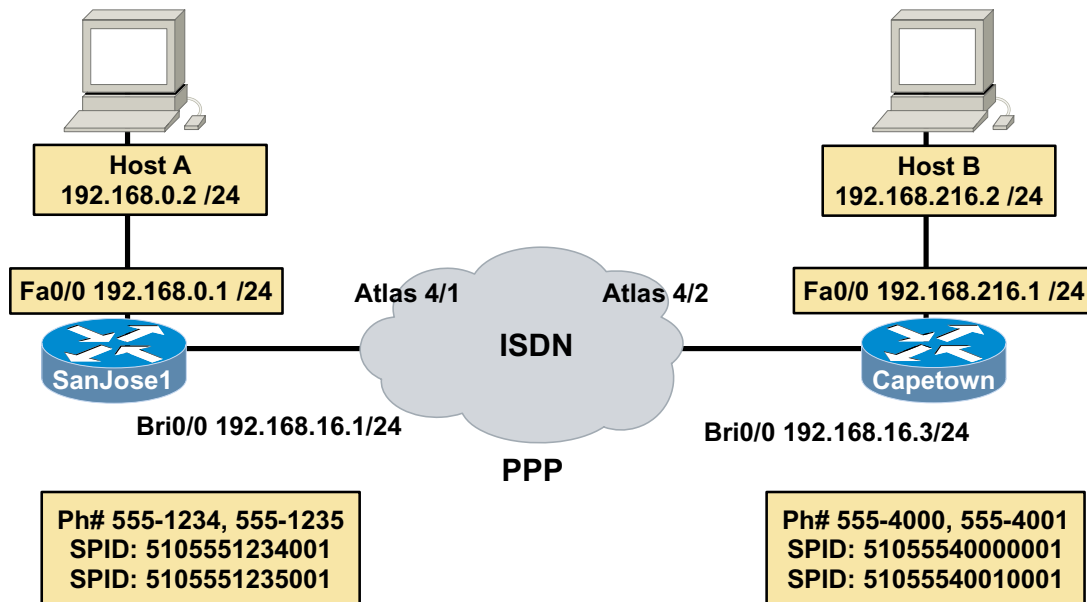


## Lab 5.3.1 Configuring ISDN Using Dialer Profiles



### Objective

In this lab, you will configure two Cisco routers for ISDN BRI using dialer profiles.

### Scenario

The International Travel Agency wants you to configure an ISDN DDR connection between a remote office (Capetown) and its corporate network core router (SanJose1). They have asked that you configure PPP encapsulation and CHAP authentication over this link. Because the company plans to increase the number of ISDN connections at the central and remote sites, you will use dialer profiles to simplify future configurations.

### Step 1

Before beginning this lab, it is recommended that you reload the router after erasing its startup configuration. This prevents 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 a 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 BRI module ports of the Atlas 550 as labeled in the diagram. Also, be sure to configure both workstations with the correct IP address and default gateway (router Fa0/0 IP address).

### Step 2

Configure both routers to use the appropriate ISDN switch type, National ISDN-1. Because you will be using PPP encapsulation and CHAP on the B channels, enter the case sensitive username and password information on both routers as shown below for SanJose1:

```
SanJose1(config)#isdn switch-type basic-ni
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)#exit
```

1. PPP is the line encapsulation on the B channels; what is the encapsulation protocol used on the D channel?
- 

Configure **dialer-list 1** to identify all IP traffic as “interesting” on both routers as shown here:

```
SanJose1(config)#dialer-list 1 protocol ip permit
```

### Step 3

Configure the BRI on SanJose1 and Capetown to use a dialer profile as shown here; do not assign an IP address to these interfaces:

```
SanJose1(config)#interface bri0/0
SanJose1(config-if)#isdn spid1 51055512340001 5551234
SanJose1(config-if)#isdn spid2 51055512350001 5551235
SanJose1(config-if)#encapsulation ppp
SanJose1(config-if)#ppp authentication chap
SanJose1(config-if)#dialer pool-member 1
SanJose1(config-if)#no shutdown

Capetown(config)#interface bri0/0
Capetown(config-if)#isdn spid1 51055540000001 5554000
Capetown(config-if)#isdn spid2 51055540010001 5554001
Capetown(config-if)#encapsulation ppp
Capetown(config-if)#ppp authentication chap
Capetown(config-if)#dialer pool-member 1
Capetown(config-if)#no shutdown
```

Dialer profiles were introduced in IOS version 11.2 and are the preferred way to configure DDR in complex environments. The dialer profile concept is based on a separation between logical and physical interface configuration. The use of dialer profiles allows the logical and physical configurations to be bound together dynamically on a per-call basis. When using a dialer profile, you assign an interface to a dialer pool or pools. In this case, you have assigned BRI0/0 to be in dialer pool 1. All of the other logical configurations (IP address, dialer string, dialer group) will be assigned by the dialer interface. Depending on the IOS version, you may have to specify the line encapsulation on both the physical interface and the logical interface.

In Cisco IOS software releases prior to IOS 12.0(7)T, dialer profiles in the same dialer pool need encapsulation configuration information entered under both the dialer profile interface and the ISDN interface. If any conflict arises between the logical and the physical interfaces, the dialer profile will not work. That's why this configuration has **encapsulation ppp** configured on BRI0/0 and dialer interface 0 as shown below.

In the new dialer profile model introduced by the dynamic multiple encapsulations feature (IOS 12.0(7)T and later), the configuration on the ISDN interface is ignored and only the configuration on the profile interface is used, unless PPP name binding is used. Before a successful bind by calling line identification (CLID) occurs, no encapsulation type and configuration are assumed or taken from the physical interfaces.

#### Step 4

Configure the dialer interfaces for both routers, starting with SanJose1. The dialer interface receives the logical configuration that is applied to a physical interface. Issue the following commands on SanJose1:

```
SanJose1(config)#interface dialer 0
SanJose1(config-if)#dialer pool 1
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)#ppp multilink
SanJose1(config-if)#dialer load-threshold 1 either
SanJose1(config-if)#dialer-group 1
SanJose1(config-if)#dialer remote-name Capetown
SanJose1(config-if)#dialer string 5554000
SanJose1(config-if)#dialer string 5554001
```

Now create a dialer profile on Capetown as shown here:

```
Capetown(config)#interface dialer 0
Capetown(config-if)#dialer pool 1
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)#ppp multilink
Capetown(config-if)#dialer load-threshold 1 either
Capetown(config-if)#dialer-group 1
Capetown(config-if)#dialer remote-name SanJose1
Capetown(config-if)#dialer string 5551234
Capetown(config-if)#dialer string 5551235
```

**Note:** With a dialer interface, you use the `dialer remote-name` and `dialer string` commands in place of a dialer map.

Use the `show isdn status` command to check ISDN Layer 2 and SPID status. Use the `clear interface bri0/0` command, multiple times if necessary, to enable a SPID status of established and valid.

1. How will SanJose1 know to use Capetown at 5554000 when it receives interesting traffic that must be routed to 192.168.16.3? In other words, is there anything in the dialer interface configuration that SanJose1 can use to determine that this dialer profile should be used to reach 192.168.16.3?

---

---

---

#### Step 5

Configure static routing on both routers so that nodes on the remote network can reach nodes at the central site. Use a default route on the Capetown router (since it is a remote site stub network) as shown here:

```
SanJose1(config)#ip route 192.168.216.0 255.255.255.0 192.168.16.3
Capetown(config)#ip route 0.0.0.0 0.0.0.0 192.168.16.1
```

## Step 6

Enable **debug dialer** on both SanJose1 and Capetown.

Test your ISDN connection by pinging Host B from Host A. This ping should eventually be successful. Once you are connected, issue the **show dialer** command.

1. According to the output from **show dialer**, what logical interface has been bound to interface BRI0/0:1?

---

Issue the **show ip interface brief** command. Since you configured PPP multilink, both B Channels should show “up and up.” Troubleshoot as necessary.

Allow the ISDN connection to time out, or manually disconnect both B channels by issuing the **isdn disconnect interface bri0/0 all** command at either router.

With both B Channels disconnected on each router, issue the **show ip interface brief** command a second time.

2. According to this command, interface dialer 0 is still “up and up.” Why?

---

---