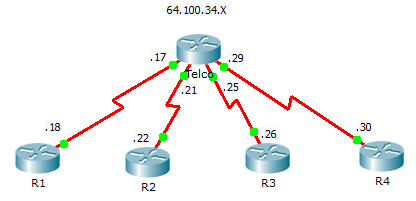
Packet Tracer – Troubleshooting Serial Interfaces

1. Topology



1. 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 |

1. 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.

1. Diagnose and Repair the Physical Layer
   1. Diagnose and repair the cabling.
      1. Examine the Addressing Table to determine the location of the DCE connections.
      2. 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*]

* + 1. Reverse any cables that are incorrectly connected.

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

* 1. Diagnose and repair incorrect port connections.
     1. Examine the Addressing Table to match each router port with the correct **Telco** port.
     2. Hold the mouse over each wire to ensure that the wires are connected as specified. If not, correct the connections.
  2. Diagnose and repair ports that are shutdown.
     1. Show a brief interface summary of each router. Ensure that all of the ports that should be working are not administratively down.
     2. Enable the appropriate ports that are administratively down:

1. Diagnose and Repair the Data Link Layer
   1. Examine and set clock rates on DCE equipment.
      1. 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.
      2. Set the clock rate of any serial interfaces that requires it:
   2. Examine the encapsulation on DCE equipment.
      1. 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*]

* + 1. Change the encapsulation type to HDLC for any interface that is set otherwise:

1. Diagnose and Repair the Network Layer
   1. Verify the IP addressing.
      1. 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.
      2. Correct any IP addresses that overlap, or are set to the host or broadcast address:
   2. Verify connectivity between all routers.