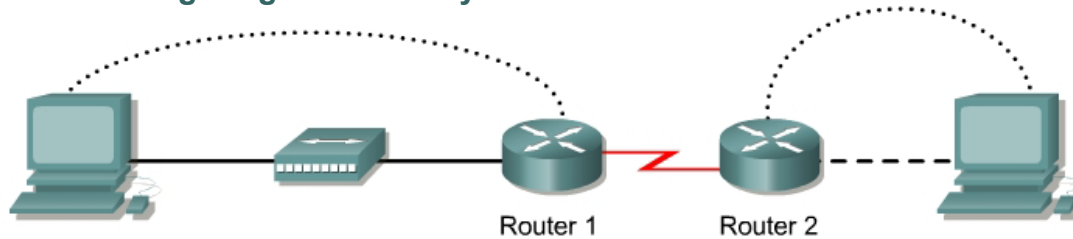


Lab 5.2.2 Configuring Frame Relay PVC



Router Designation	Router Name	Interface Type	Serial 0 Address	FastEthernet 0 Address/Subnet Mask	DLCI Number	Enable Password	Secret Password	Enable/VTY/Console Passwords
Router 1	Washington	DCE	192.168.1.1/24	192.168.3.1/24	102	class		cisco
Router 2	Dublin	DTE	192.168.1.2/24	192.168.2.1/24	102	class		cisco

Straight-through cable	—————
Serial cable	————— ⚡
Console (rollover)	
Crossover cable	- - - - -

Objective

- Configure two routers back-to-back as a Frame Relay permanent virtual circuit (PVC). This will be done manually, in the absence of a Frame Relay switch, and therefore there will be no Local Management Interface (LMI).

Background/Preparation

Cable a network similar to the one in the diagram above. Any router that meets the interface requirements displayed on the above diagram may be used. This includes the following and any of their possible combinations:

- 800 series routers
- 1600 series routers
- 1700 series routers
- 2500 series routers
- 2600 series routers

Please refer to the chart at the end of the lab to correctly identify the interface identifiers to be used based on the equipment in the lab. The configuration output used in this lab is produced from 1721 series routers. Any other router used may produce slightly different output. Conduct the following steps on each router unless specifically instructed otherwise.

Start a HyperTerminal session.

Note: Refer to the erase and reload instructions at the end of this lab. Perform those steps on all routers in this lab assignment before continuing.

Step 1 Configure the routers

Configure the following according to the chart:

- The hostname
- The console
- The virtual terminal
- The enable passwords
- The Fast Ethernet interfaces

If problems occur during this configuration, refer to Lab 1.1.4a Configuring NAT.

Step 2 Configuring the Washington serial interface

First, define the Frame Relay frame type to be used on this link. To configure the encapsulation type, use the command **encapsulation frame-relay ietf**. Disable keepalive messages since there is no Frame Relay switch in this configuration and consequently no Frame Relay DCE:

```
Washington#configure terminal
Washington(config-if)#interface serial 0
Washington(config-if)#encapsulation frame-relay ietf
Washington(config-if)#no keepalive
Washington(config-if)#ip address 192.168.1.1 255.255.255.0
Washington(config-if)#no shutdown
```

Step 3 Configure the Frame Relay map on Washington

- a. When sending an Ethernet frame to a remote IP address, the remote MAC address must be discovered, so that the correct frame type can be constructed. Frame Relay needs a similar mapping.
- b. The remote IP address needs to be mapped to the local DLCI (Layer 2 address), so the correctly addressed frame can be created locally for this PVC. Since there is no way of mapping the DLCI automatically with LMI disabled, this map must be created manually, using the **frame-relay map** command. The **broadcast** parameter also allows for IP broadcasts to use the same mapping for crossing this PVC:

```
Washington(config-if)#frame-relay map ip 192.168.1.2 102 ietf broadcast
```

Step 4 Configure the DCE on Washington

In this configuration, when DCE cables are used, a clock signal is necessary. The **bandwidth** command is optional, but wise to use to verify bandwidth transmission. Another option is to title the connection using the **description** command. It is very useful to record information in the description about the PVC, such as remote contact person and the leased line circuit identifier:

```
Washington(config-if)#clock_rate 64000
Washington(config-if)#bandwidth 64
Washington(config-if)#description PVC to Dublin, DLCI 102, Circuit
#DASS465875, Contact John Tobin (061-8886745)
```

Step 5 Configure Dublin router

Configure the Dublin router using the following commands.

```
Dublin#configure terminal
Dublin(config-if)#interface serial 0
Dublin(config-if)#encapsulation frame-relay ietf
Dublin(config-if)#no keepalive
Dublin(config-if)#no shutdown
Dublin(config-if)#ip address 192.168.1.2 255.255.255.0
Dublin(config-if)#frame-relay map ip 192.168.1.1 102 ietf broadcast
Dublin(config-if)#bandwidth 64
Dublin(config-if)#description PVC to Washington, DLCI 102, Circuit
#DASS465866 Contact Pat White (091-6543211)
```

Step 6 Verifying Frame Relay PVC

- a. On the Washington router, type the command `show frame-relay pvc`:

```
Washington#show frame-relay pvc
```

- b. What is the DLCI number reported?

- c. What is the PVC status?

- d. What is the value of the DLCI USAGE?

Step 7 Showing Frame Relay map

- a. To view the Layer 2 to Layer 3 mapping, use the `show frame-relay map` command at the privileged EXEC mode prompt:

```
Washington#show frame-relay map
```

- b. What is the IP address shown?

- c. What state is interface serial 0 in?

Step 8 Verify Frame Relay connectivity

- a. From the Washington router, ping the Dublin router serial interface.
b. Was the ping successful?

- c. If the ping was not successful, troubleshoot the router configurations.

Upon completion of the previous steps, finish the lab by doing the following:

- Logoff by typing `exit`
- Turn the router off
- Remove and store the cables and adapter

Erasing and reloading the router

Enter into the privileged EXEC mode by typing **enable**.

If prompted for a password, enter **class** (if that does not work, ask the instructor).

```
Router>enable
```

At the privileged EXEC mode, enter the command **erase startup-config**.

```
Router#erase startup-config
```

The responding line prompt will be:

```
Erasing the nvram filesystem will remove all files! Continue? [confirm]
```

Press **Enter** to confirm.

The response should be:

```
Erase of nvram: complete
```

Now at the privileged EXEC mode, enter the command **reload**.

```
Router(config)#reload
```

The responding line prompt will be:

```
System configuration has been modified. Save? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Proceed with reload? [confirm]
```

Press **Enter** to confirm.

In the first line of the response will be:

```
Reload requested by console.
```

After the router has reloaded the line prompt will be:

```
Would you like to enter the initial configuration dialog? [yes/no]:
```

Type **n** and then press **Enter**.

The responding line prompt will be:

```
Press RETURN to get started!
```

Press **Enter**.

Now the router is ready for the assigned lab to be performed.

Router Interface Summary				
Router Model	Ethernet Interface #1	Ethernet Interface #2	Serial Interface #1	Serial Interface #2
800 (806)	Ethernet 0 (E0)	Ethernet 1 (E1)		
1600	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
1700	FastEthernet 0 (FA0)	FastEthernet 1 (FA1)	Serial 0 (S0)	Serial 1 (S1)
2500	Ethernet 0 (E0)	Ethernet 1 (E1)	Serial 0 (S0)	Serial 1 (S1)
2600	FastEthernet 0/0 (FA0/0)	FastEthernet 0/1 (FA0/1)	Serial 0/0 (S0/0)	Serial 0/1 (S0/1)
In order to find out exactly how the router is configured, look at the interfaces. This will identify what type and how many interfaces the router has. There is no way to effectively list all of the combinations of configurations for each router class. What is provided are the identifiers for the possible combinations of interfaces in the device. This interface chart does not include any other type of interface even though a specific router may contain one. An example of this might be an ISDN BRI interface. The string in parenthesis is the legal abbreviation that can be used in an IOS command to represent the interface.				