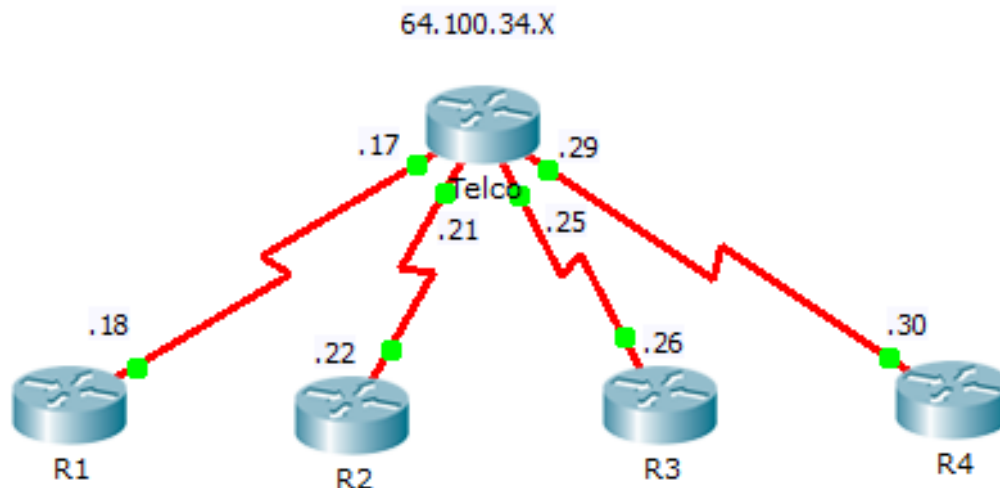


Packet Tracer – Troubleshooting Serial Interfaces

Topology



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Route
Telco	S0/0/0 (DCE)	64.100.34.17	255.255.255.252	N/A
	S0/0/1 (DCE)	64.100.34.21	255.255.255.252	N/A
	S0/1/0 (DCE)	64.100.34.25	255.255.255.252	N/A
	S0/1/1 (DCE)	64.100.34.29	255.255.255.252	N/A
R1	S0/0/0	64.100.34.18	255.255.255.252	64.100.34.17
R2	S0/0/1	64.100.34.22	255.255.255.252	64.100.34.21
R3	S0/0/0	64.100.34.26	255.255.255.252	64.100.34.25
R4	S0/0/1	64.100.34.30	255.255.255.252	64.100.34.29

Objectives

Part 1: Diagnose and Repair the Physical Layer

Part 2: Diagnose and Repair the Data Link Layer

Part 3: Diagnose and Repair the Network Layer

Scenario

You have been asked to troubleshoot WAN connections for a local telephone company (**Telco**). The Telco router should communicate with four remote sites, but none of them are working. Use your knowledge of the OSI model and a few general rules to identify and repair the errors in the network.

Part 1: Diagnose and Repair the Physical Layer

Step 1: Diagnose and repair the cabling.

- Examine the Addressing Table to determine the location of the DCE connections.
- Each serial connection has a DCE and a DTE connection. To determine if each **Telco** interface is using the correct end of the cable look on the third line of output following the **show controllers** command.

```
Telco# show controllers [interface_type interface_num]
```

- Reverse any cables that are incorrectly connected.

Note: In real network settings, the DCE (which sets the clock rate) is typically a CSU/DSU.

Step 2: Diagnose and repair incorrect port connections.

- Examine the Addressing Table to match each router port with the correct **Telco** port.
- Hold the mouse over each wire to ensure that the wires are connected as specified. If not, correct the connections.

Step 3: Diagnose and repair ports that are shutdown.

- Show a brief interface summary of each router. Ensure that all of the ports that should be working are not administratively down.
- Enable the appropriate ports that are administratively down:

Part 2: Diagnose and Repair the Data Link Layer

Step 1: Examine and set clock rates on DCE equipment.

- All of the DCE cables should be connected to **Telco**. Show the running configuration of **Telco** to verify that a clock rate has been set on each interface.
- Set the clock rate of any serial interfaces that requires it:

Step 2: Examine the encapsulation on DCE equipment.

- All of the serial interfaces should be using HDLC as the encapsulation type. Examine the protocol setting of the serial interfaces.

```
Telco# show interface [interface_type interface_num]
```

- Change the encapsulation type to HDLC for any interface that is set otherwise:

Part 3: Diagnose and Repair the Network Layer

Step 1: Verify the IP addressing.

- Show a brief interface summary of each router. Check the IP addresses against the Addressing Table and ensure that they are in the correct subnet with their connecting interface.
- Correct any IP addresses that overlap, or are set to the host or broadcast address:

Step 2: Verify connectivity between all routers.