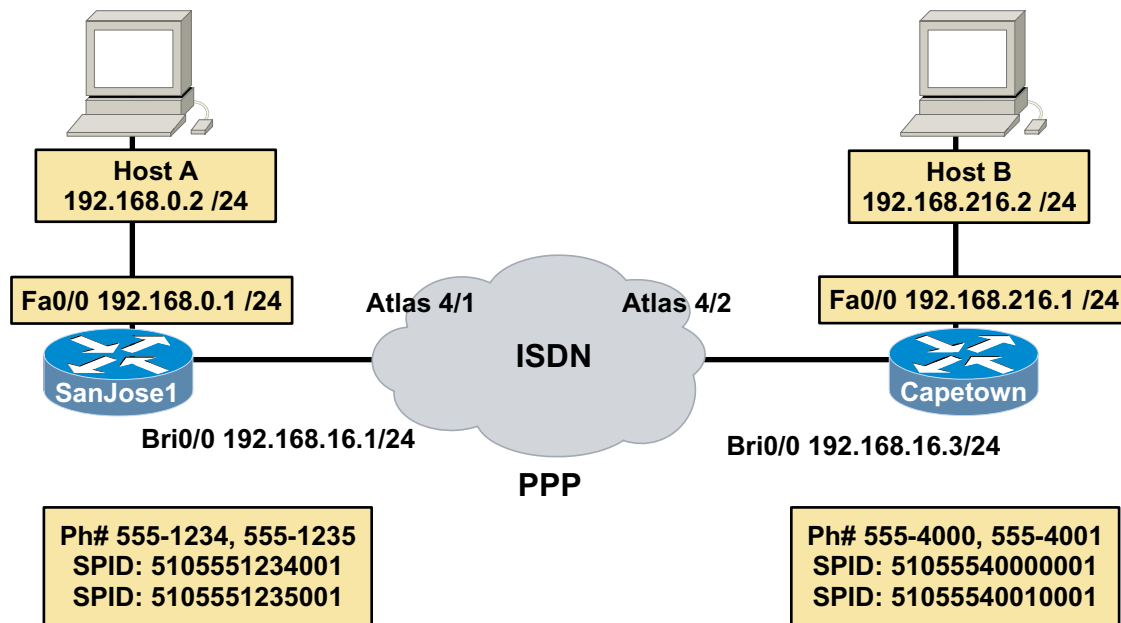


Lab 4.9.2: Configuring Snapshot Routing



Objective

In this lab, you will configure two Cisco routers for DDR and snapshot routing using ISDN BRI.

Scenario

The International Travel Agency wants you to configure an ISDN DDR connection between its Capetown Regional Headquarters and the corporate network's SanJose1 core router. You are to configure snapshot routing so that routing updates are exchanged between the routers without keeping the link up continuously. The company has also asked that you configure PPP encapsulation and CHAP authentication over this link.

Step 1

Before beginning this lab, it is recommended that you reload the routers after erasing their startup configuration. This will prevent you from having problems caused by residual configurations. Build and configure the network according to the above diagram, but do not configure either router's BRI interfaces yet. Use the Adtran Atlas 550 or similar device to simulate the ISDN cloud. If you are using the Atlas 550, be sure to use straight-through cables and connect both routers to the respective BRI module ports of the Atlas 550 as labeled in the diagram. Be sure to configure both workstations with the correct IP address and default gateway (i.e., router Fa0/0 IP address).

Step 2

Configure SanJose1 and Capetown for ISDN. Refer to the following commands to guide your configuration.

```
SanJose1(config)#isdn switch-type basic-ni
SanJose1(config)#dialer-list 1 protocol ip permit
SanJose1(config)#interface bri0/0
SanJose1(config-if)#ip address 192.168.16.1 255.255.255.0
SanJose1(config-if)#encapsulation ppp
SanJose1(config-if)#ppp authentication chap
SanJose1(config-if)#isdn spid1 51055512340001 5551234
SanJose1(config-if)#isdn spid2 51055512350001 5551235
SanJose1(config-if)#dialer-group 1
SanJose1(config-if)#dialer map ip 192.168.16.3 name Capetown broadcast 5554000
SanJose1(config-if)#no shutdown
```

```
Capetown(config)#isdn switch-type basic-ni
Capetown(config)#dialer-list 1 protocol ip permit
Capetown(config)#interface bri0/0
Capetown(config-if)#ip address 192.168.16.3 255.255.255.0
Capetown(config-if)#encapsulation ppp
Capetown(config-if)#ppp authentication chap
Capetown(config-if)#isdn spid1 51055540000001 5554000
Capetown(config-if)#isdn spid2 51055540010001 5554001
Capetown(config-if)#dialer-group 1
Capetown(config-if)#dialer map ip 192.168.16.1 name SanJose1 broadcast 5551234
Capetown(config-if)#no shutdown
```

1. What does the keyword, **broadcast**, do when used with the **dialer map** command?

Use the **show isdn status** command to verify that the routers have established communication with the ISDN switch. Use the **clear interface bri0/0** command multiple times if necessary to enable a valid and established SPID status. Also, remember the random timer of up to 5 minutes.

Step 3

Configure *both* routers with the appropriate password and username information, as shown for SanJose1 below. Be sure to substitute the appropriate username on the Capetown router.

```
SanJose1(config)#username Capetown password cisco
SanJose1(config)#enable password cisco
SanJose1(config)#line vty 0 4
SanJose1(config-line)#password cisco
SanJose1(config-line)#^z
```

Once both routers are configured, issue the **debug dialer** command on *both* SanJose1 and Capetown. Then verify that DDR works by pinging SanJose1 (192.168.16.1) from Capetown. The **show isdn active** command may also be used to verify an active connection. Troubleshoot as necessary.

Leave **debug dialer** enabled; you will use the output of this command in Step 5.

Step 4

In this lab, you will not use static routes. The International Travel Agency has asked you to configure dynamic routing, so that as new networks are added, routing table updates will occur automatically.

1. How often does IGRP send updates by default?

2. Are IGRP updates unicast, multicast, or broadcast?

3. What is the default setting of the **dialer idle-timeout**?

Starting with SanJose1, configure IGRP for AS 100 on *both* SanJose1 and Capetown. The commands for SanJose1 are:

```
SanJose1(config)#router igrp 100
SanJose1(config-router)#network 192.168.0.0
SanJose1(config-router)#network 192.168.16.0
```

Once you configure the routing process on Capetown, the **debug dialer** output should show the following:

```
BRI0/0 DDR: Dialing cause ip (s=192.168.16.3, d=255.255.255.255)
BRI0/0 DDR: Attempting to dial 5551234
```

1. According to the debug output, what is the destination of the packet that caused the attempt to dial?

2. What process on the router is causing this broadcast packet to be generated?

3. Under the current configuration, this DDR link should never go down, why?

Step 5

Configure snapshot routing. The core router, SanJose1 will act as the server and Capetown will be the client. Issue the following commands on SanJose1:

```
SanJose1(config)#interface bri0/0
SanJose1(config-if)#snapshot server 5
```

The **snapshot server 5** command tells the server that the active period is five minutes long.

1. What is the maximum interval that you can assign using the snapshot server command (use the help feature to find this)?

Now configure Capetown as a snapshot routing client:

```
Capetown(config)#interface bri0/0
Capetown(config-if)#dialer map snapshot 1 name SanJose1 broadcast 5551234
Capetown(config-if)#snapshot client 5 10 suppress-statechange-update dialer
```

The **dialer map snapshot** command establishes a map that Capetown uses to connect for the exchange of routing updates with SanJose1. The **snapshot client** command configures the length of the active and quiet periods. In the command above, the active period is set to 5 minutes (this value must match the value set in the snapshot server's configuration) and sets the length of the quiet period to 10 minutes.

The **suppress-statechange-update** keyword prevents the routers from exchanging updates during connections that are established to transfer user data. The **dialer** keyword allows the client router to dial up the server router in the absence of regular traffic and is required when you use the **suppress-statechange-update** keyword.

Observe the result of your configuration. If the routers are still connected, use the **show dialer** command to determine how long the routers will wait until disconnecting an idle link.

Let the link remain idle for 120 seconds; the routers should disconnect.

Check the routing tables of SanJose1 and Capetown. Verify that routing is working in your network by pinging SanJose1 (192.168.16.1) from Capetown.

Issue the **show snapshot** command on both routers. Notice that SanJose1's output differs significantly from Capetown's output, as shown:

```
SanJose1#show snapshot
BRI0/0 is up, line protocol is upSnapshot server line state down
  Length of active period:          5 minutes
  For ip address: 192.168.16.3
  Current state: active, remaining time: 5 minutes
```

```

Capetown#show snapshot
BRI0/0 is up, line protocol is upSnapshot client
Options: dialer support, stay asleep on carrier up
Length of active period:          5 minutes
Length of quiet period:           10 minutes
Length of retry period:           8 minutes
For dialer address 1
Current state: active, remaining/exchange time: 5/0 minutes
Connected dialer interface:
    BRI0/0:1

```

2. According to the output of this command, what is the retry period set to?

After allowing the connection to time out, wait five minutes with **debug dialer** running on each router. Below are sample outputs for SanJose1 and Capetown when snapshot routing is activated.

```

SanJose1#debug dialer
01:21:49: %LINK-3-UPDOWN: Interface BRI0/0:1, changed state to up
01:21:49: %ISDN-6-CONNECT: Interface BRI0/0:1 is now connected to unknown
01:21:49: isdn_call_connect: Calling lineaction of BRI0/0:1
01:21:49: BRI0/0:1 DDR: Authenticated host Capetown with no matching dialer map
01:21:49: BR0/0:1 DDR: Dialer protocol up
01:21:49: BRI0/0:1 DDR: dialer protocol up
01:21:49: BRI0/0: dialer_ckt_swt_client_connect: incoming circuit switched call
01:21:50: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0/0:1, changed state
to up
01:21:55: %ISDN-6-CONNECT: Interface BRI0/0:1 is now connected to Capetown

```

```

Capetown#debug dialer
00:29:27282767: isdn_call_connect: Calling lineaction of BRI0/0:1
00:29:00: BRI0/0:1 DDR: Authenticated host SanJose1 with no matching dialer map
00:29:00: BR0/0:1 DDR: Dialer protocol up
00:29:00: BRI0/0:1 DDR: dialer protocol up
00:29:00: BRI0/0: dialer_ckt_swt_client_connect: incoming circuit switched call
00:29:01: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI0/0:1, changed state
to up
00:29:06: %ISDN-6-CONNECT: Interface BRI0/0:1 is now connected to 5551234 SanJose1

```

3. Which router dials the other to receive snapshot routing information?