Packet Tracer: Beyond the Basics

Cisco Networking Academy®
Mind Wide Open™

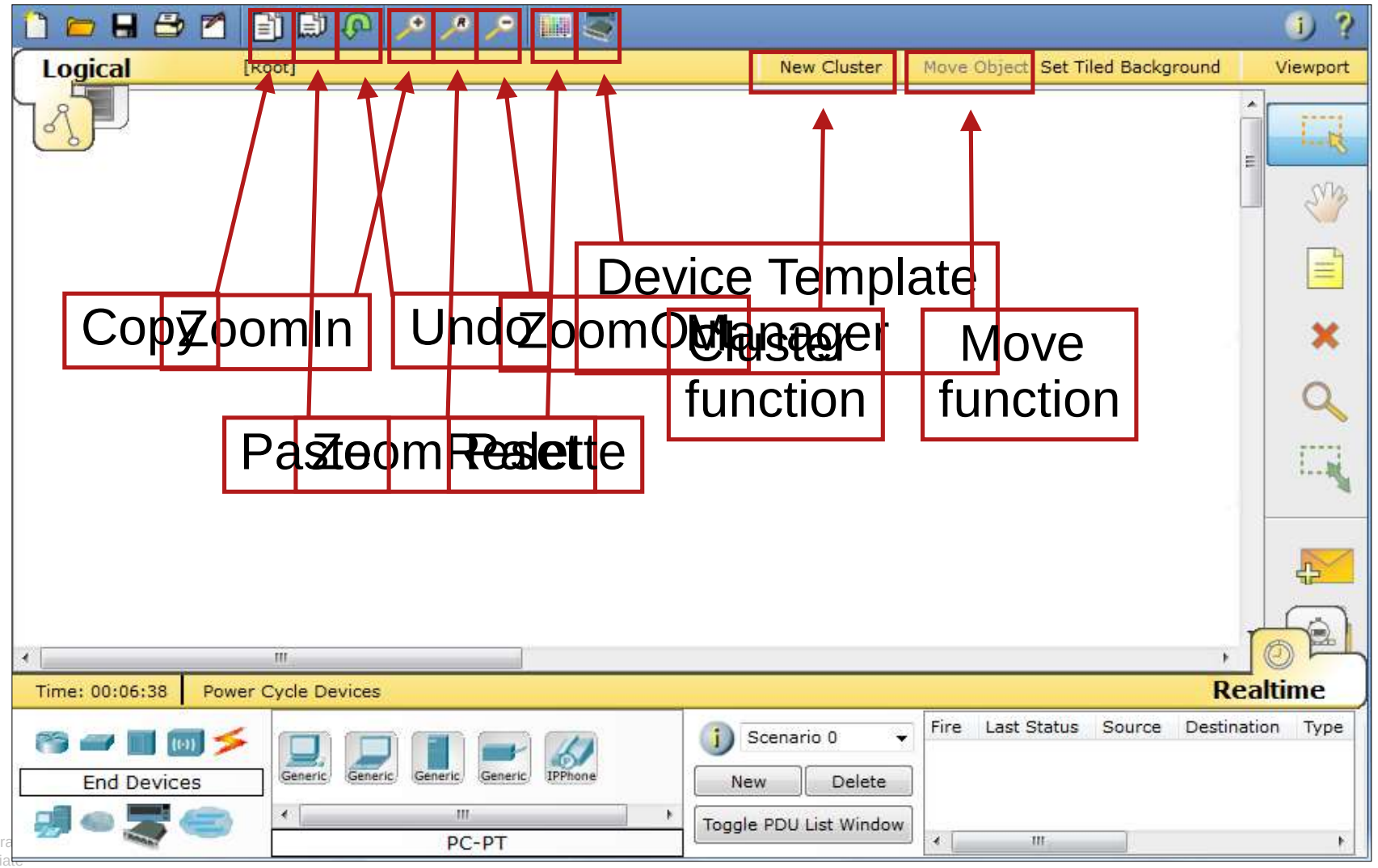
PT Intermediate Session

This presentation will cover these topics

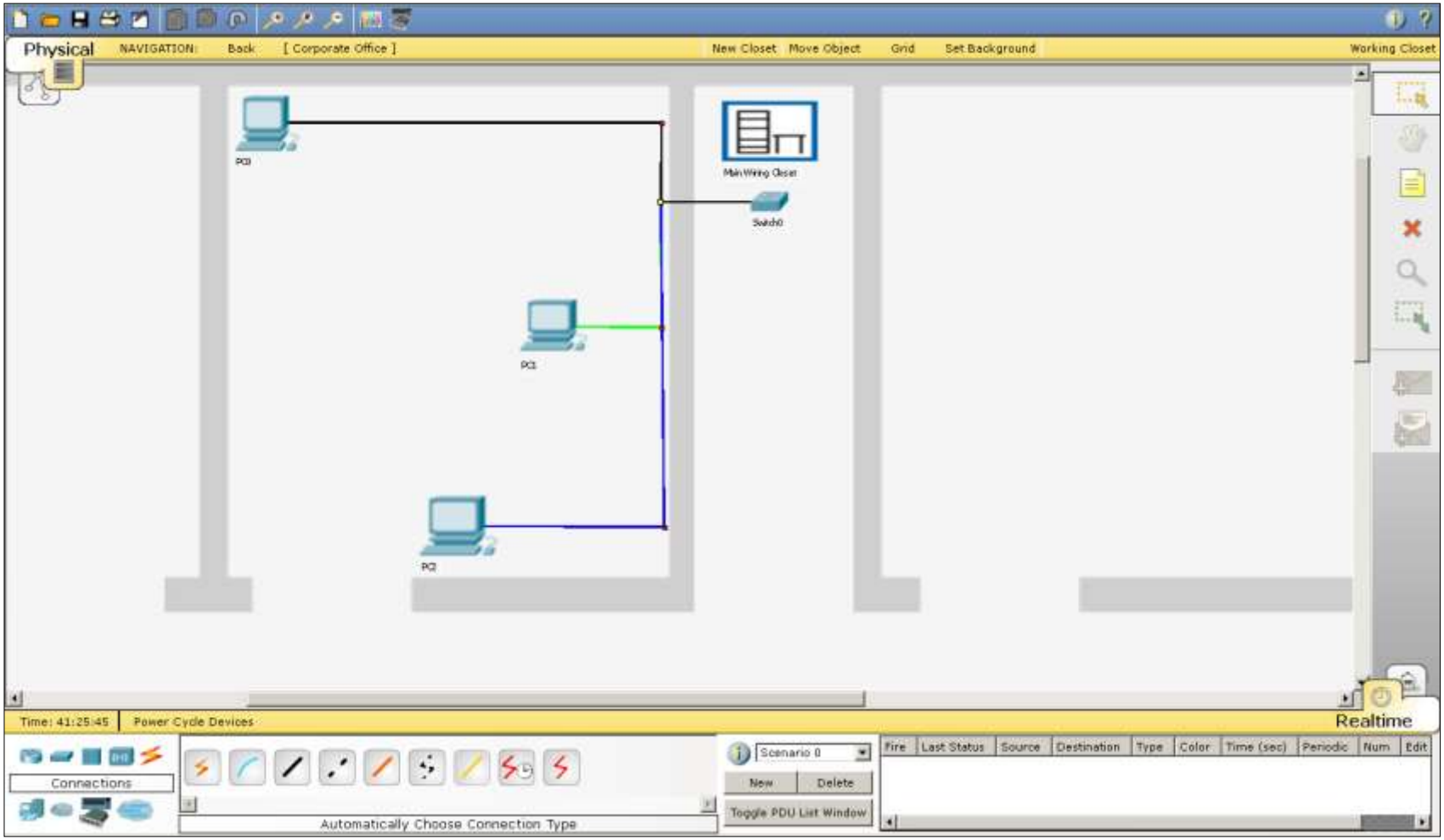
- PT Features
- Simulation Mode
- PDU information
- Complex PDUs
- Challenge Mode
- Scenarios

PT Features

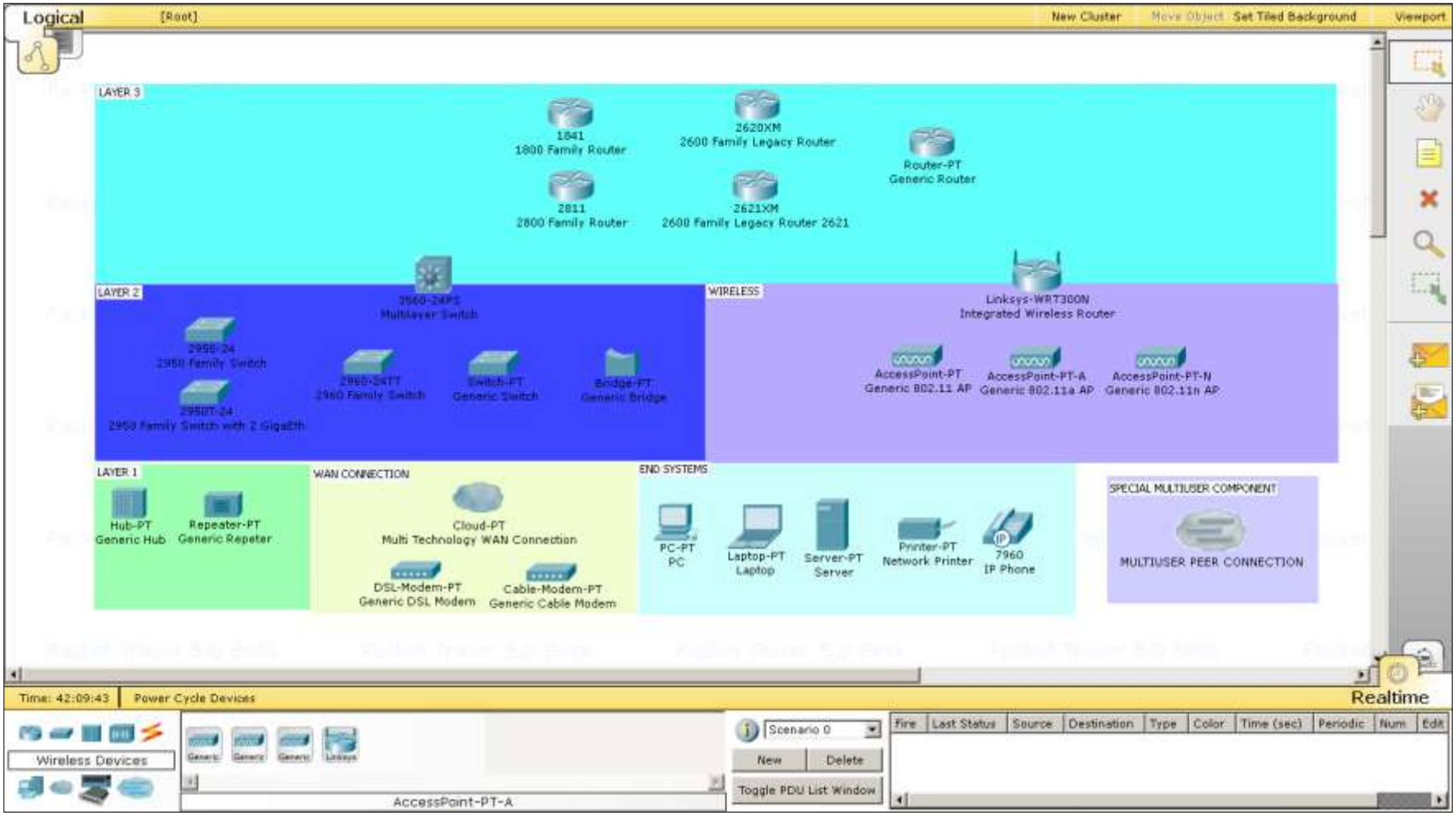
Features



Create Bend Point

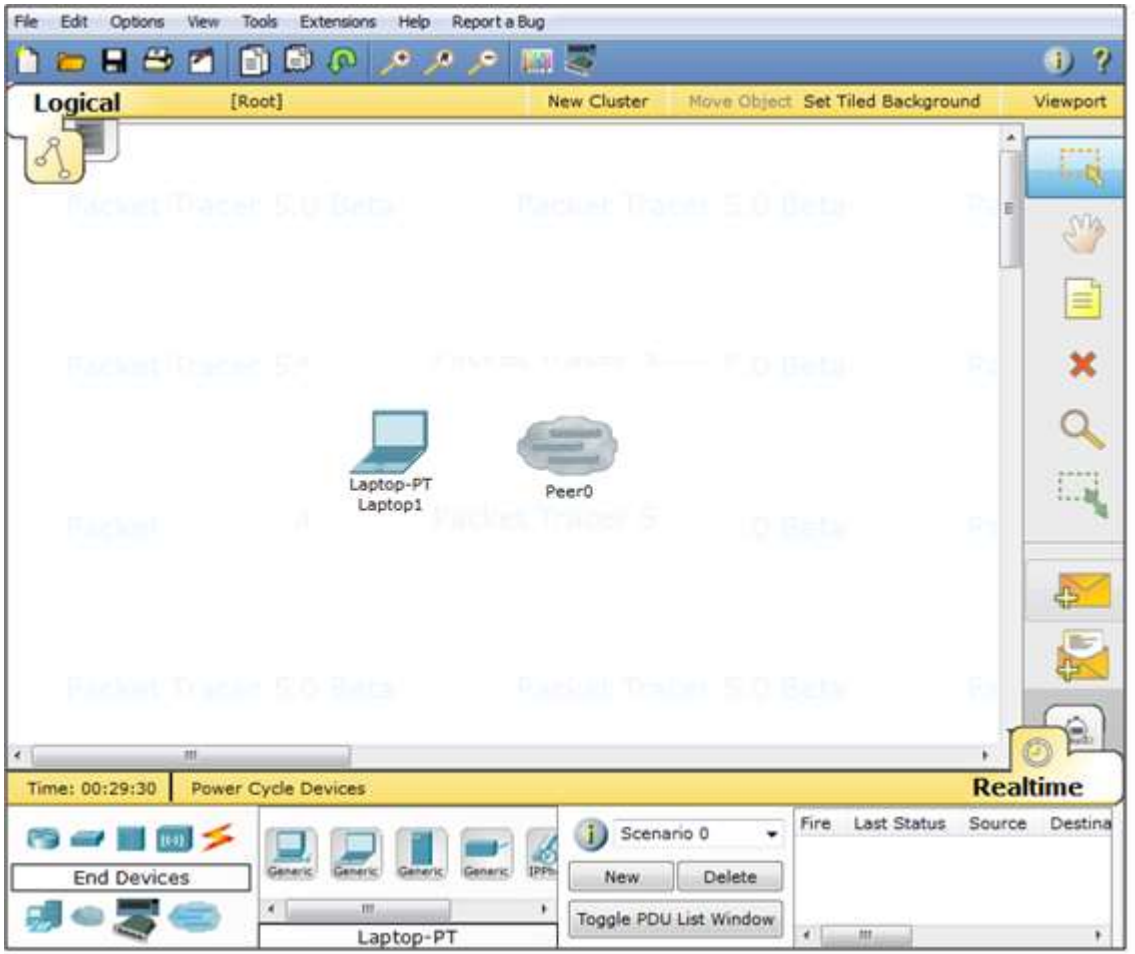


Legacy Devices (PT5.x)

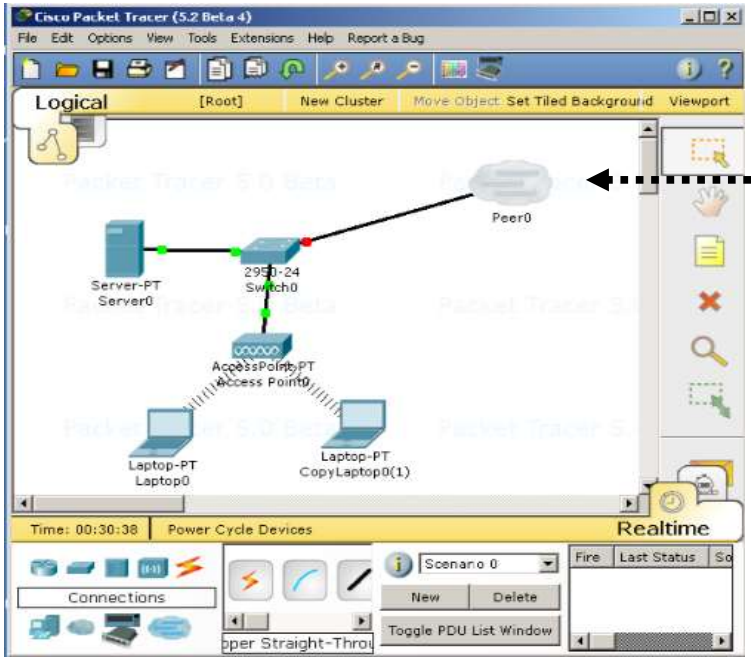


New Devices (PT5.x)

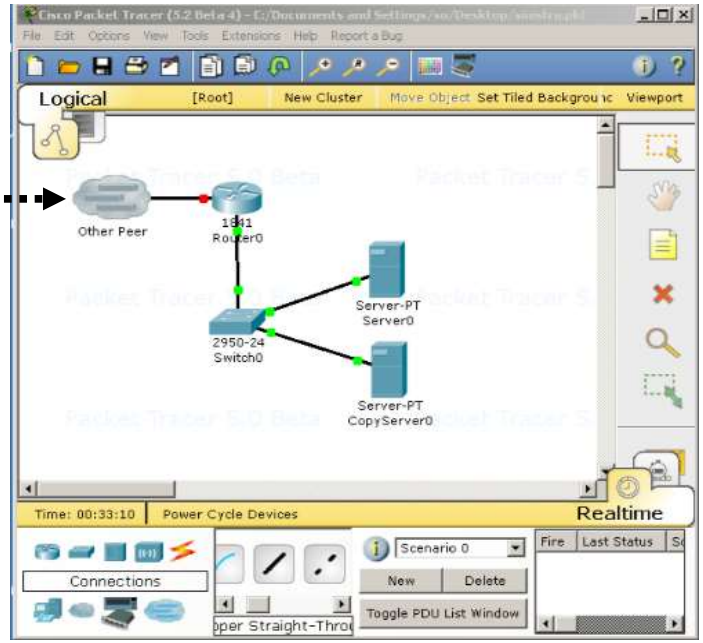
- The new device: laptop-PT



Multiuser Cloud and New Laptop

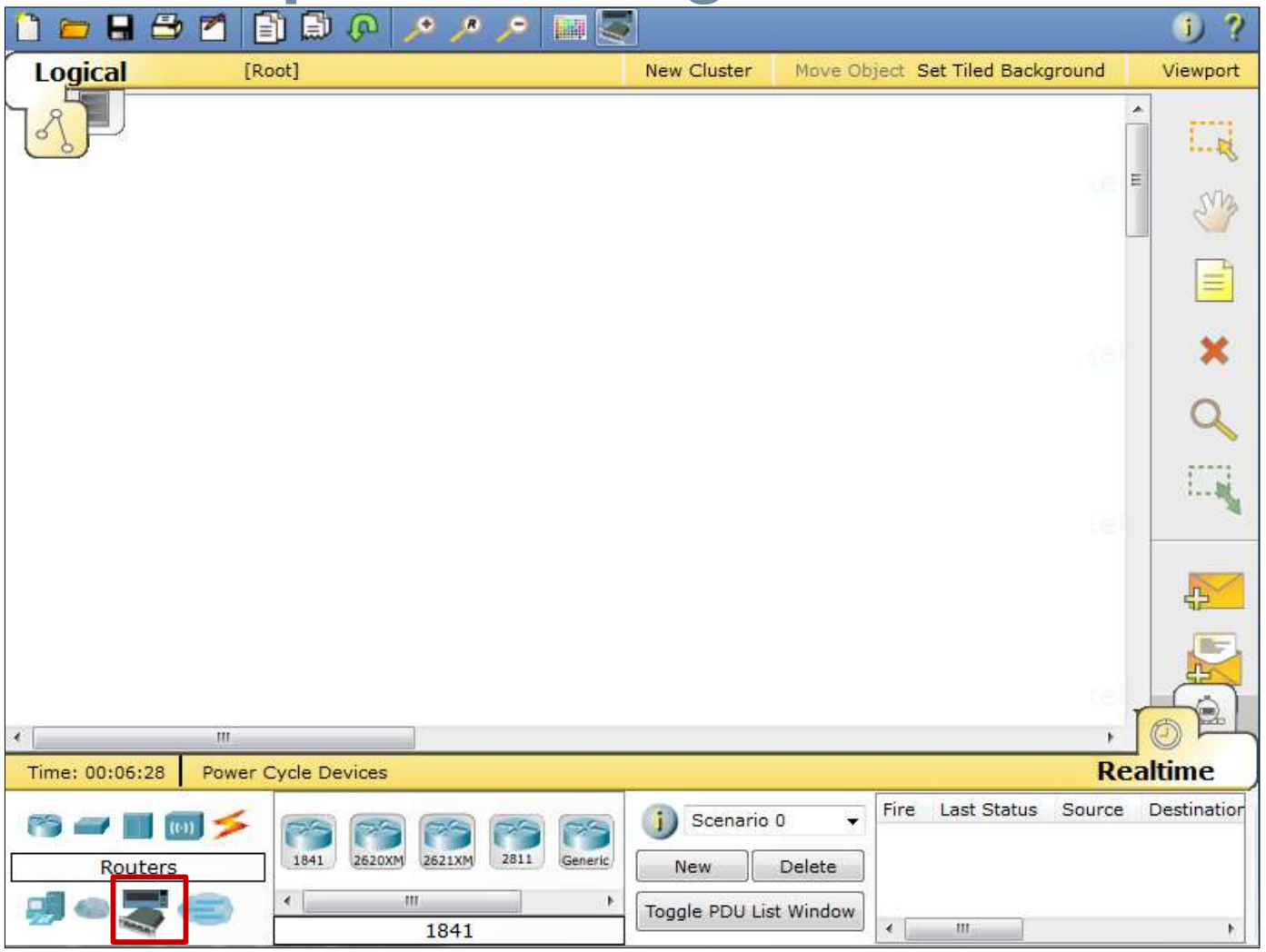


PTMP
TCP/IP

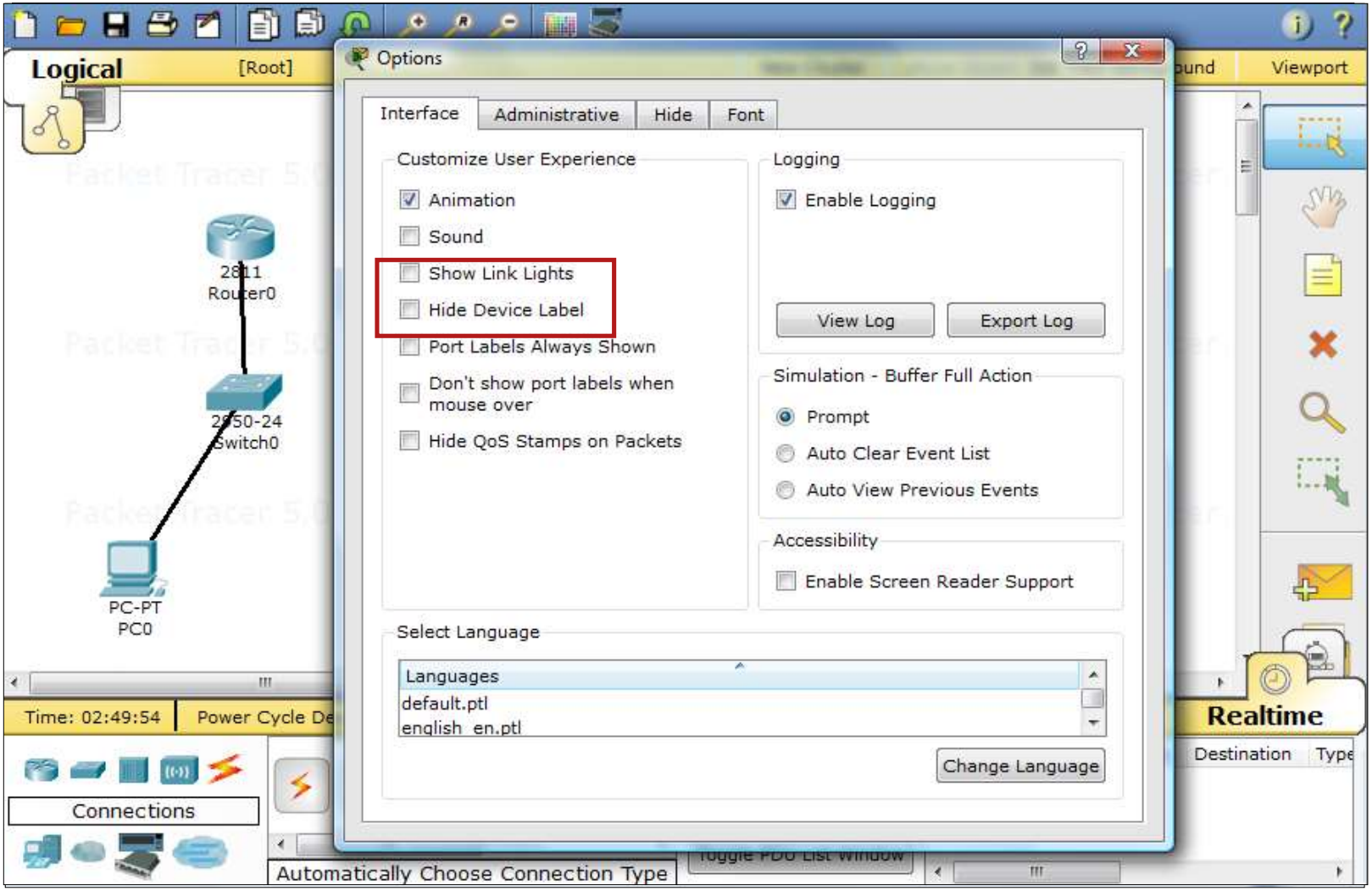


- The Multiuser connection (Peer0 in the picture) can connect by TCP/IP to a Multiuser connection of another PT (Instance on a different computer)

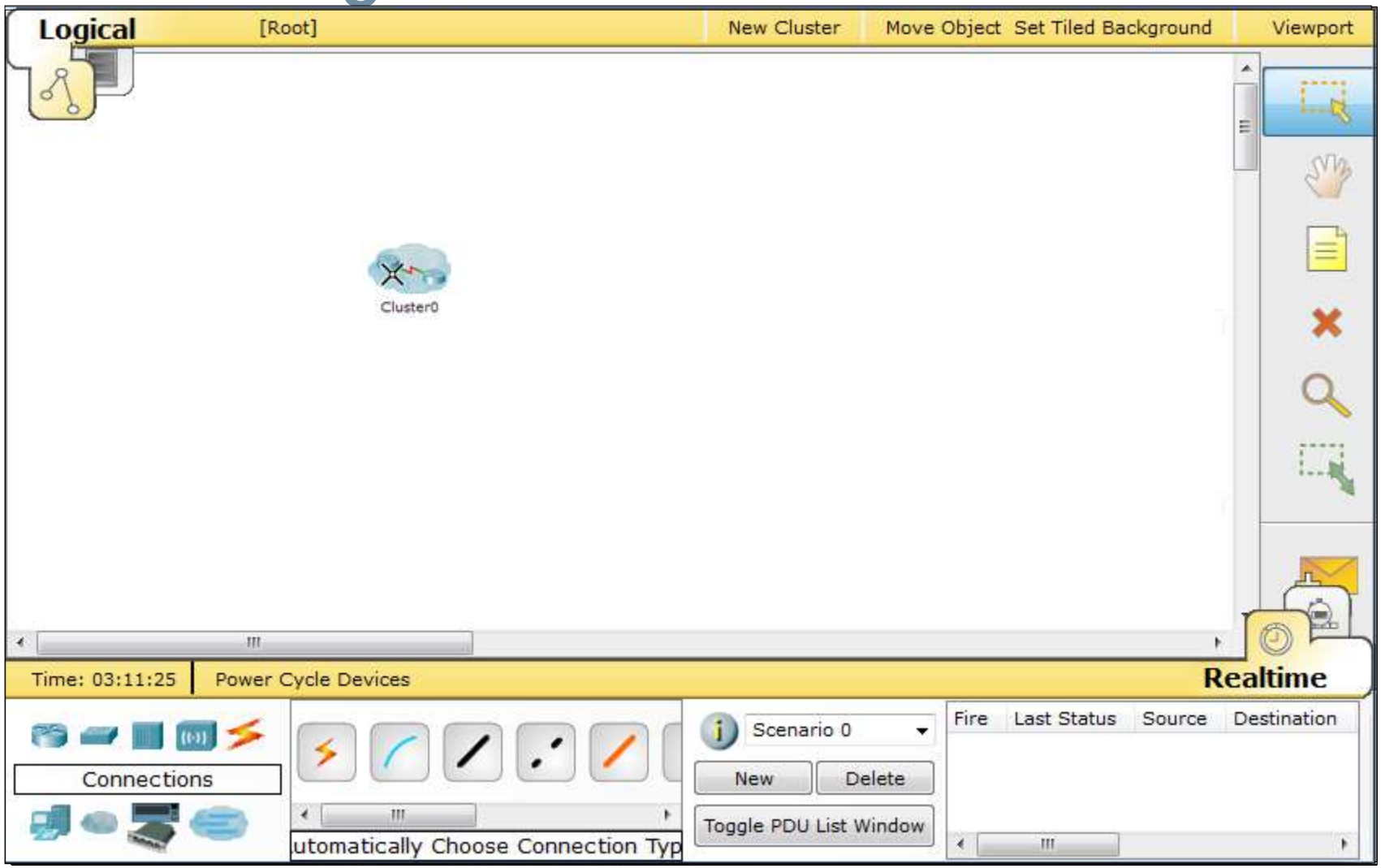
Device Template Manager



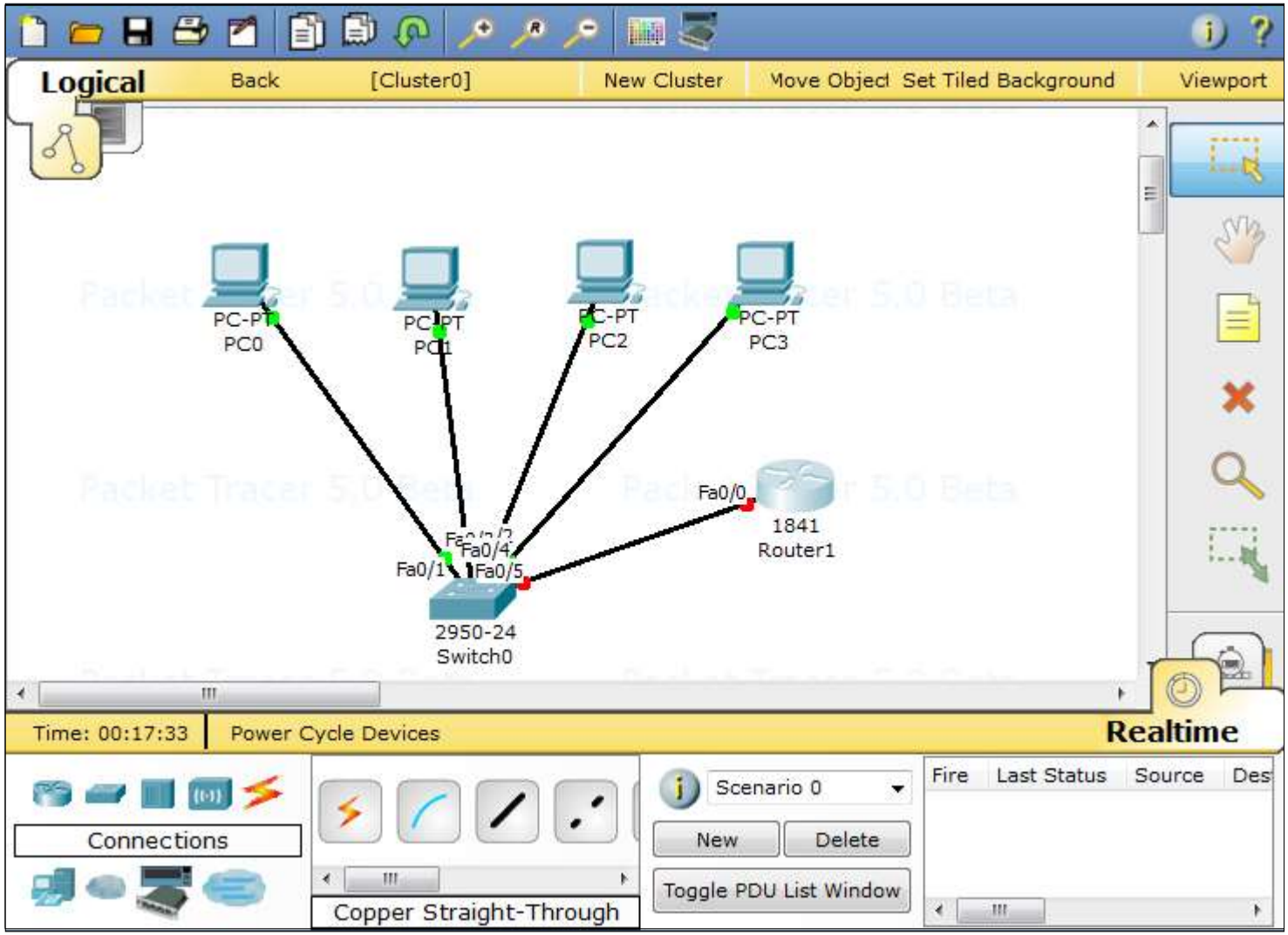
Port Label Options and Other Options



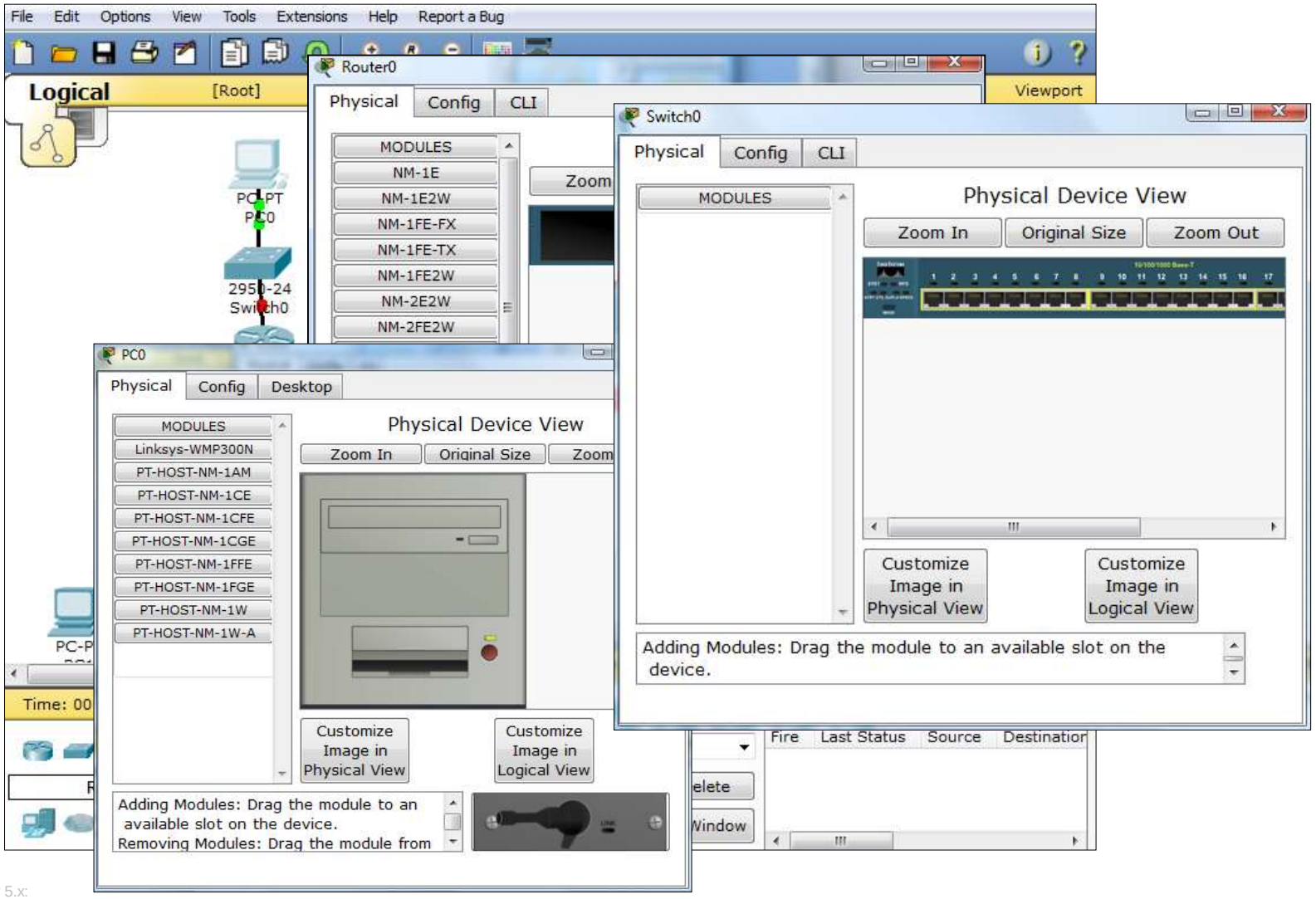
Clustering Devices



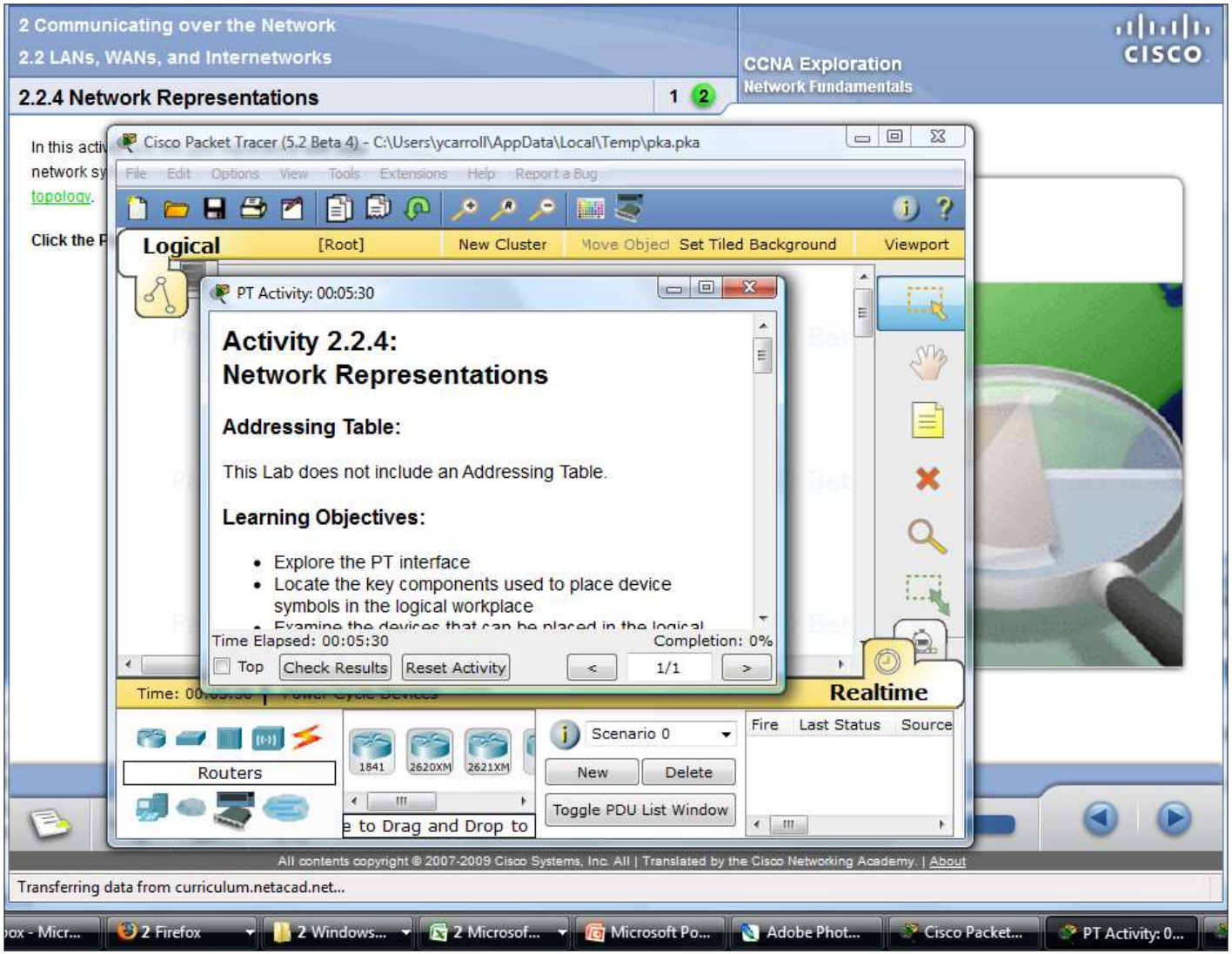
Connect to a Device Within a Cluster



Multiple Device Windows



Where is the Activity Instructions Window?



Simulation Mode Basics

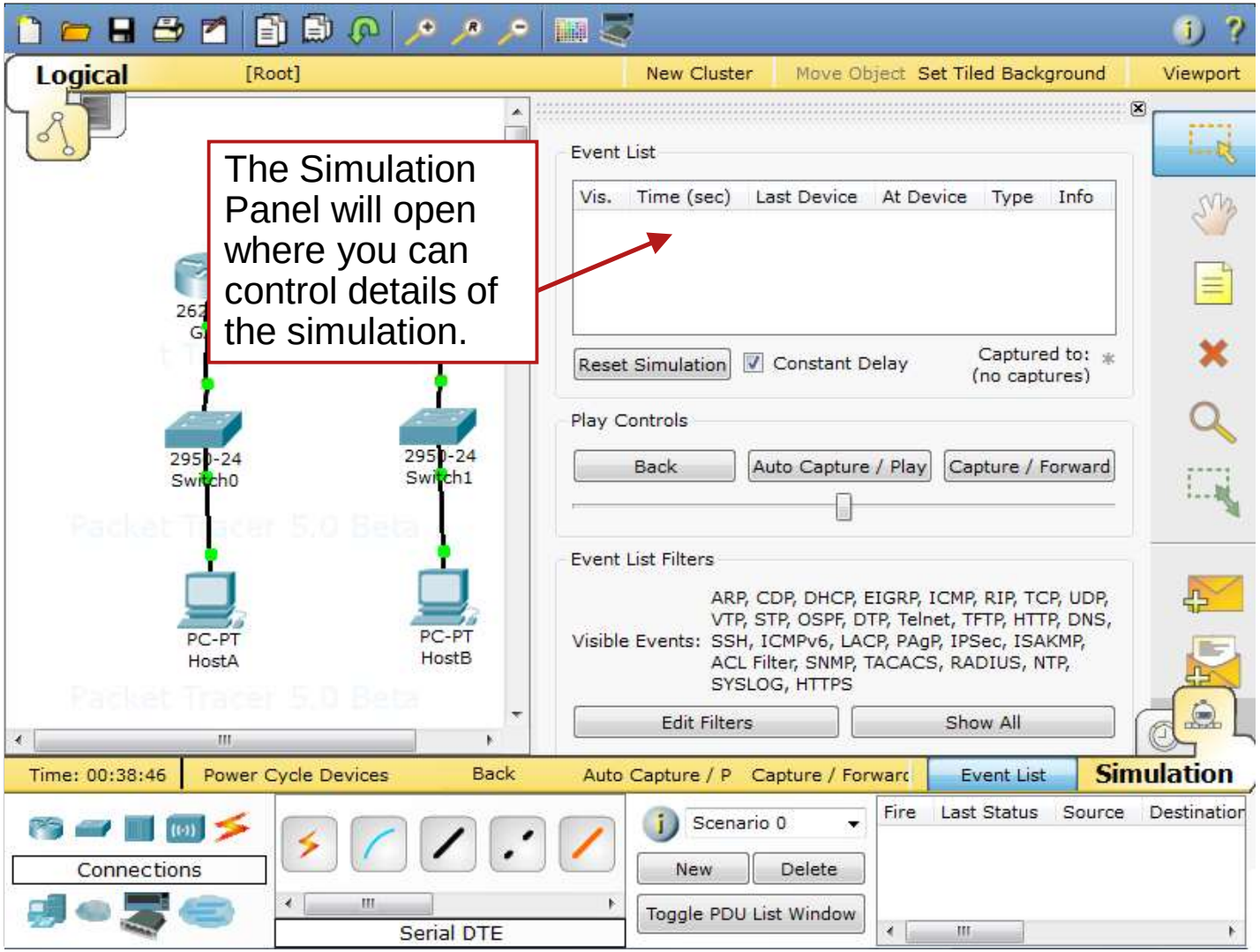
What is Simulation Mode?

- In Simulation Mode, you have direct control over time related to the flow of PDUs.
- You can see the network run step by step, or event by event.
- Nothing "runs" until you play it. When you play the simulation, you will see graphical representations of packets traveling from one device to another.
- You can pause the simulation, or step forward or backward in time, investigating many types of information on specific objects at specific times.

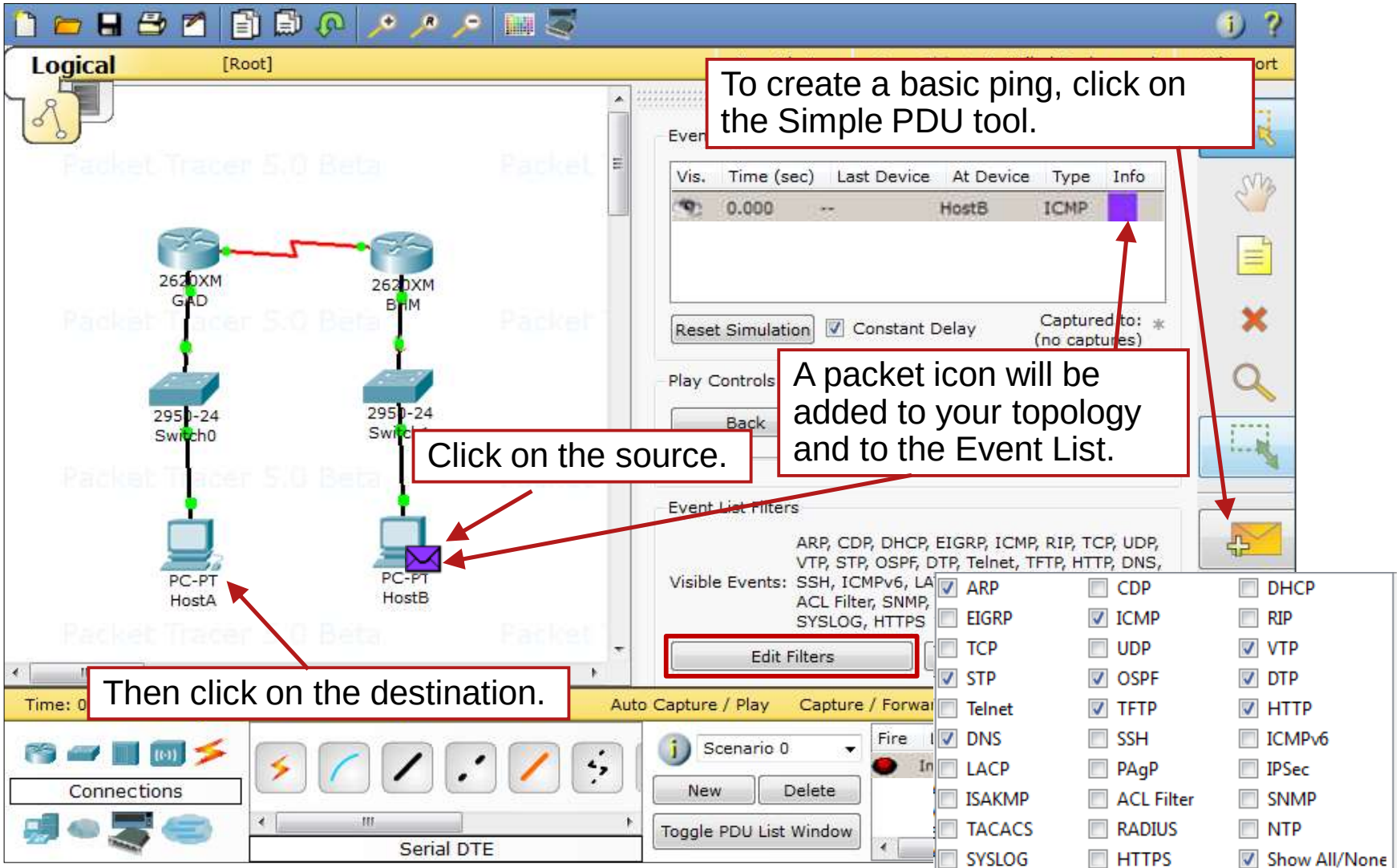
Simulation Mode in Classroom Instruction

- A picture is worth a thousand words…
- Many students are visual learners. Using “packet” icons that travel along graphical topologies allows these students to “see” how the network operates.
- Add to this graphical environment the ability to pause and rewind…

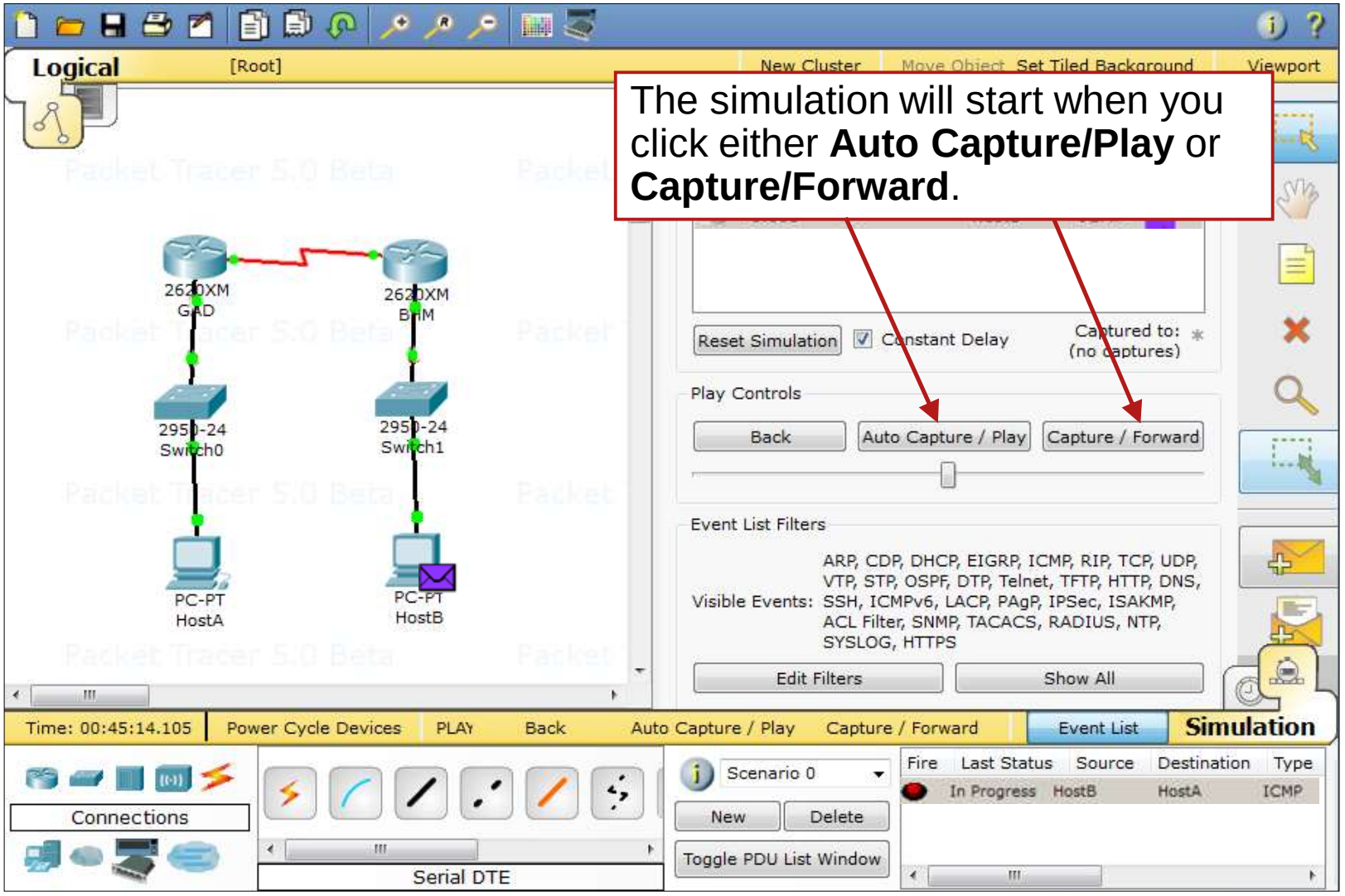
Opening Simulation Mode



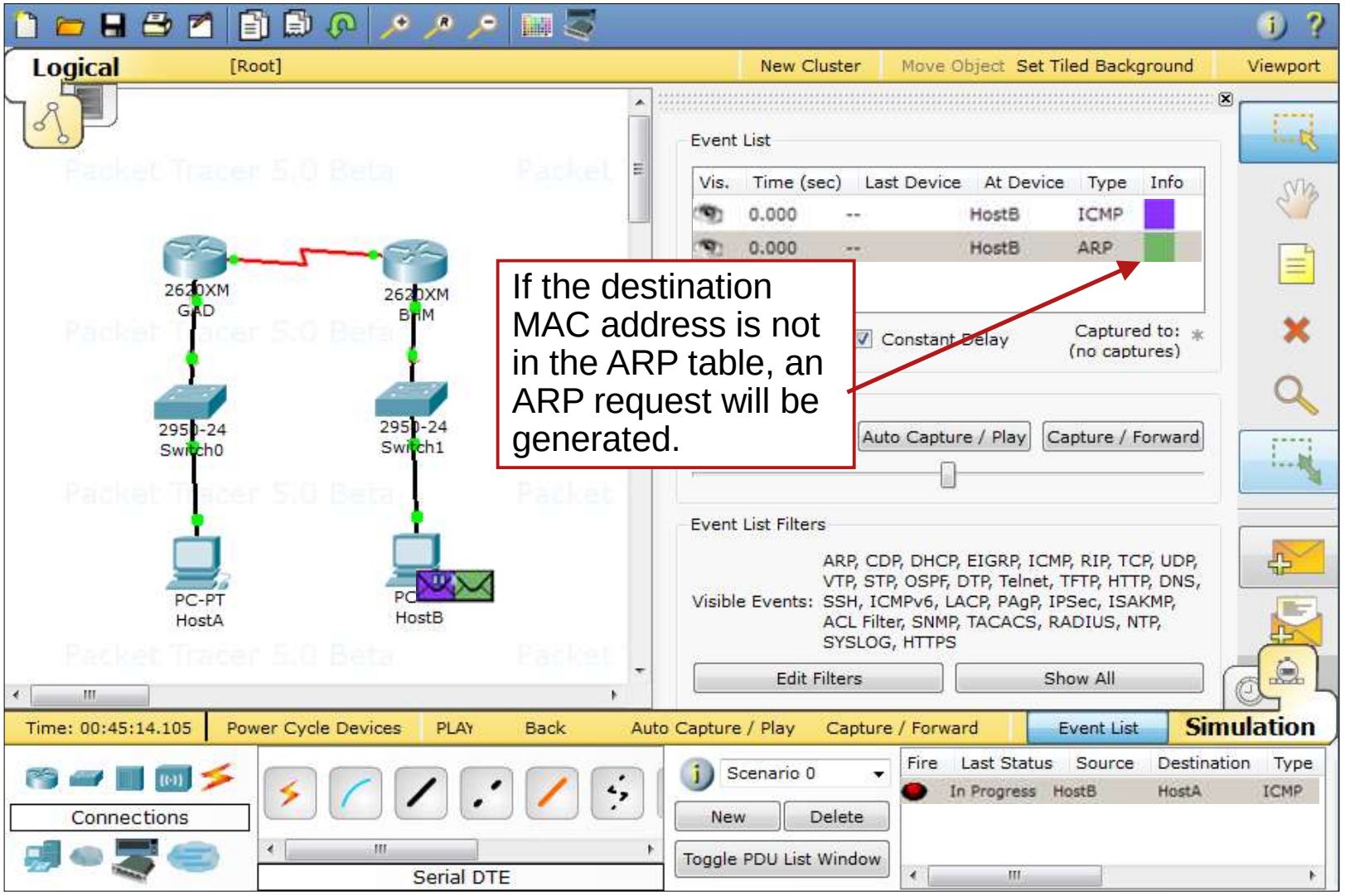
Adding a Simple PDU



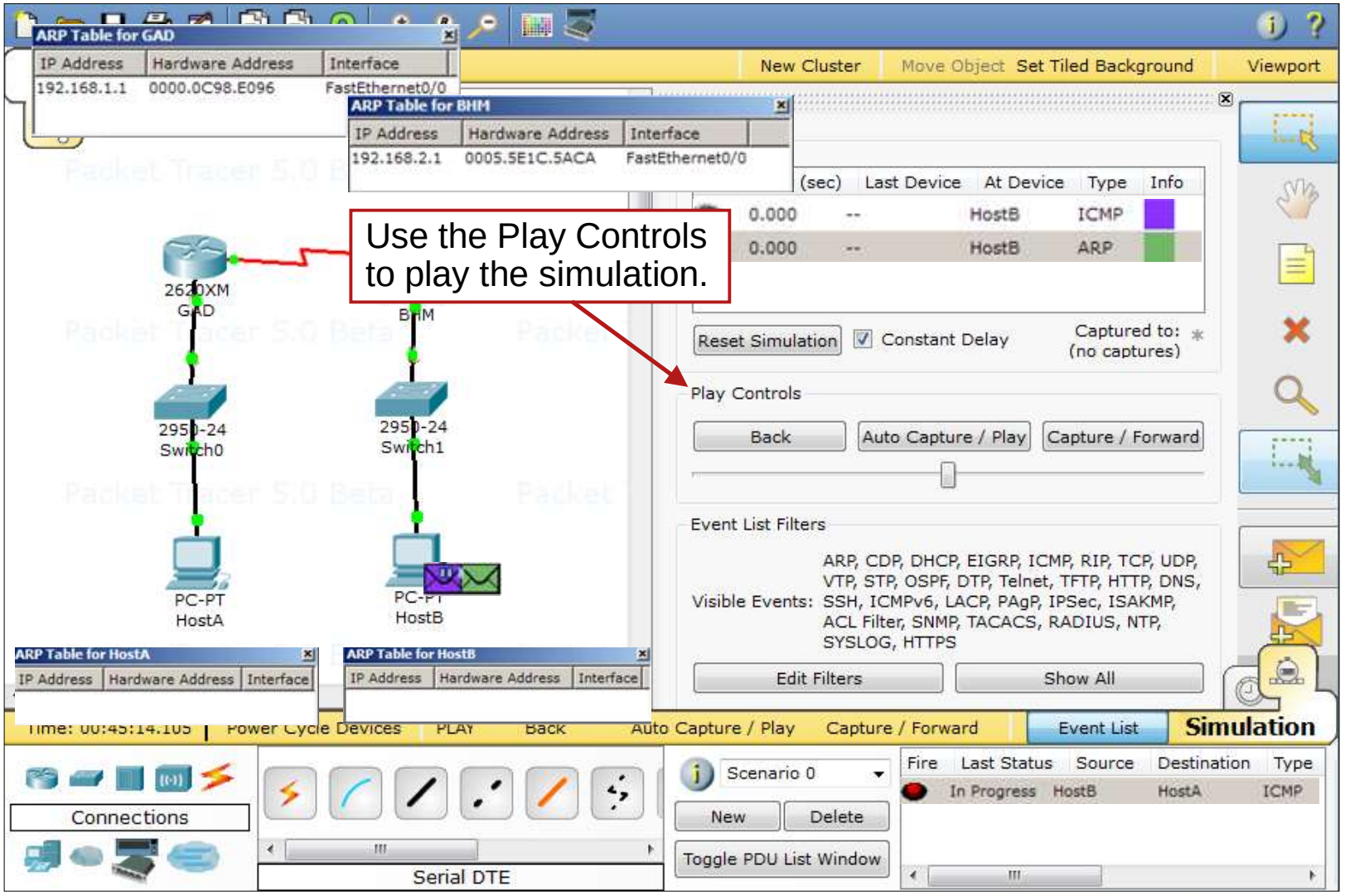
Playing the Simulation



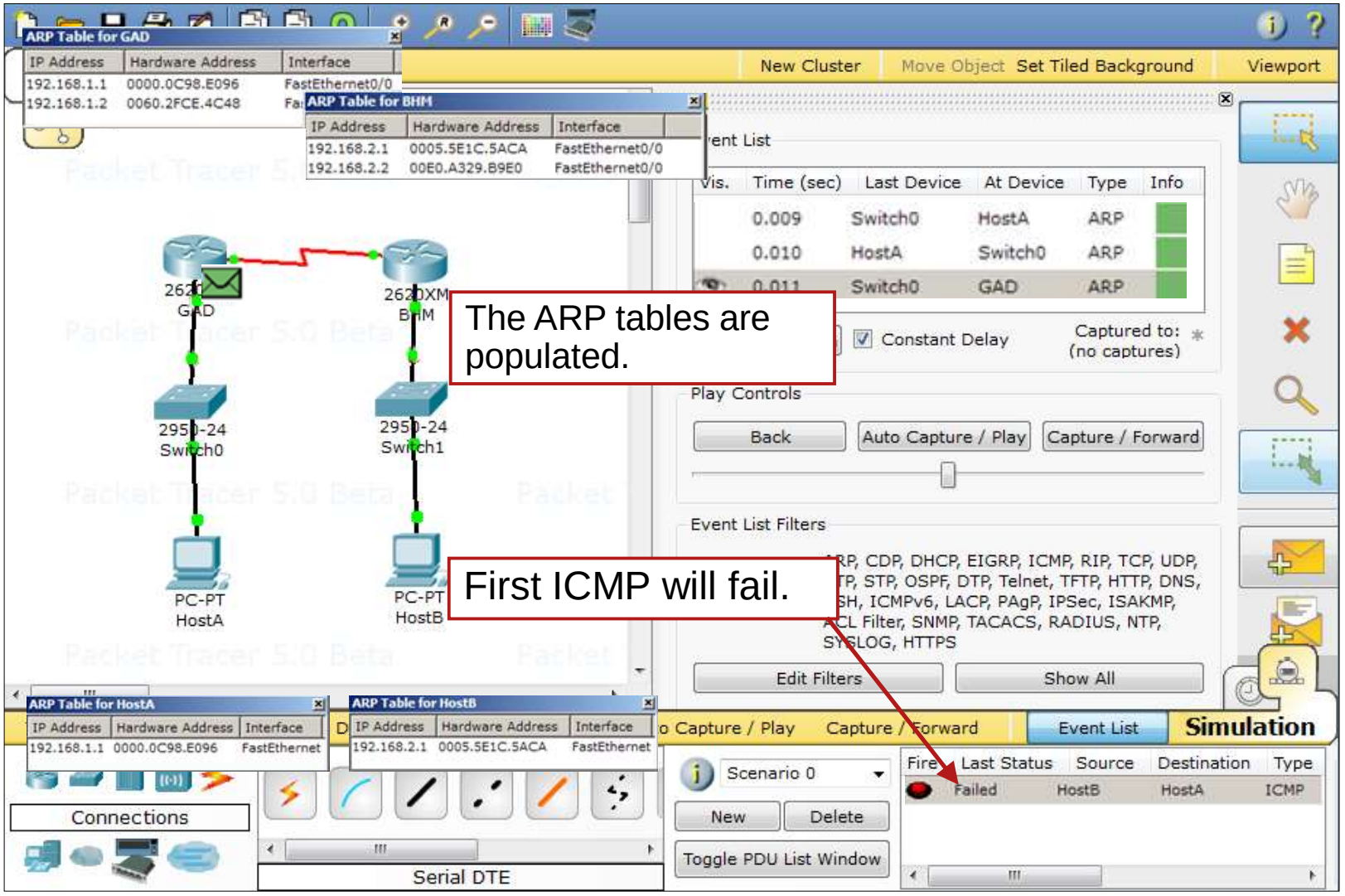
ARP Before PING!



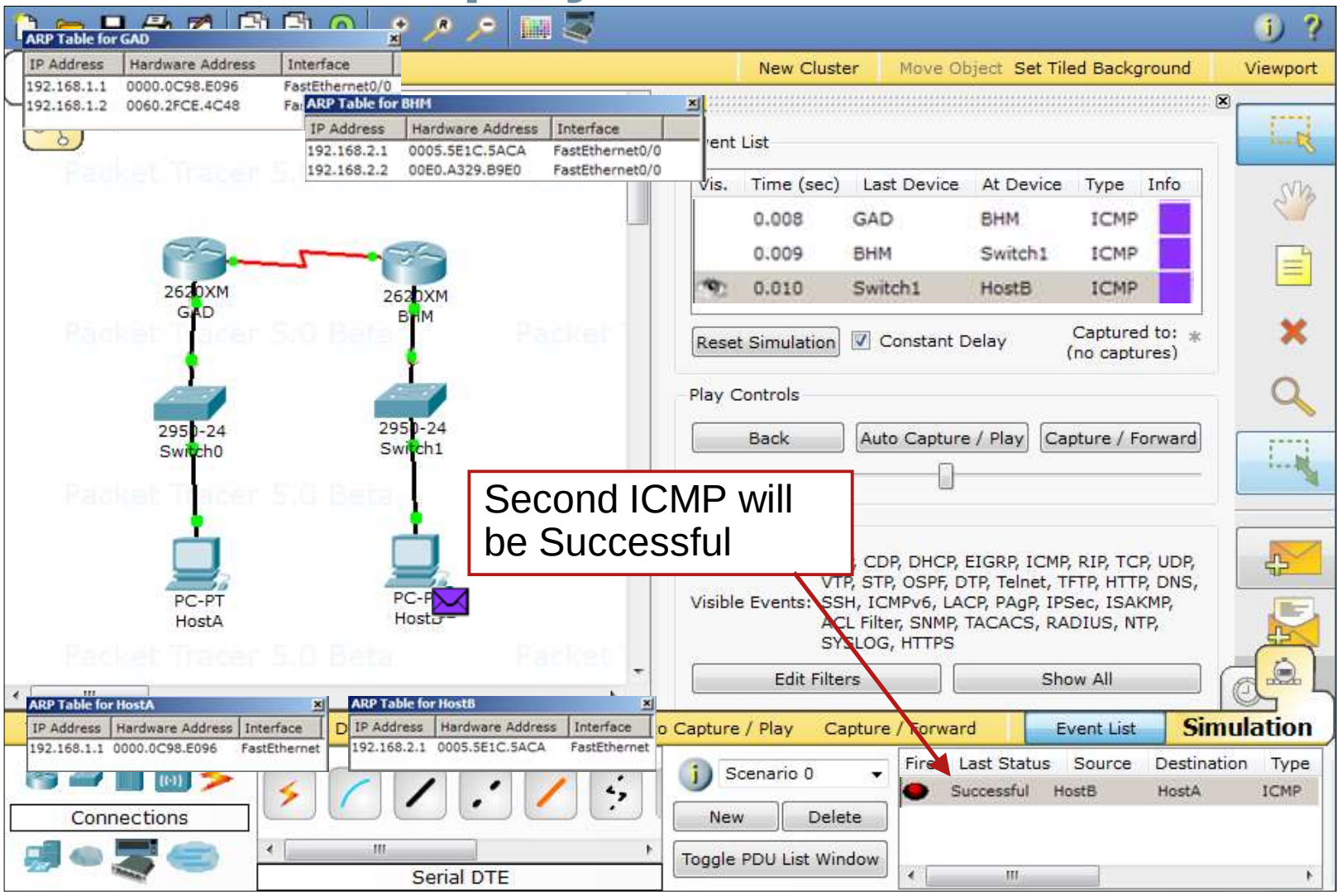
ARP Tables Before…



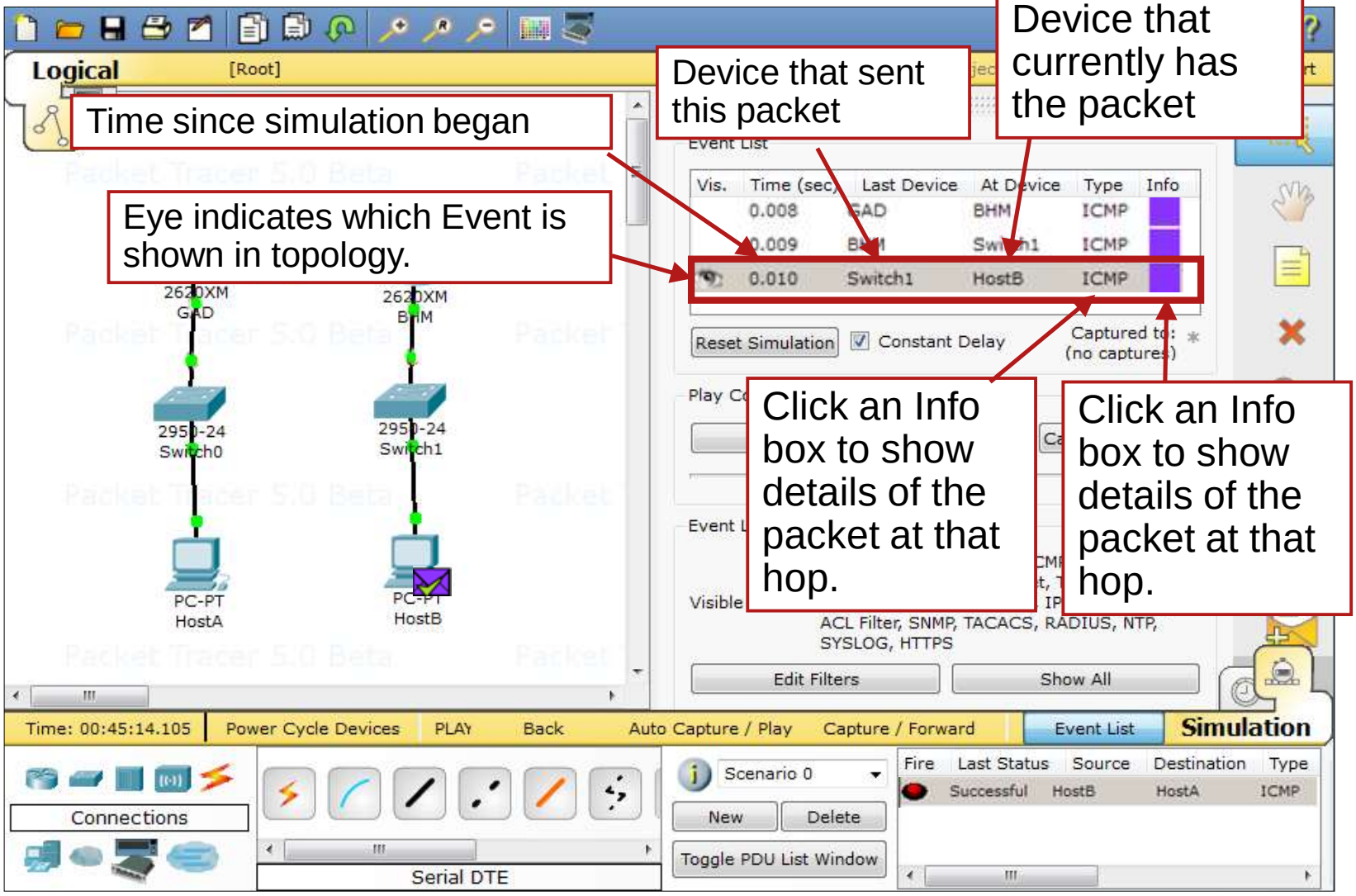
ARP Tables after…



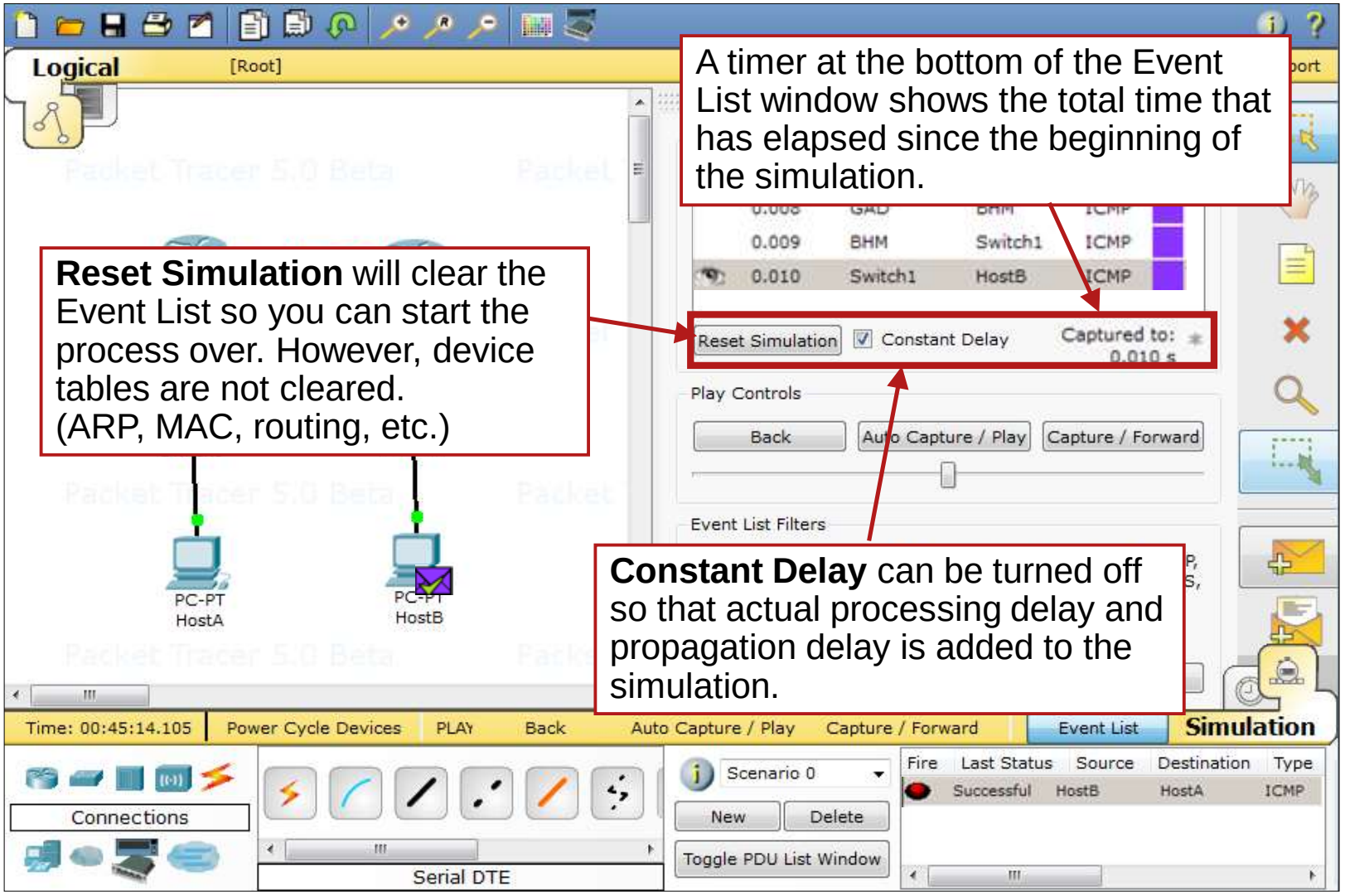
Reset and Replay



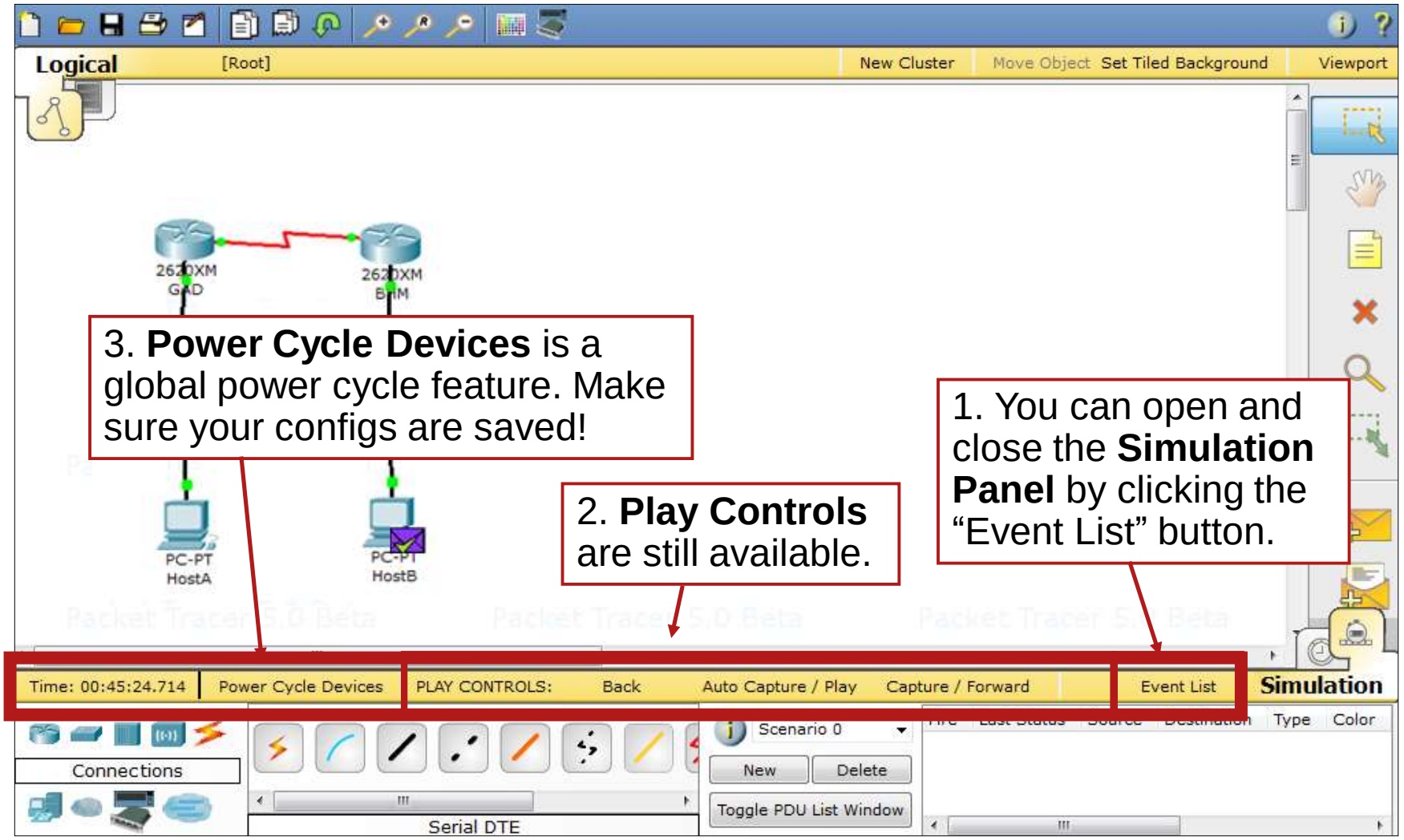
Event List



Simulation Controls



More Simulation Controls

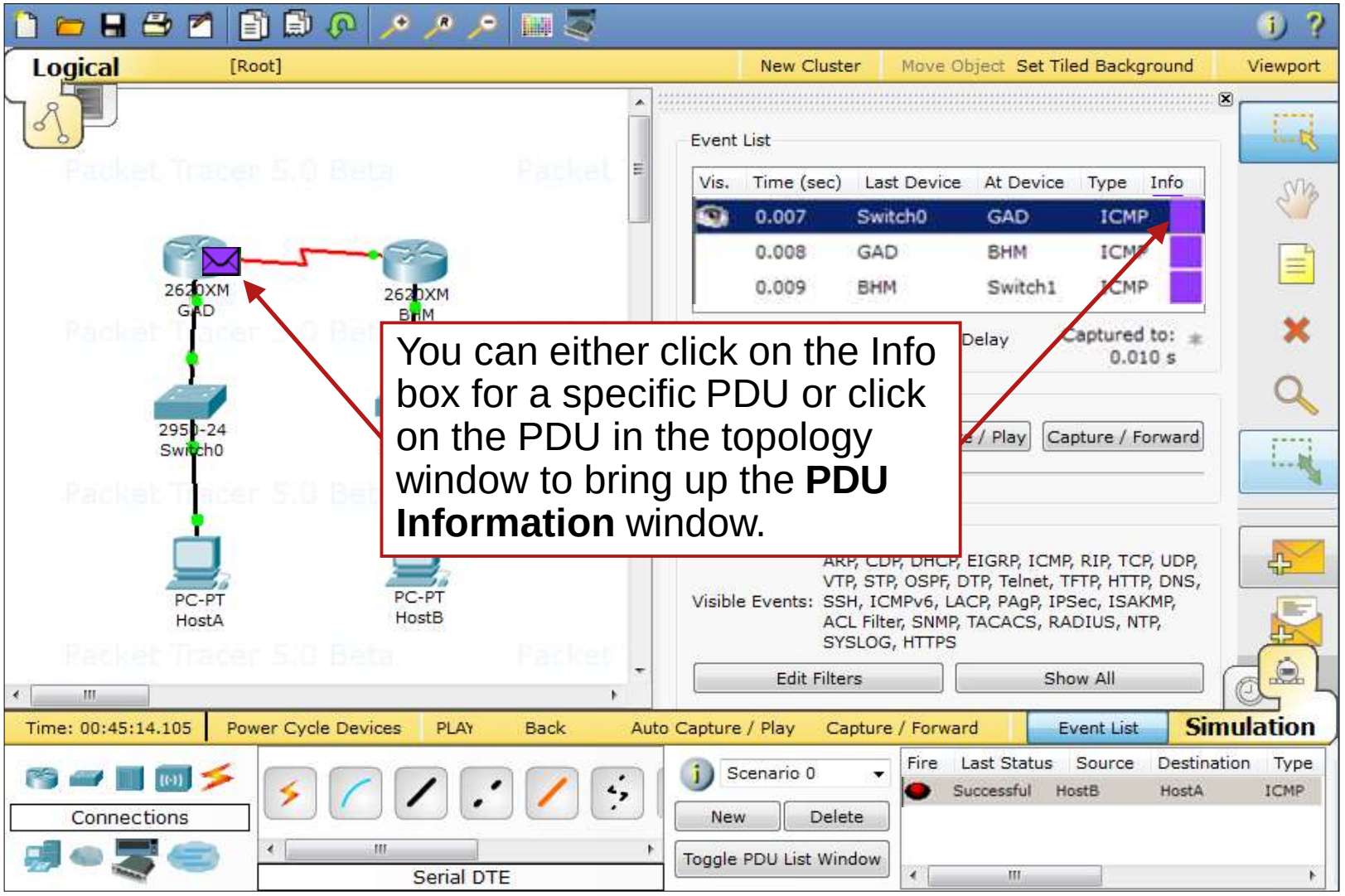


PDU Information

What is PDU Information?

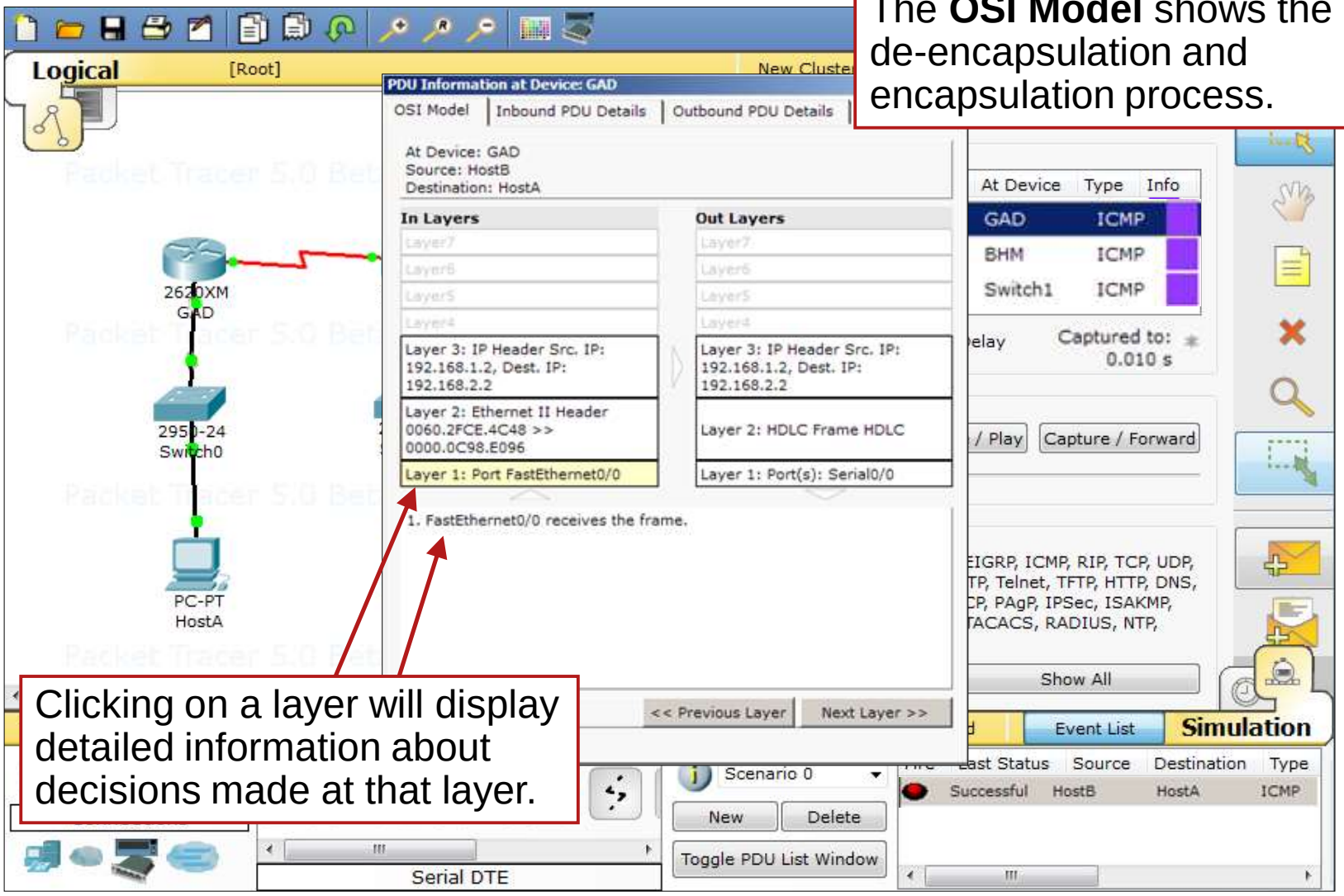
- The PDU Information window allows you to “open” a packet and look inside to see how it is being processed at each layer of the OSI Model.
- It’s like a very simple sniffer, presenting CCNA level information.

PDU Information



OSI Model

The **OSI Model** shows the de-encapsulation and encapsulation process.



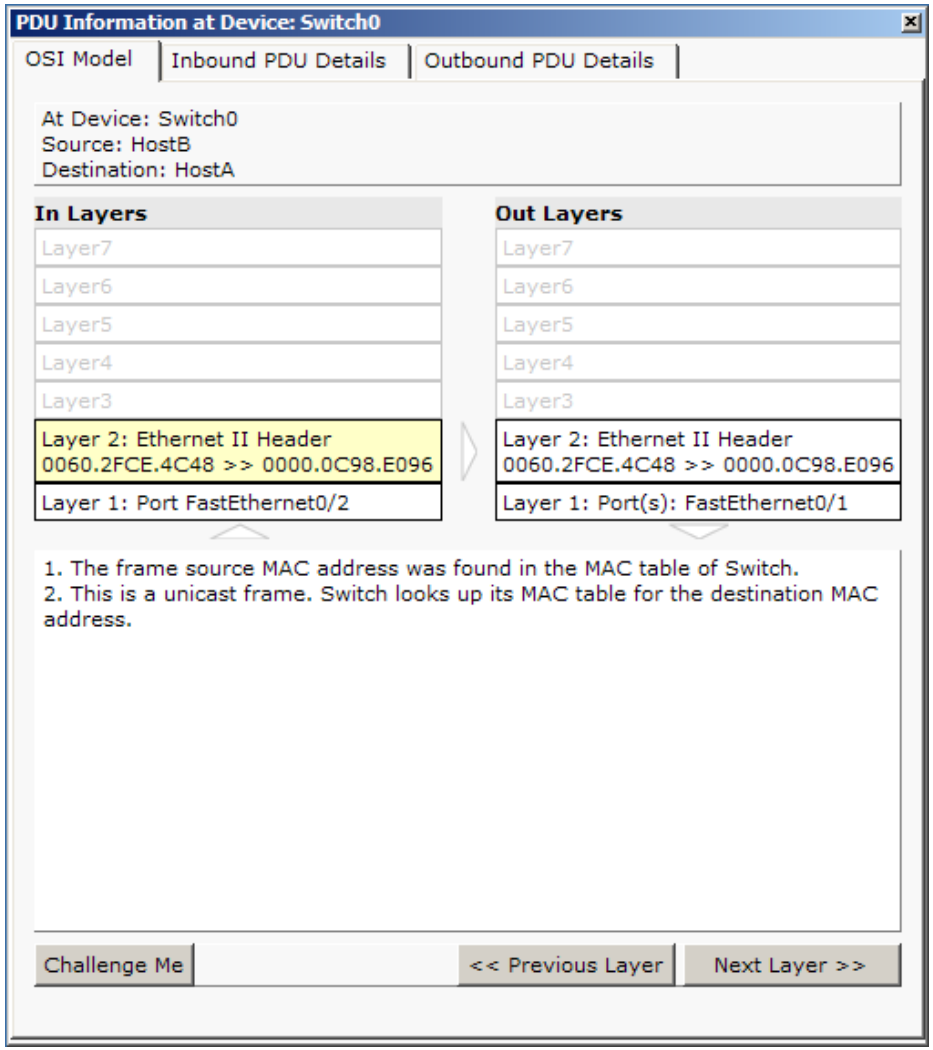
Clicking on a layer will display detailed information about decisions made at that layer.

How can I use the OSI Model Tab?

- Demonstrate how switches process only to layer 2 (no layer 3 switches in PT) and routers process to layer 3.
- Show what happens to a packet with no ARP table entry.
- Show encapsulation and decapsulation to accommodate different interfaces. An Ethernet frame is changed to an HDLC frame when going from an Ethernet interface to a Serial interface.
- Show routing decisions. When a packet is at a router, the router will make a routing decision about the packet…either forwarding it or dropping based on routing table entries.
- Show operation of an ACL.
- Show operation of NAT.
- Many other ways!

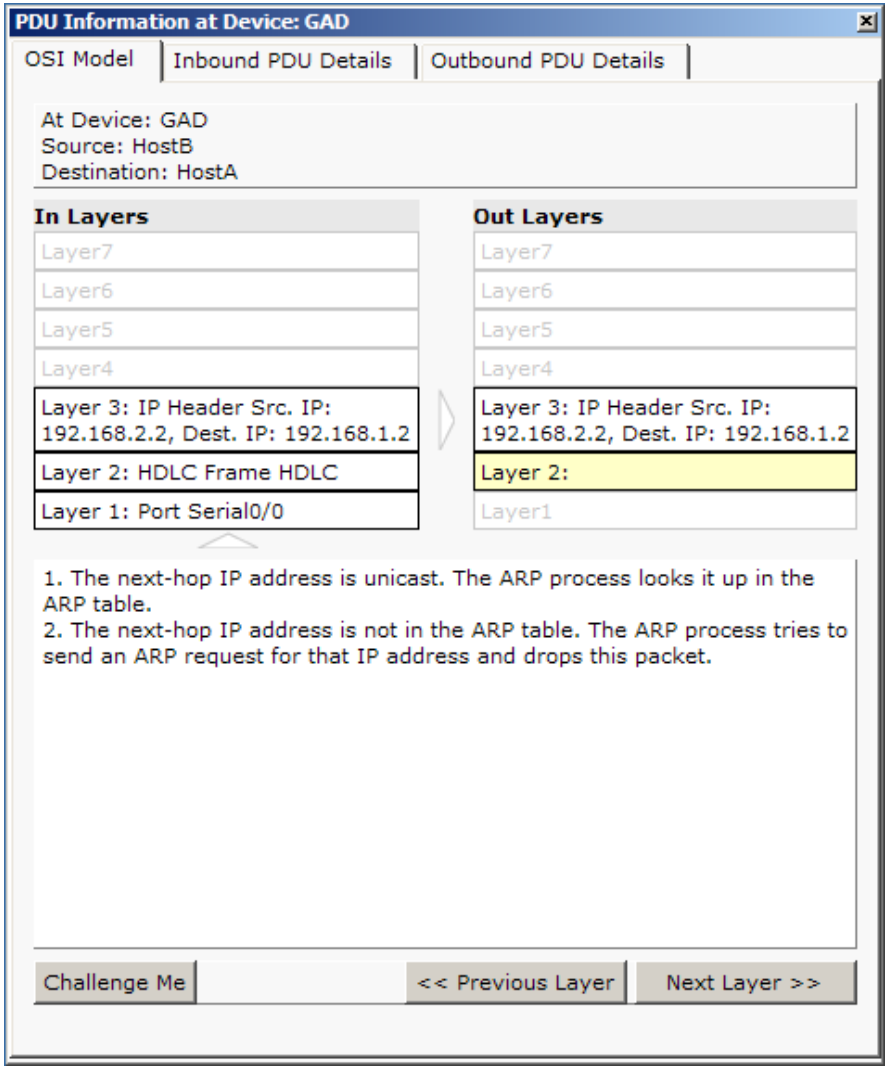
Packet at Layer 2 Device

- Here the packet is at a layer 2 switch.
- Notice that the packet is only processed up through Layer 2 of the OSI Model.



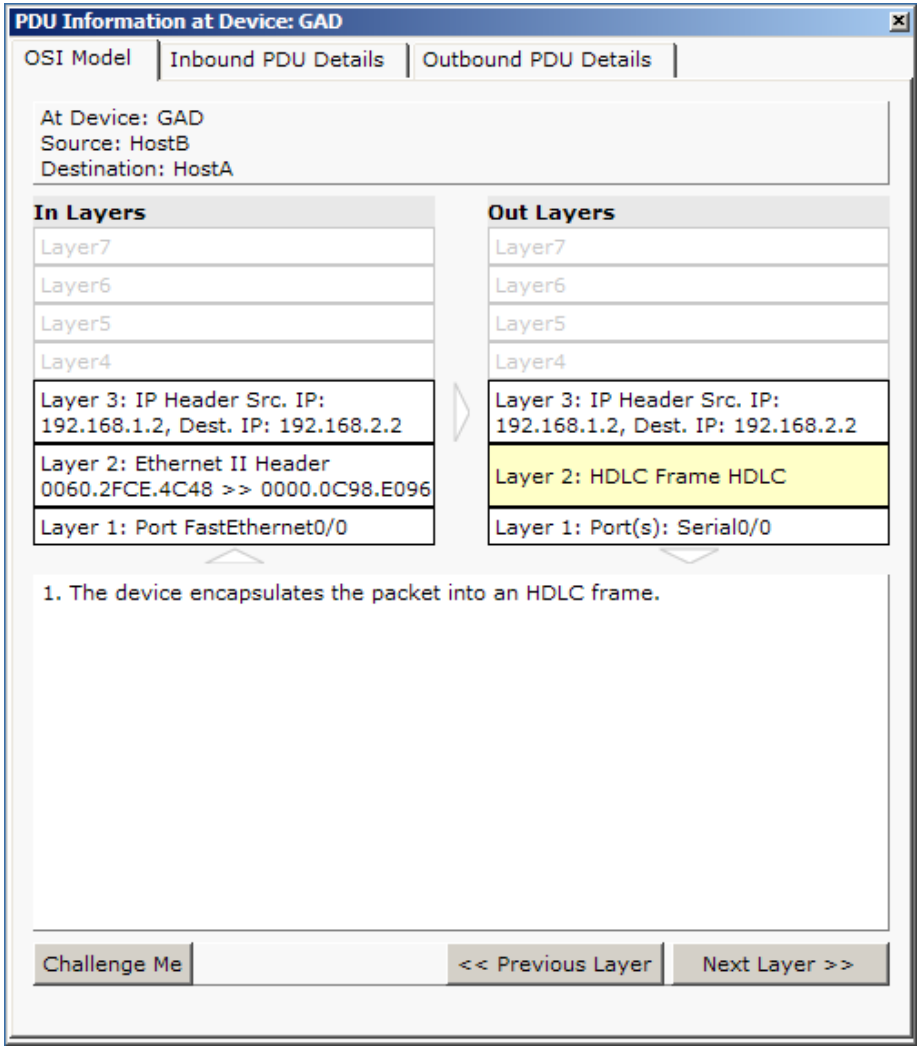
No ARP Table Entry

- In this example, the router does not have an ARP Table entry for the next hop.
- An ARP is generated.
- The packet is dropped.



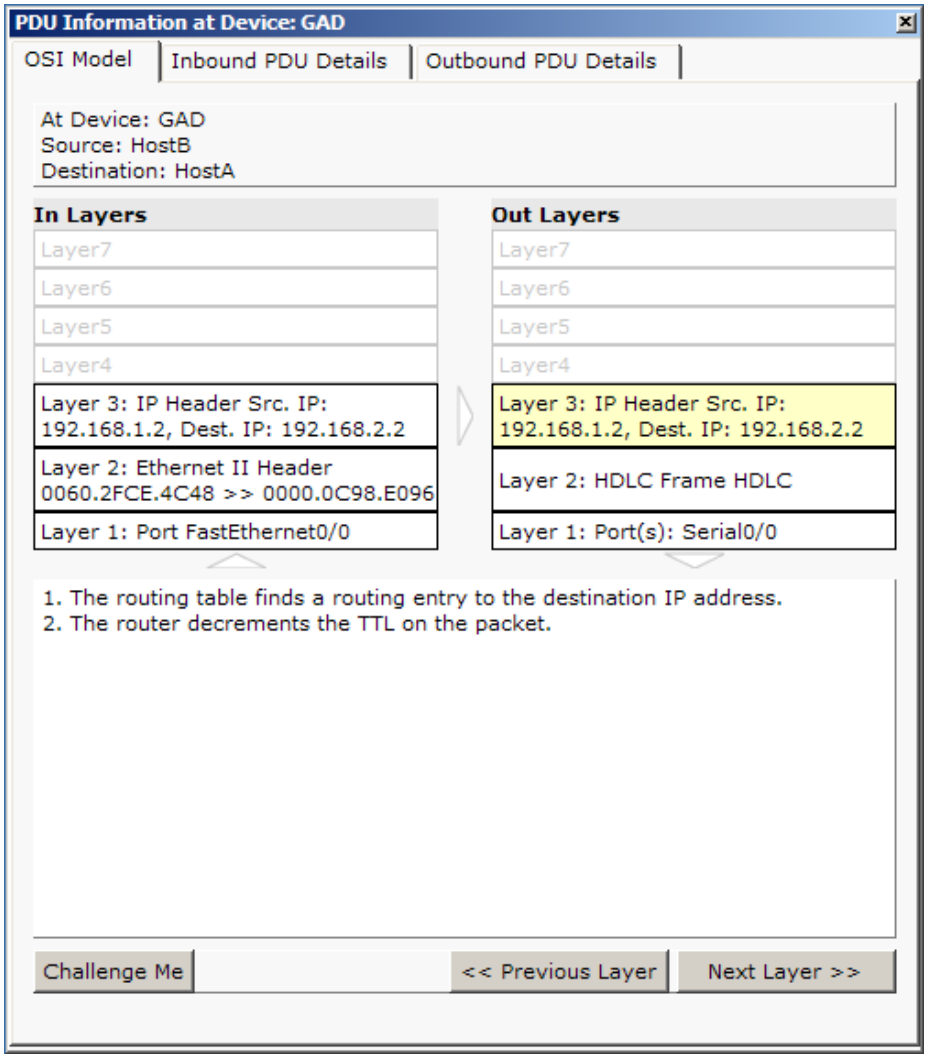
Encapsulation

- In this example, a packet comes in on an Ethernet interface in an Ethernet II Header.
- The device decapsulates the packet for processing.
- The device then encapsulates the packet into the appropriate frame to be sent out the Serial interface.



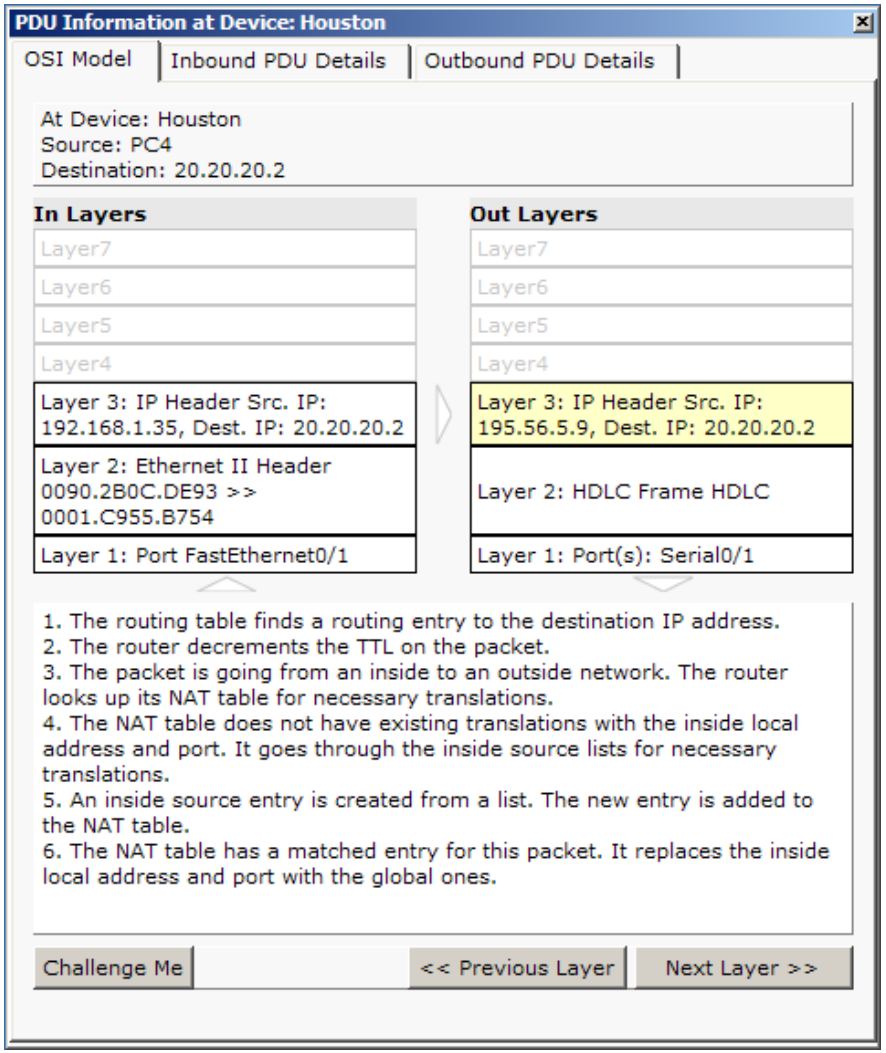
Routing

- Since this device is a router, it makes a routing decision on the packet.
- From the highlighted layer, we see that the router finds an entry for this destination in the routing table.



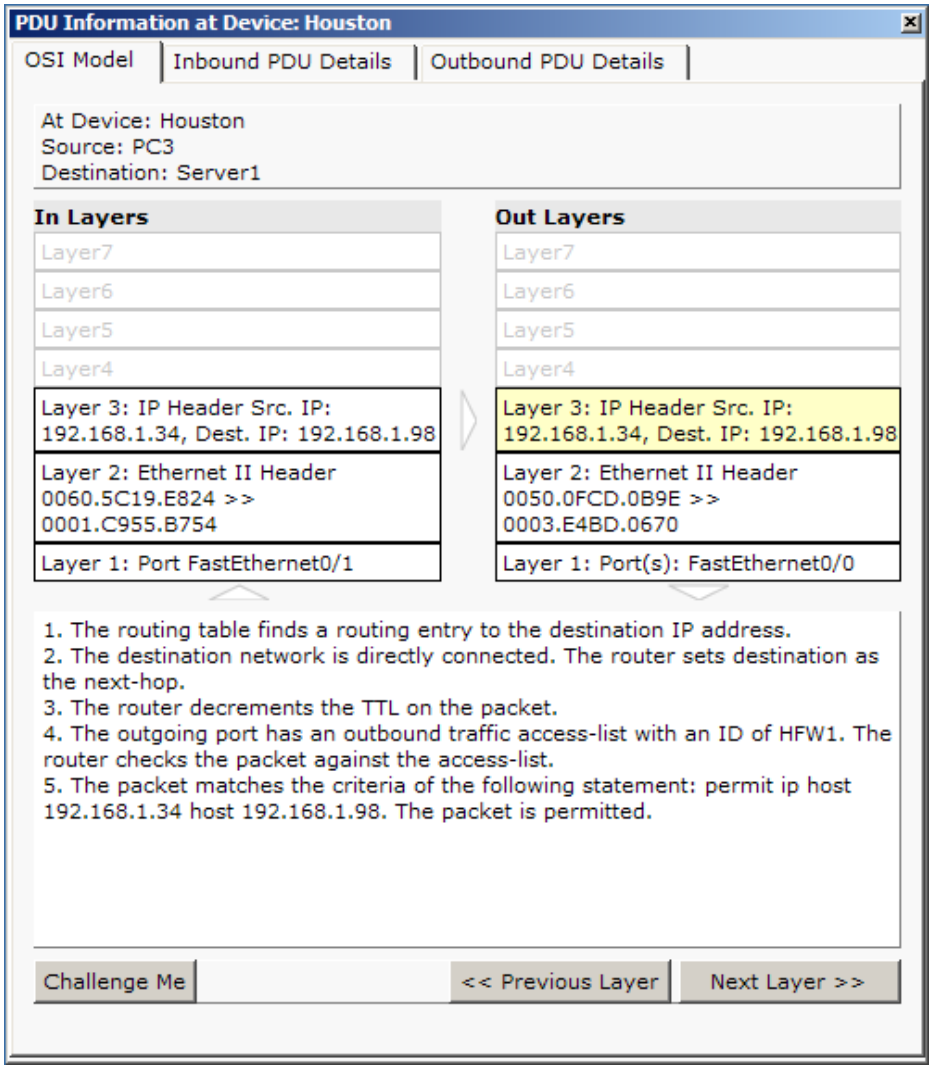
NAT

- In this example, the router is configured with NAT.
- A packet is processed going from an inside to an outside interface.
- There is no entry in the NAT table for this address.
- The router creates an entry and processes the packet.

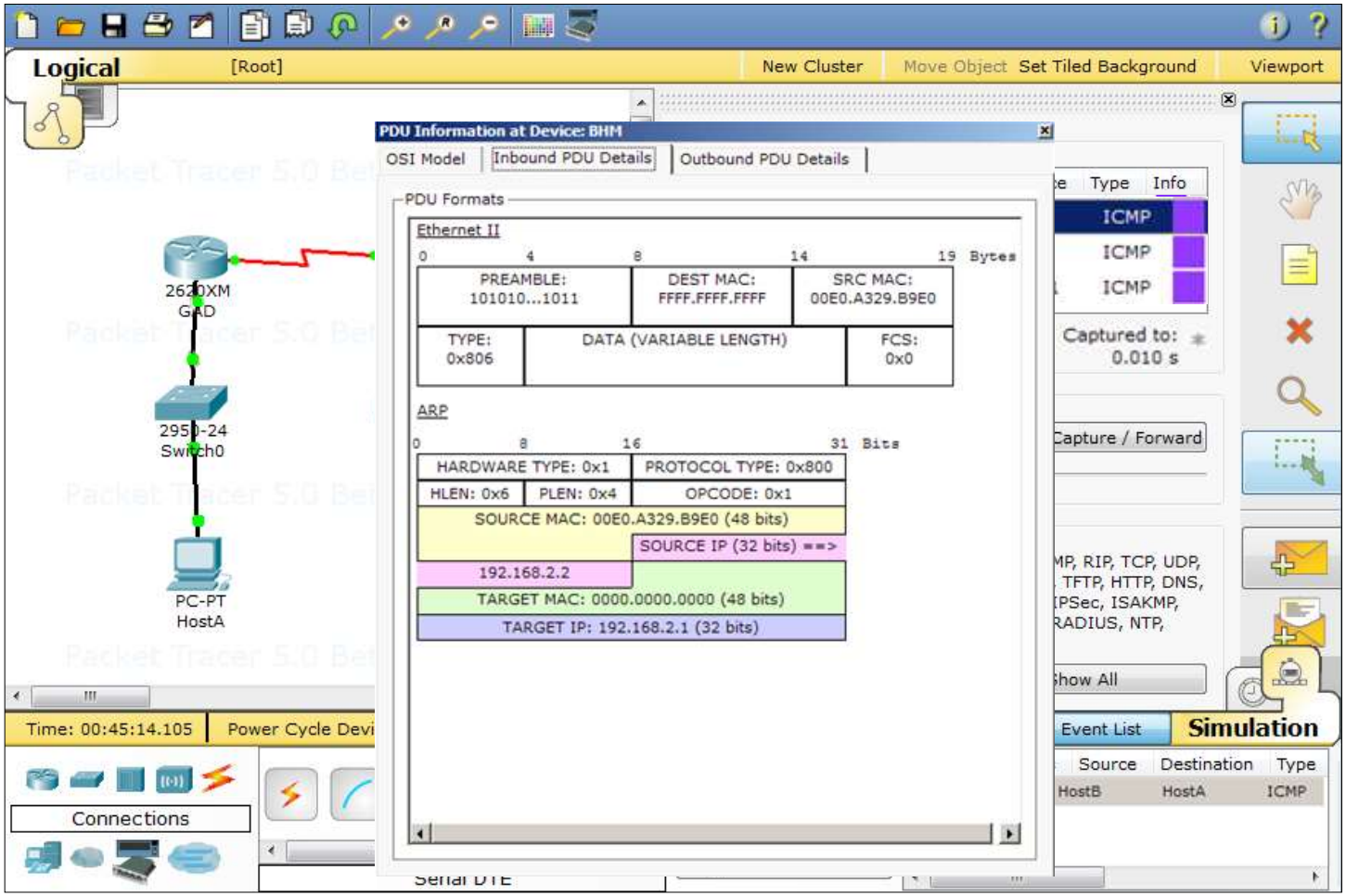


ACLs

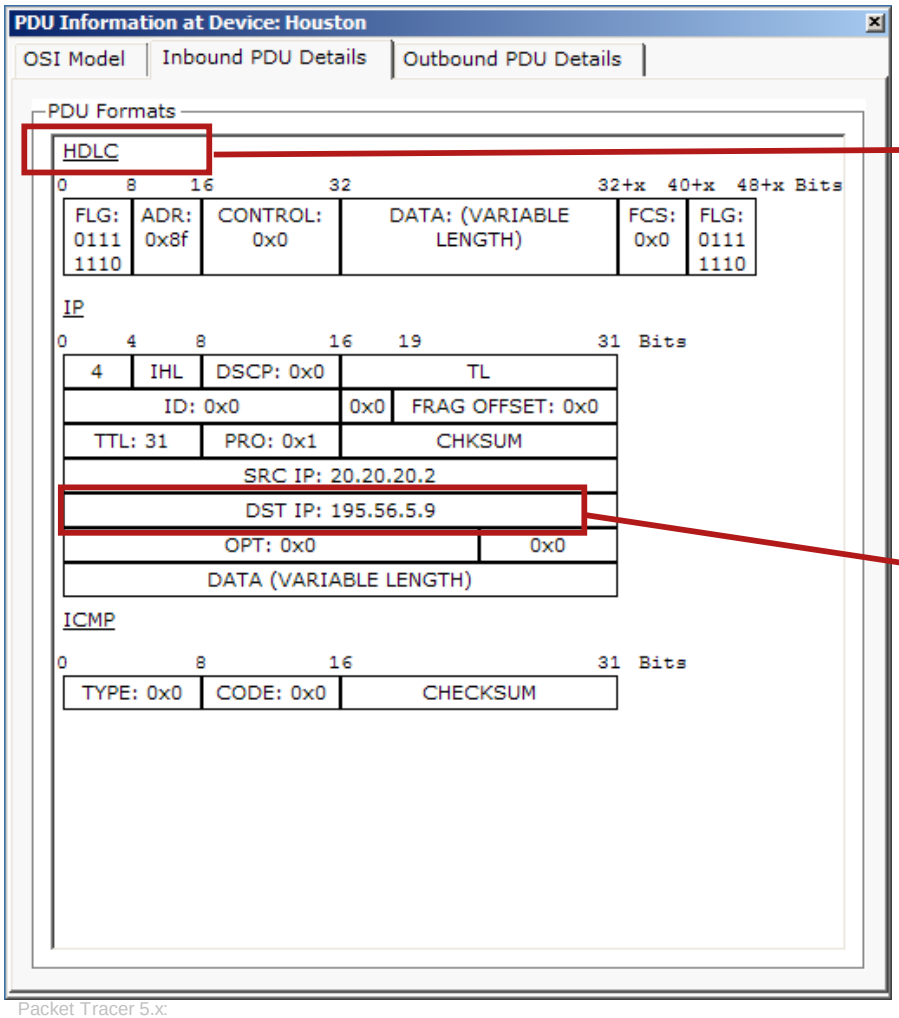
- In this example, an ACL is configured on an outgoing port of the router.
- The packet is checked against the ACL.
- The packet matches a “permit” statement in the ACL and is permitted.
- The router processes the packet.

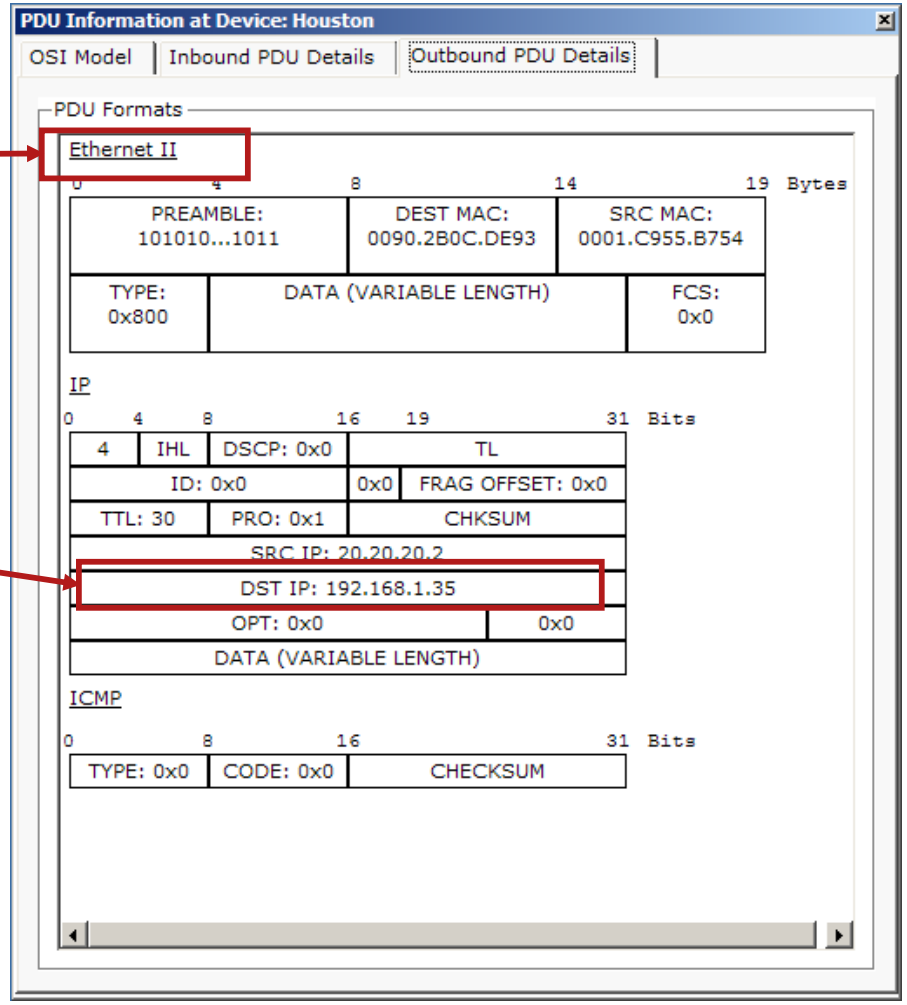


Inbound/Outbound PDU Window

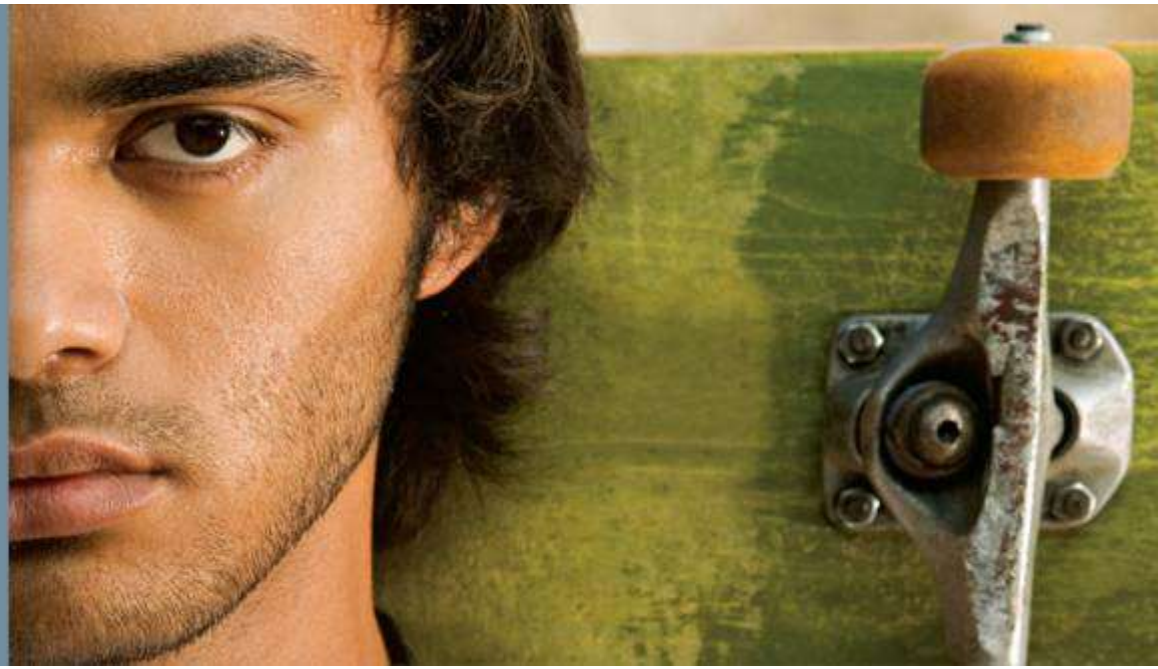


Inbound/Outbound PDU Details





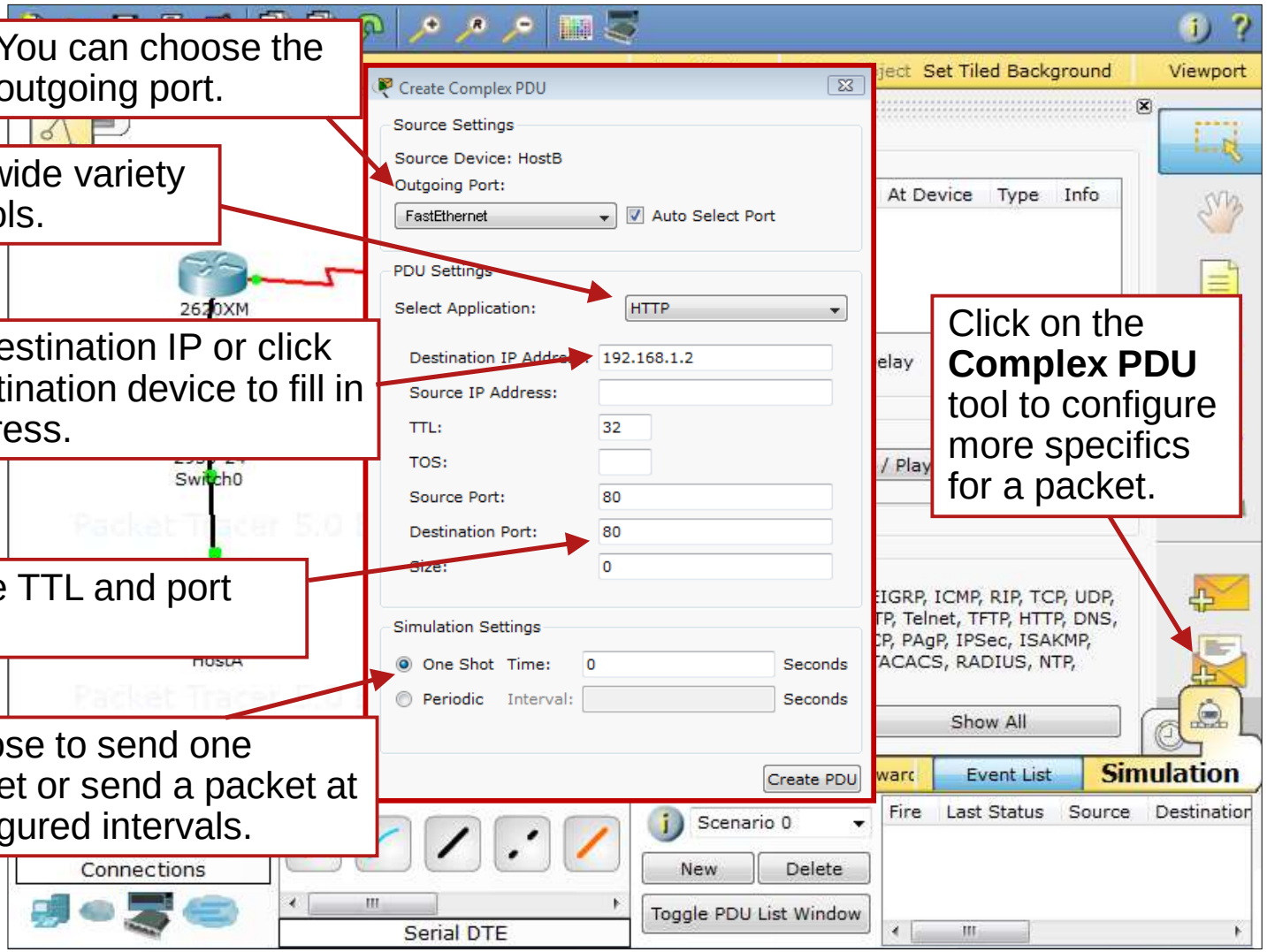
Complex PDUs



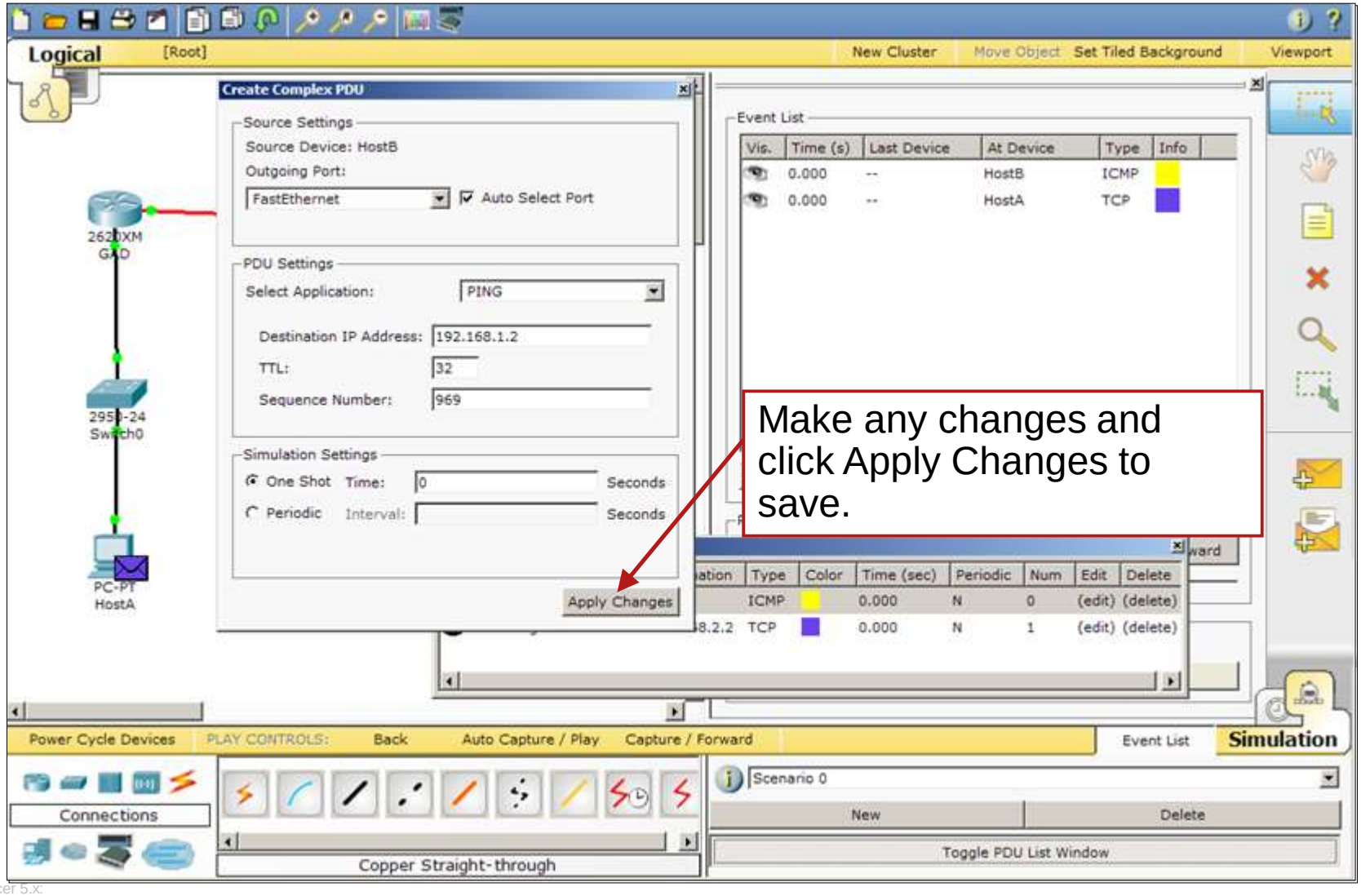
Why would I want a Complex PDU?

- Creating a Complex PDU allows you to control parameters of the packet such as:
  - Protocol
  - Source and Destination IP
  - Port
  - TTL
  - Sequence number
- This granular control allows you to test packets against ACLs.
- This also allows you to test connectivity to specific interfaces on a device.

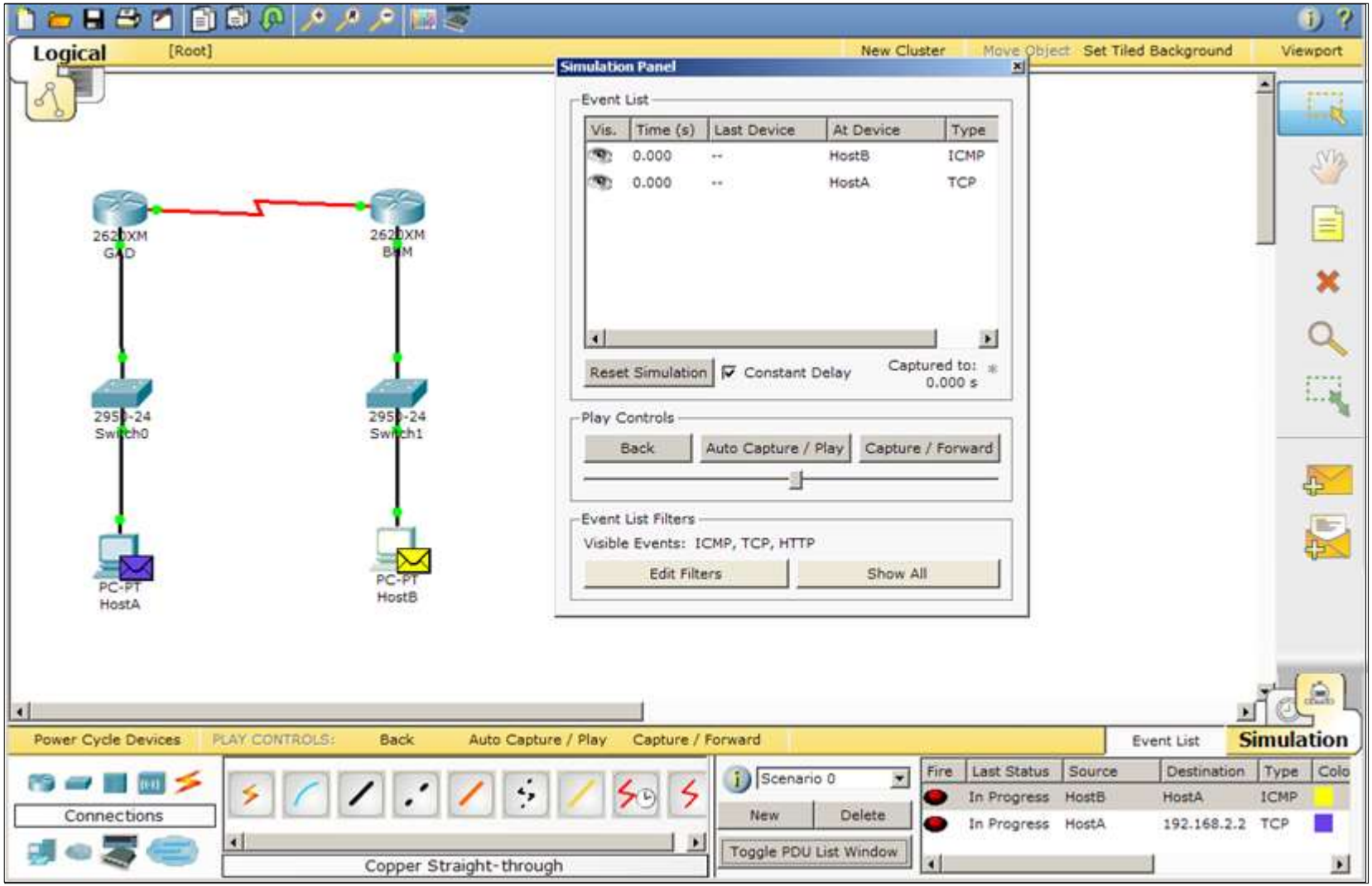
Creating a Complex PDU



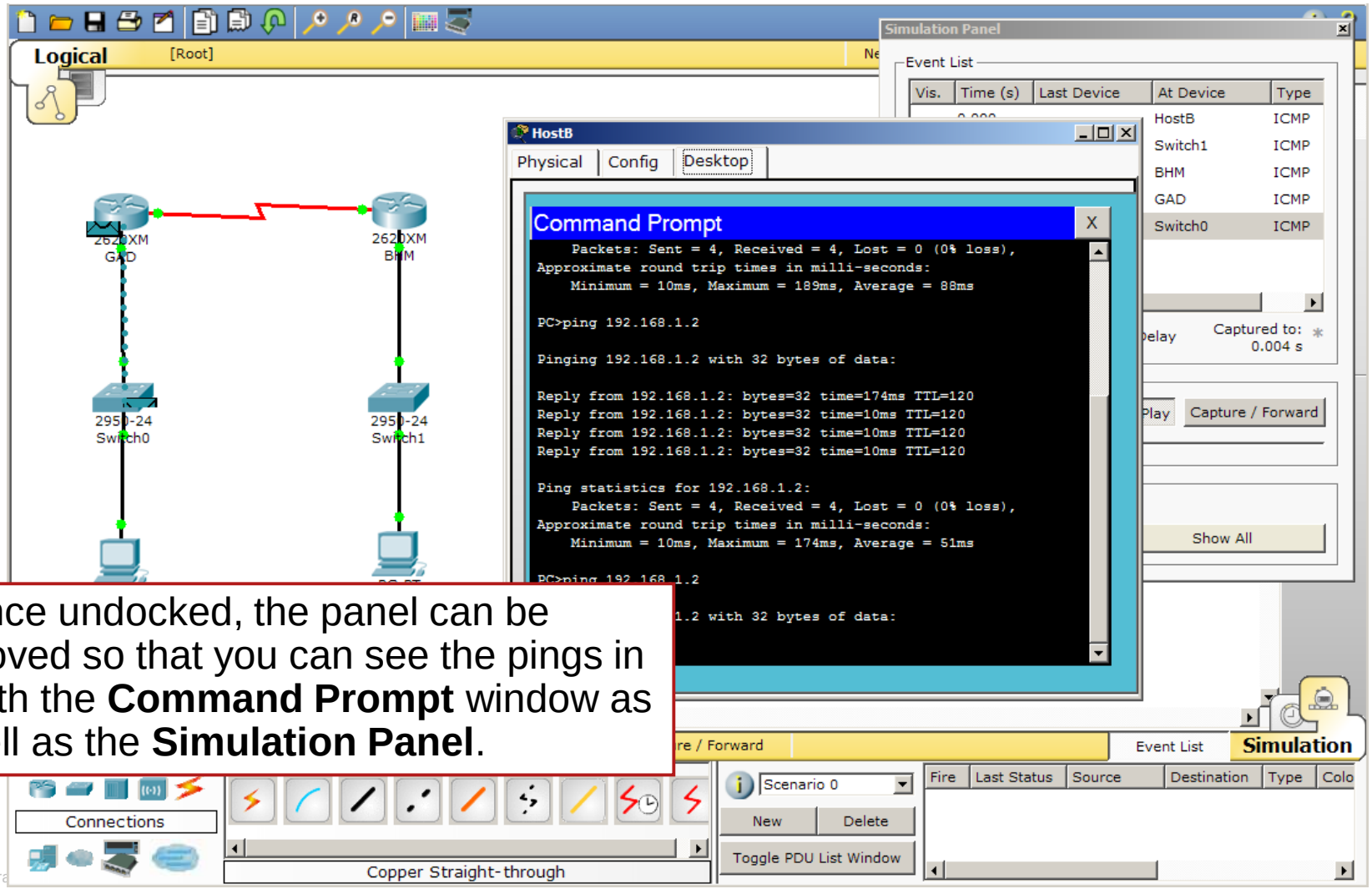
Editing a PDU



Managing Your Workspace

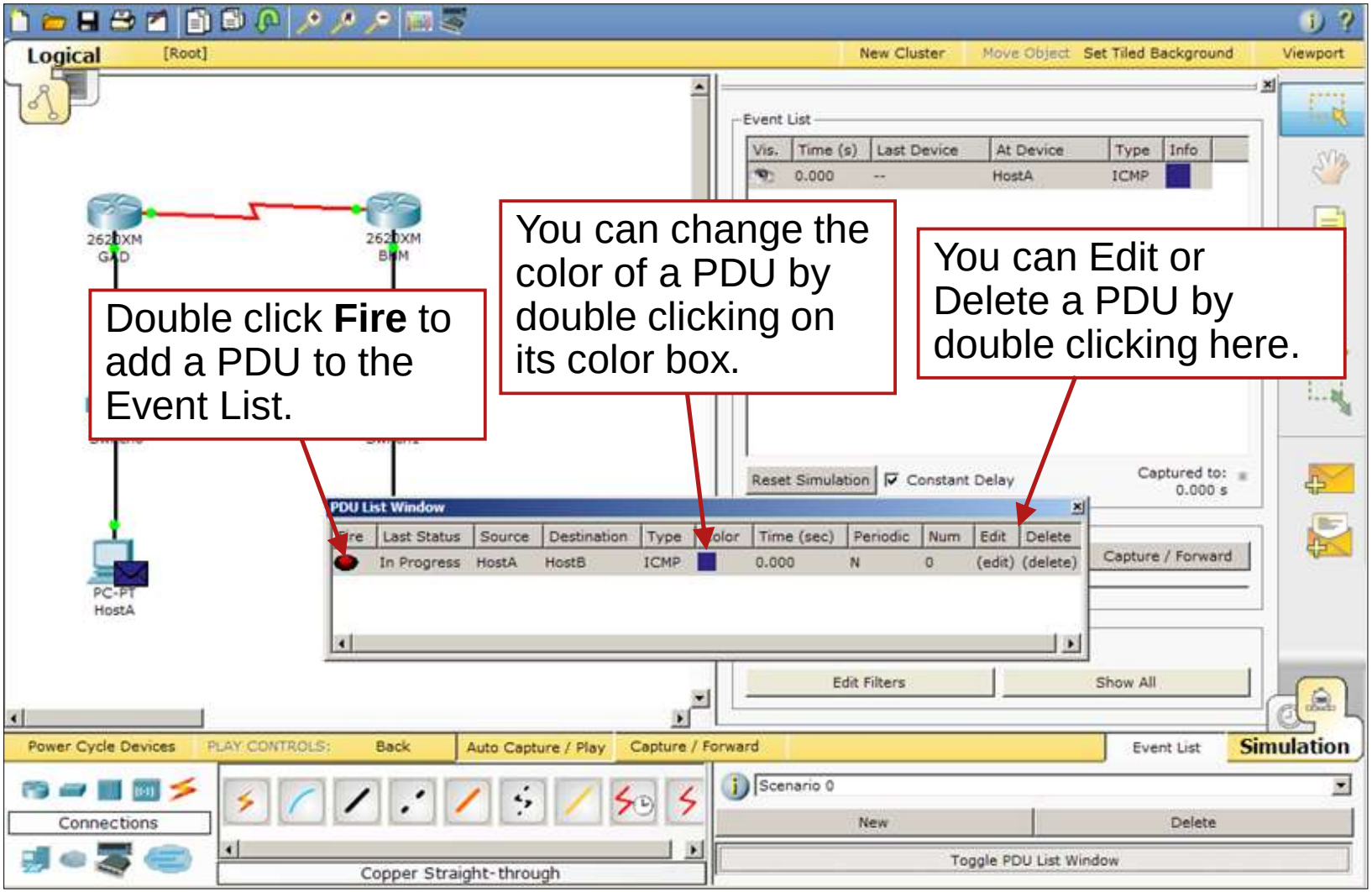


Using Command Prompt in Simulation



Once undocked, the panel can be moved so that you can see the pings in both the **Command Prompt** window as well as the **Simulation Panel**.

PDU List Window

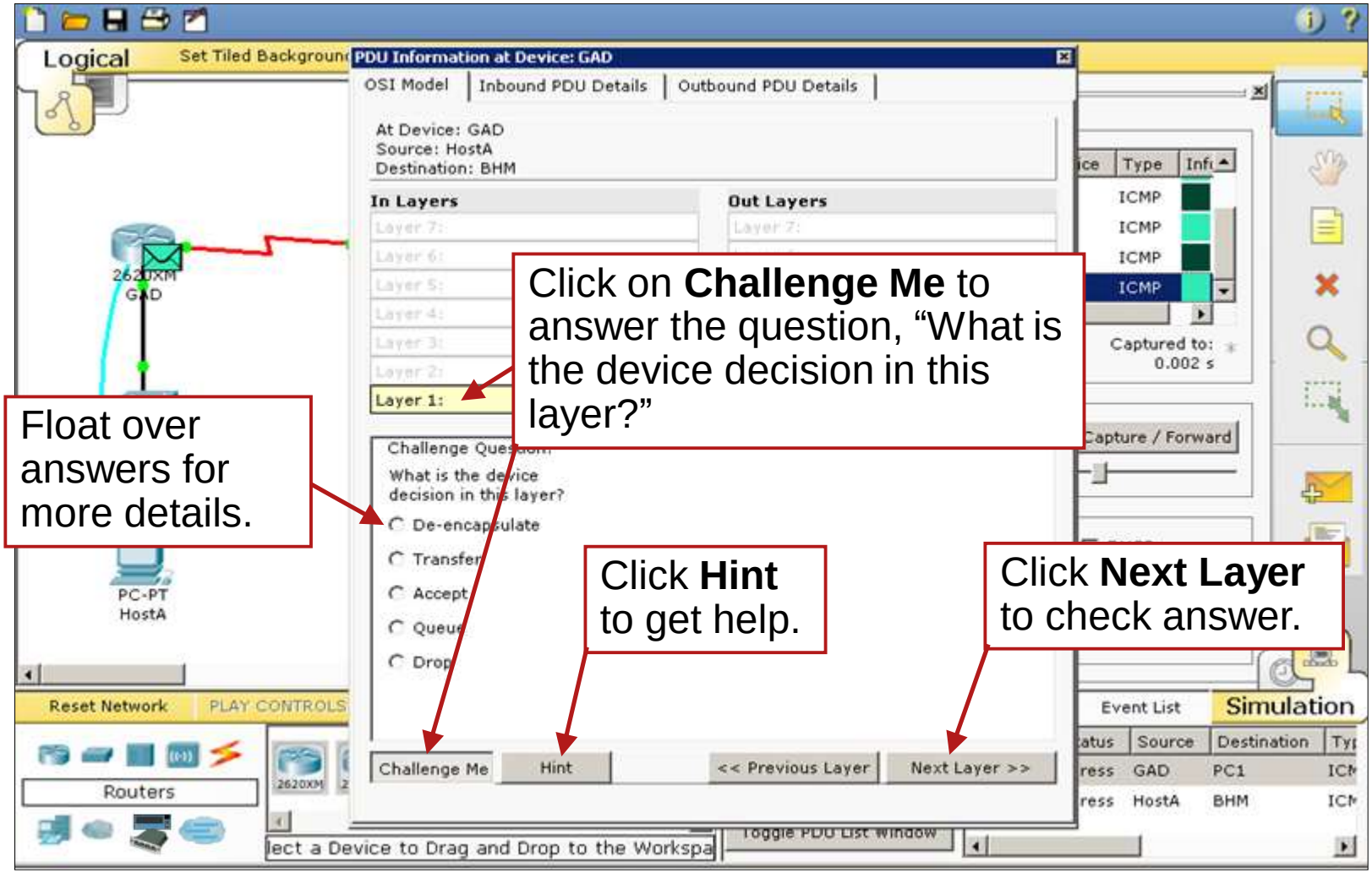


Challenge Mode

Challenge Mode

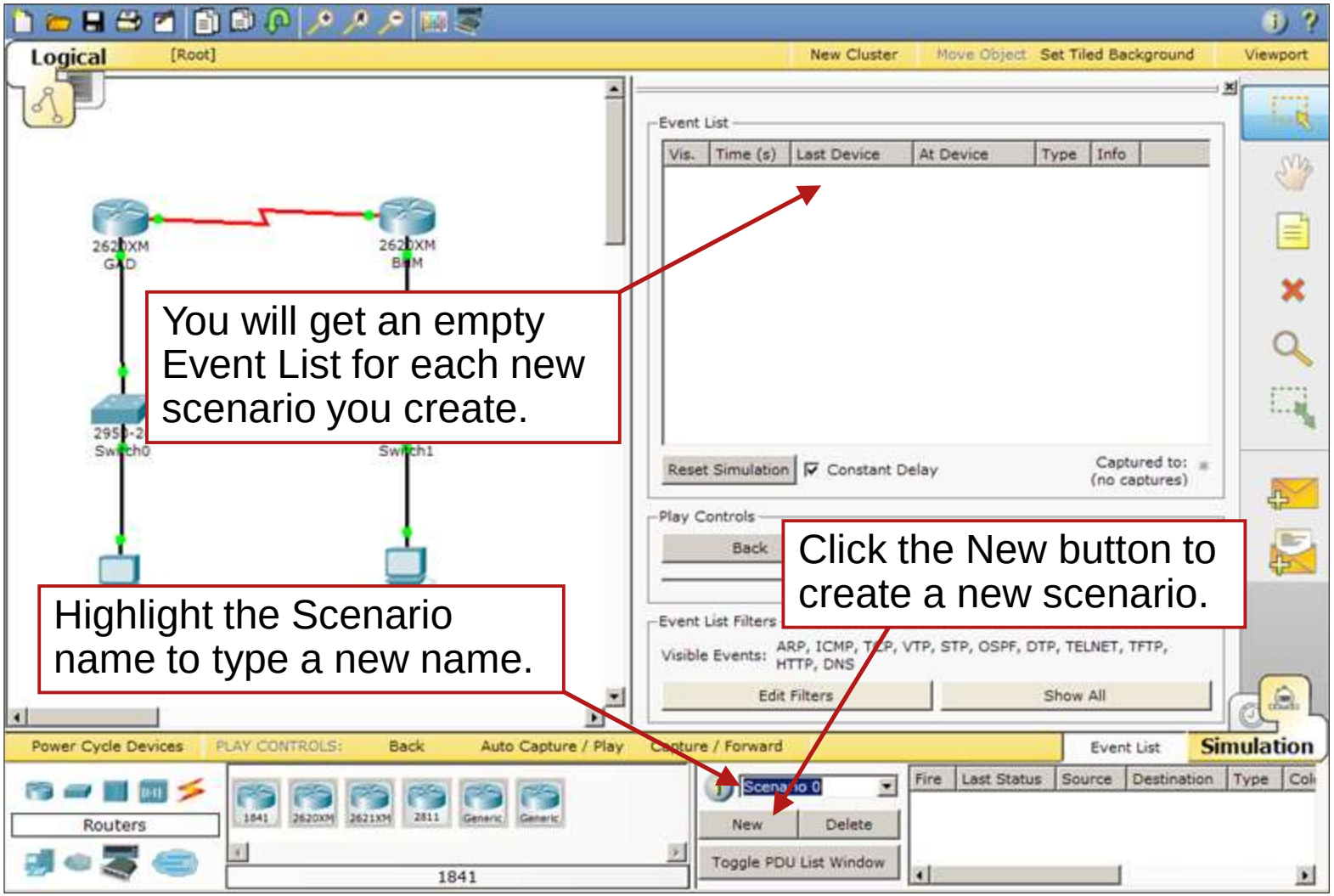
- Students can quiz themselves on the encapsulation process by entering Challenge Mode.
- The **Challenge Me** button from the OSI Model tab of the PDU Info window starts Challenge Mode.
- The layer details are hidden, and the information window is replaced by a question window that asks what the device does to a PDU on a given layer.
- Students select from a multiple-choice list. If they answer correctly, the details for that layer are shown and the question window advances to the next layer.
- The **Hint** button provides hints.

Challenge Mode

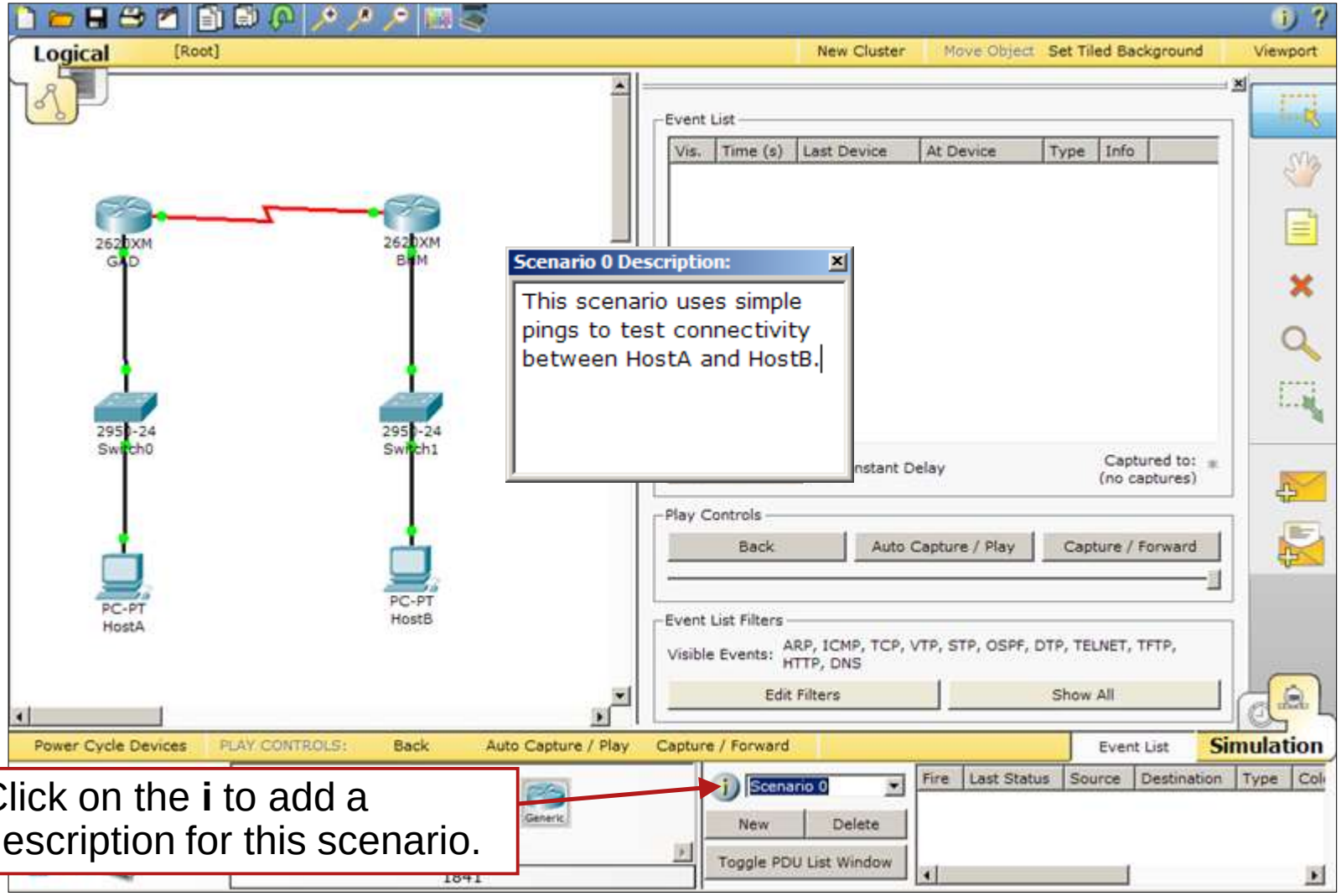


Scenarios

Creating a Named Scenario

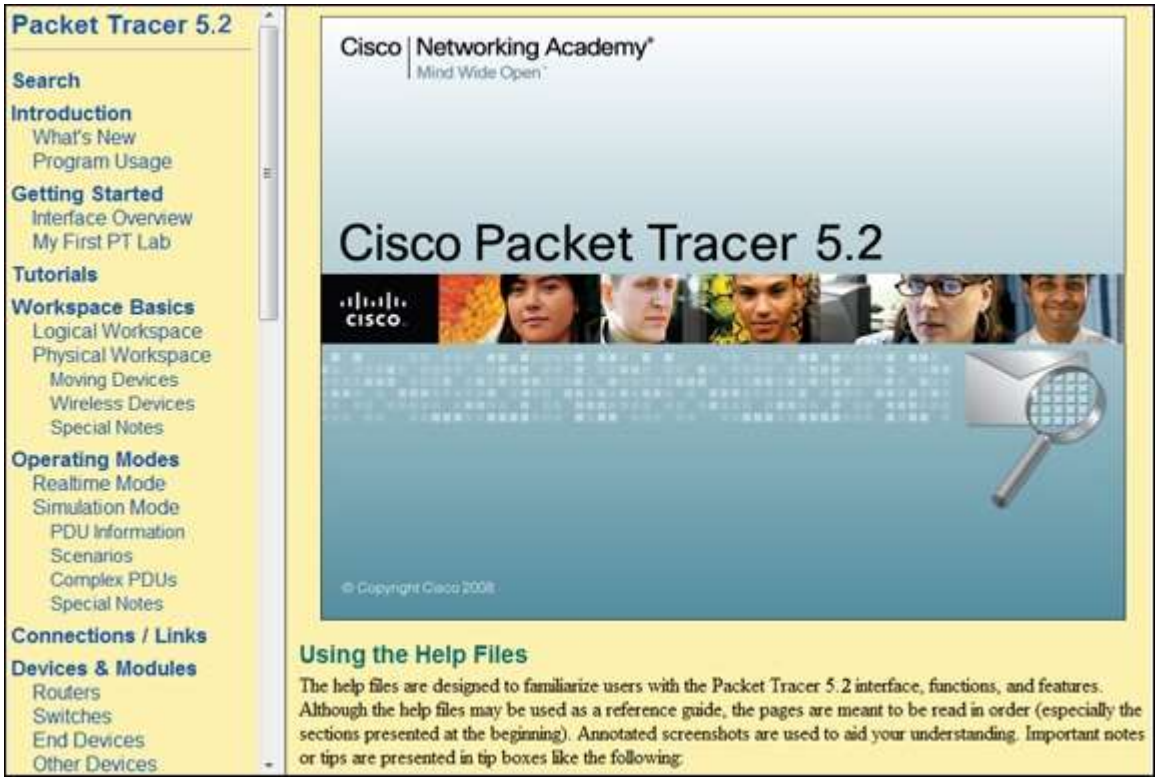


Adding a Scenario Description

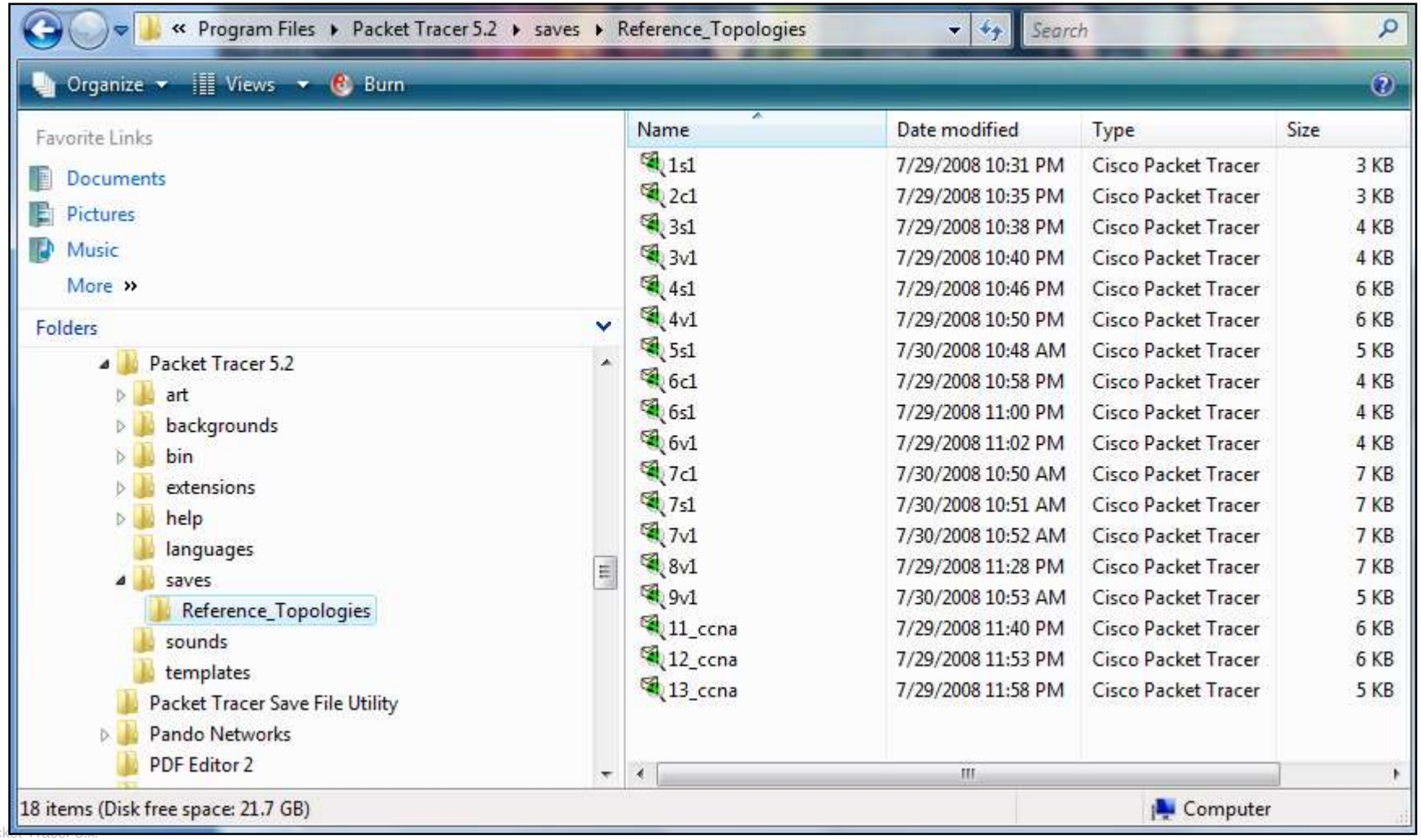


Click on the **i** to add a description for this scenario.

Interested in More Help?



Reference Topologies



Q and A