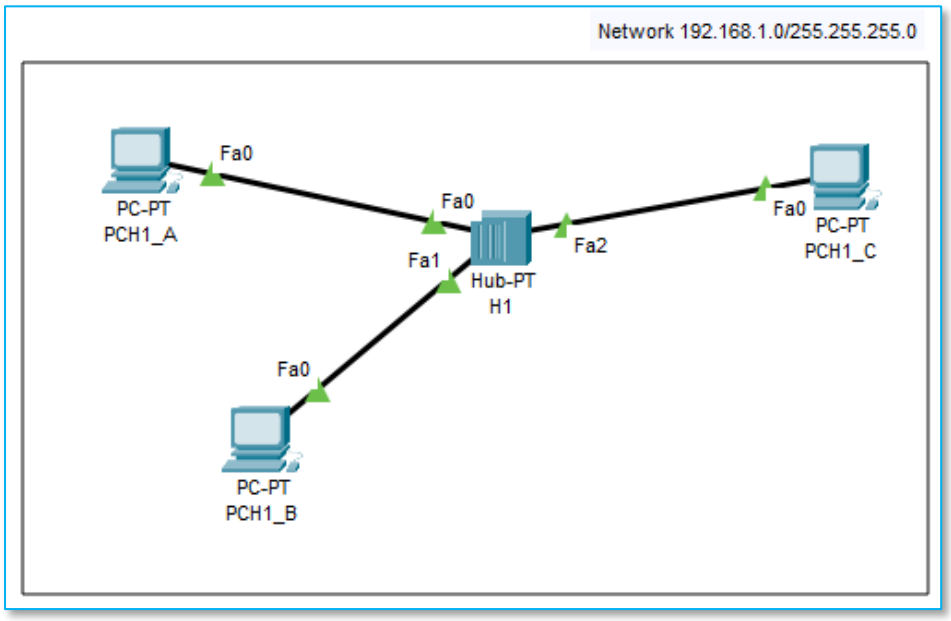
P03: Networking with Layer 1 Devices, Simulating Internet

Q1: Understand the elements on the Layer 1

An Ethernet hub, active hub, network hub, repeater hub, multiport repeater, or simply hub is a network hardware device for connecting multiple Ethernet devices together and making them act as a single network segment. It has multiple input/output (I/O) ports, in which a signal introduced at the input of any port appears at the output of every port except the original incoming. A hub works at the physical layer (layer 1) of the OSI model.

Q2: Simple network with a hub

- Open **PTLab 03.1.pka** and implement the network shown below:



Q3: Working with a packet tracer activity files

- Packet tracer activity files (.pka), unlike regular packet tracer files (.pkt); are used to assess your work while providing a feedback.
- Open packet tracer activity for the first time?
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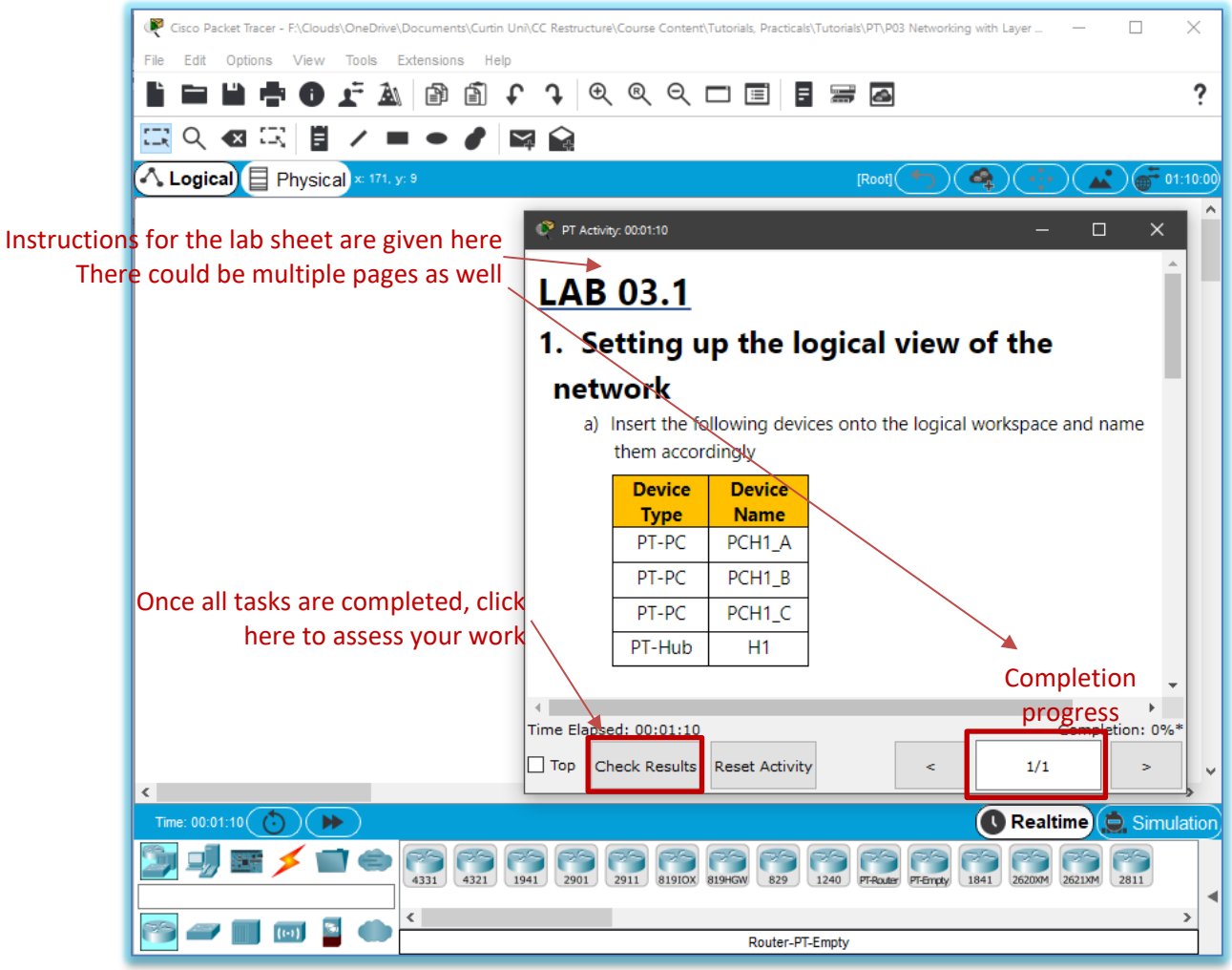
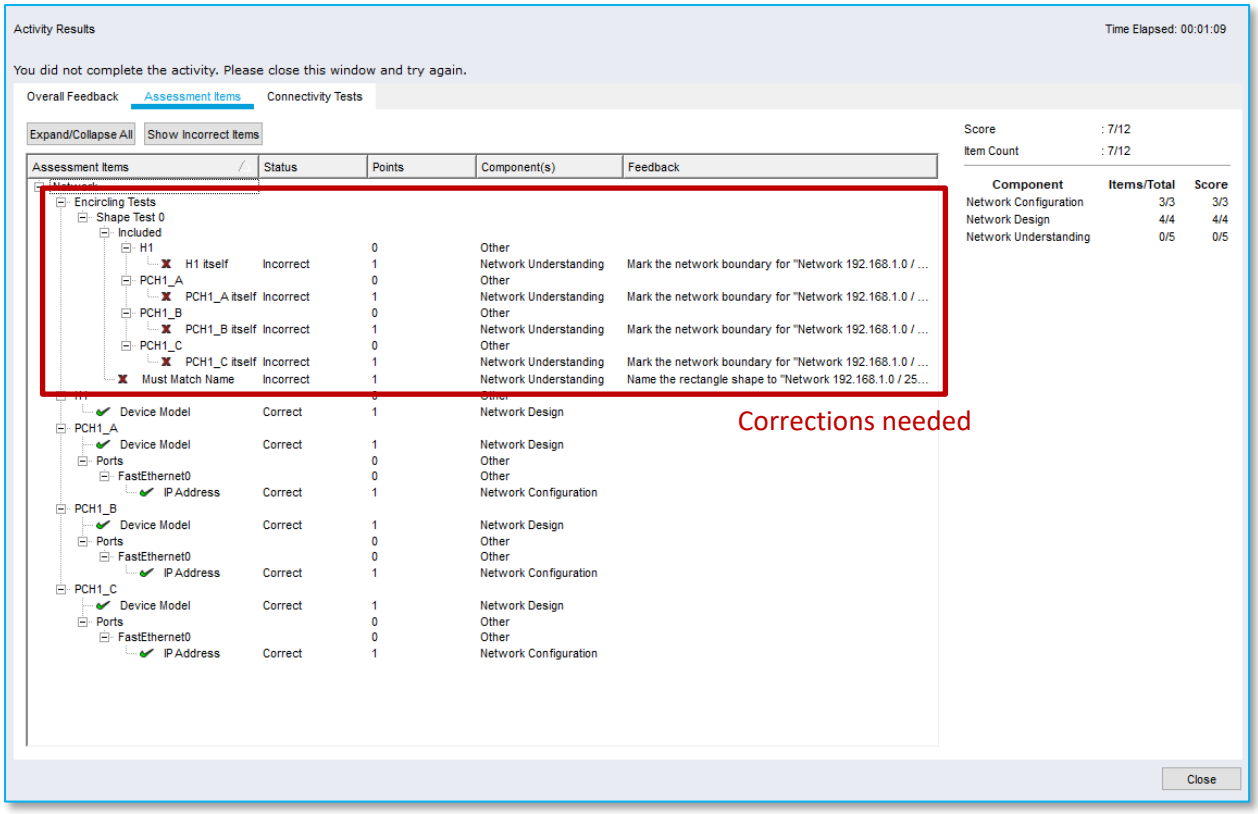
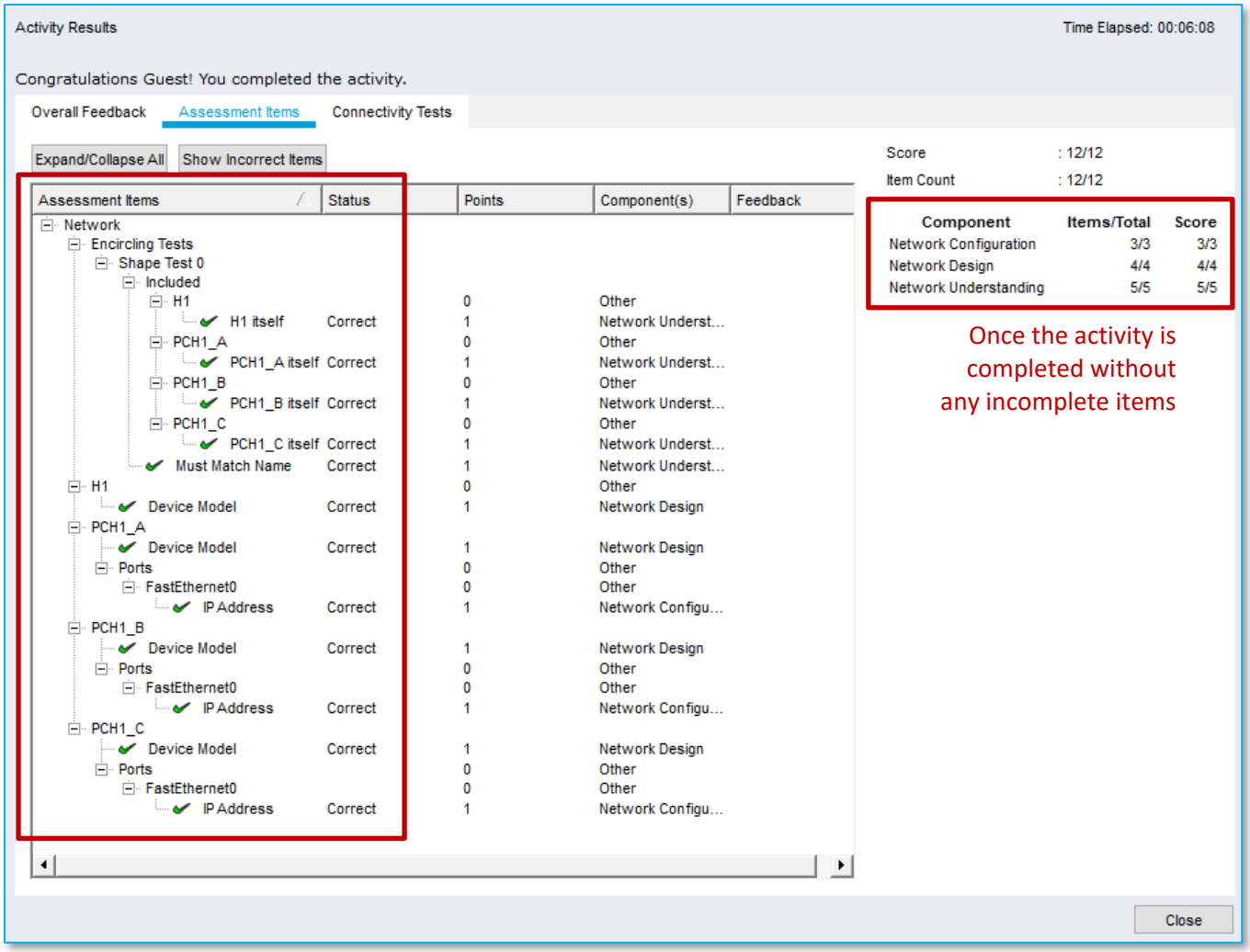
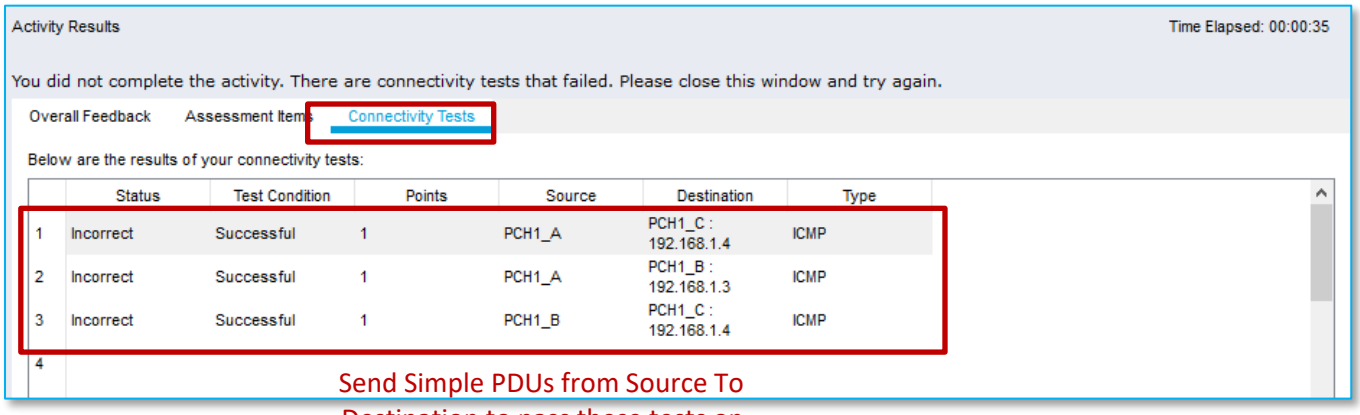



Activity Results
Time Elapsed: 00:01:09
You did not complete the activity. Please close this window and try again.
Overall Feedback
Assessment Items
Connectivity Tests
Expand/Collapse All
Show Incorrect Items
Score : 7/12
Item Count : 7/12
Component Items/Total Score
Network Configuration 3/3 3/3
Network Design 4/4 4/4
Network Understanding 0/5 0/5
Assessment Items | Status | Points | Component(s) | Feedback
Encircling Tests
Shape Test 0
Included
H1 0 Other
H1 itself Incorrect 1 Network Understanding Mark the network boundary for "Network 192.168.1.0 / ...
PCH1_A 0 Other
PCH1_A itself Incorrect 1 Network Understanding Mark the network boundary for "Network 192.168.1.0 / ...
PCH1_B 0 Other
PCH1_B itself Incorrect 1 Network Understanding Mark the network boundary for "Network 192.168.1.0 / ...
PCH1_C 0 Other
PCH1_C itself Incorrect 1 Network Understanding Mark the network boundary for "Network 192.168.1.0 / ...
Must Match Name Incorrect 1 Network Understanding Name the rectangle shape to "Network 192.168.1.0 / 25...
Device Model Correct 1 Network Design
PCH1_A
Device Model Correct 1 Network Design
Ports 0 Other
FastEthernet0 0 Other
IP Address Correct 1 Network Configuration
PCH1_B
Device Model Correct 1 Network Design
Ports 0 Other
FastEthernet0 0 Other
IP Address Correct 1 Network Configuration
PCH1_C
Device Model Correct 1 Network Design
Ports 0 Other
FastEthernet0 0 Other
IP Address Correct 1 Network Configuration
Corrections needed
Close



Once the activity is completed without any incomplete items

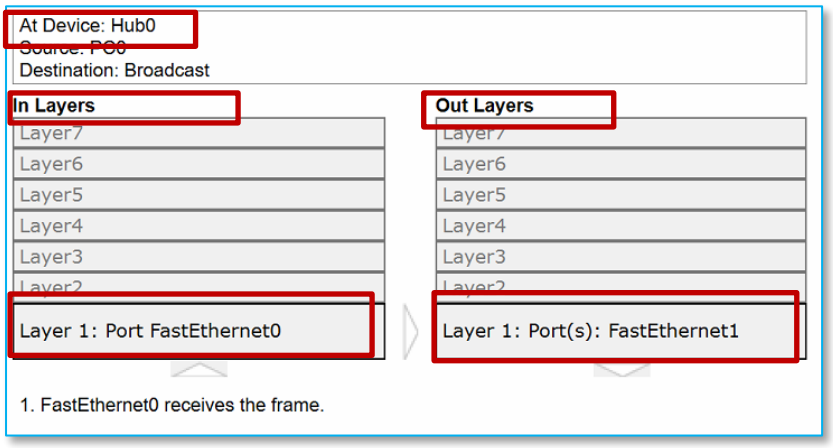


Send Simple PDUs from Source To Destination to pass these tests on network connectivity

IMPORTANT: Packet Tracer v7.3 Connectivity Tests does not support working with HUBs, but Switches and Routers and End Devices

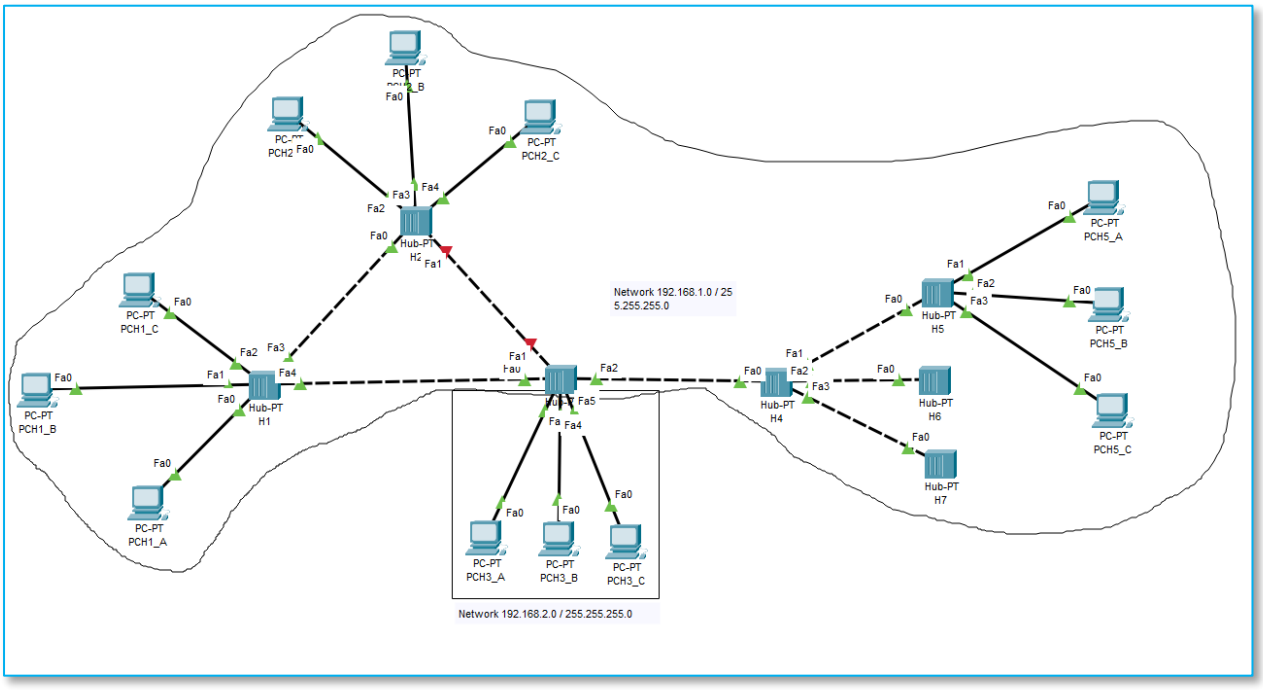
Q4: Observe the packet information, structure

1. Switch to simulation mode
2. Send a PDU from PC_A to PC_B, observe how it broadcasts the message on every port.
3. Observe the internals of the packet at the HUB by clicking on it
4. Note that HUBs do not work with layer 2 information (MAC address) of the packet, in fact they are unable to see layer 2 information of the packet



Q5: Complex network with cascading hubs

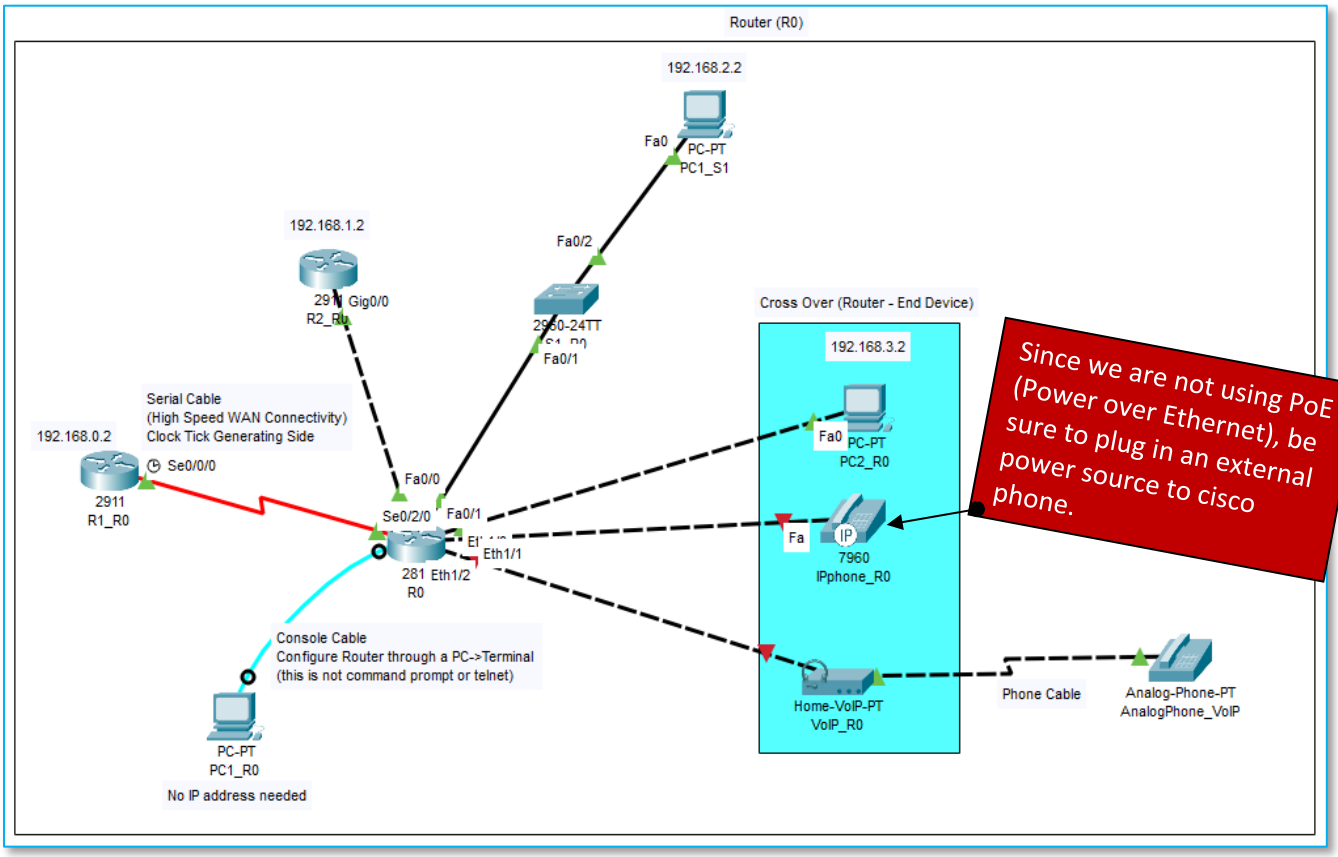
- Open **PTLab 03.2.pka** and implement the network shown below:

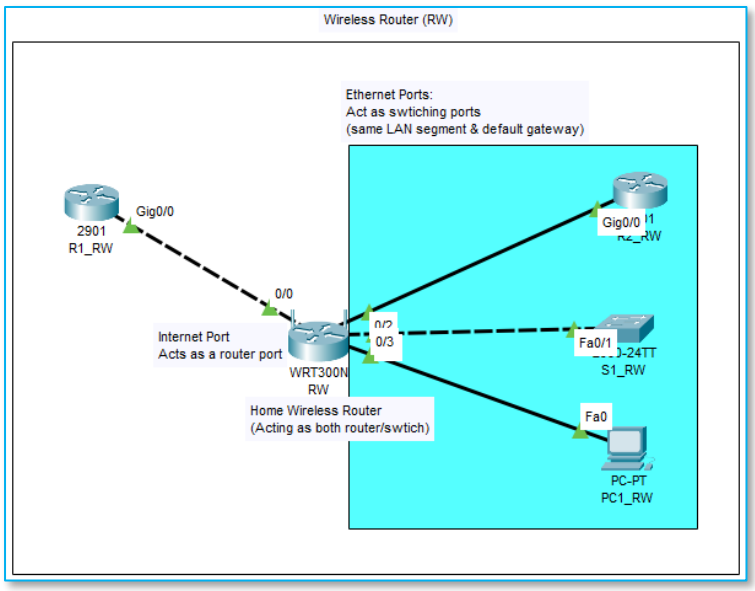


1. Try to send a simple PDU from a PC connected to H1 to a PC connected to H2/H5? Is the delivery successful?
2. Try to send a simple PDU from a PC connected to H1 to a PC connected to H3? Is the delivery successful? Why?

Q6: Networking with physical medium

- Open **PTLab 03.3.pka** and implement the network shown below:



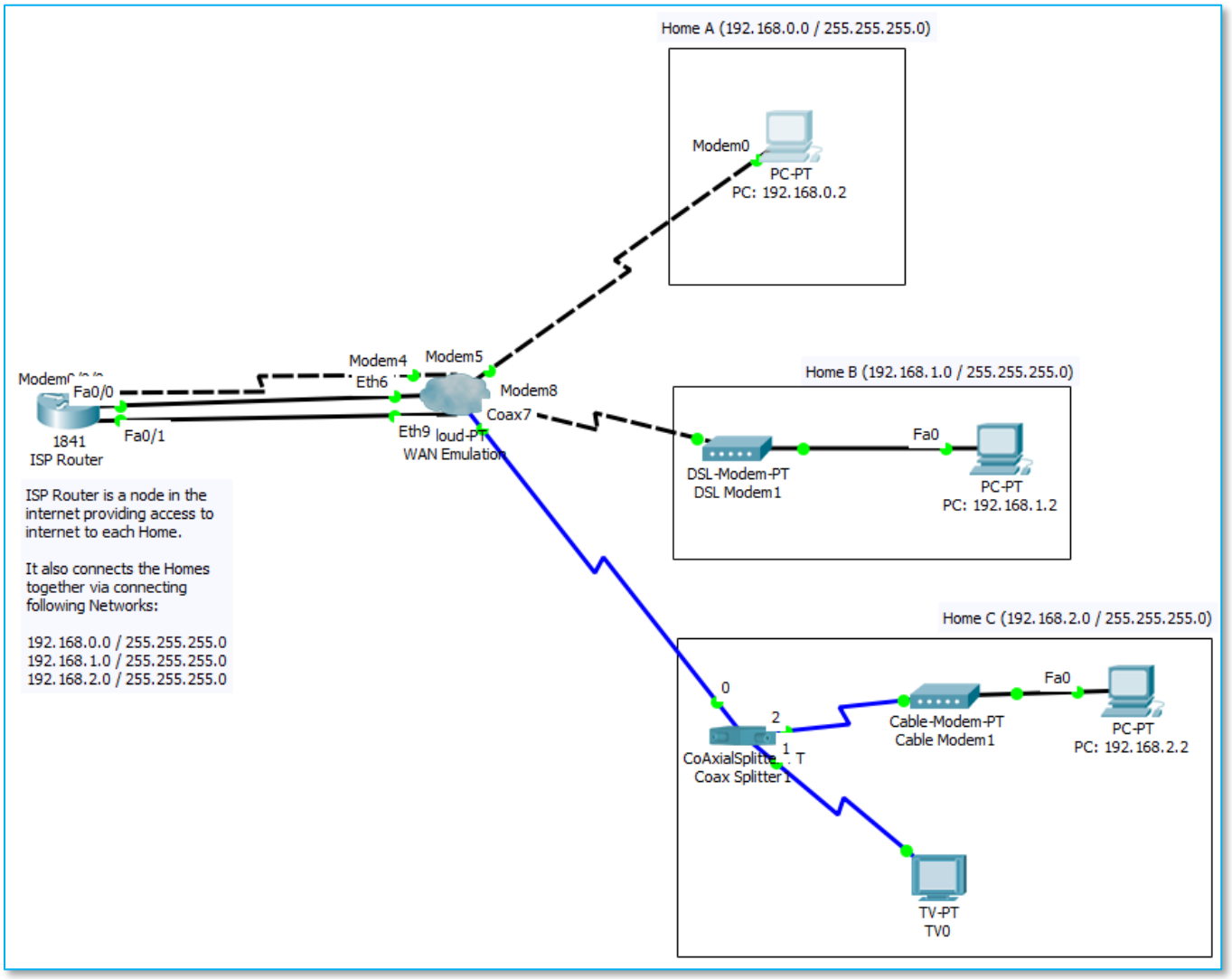


1. Change the cable configuration from cross-over to straight-through purposely to see whether the links work. For i.e. **PC2_R0 to R0** link

Q7: Connecting to the Internet

- Open **PTLab 03.4 (v7.3.1).pka** **in Packet Tracer v7.3.1** (not Packet Tracer v7.3.0) and implement the network shown below:

IMPORTANT: Packet Tracer v7.3.0 has connectivity failures on modem dial-up connections. Therefore, use Packet Tracer v7.3.1 for this activity



Q8: Try me! Questions

1. In **Q5,** why is the link H2 – H3 is put to offline? What happens if H1-H2 link go offline (you may disconnect the link in PT and observe the situation to come up with an answer)
2. In **Q6,** insert a HWIC-4ESW module (this module provides four switching ports) to one of the empty slots of R1_R0 Router. Connect a switch to one of the ports on HWIC-4ESW module. What cable configuration (cross-over or straight-through) should you use? Why?
3. In **Q7**, How would you extend Home C network to support 3 TVs and a small network with 3 PCs connected to the internet via the cable modem?

Summary

1. Understand the elements on Layer 1
2. Simple network with a hub
3. Working with a packet tracer activity
4. Observe the packet information, structure
5. Complex network with cascading hubs
6. Networking with physical medium
7. Connecting to the Internet
8. **Try me! Questions**