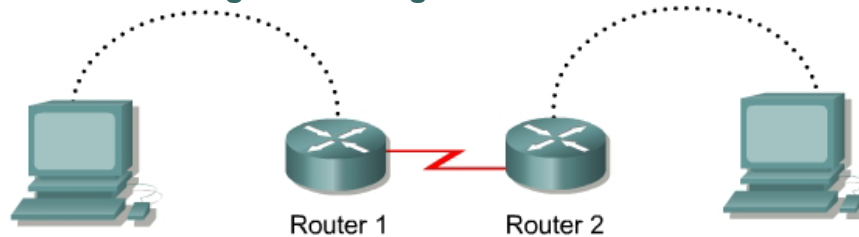


Lab 3.3.5 Troubleshooting PPP Configuration



Router Designation	Router Name	Interface Type	Serial 0 Address	Subnet Mask	Enable Secret Password	Enable/VTY/Console Passwords
Router 1	London	DCE	192.168.15.1	255.255.255.0	class	cisco
Router 2	Paris	DTE	192.168.15.2	255.255.255.0	class	cisco

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

Objective

- Configure PPP on the serial interfaces of two routers.
- Use `show` and `debug` commands to troubleshoot connectivity issues.

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 all of the following according to the chart:

- The hostname
- The console
- The virtual terminal
- The enable passwords

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

Step 2 Configure the Paris interface as shown

Configure the Paris router serial interface as follows:

```
Paris(config)#interface serial 0
Paris(config-if)#ip address 192.168.15.2 255.255.255.0
Paris(config-if)# clockrate 56000
Paris(config-if)#exit
Paris(config)#exit
```

Step 3 Configure the London interface as shown

Configure the London router serial interface as follows:

```
London(config)#interface serial 0
London(config-if)#ip address 192.168.15.1 255.255.255.0
London(config-if)# encapsulation ppp
London(config-if)#no shutdown
London(config-if)#exit
London(config)#exit
```

Step 4 Save the configuration

```
London#copy running-config startup-config

Paris#copy running-config startup-config
```

Step 5 Enter the command `show interface serial 0` (refer to interface chart) on London

```
London#show interface serial 0
```

This will show the details of interface serial 0.

- List the following information discovered from issuing this command.
- Serial 0 is _____, line protocol is _____.
- What type of problem is indicated in the last statement? _____

- Internet address is _____.
- Encapsulation _____

Step 6 Enter the command `show interface serial 0` (refer to interface chart) on Paris

```
Paris#show interface serial 0
```

This will show the details of interface serial 0.

- List the following information discovered from issuing this command.
 - Serial 0 is _____, line protocol is _____.
 - Internet address is _____.
 - Encapsulation _____
 - To what OSI layer is the "Encapsulation" referring? _____
 - If the Serial interface was configured, why did the `show interface serial 0` output show that the interface is down?
-

Step 7 Correct the clock location

The clockrate statement has been placed on the wrong interface. It is currently placed on the Paris router, but the London router is the Data Communications Equipment (DCE). Remove the clockrate statement from the Paris router using the `no` version of the command and then add it to the London routers configuration.

Step 8 Enter the command `show cdp neighbors` on London

- Is there any output from the command? _____
- Should there be output? _____

Step 9 Enter the command `debug ppp negotiation` on London

- It may take 60 seconds or more before output occurs.
 - Is there output? _____
 - What is the output saying? _____
 - Is there a problem with PPP encapsulation on the London router or the Paris router?
-
- Why? _____
 - What were the encapsulations listed for the interfaces?
London? _____ Paris? _____
 - Is there an issue with the above statement? _____
 - What is the issue? _____

Step 10 Enter the command `debug ppp negotiation` on the Paris router

- Enter the command `debug ppp negotiation` on the Paris router at the privileged EXEC mode prompt.
- Is there any output from the `debug` command? _____

Step 11 Correct the encapsulation type

- Convert the encapsulation to PPP on the Paris router.
- Is there any output from the `debug` command? _____
- Does it confirm link establishment? _____

Step 12 Enter the command `show interface serial 0` on Paris

```
Paris#show interface serial 0
```

- Serial 0 is _____, line protocol is _____.
- Encapsulation _____
- What is the difference in the Line and Protocol status recorded on Paris earlier? Why?

Step 13 Verify that the serial connection is functioning by pinging the serial interface of the other router

```
London#ping 192.168.15.1
```

```
Paris#ping 192.168.15.2
```

- From London, can the serial interface ping the Paris router? _____
- From Paris, can the serial interface ping the London router? _____
- If the answer is no for either question, troubleshoot the router configurations to find the error. Then do the pings again until the answer to both questions is yes.

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.				