How to Use Packet Tracer

Last Update 2007.06.08
1.0.0

What is Packet Tracer

- Packet Tracer is a program used to illustrate at a basic level how networks work

- This presentation will demonstrate how to get around in Packet Tracer

- It is copied more or less word for word from the packet Tracer Help files

Organization of Packet Tracer

- Packet Tracer has two different views
  - Logical Workspace
  - Physical Workspace
- Packet Tracer also has two modes of operation
 - Realtime Mode
  - Simulation Mode

Organization of Packet Tracer

- At startup, you are in the Logical Workspace in Realtime Mode

- You can build your network and see it run in real time in this configuration

- You can switch to Simulation Mode to run controlled networking scenarios

- You can also switch to the Physical Workspace to arrange the physical aspects, such as location, of your devices

Organization of Packet Tracer

- You cannot run your network while you are in the Physical Workspace

- You should return to the Logical Workspace after you are done in the Physical Workspace

Interface
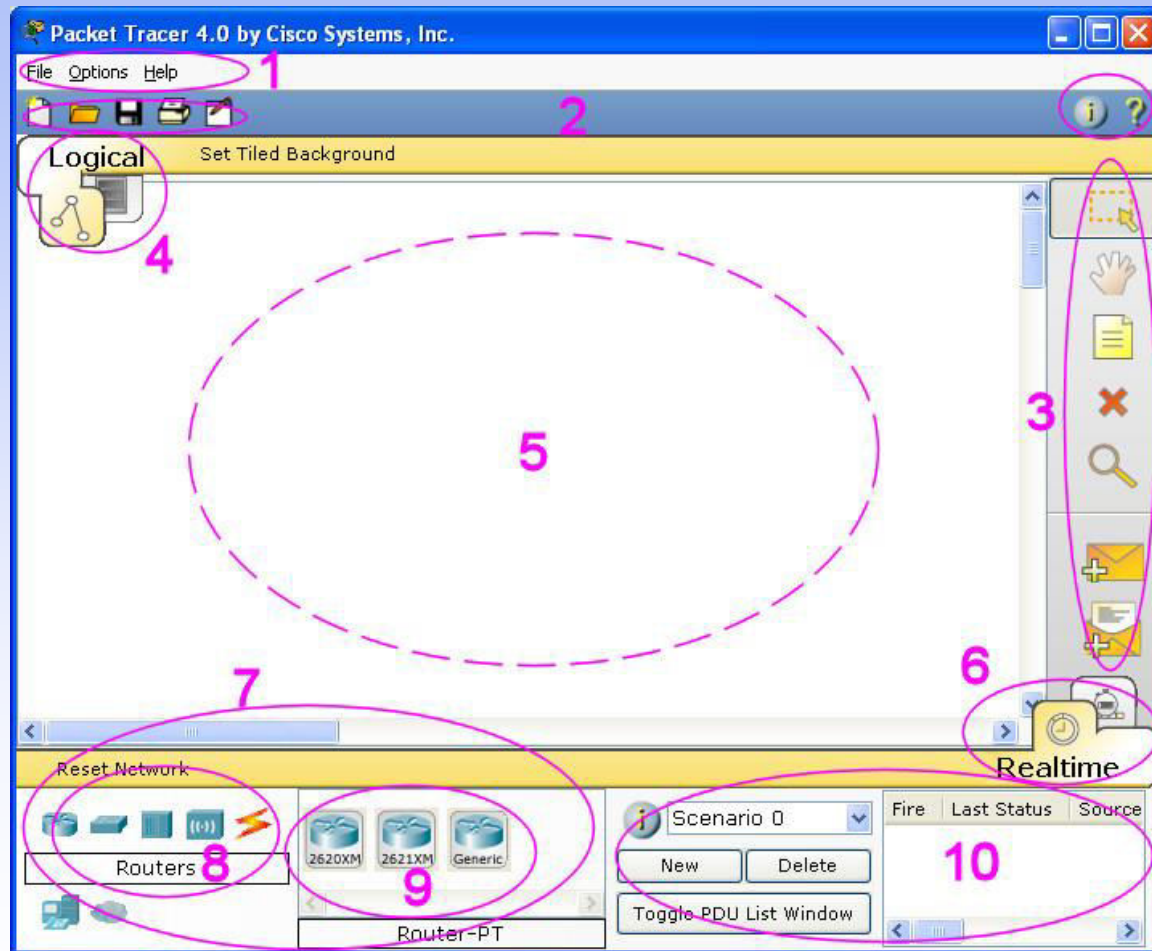
Interface

- The areas show on the screenshot are

Menu Bar - 1

- This bar provides the File, Options, and Help menus

- You will find basic commands such as Open, Save, Print, and Preferences in these menus

- You will also be able to access the Activity Wizard from the File menu

Main Tool Bar - 2

- This bar provides shortcut icons to the File menu commands, including the Activity Wizard

- On the right, you will also find the Network Information button, which you can use to enter a description for the current network or any text you wish to include

Common Tools Bar - 3

- This bar provides access to these commonly used workspace tools
  - Select
  - Move Layout
  - Place Note
  - Delete
  - Inspect
  - Add Simple PDU
  - Add Complex PDU

Workspace Type Bar - 4

- You can toggle between the Physical Workspace and the Logical Workspace with the tabs on this bar

Workspace - 5

- This area is where you will create your network, watch simulations, and view many kinds of information and statistics

Realtime or Simulation Bar - 6

- You can toggle between Realtime Mode and Simulation Mode with the tabs on this bar

Network Component Box - 7

- This box is where you choose devices and connections to put onto the workspace

- It contains the Device-Type Selection Box and the Device-Specific Selection Box

Device Type Selection Box - 8

- This box contains the type of devices and connections available in Packet Tracer 4.0

- The Device-Specific Selection Box will change depending on which type of devices you clicked

Device Selection Box - 9

- This box is where you choose specifically which devices you want to put in your network and which connections to make

Created Packet Window -10

- This window manages the packets you put in the network during simulation scenarios
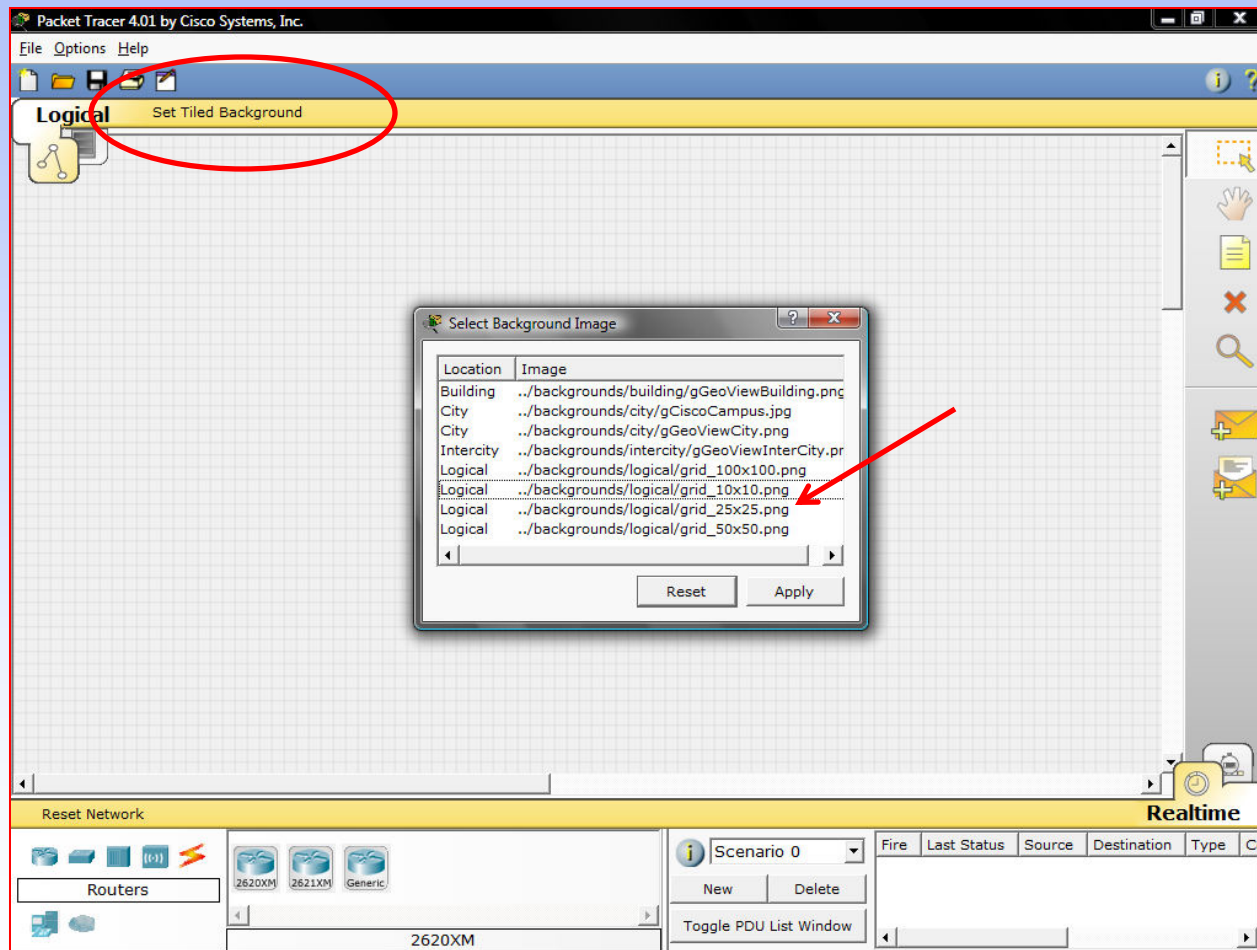
Sample Network Simulation

- Let's create a sample network to see how Packet Tracer simulates a network

Sample Network Simulation

- Start creating your network by loading a background grid using the Set Tiled Background button
- Select the
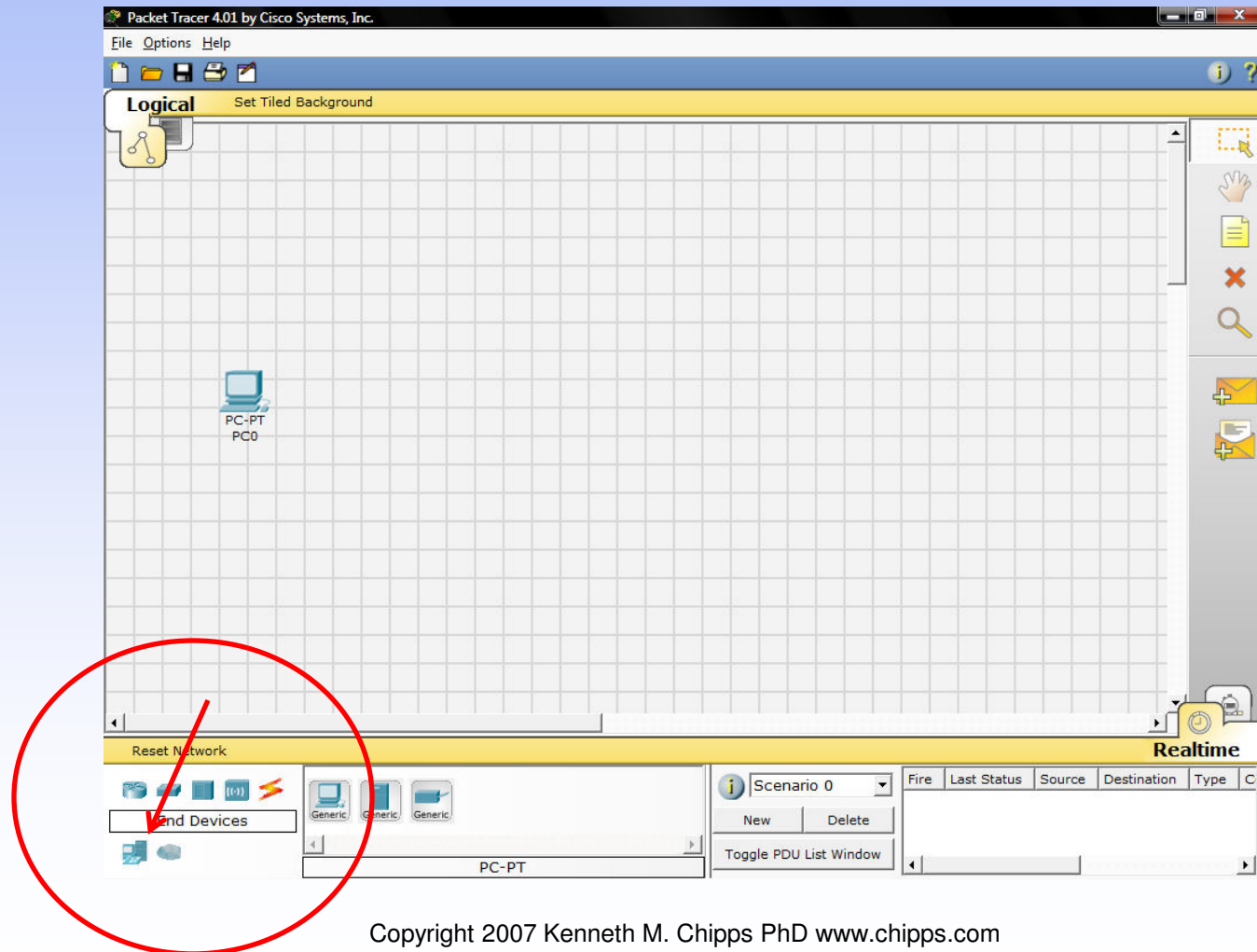 - grid_25x25.png
- for this example

Sample Network Simulation

Sample Network Simulation

- Select the Generic PC under End Devices and drag it as the first PC onto the workspace
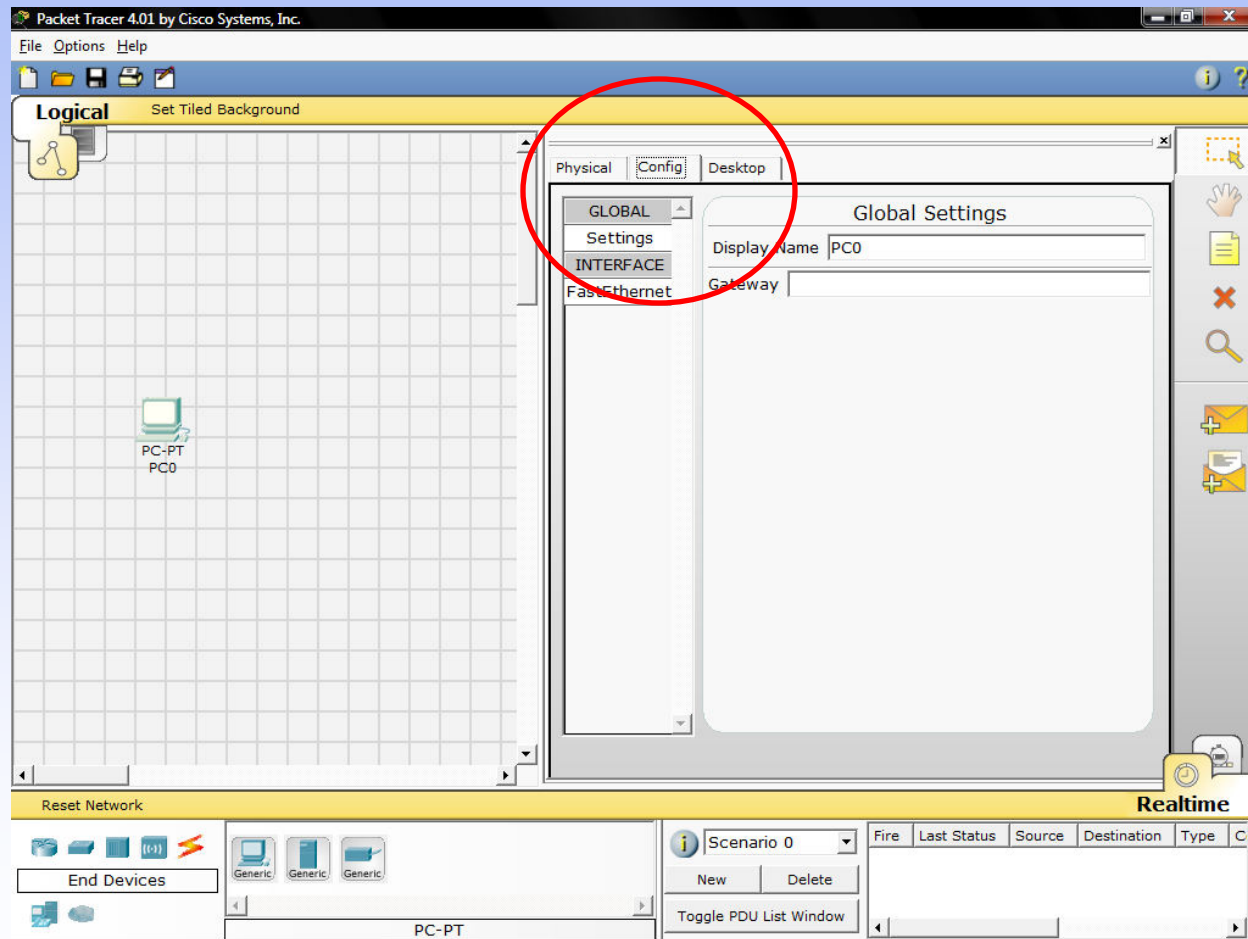
Sample Network Simulation

22

Sample Network Simulation

- Always remember to close windows after you're done viewing them, otherwise, they will clutter the workspace

- Open the PC's configuration window and change its settings by going to the Config tab

Sample Network Simulation

Sample Network Simulation

- Change the PC's name to Tokyo
- Under Interface, click on FastEthernet and set the IP address as 192.168.1.1

Sample Network Simulation

- It will assume other settings for you
- Make sure that the Port Status is on
- Note for future reference that you could modify other Ethernet interface settings, such as bandwidth, duplex, MAC address, and subnet mask in this window
- Drag another PC to the workspace, name it Paris and set its IP address as 192.168.1.2
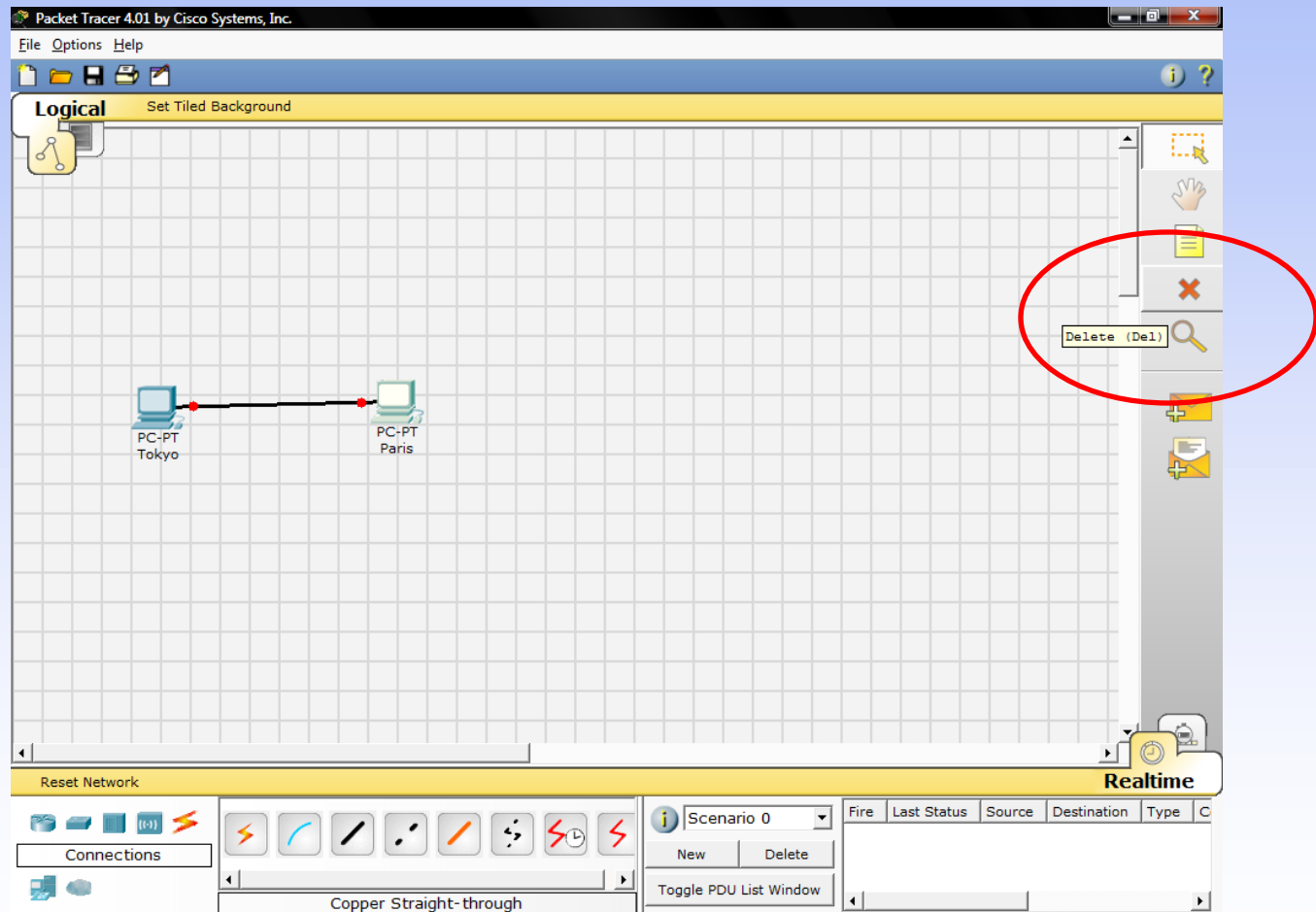
Sample Network Simulation

- Make sure that the Port Status is on
- Under Connections, select the Copper Straight-through cable, the solid black line, and make a connection between the devices with it
- The red lights on the link indicate that the connection is not working
- The point is the simulator will do what you tell it, whether that is right ort wrong

Sample Network Simulation

- Now, using the Delete tool, remove the Copper Straight-through cable, and use a Copper Cross-over cable instead
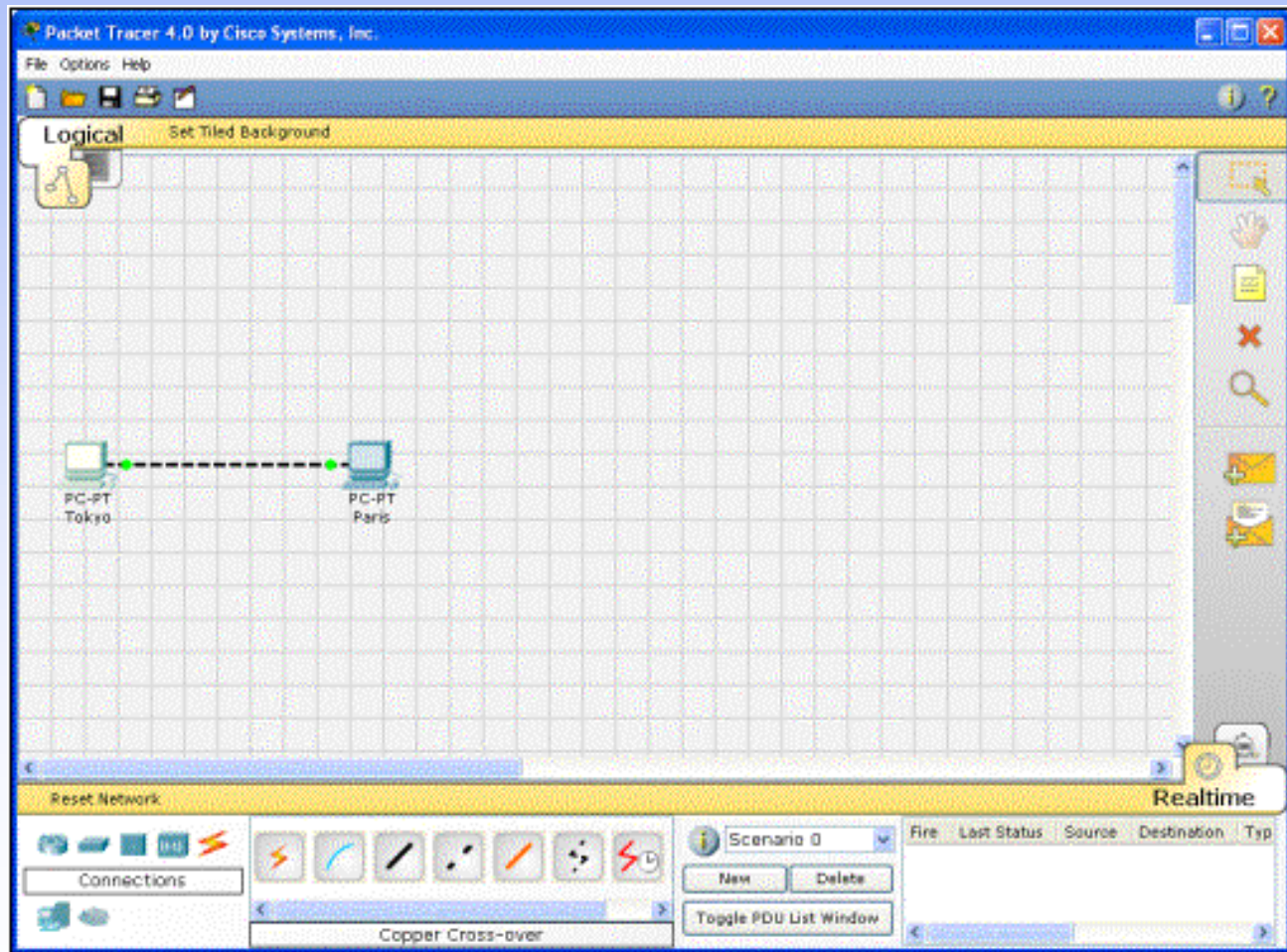
Sample Network Simulation

Sample Network Simulation

- The lights should turn green at this point, and if you mouse over or hover over either PC, you'll see the link status indicated as up

Sample Network Simulation

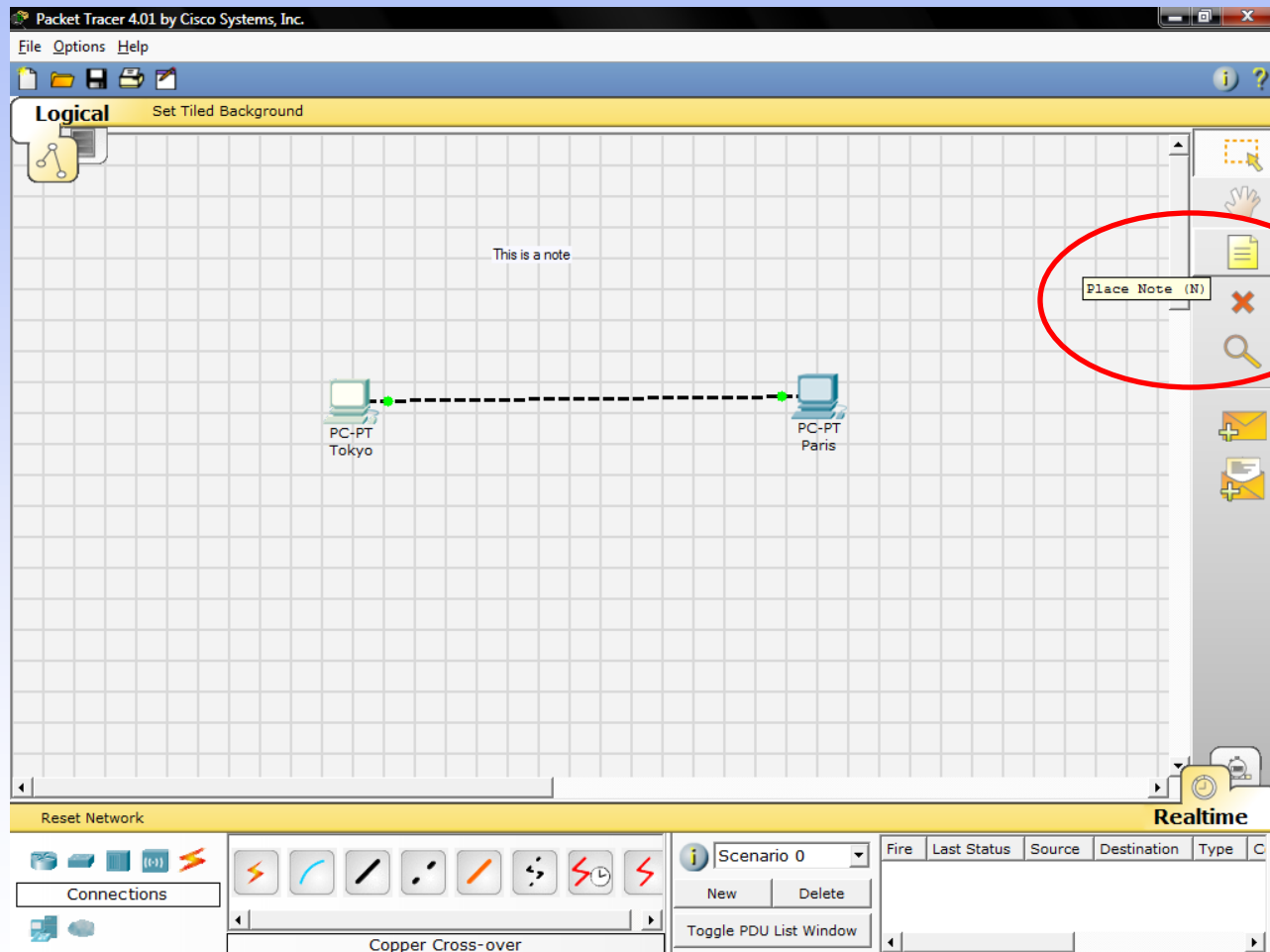- Your network should look similar to this

Sample Network Simulation

32

Sample Network Simulation

- Reposition your network devices by dragging them

- Add an overall network description by using the i button on the upper right corner of Packet Tracer 4.0

- Then add some text labels on the logical workspace by using the Place Note tool
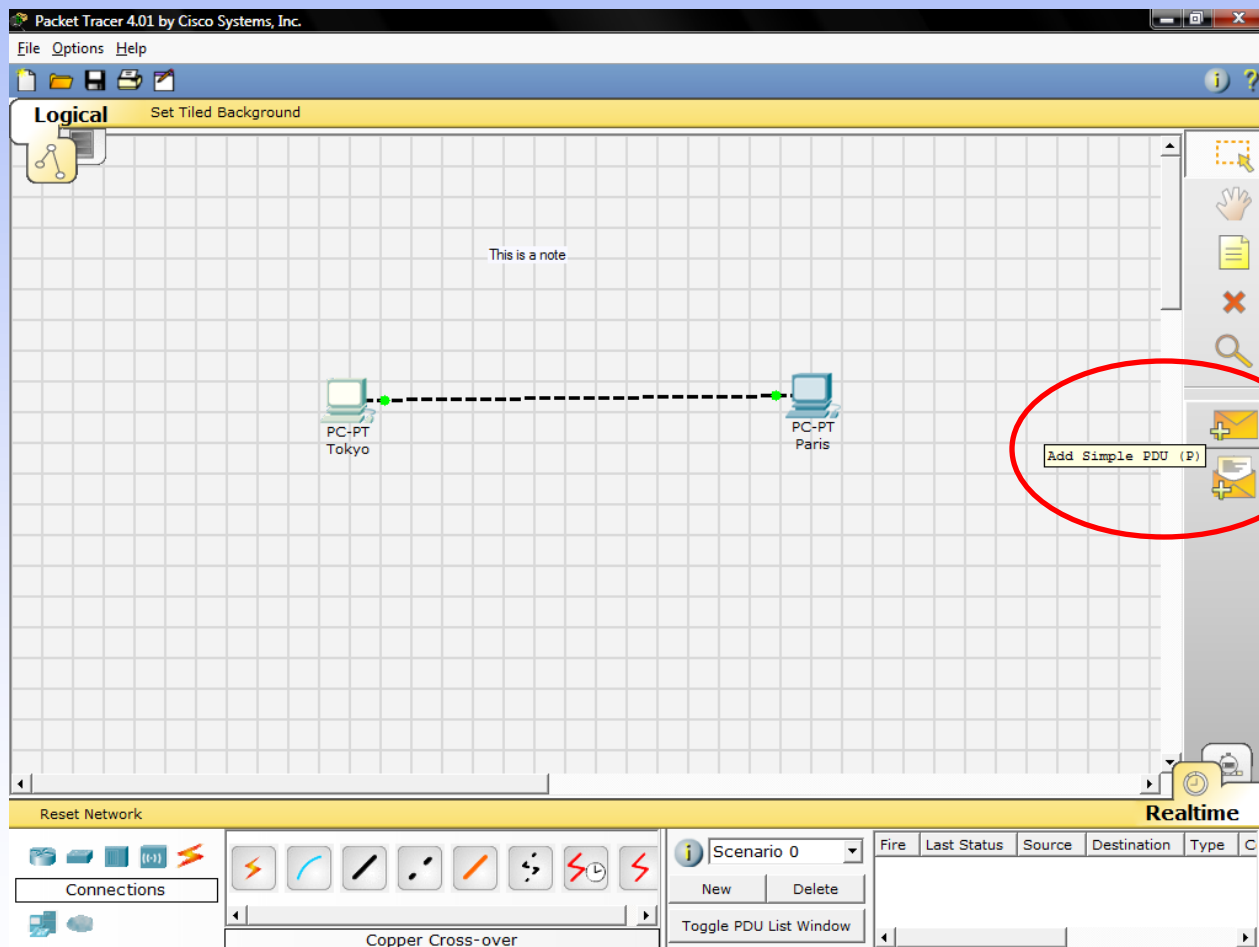
Sample Network Simulation

Sample Network Simulation

- Single click on the Tokyo PC

- Turn the PC on and off and on again, while paying attention to the link lights

- Do the same step for the Paris PC

- Turning devices off will result in red link lights meaning that the link is down

- Save your work by using the File -> Save As option

Sample Network Simulation

- Start with your original saved file open

- Notice you are in Realtime Mode

- Use the Add Simple PDU tool to send a simple 1-time ping message called an echo request, to the other PC, which responds with an echo reply because you have properly configured their IP address settings
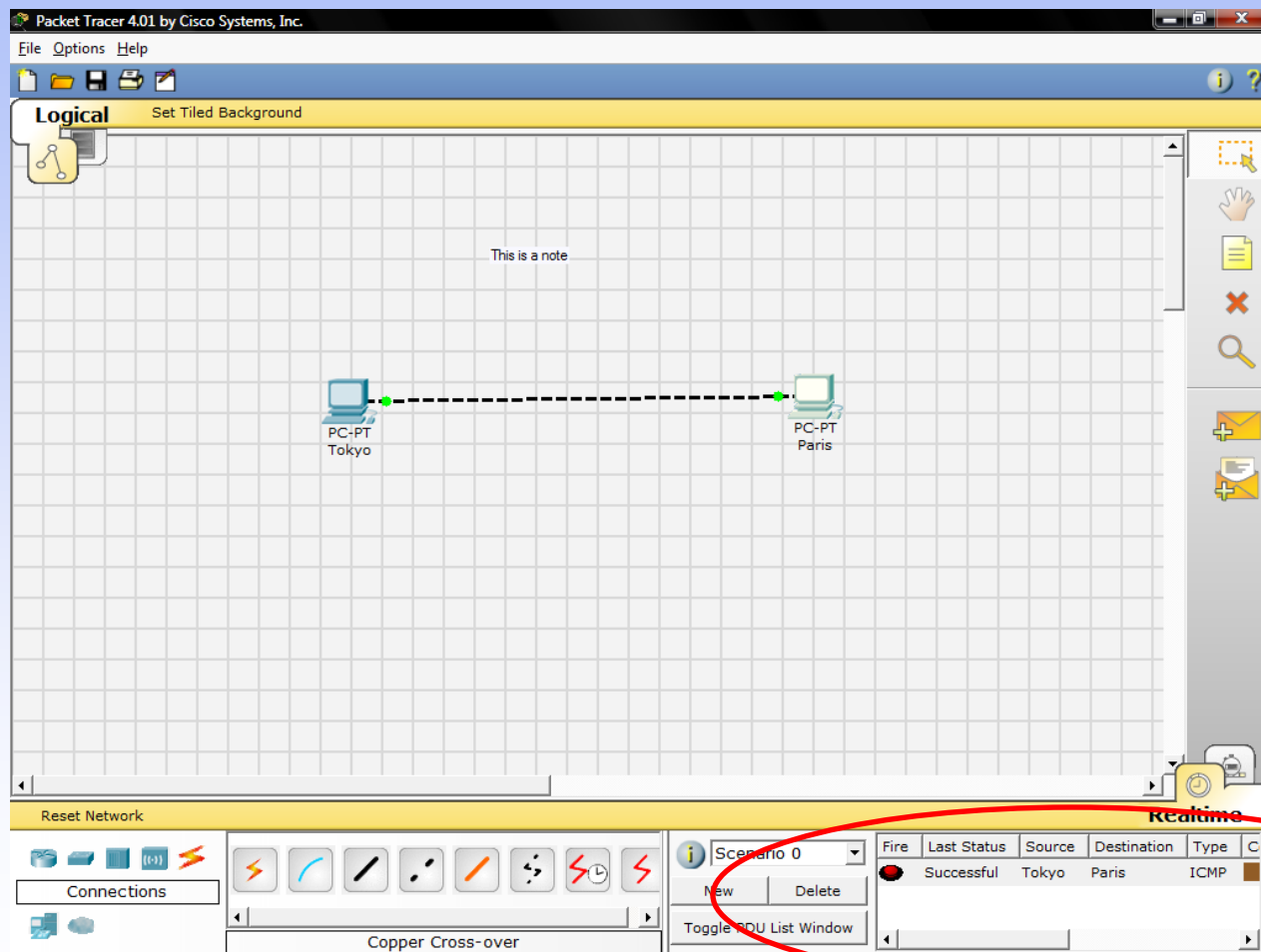
Sample Network Simulation

Sample Network Simulation

- To use the Add Simple PDU tool
  - Click on it
  - Click on the first PC
  - Click on the second PC
- Then look down in the bottom right corner to see if the ping was successful
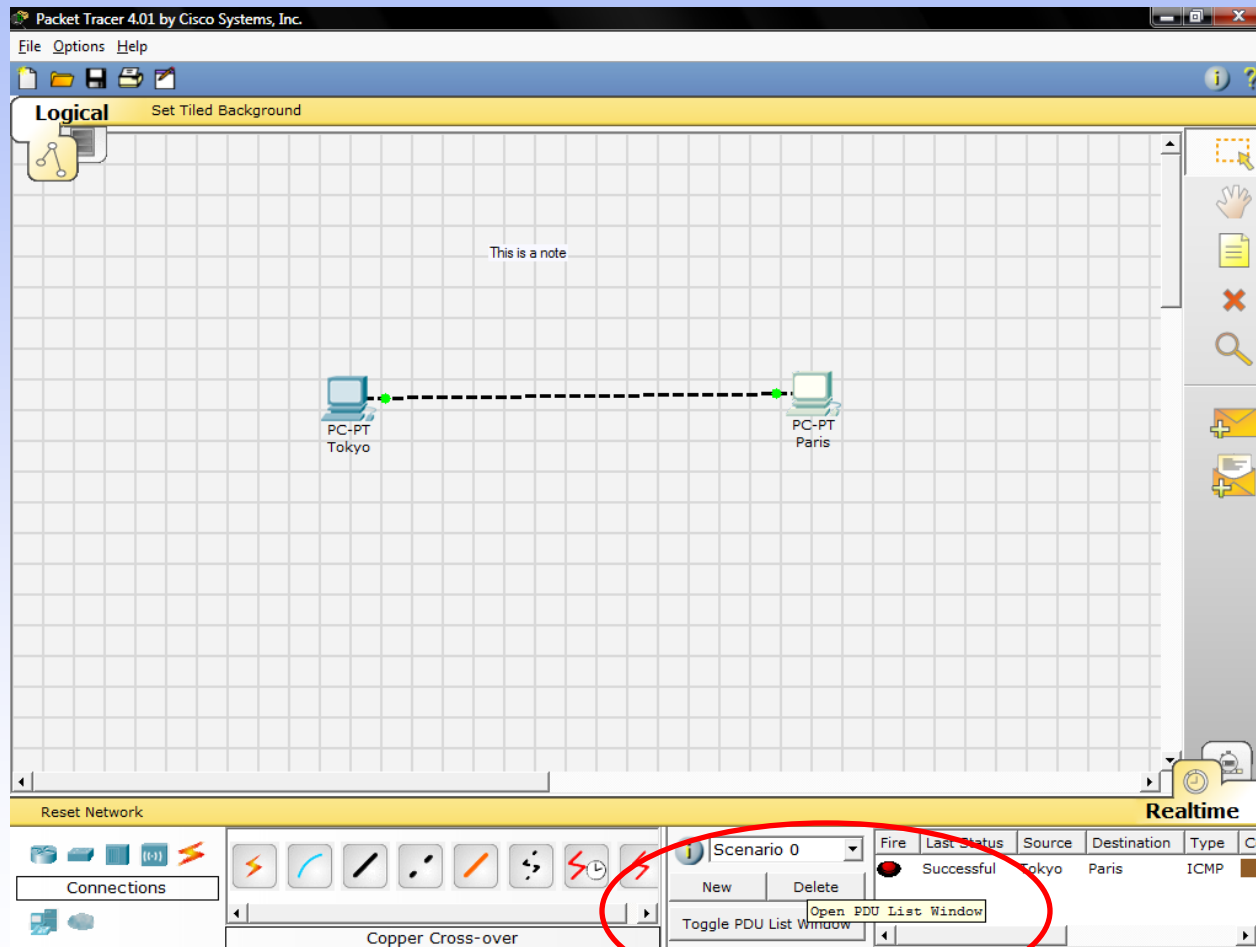
Sample Network Simulation

39

Sample Network Simulation

- Scroll around in the User Created Packet Window to see the different aspects of this ping message, including an indication that the ping was successful

- Alternatively, toggle the PDU List Window to see a larger display of this message
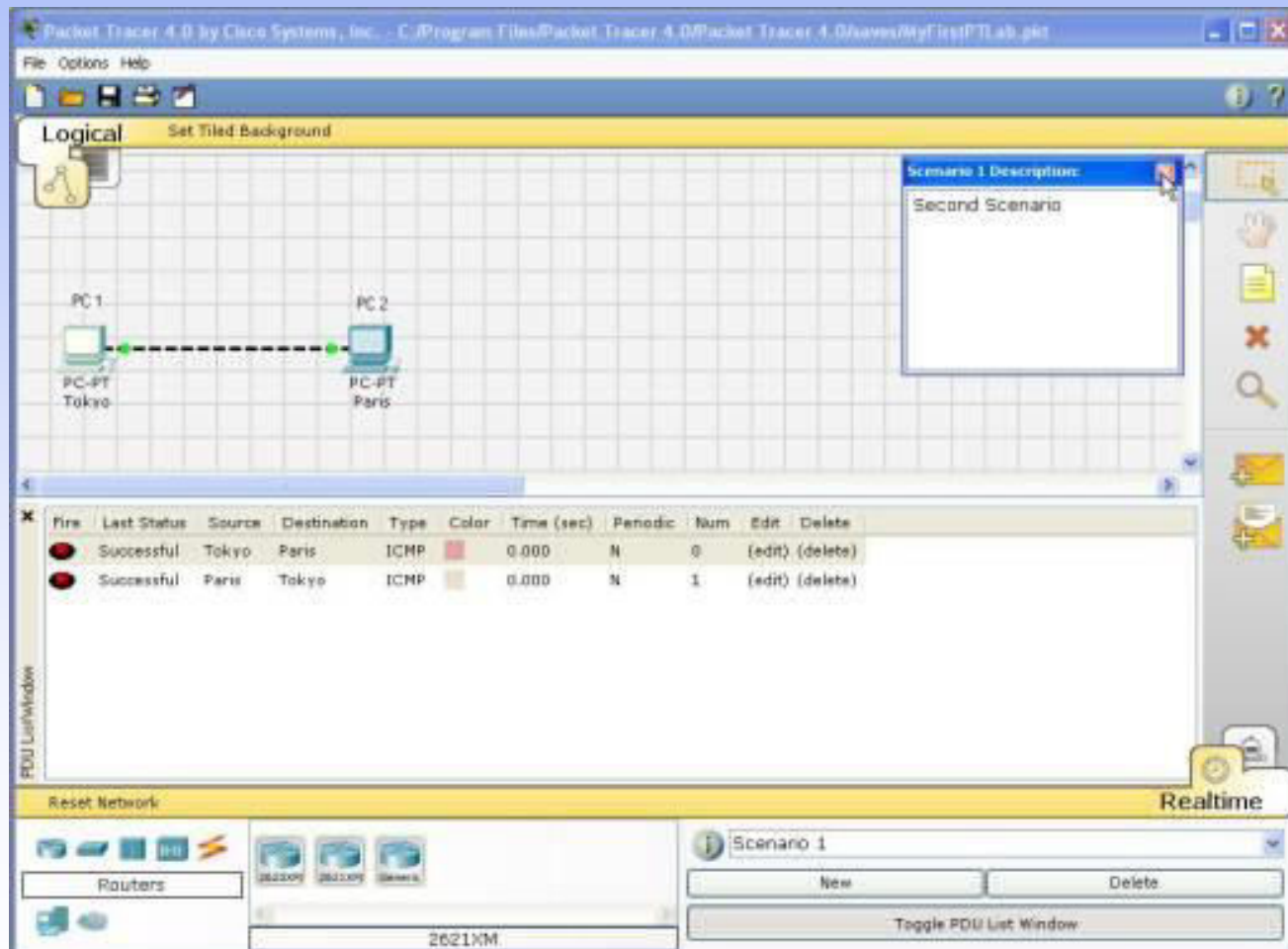
Sample Network Simulation

Sample Network Simulation

- You can save one or more of these messages as a scenario

- When you start, you are in Scenario 0

- Label this first scenario with an i note

- Different scenarios allow you to use the same topology for experiments with different groupings of user created packets

- Click on New to create a new scenario

Sample Network Simulation

- New scenarios will always initially be blank
- Add two packets by using the Simple PDU tool, perhaps a PDU from Paris to Tokyo and a different PDU from Tokyo to Paris
- Then add a little i note describing the scenario, to complete Scenario 1
- An example is shown next

Sample Network Simulation

44

Sample Network Simulation

- Go back and forth between Scenario 0 and 1

- Several different scenarios can be saved for a single network

- Now delete Scenario 1 using the Delete button

- You are back at Scenario 0

Sample Network Simulation

- If you want to remove the PDU, you could scroll across in the User Created Packet Window and click on delete on the last column

- Do so

- Delete the whole scenario

Sample Network Simulation

- Start with your original saved file open

- In Realtime Mode, send a simple PDU from Tokyo to Paris

- Delete the PDU by using the method learned in the previous section

- Switch to Simulation Mode

Sample Network Simulation

- In this mode, time freezes, therefore you can watch your network run at a slower pace, observing the paths that packets take and inspecting them in detail packet tracing

- Under the Event List Filters, click on All/None to uncheck all fields, and then click on ICMP to only view ICMP packets in the animation

48

Sample Network Simulation

- Add a simple PDU from Tokyo to Paris

- The eye icon at the left of the Event List indicates that this packet is currently displayed as an envelope

- Click on Capture/Forward button once

- This acts like a network sniffing program, capturing the next event that occurs on the network

Sample Network Simulation

- Note that after clicking on Capture/Forward, the packet in the workspace moves from one device to another - this is the ICMP echo request message from Tokyo to Paris

- Another event is also added in the Event List this reflects the change that happened in the workspace

Sample Network Simulation

- The first time through an animation, the meaning of the Capture/Forward is Capture; after resetting the simulation, the meaning would be Forward

- Adjust the speed of the animation by dragging the Play Speed slider to the right

- Click on Capture/Forward button a second time

Sample Network Simulation

- This captures the next network event - this is the echo reply from Paris to Tokyo, shown as successful with a green check mark on the envelope, and the animation plays faster this time

- Dragging the speed slider to the opposite direction - to the left - would have slowed the animation

- Click on Capture/Forward button again

Sample Network Simulation

- At this point, Paris has already sent an echo reply to Tokyo therefore, there are no more ICMP events left to capture

- A No More Events window will appear notifying you of this, as shown in the screenshot below

- Click OK

Sample Network Simulation
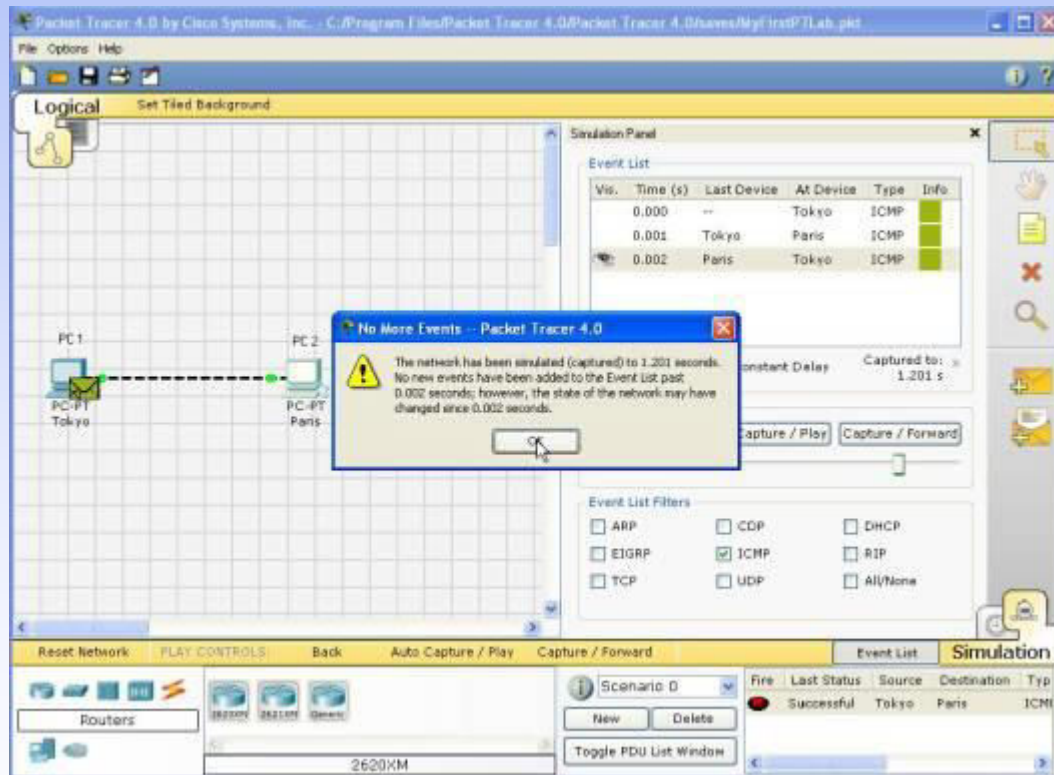
Sample Network Simulation

- Continuing from the last activity, click on Reset Simulation

- This clears the entries in the Event List except for the original packet

- Click on the packet envelope on the workspace to bring up the PDU Information window like the one shown in the screenshot below
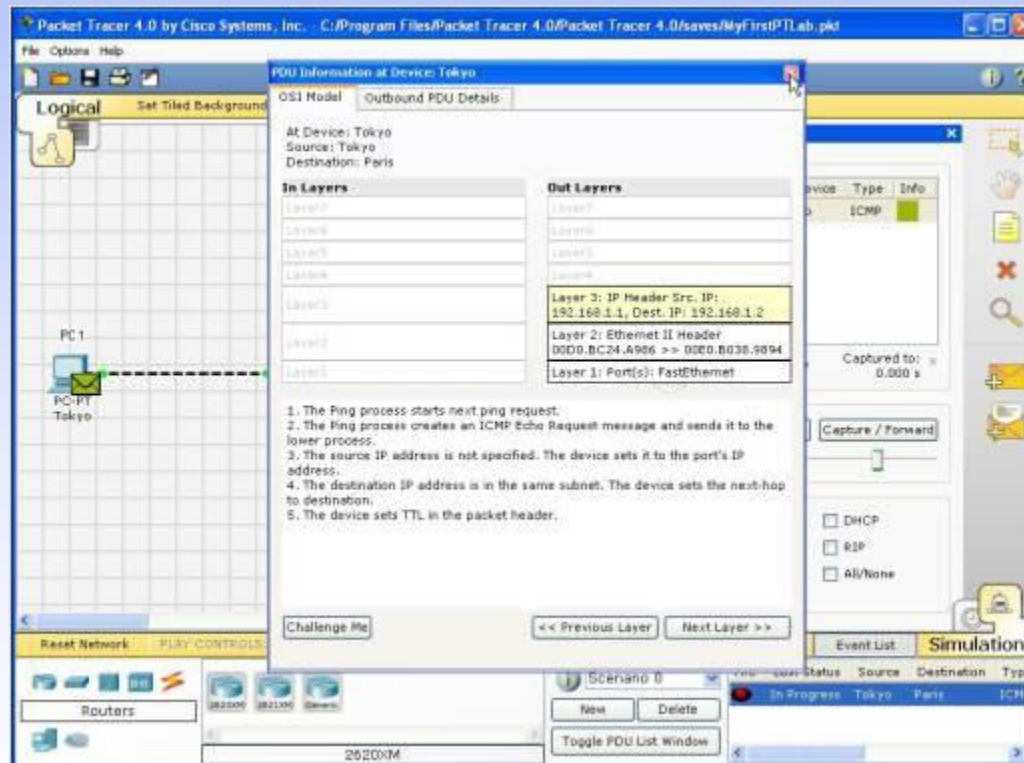
Sample Network Simulation

- This window contains the OSI model tab which shows how the packet is processed at each layer of the OSI model by the current device

- Close this window, and note that this packet is indicated in the Event List by the eye icon

- The whole row in the Event List is also highlighted

Sample Network Simulation

- For this row, clicking on the color square in the Info column is equivalent to clicking directly on the packet envelope

Sample Network Simulation

58

Sample Network Simulation

- Use the Next Layer and Previous Layer buttons to see details of the packet processing at the relevant OSI Layers

- Note that only the Out Layers can be viewed in the case of this original echo request message

Sample Network Simulation

- Click on the Outbound PDU Details tab
- This shows exactly what is in the PDU headers, broken up into header type and the individual fields in each header
- Close the PDU Information window
- Click on Capture/Forward button once

Sample Network Simulation

- Click again on the packet in the workspace to open the PDU Information window

- Notice that this time, information regarding the In Layers and Out Layers can both be viewed

- Click on the Inbound PDU Details tab

Sample Network Simulation

- In this case this shows the details of the inbound echo request packet from Tokyo to Paris

- Click on the Outbound PDU Details tab, which shows similar information, but in this case for the echo reply packet from Paris to Tokyo

Sample Network Simulation

- Click on Reset Simulation again

- This time click on Auto Capture/Play

- The echo request and echo reply will be automatically captured, and the No More Events message will occur automatically

Sample Network Simulation

- Click on the Back Button twice to rewind the animation one step at a time

- Now click on the Capture/Forward button twice to forward the packet through the animation

- Also note the change in which packet is highlighted in the Event List

Sample Network Simulation

- Remember that at any time, you can either click on the packet envelope directly, or click on the Info column in the Event List, to open up the PDU Information window

- Click on the Back Button twice to rewind the animation

- This time click Auto Capture/Play and the packet animation will automatically occur
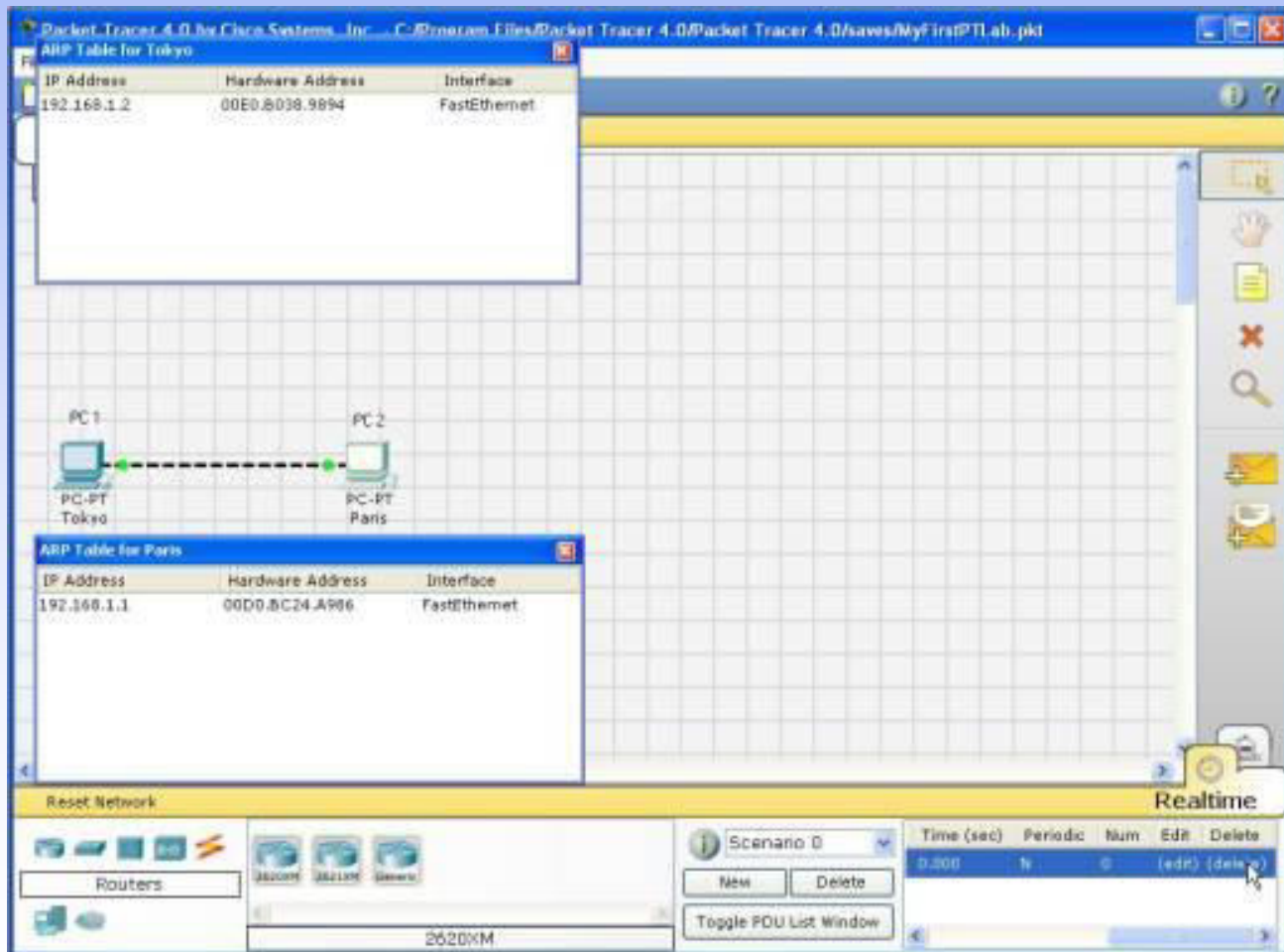
Sample Network Simulation

- Start by closing the existing workspace and reopening your original saved file

- Open the ARP Tables for both PCs by clicking on each PC using the Inspect tool

- The ARP tables always appear on the same spot

- Reposition one of them to make them both visible

Sample Network Simulation

- You can also resize the tables for better viewing

- In Realtime Mode, send a simple PDU from Tokyo to Paris

- Notice that the ARP tables are filled in automatically as shown here

Sample Network Simulation

Sample Network Simulation

- Delete the PDU using the method learned in the previous sections

- Notice that the entries in the ARP tables are not cleared

- This is so because the ARP entries for both devices have already been learned

- Deleting the user created PDUs does not reset what already occurred in the network

Sample Network Simulation

- Click Reset Network
- Notice that the ARP tables are cleared
- The Reset Network button power cycles devices by turning them off and then on
- By doing so, they lose temporary information like the tables they learned
- Go to Simulation Mode

Sample Network Simulation

- In the Event List Filters, make sure that ICMP and ARP are checked so that you can view ICMP and ARP packets in the animation

- Create a new simple PDU from Tokyo to Paris

- Notice that since you reset the network earlier, the ARP tables are empty

Sample Network Simulation

- ARP request packets need to be issued before the ICMP ping packets, so that the devices in the network can learn about each other

- Click on Auto Capture/Play to watch the animation

- Click on Reset Simulation

Sample Network Simulation

- Notice that even though the Event List is cleared - except for the user created PDU, the ARP tables still remain full

- Click on Capture/Play

- This time, since the ARP tables are full, there are no new ARP packets issued

- Click on Reset Network

- Doing so will empty the tables

Sample Network Simulation

- Notice that a new ARP request packet appears automatically on the Event List

- Single-clicking on the Delete button removes the entire scenario including all the PDUs associated with it

- Double-clicking on (delete) in the far right column in the PDU List window deletes individual PDUs

Sample Network Simulation

- The Reset Simulation button clears all entries in the Event List, except for User Created PDUs, and allows you to restart the animation

- This, however, does not reset the device tables

- The Reset Network button allows you to power-cycle all of the devices in your network

Sample Network Simulation

- It turns all devices off and then turns them back on so the tables that the devices built are lost along with configurations and other information not automatically saved

- Saving your work periodically prevents you from losing configurations and changes in the network that you want to keep