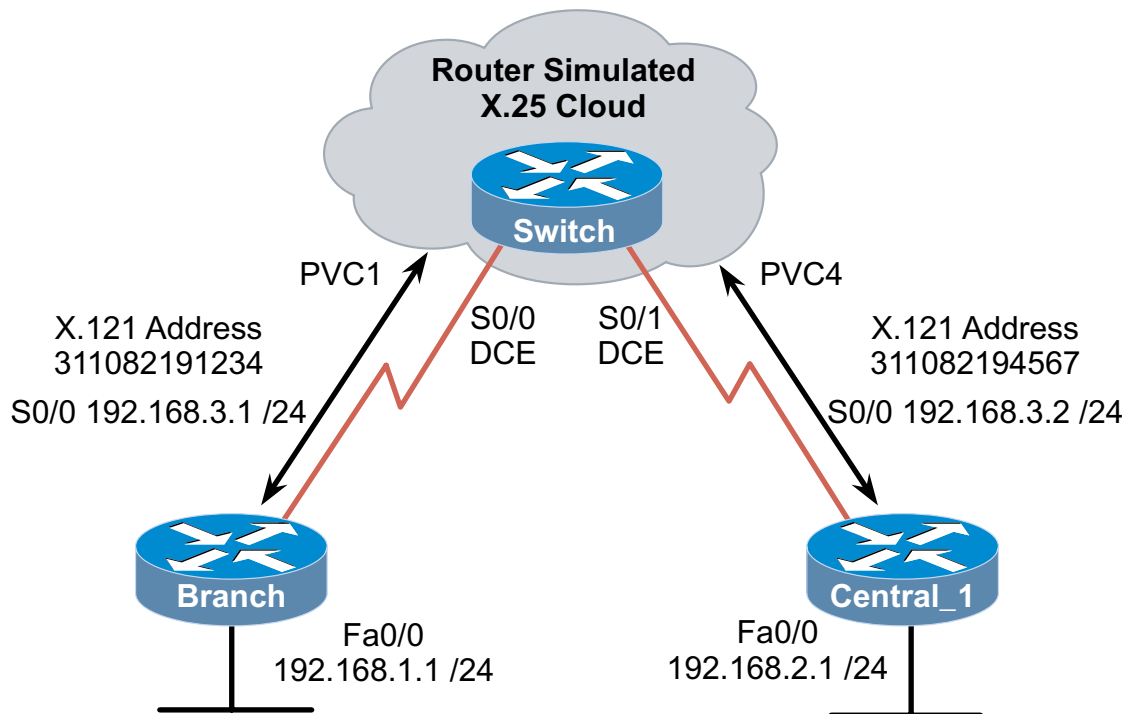


6.3.2 Configuring X.25 PVCs



Objective

Configure X.25 PVCs to connect a central office router to a branch location using a third router as a simulated X.25 switch.

Scenario

International Travel Agency (ITA) has a small branch office (Branch) in an area that is not served by either Frame Relay or ISDN technology. You have been asked to put together an X.25 prototype to see if the technology will meet ITA's requirements. In this second trial, you will be using permanent virtual circuits (PVCs).

Because an X.25 network is not available, you will first configure a router to act as an X.25 switch. Once the switch is configured, you will configure two routers to interface with the X.25 network. Use X.25 PVCs to create a functional link between the two routers. The branch router (Branch) connects a stub network, so configure a default route on the branch router side and a static route on the central router (Central_1) side.

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. Cable the lab as shown in the diagram.

Step 2

The first router to be configured will be the Switch router, which will simulate the X.25 network. Log into the Switch router and enter global configuration mode. Configure the following information into the router:

Set the hostname to Switch on the router.

```
router(config)#hostname Switch
```

Turn on the X.25 switching feature with the following command:

```
Switch(config)#x25 routing
```

Set up the static X.121 address so that the router will know which interfaces to switch the X.25 packets out:

```
Switch(config)#x25 route 311082191234 interface serial 0/0  
Switch(config)#x25 route 311082194567 interface serial 0/1
```

Configure each of the serial interfaces on the X.25 switch router so that they use X.25 encapsulation and set up the PVC mappings:

```
Switch(config)#interface serial 0/0  
Switch(config-if)#encapsulation x25 dce  
Switch(config-if)#x25 pvc 1 interface serial1 pvc 4  
Switch(config-if)#clockrate 56000  
Switch(config-if)#no shutdown  
Switch(config-if)#interface serial 0/1  
Switch(config-if)#encapsulation x25 dce  
Switch(config-if)#x25 pvc 4 interface serial0 pvc 1  
Switch(config-if)#clockrate 56000  
Switch(config-if)#no shutdown
```

Step 3

Configure the branch (Branch) router using the following steps:

Set the router hostname to Branch:

```
router(config)#hostname Branch
```

Configure the interfaces and assign the IP addresses:

```
Branch(config)#interface fastethernet 0/0  
Branch(config-if)#ip address 192.168.1.1 255.255.255.0  
Branch(config-if)#no shutdown  
Branch(config-if)#interface serial 0/0  
Branch(config-if)#encapsulation x25  
Branch(config-if)#ip address 192.168.3.1 255.255.255.0  
Branch(config-if)#no shutdown
```

Assign the X.121 address to this interface:

```
Branch(config-if)#x25 address 311082191234
```

Instead of using the **x25 map** command to establish an SVC, use the **x25 pvc** command to create a PVC. Set up the PVC in interface configuration mode:

```
Branch(config-if)#x25 pvc 1 ip 192.168.3.2 311082194567 broadcast
```

Add the necessary default route to facilitate successful routing:

```
Branch(config)#ip route 0.0.0.0 0.0.0.0 192.168.3.2
```

Step 4

Configure the central office (Central_1) router using the following steps:

Set the hostname to Central_1 on the router:

```
router(config)#hostname Central_1
```

Configure the interfaces and assign the IP addresses:

```
Central_1(config)#interface fastethernet 0/0
Central_1(config-if)#ip address 192.168.2.1 255.255.255.0
Central_1(config-if)#no shutdown
Central_1(config-if)#interface serial 0/0
Central_1(config-if)#encapsulation x25
Central_1(config-if)#ip address 192.168.3.2 255.255.255.0
Central_1(config-if)#no shutdown
```

Assign the X.121 address to this interface:

```
Central_1(config-if)#x25 address 311082194567
```

Set up the X.25 PVC to the other side:

```
Central_1(config-if)#x25 pvc 4 ip 192.168.3.1 311082191234
broadcast
```

Add the necessary static route to facilitate successful routing:

```
Central_1(config)#ip route 192.168.1.0 255.255.255.0 192.168.3.1
```

Step 5

Verify end-to-end connectivity.

From either Branch or Central_1, ping the other's FastEthernet interface.

If it doesn't work you have a problem with your configuration. Make sure that the FastEthernet interfaces are up; troubleshoot as necessary.

Remember connectivity is between Branch and Central_1; the other router is working as a switch.

Step 6

On all three routers, use the appropriate show interfaces command and see what X.25 information is available.

Use the **show x25 pvc** command to display information about the X.25 PVC.

On all three routers, use the appropriate show interfaces command and see what X.25 information is available. The following is an example of what Switch might look like:

```
Switch#show interfaces
Serial 0/0 is up, line protocol is up
  Hardware is HD64570 with 5-in-1 module
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation X25, loopback not set
  X.25 DCE, address <none>, state R1, modulo 8, timer 0
    Defaults: idle VC timeout 0
      cisco encapsulation
        input/output window sizes 2/2, packet sizes 128/128
        Timers: T10 60, T11 180, T12 60, T13 60
        Channels: Incoming-only none, Two-way 25-128, Outgoing-only none
        RESTARTs 1/0 CALLs 0+0/0+0/0+0 DIAGs 0/0
  LAPB DCE, state CONNECT, modulo 8, k 7, N1 12056, N2 20
    T1 3000, T2 0, interface outage (partial T3) 0, T4 0
    VS 0, VR 0, tx NR 0, Remote VR 0, Retransmissions 0
    Queues: U/S frames 0, I frames 0, unack. 0, reTx 0
    IFRAMES 8/8 RNRs 0/0 REJs 0/0 SABM/Es 24/1 FRMRs 0/0 DISCs 0/0
  Last input never, output 00:05:29, output hang never

Serial 0/1 is up, line protocol is up
  Hardware is HD64570 with 5-in-1 module
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation X25, loopback not set
  X.25 DCE, address <none>, state R1, modulo 8, timer 0
    Defaults: idle VC timeout 0
      cisco encapsulation
        input/output window sizes 2/2, packet sizes 128/128
        Timers: T10 60, T11 180, T12 60, T13 60
        Channels: Incoming-only none, Two-way 25-128, Outgoing-only none
        RESTARTs 1/0 CALLs 0+0/0+0/0+0 DIAGs 0/0
  LAPB DCE, state CONNECT, modulo 8, k 7, N1 12056, N2 20
    T1 3000, T2 0, interface outage (partial T3) 0, T4 0
    VS 7, VR 7, tx NR 7, Remote VR 7, Retransmissions 0
    Queues: U/S frames 0, I frames 0, unack. 0, reTx 0
    IFRAMES 7/7 RNRs 0/0 REJs 0/0 SABM/Es 92/1 FRMRs 0/0 DISCs 0/0
  Last input never, output 00:06:54, output hang never
```