Dial String	Successes	Failures	Last DNIS	Last status
0 incoming call(s) have been screened.				
0 incoming call(s) rejected for callback.				

BRI0/0:1 - dialer type = ISDN
Idle timer (180 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is data link layer up
Dial reason: Dialing on watched route loss
Interface bound to profile Dil
Time until disconnect 47 secs

!--- Idle timeout is ticking.

Current call connected 00:02:12
Connected to 94134028 (r2)

BRI0/0:2 - dialer type = ISDN
Idle timer (120 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is idle

Dil - dialer type = DIALER PROFILE
Idle timer (180 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is data link layer up
Number of active calls = 1

Dial String	Successes	Failures	Last DNIS	Last status	Default
94134028	45	24	00:02:14	successful	Default

r1#show dialer

BRI0/0 - dialer type = ISDN

Dial String Successes Failures Last DNIS Last status
0 incoming call(s) have been screened.
0 incoming call(s) rejected for callback.

BRI0/0:1 - dialer type = ISDN
Idle timer (180 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is data link layer up
Dial reason: Dialing on watched route loss
Interface bound to profile Dil
Time until disconnect 0 secs

!--- Idle timeout is ticking.

Current call connected 00:02:59
Connected to 94134028 (r2)

BRI0/0:2 - dialer type = ISDN
Idle timer (120 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is idle

Dil - dialer type = DIALER PROFILE
Idle timer (180 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is data link layer up
Number of active calls = 1

Dial String	Successes	Failures	Last DNIS	Last status	
94134028	45	24	00:03:05	successful	Default

r1#

03:03:22: BR0/0:1 DDR: idle timeout

!--- Idle timed out.

!--- Dialer watch checks lost routes

!--- again and reset the idle time since primary is not up yet.

03:03:22: DDR: Dialer Watch: watch-group = 1
03:03:22: DDR: network 222.222.222.222/255.255.255.255 UP,
03:03:22: DDR: **primary DOWN**

!--- Primary link is still down.

r1#

r1#**show dialer**

BRI0/0 - dialer type = ISDN

Dial String Successes Failures Last DNIS Last status
0 incoming call(s) have been screened.
0 incoming call(s) rejected for callback.

BRI0/0:1 - dialer type = ISDN
Idle timer (180 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is data link layer up
Dial reason: Dialing on watched route loss
Interface bound to profile Dil
Time until disconnect 154 secs

!--- Idle timeout was reset by dialer watch.

Current call connected 00:03:25
Connected to 94134028 (r2)

```

BRI0/0:2 - dialer type = ISDN
Idle timer (120 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is idle

Dil - dialer type = DIALER PROFILE
Idle timer (180 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is data link layer up
Number of active calls = 1

Dial String   Successes   Failures   Last DNIS   Last status
94134028      45          24         00:03:28   successful   Default
r1#
03:04:59: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0,
changed state to up

!--- Primary link was brought up manually when the switch ports are enabled.

r1#
r1#
03:05:50: %OSPF-5-ADJCHG: Process 1, Nbr 222.222.222.222 on FastEthernet0/0
from LOADING to FULL, Loading Done
r1#
r1#show ip ospf neigh

Neighbor ID    Pri   State       Dead Time   Address      Interface
222.222.222.222  0    FULL/ -    00:00:02   20.1.1.2    Dialer1

!--- OSPF over secondary link is still up because
!--- the call is not terminated yet, waiting for idle timeout.

222.222.222.222  1    FULL/DR    00:00:38   10.1.1.2    FastEthernet0/0

!--- OSPF is now starts to converge over primary link.

r1#
r1#show ip route 222.222.222.222

!--- The watched route is now learned through the primary link.
!--- Check the cost.

Routing entry for 222.222.222.222/32
  Known via "ospf 1", distance 110, metric 2, type intra area
  Last update from 10.1.1.2 on FastEthernet0/0, 00:00:16 ago
  Routing Descriptor Blocks:
    * 10.1.1.2, from 222.222.222.222, 00:00:16 ago, via FastEthernet0/0
      Route metric is 2, traffic share count is
r1#
03:06:22: BR0/0:1 DDR: idle timeout

!--- Idle timed out.
!--- Dialer watch checks lost routes. Since primary is up,
!--- it tears down the call.

03:06:22: DDR: Dialer Watch: watch-group = 1
03:06:22: DDR:   network 222.222.222.222/255.255.255.255 UP,
03:06:22: DDR:   primary UP
03:06:22: BR0/0:1 DDR: disconnecting call
03:06:22: BR0/0:1 DDR: Dialer Watch: resetting call in progress
03:06:22: DDR: Dialer Watch: watch-group = 1
03:06:22: DDR:   network 222.222.222.222/255.255.255.255 UP,
03:06:22: DDR:   primary UP
03:06:22: %ISDN-6-DISCONNECT: Interface BRI0/0:1
disconnected from 94134028 r2,

```

```

    call lasted 360 seconds
03:06:96677768412: %LINK-3-UPDOWN: Interface BRI0/0:1, changed state to down
03:06:94489281195: BR0/0 DDR: has total 0 call(s), dial_out 0, dial_in 0
r1#
03:06:94489280544: %DIALER-6-UNBIND: Interface BR0/0:1
    unbound from profile Di1
03:06:23: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0/0:1,
    changed state to down
r1#
03:06:37: %ISDN-6-LAYER2DOWN: Layer 2 for Interface BR0/0,
    TEI 82 changed to down
r1#
03:07:01: %OSPF-5-ADJCHG: Process 1, Nbr 222.222.222.222 on Dialer1
    from FULL to DOWN, Neighbor Down: Dead timer expired

!--- OSPF neighbor is down because the secondary link is down.
!--- Dead timer has expired.

r1#
r1#show ip ospf neigh

Neighbor ID      Pri   State           Dead Time   Address      Interface
222.222.222.222  1    FULL/DR         00:00:38   10.1.1.2    FastEthernet0/0

!--- OSPF neighbor is through the primary link only.

r1#u all
All possible debugging has been turned off
r1#

```

Troubleshoot

This section provides information you can use to troubleshoot your configuration. For information on troubleshooting general issues with ISDN Layers 1, 2, and 3, refer to Using the show isdn status Command for BRI Troubleshooting.

Troubleshooting Commands

Certain **show** commands are supported by the Output Interpreter Tool (registered customers only) , which allows you to view an analysis of **show** command output.

Note: Before you issue **debug** commands, refer to Important Information on Debug Commands.

These **debug** commands can be run on both IPSec peers.

- **debug crypto isakmp** Displays errors during Phase 1.
- **debug crypto ipsec** Displays errors during Phase 2.
- **debug crypto engine** Displays information from the crypto engine.

These **show** commands can be run on both IPSec peers.

- **show crypto isakmp sa** Displays all current Internet Key Exchange (IKE) security associations (SAs) at a peer.
- **show crypto ipsec sa** Displays the settings used by current [IPSec] SAs.
- **show crypto engine connections active** Displays current connections and information regarding encrypted and decrypted packets.

These **clear** commands can be used to clear SAs.

- **clear crypto isakmp** Clears the Phase one security associations.
 - **clear crypto sa** Clears the Phase two security associations.
-

Related Information

- **IPSec Support Page**
 - **Configuring and Troubleshooting DDR Backup**
 - **Evaluating Backup Interfaces, Floating Static Routes, and Dialer Watch for DDR Backup**
 - **Configuring Dial Backup Using Dialer Watch**
 - **Using the show isdn status Command for BRI Troubleshooting**
 - **Technical Support – Cisco Systems**
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