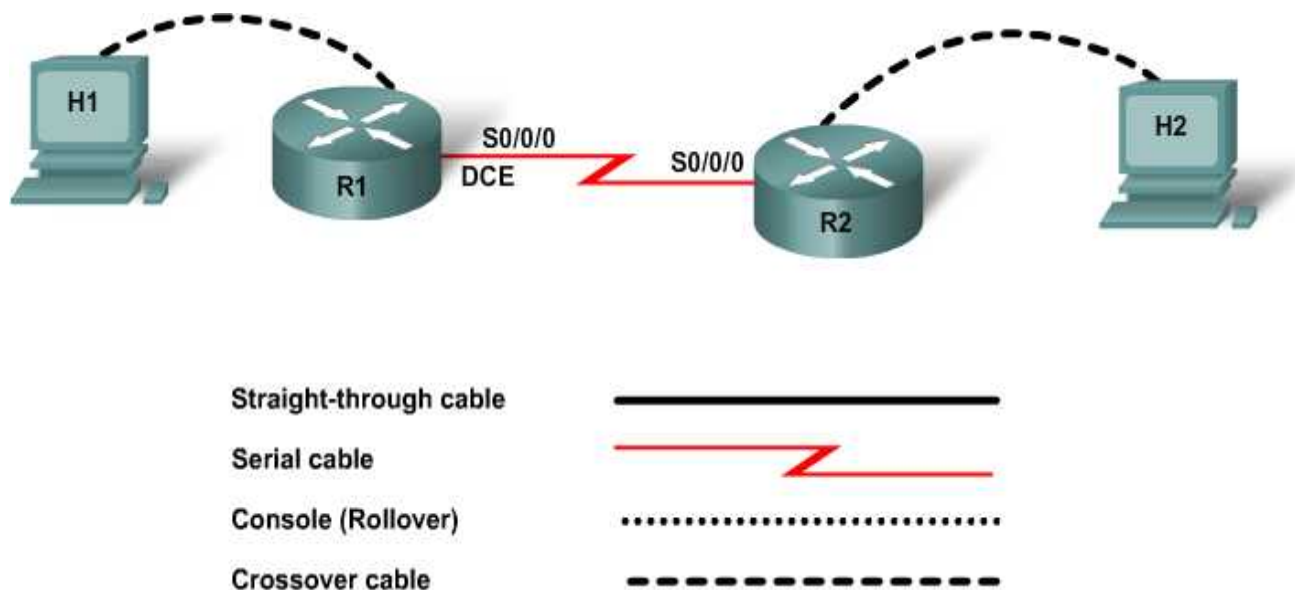Cisco | Networking Academy®
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Lab 7.2.3 Configuring and Verifying a PPP Link

Device	Host Name	Serial 0/0/0 IP Address	Subnet Mask	Serial 0/0/0 Interface Type	Enable Secret Password	Enable, vty, and Console Password
Router 1	R1	192.168.15.1	255.255.255.252	DCE	class	cisco
Router 2	R2	192.168.15.2	255.255.255.252	DTE	class	cisco

Objectives

- Configure the serial interfaces on two routers to use PPP.
- Verify and test the link for connectivity.

Background / Preparation

Cable a network similar to the one shown in the topology diagram. Any router that has a single serial interface may be used for this lab. For example, router series 800, 1600, 1700, 1800, 2500, 2600, 2800, or any combination are acceptable.

The information in this lab applies to other routers; however, command syntax may vary. Depending on the router model, the interfaces may be identified differently. For example, on some routers, Serial 0 may be Serial 0/0 or Serial 0/0/0 and Ethernet 0 may be FastEthernet 0/0. The information in this lab applies to routers that use the Serial 0/0/0 notation. If the router in use differs, use the correct notation for the serial interface.

The following resources are required:

- Two routers both with a serial interface
- Two Windows-based PCs, each with a terminal emulation program

- At least one RJ-45-to-DB-9 connector console cable to configure the routers
- One 2-part (DTE/DCE) serial cable

NOTE: Make sure that the routers and the switches have been erased and have no startup configurations. Instructions for erasing both switch and router are provided in the Lab Manual, located on Academy Connection in the Tools section.

NOTE: SDM Enabled Routers – If the startup-config is erased in an SDM enabled router, SDM will no longer come up by default when the router is restarted. It will be necessary to build a basic router configuration using IOS commands. The steps provided in this lab use IOS commands and do not require the use of SDM. If you wish to use SDM, refer to the instructions in the Lab Manual, located on the Academy Connection in the Tools section or contact your instructor if necessary.

Step 1: Connect the equipment

Connect Router 1 and Router 2 with a serial cable connecting both Serial 0/0/0 interfaces as shown in the topology diagram.

Step 2: Perform basic configuration on Router 1

a. Connect a PC to the console port of the router to perform configurations using a terminal emulation program.

b. On Router 1, configure the hostname, IP addresses, and passwords as provided in the addressing table. Save the configuration.

Step 3: Perform basic configuration on Router 2

On Router 2, configure the hostname, IP addresses, and passwords as provided in the addressing table. Save the configuration.

Step 4: Show the details of Serial 0/0/0 interface on R1

Enter the command **show interfaces serial 0/0/0** to view the details of the interface.

```
R1#show interfaces serial 0/0/0
```

What is the status of Serial 0/0/0? _____

Line Protocol is _____

The Internet address is _____

Encapsulation is _____

Step 5: Show the details of Serial 0/0/0 interface on R2

Enter the command **show interfaces serial 0/0/0** to view the details of the interface.

```
R2#show interfaces serial 0/0/0
```

What is the status of Serial 0/0/0? _____

Line Protocol is _____

The Internet address is _____

Encapsulation is _____

Step 6: Turn on PPP debugging

Turn on the PPP debug function on both routers by entering **debug ppp negotiation** at the privileged EXEC mode prompt.

```
R1#debug ppp negotiation
R2#debug ppp negotiation
```

NOTE: Debugging output is assigned high priority in the CPU process and can render a system unusable. When working on a live network, use **debug** only during periods of low network traffic.

Step 7: Change the encapsulation type

a. Change the encapsulation type to PPP by entering **encapsulation ppp** at the interface Serial 0/0/0 configuration mode prompt on both routers.

```
R1(config-if)#encapsulation ppp
R2(config-if)#encapsulation ppp
```

What did the debug function report when the PPP encapsulation was applied to each router?

_____

_____

_____

_____

b. Turn off the debug function by entering **undebug all** at the privileged EXEC mode prompt of both routers.

```
R1#undebug all
R2#undebug all
```

Step 8: Show the details of Serial 0/0/0 interface on R1

Enter the command **show interfaces serial 0/0/0** to view the details of the interface.

```
R1#show interfaces serial 0/0/0
```

What is the status of Serial 0/0/0? _____

Line Protocol is _____

The Internet address is _____

Encapsulation is _____

Step 9: Show the details of Serial 0/0/0 interface on R2

Enter the command **show interfaces serial 0/0/0** to view the details of the interface.

```
R2#show interfaces serial 0/0/0
```

What is the status of Serial 0/0/0? _____

Line Protocol is _____

The Internet address is _____

Encapsulation is _____

Step 10: Verify that the serial connection is functioning

Ping from R1 to R2 to verify that there is connectivity between the two routers.

```
R1#ping 192.168.15.2
R2#ping 192.168.15.1
```

Can the serial interface on the R2 router be pinged from R1? _____

Can the serial interface on the R1 router be pinged from R2? _____

If the answer is no for either question, troubleshoot the router configurations to find the error. Repeat the pings until they are successful.

Step 11: Reflection

What command allows you to view the details of a specific interface?

_____

_____

When should you use the debug function in a router?

_____

_____

_____

What is the default serial encapsulation on a Cisco router?

_____