## Lab 2: Network Devices & Packet Tracer: **Packet Tracer**

Packet Tracer is a protocol simulator developed by Dennis Frezzo and his team at Cisco Systems. Packet Tracer (PT) is a powerful and dynamic tool that displays the various protocols used in networking, in either Real Time or Simulation mode. Before starting to follow the procedures below you should:

1. Download Packet Tracer Simulation Tool on your PC.

Introduction to the Packet Tracer Interface using a Hub Topology

Step 1: Start Packet Tracer and Entering Simulation Mode
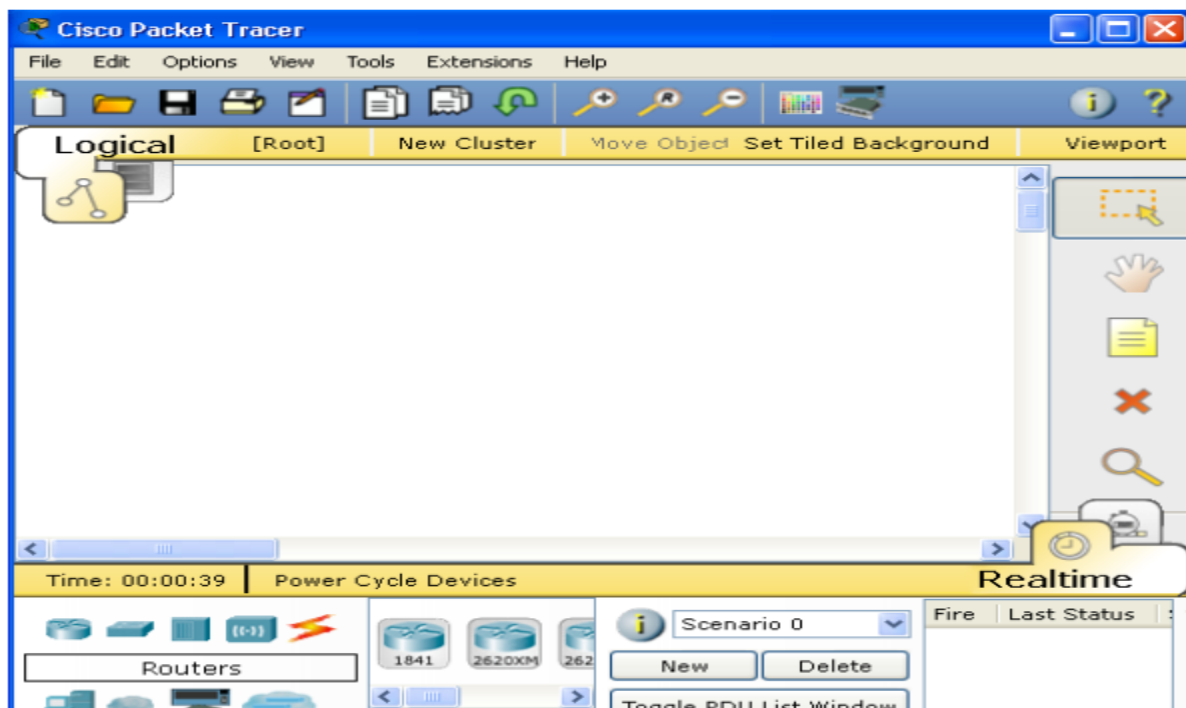
Step 2: Choosing Devices and Connections

✓ We will begin building our network topology by selecting devices and the media in

which to connect them.

✓ Several types of devices and network connections can be used. For this lab we will keep it simple by using End Devices, Switches, Hubs, and Connections.

✓ Single click on each group of devices and connections to display the various choices.

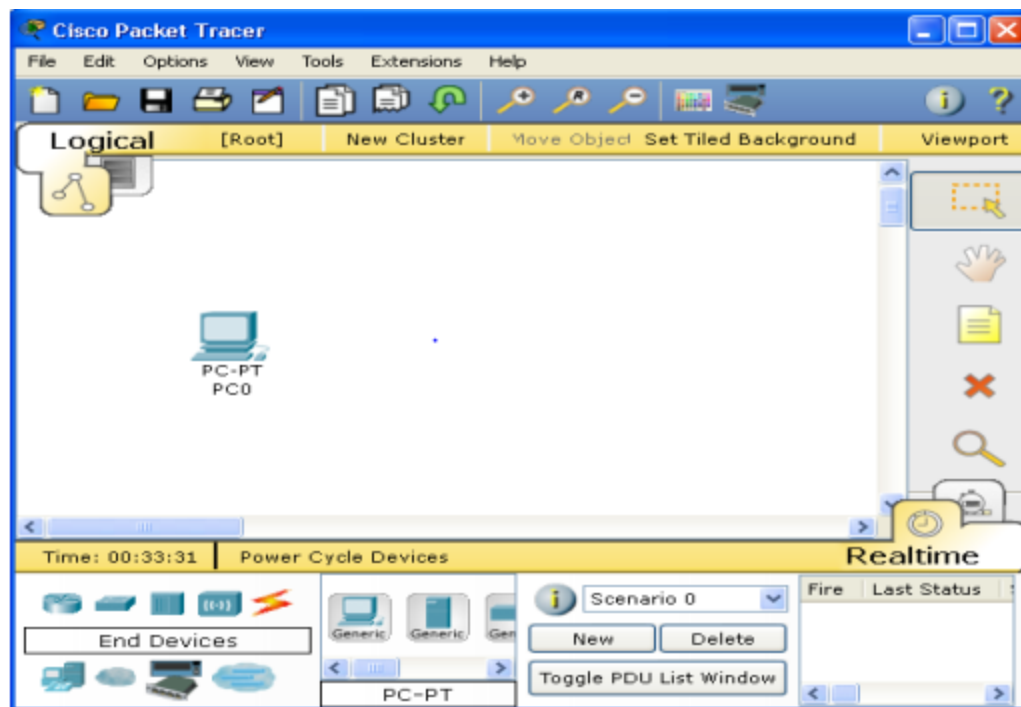**Step 3:** Building the Topology – Adding Hosts
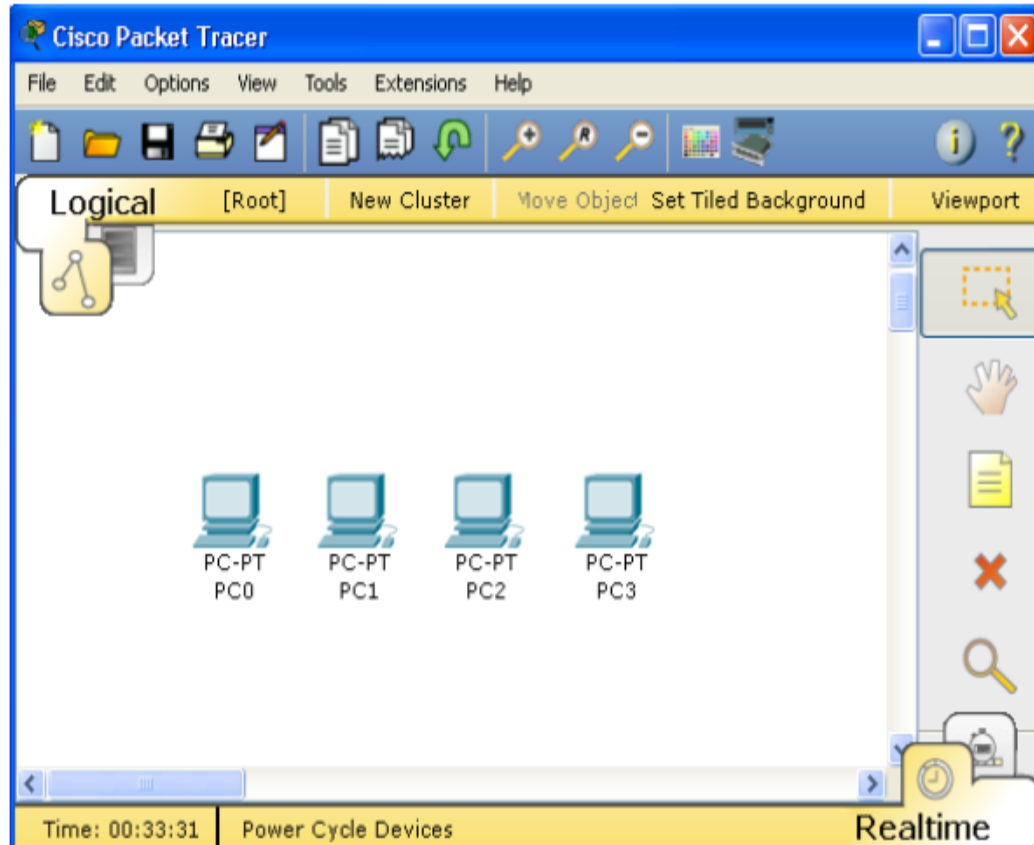
•Single click on the End Devices.

•Single click on the Generic host.

• Move the cursor into topology area. You will notice it turns into a plus "+" sign. Single click in the topology area and it copies the device.
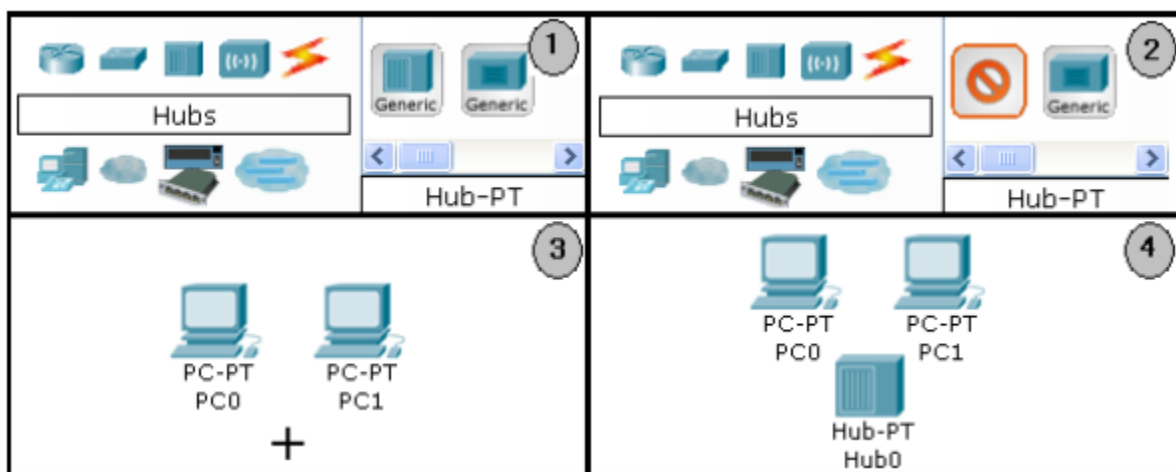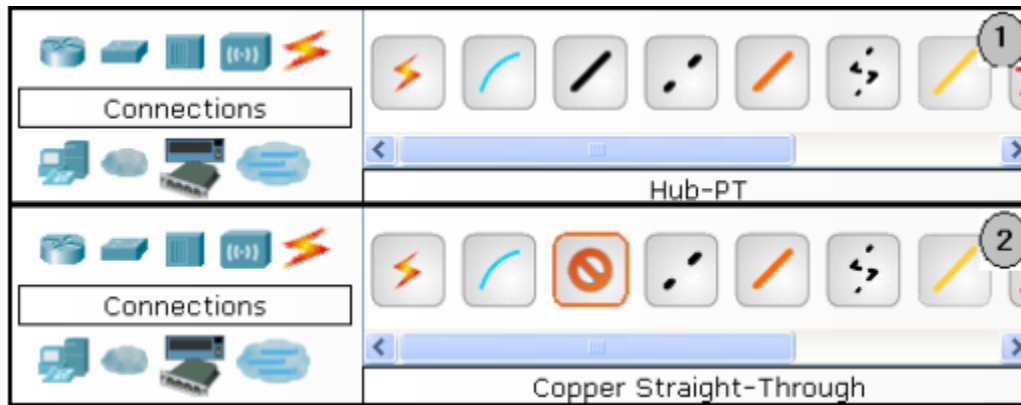
- Add three more hosts.

Step 4: Building the Topology – Connecting the Hosts to Hubs and Switches

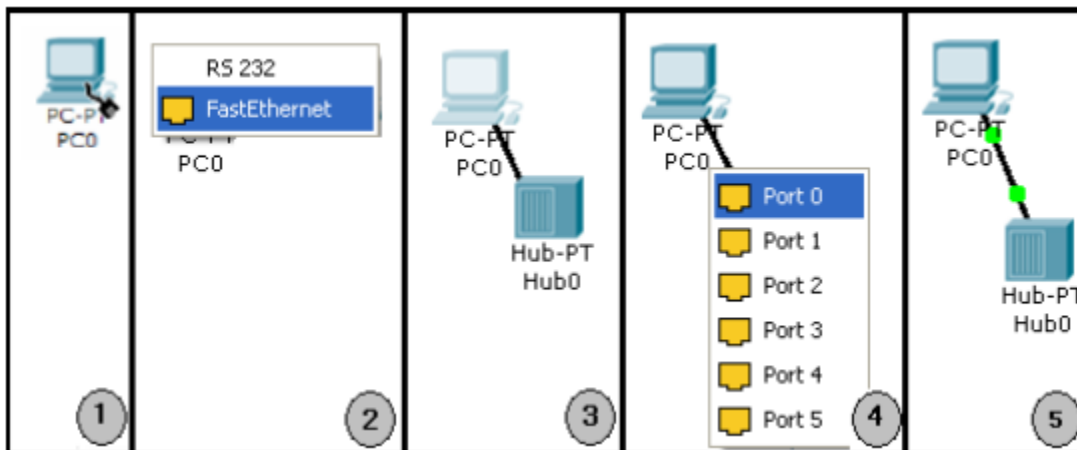• Adding a Hub: Select a hub, by clicking once on Hubs and once on a Generic hub.

•Connect PC0 to Hub0 by first choosing Connections.

•Click once on the Copper Straight-through cable.

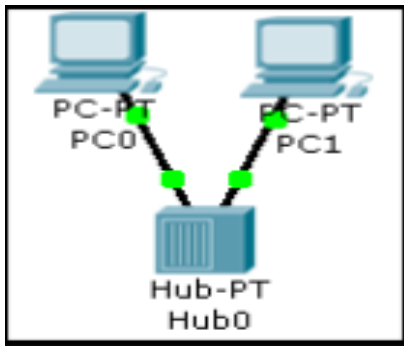
Perform the following steps to connect PC0 to Hub0:

1. Click once on PC0

2. Choose Fast Ethernet

3. Drag the cursor to Hub0

4. Click once on Hub0 and choose Port0

5. Notice the green link lights on both the PC0 Ethernet NIC and the Hub0 Port0 showing that the link is active.
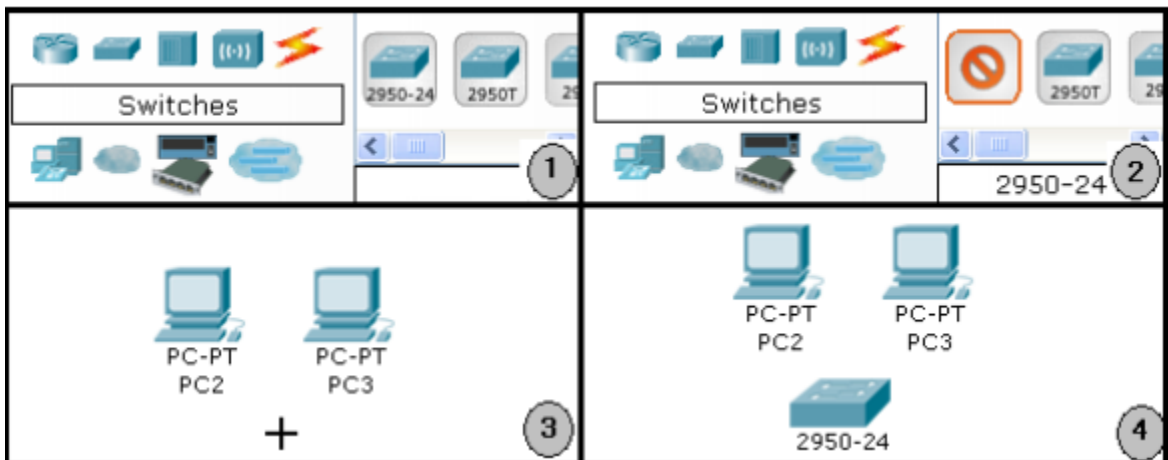

Repeat the steps above for PC1 connecting it to Port1 on Hub0. (The actual hub port you choose does not matter.)

Adding a Switch

Select a switch, by clicking once on Switches and once on a 2960 switch. Add the switch by moving the plus sign "+" below PC2 and PC3 and click once.

- Connect PC2 to Switch0 by first choosing Connections.

- Click once on the Copper Straight-through cable.

- Perform the following steps to connect PC2 to Switch0:

    1. Click once on PC2

    2. Choose FastEthernet

    3. Drag the cursor to Switch0

    4. Click once on Switch0 and choose FastEthernet0/1

    5. Notice the green link lights on PC2 Ethernet NIC and amber light Switch0 FastEthernet0/1 port. The switch port is temporarily not

forwarding frames, while it goes through the stages for the Spanning Tree
Protocol (STP) process.

6. After a about 30 seconds the amber light will change to green indicating
that the port has entered the forwarding stage. Frames can now be forwarded
out the switch port.
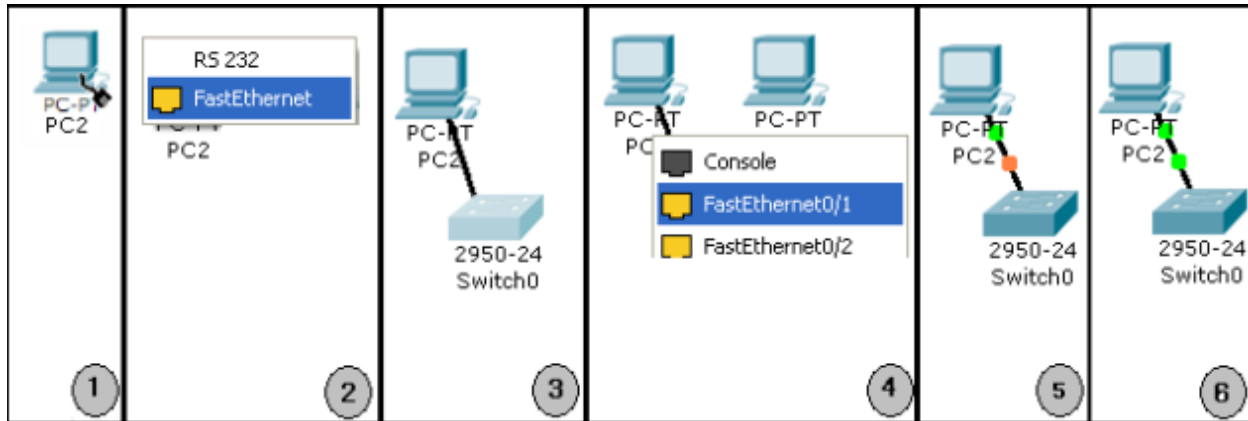
•Repeat the steps above for PC3 connecting it to Port3 on switch0 on port
FastEthernet0/2. (The actual switch port you choose does not matter.)
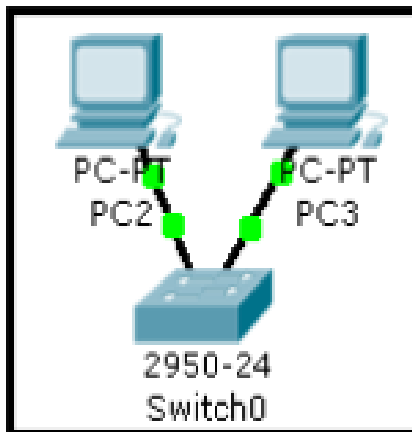
•Move the cursor over the link light to view the port. Fa
means FastEthernet, 100 Mbps Ethernet.

Step 5: Configuring IP Addresses and Subnet Masks on
the Hosts Before we can communicate between the hosts
we need to configure IP Addresses and Subnet Masks on
the devices.

• Click once on PC0.

•Choose the Config tab.

 It is here that you can change the name of PC0. It is also here where you would
enter a Gateway IP Address, also known as the default gateway.

We will discuss this later, but this would be the IP address of the local router. If you want, you can enter the IP Address 192.168.1.1.
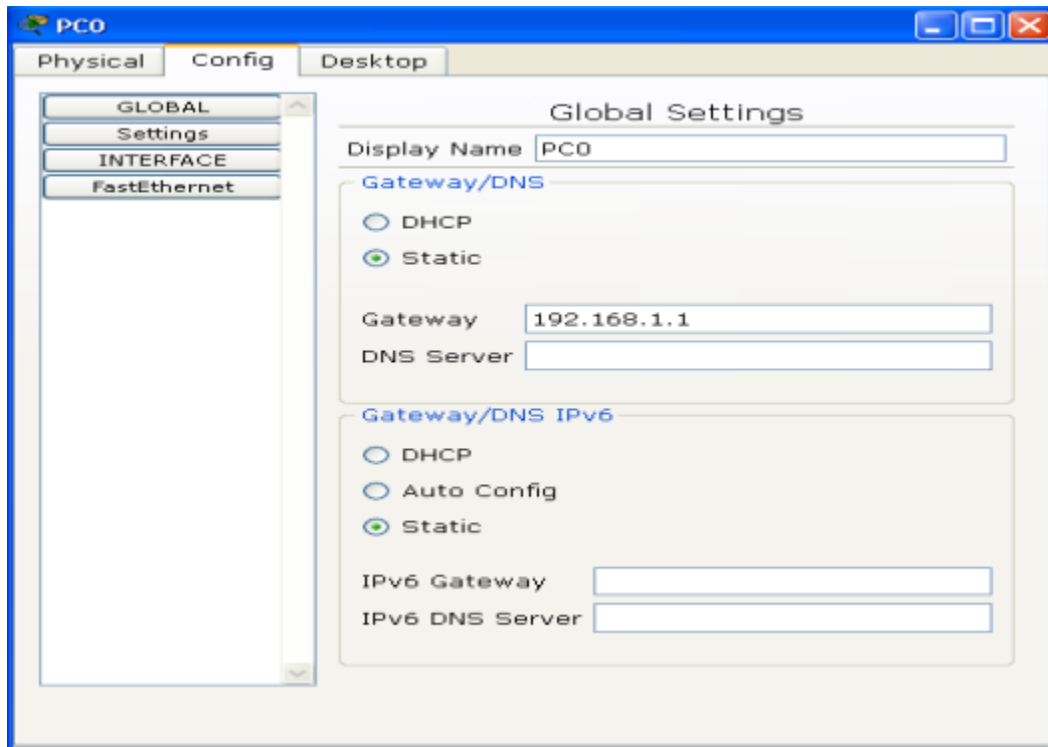
•Click on FastEthernet. Although we have not yet discussed IP Addresses, add the IP Address to 192.168.1.10. Click once in the Subnet Mask field to enter the default Subnet Mask. You can leave this at 255.255.255.0.

Use the information below for IP Addresses and Subnet Masks.

Host	IP Address	Subnet Mask
PC0	192.68.1.10	255.255.255.0
PC1	192.68.1.11	255.255.255.0
PC2	192.68.1.12	255.255.255.0
PC3	192.68.1.13	255.255.255.0

• Verify the information: To verify the information that you entered, move the Select tool (arrow) over each host.


```
PC  Link    IP Address      IPv6 Address                    MAC Address
 P  Up      192.168.1.10/24 <not set>                       00E0.B0B3.D94A

    Gateway: 192.168.1.1
    DNS Server:  <not set>
    Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet
        Hub0
```

• Deleting a Device or Link: To delete a device or link, choose the Delete tool and click on the item you wish to delete.

Step 6: Connecting Hub0 to Switch0

• To connect like-devices, like a Hub and a Switch, we will use a Cross-over cable. Click once the Cross-over Cable from the Connections options.

• Move the Connections cursor over Hub0 and click once.

• Select Port2 (actual port does not matter).

• Move the Connections cursor to Switch0.

• Click once on Switch0 and choose FastEthernet0/3 (actual port does not matter).
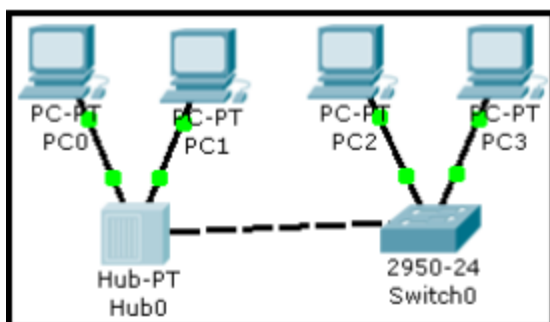
• The link light for switch port FastEthernet0/3 will begin as amber and eventually change to green as the Spanning Tree Protocol transitions the port to forwarding.

✓ **Adding routers and installing modules**

a. In the Network Component Box, click on the router.

b. Select an 1841 router.

c. Move the cursor to the Logical Workspace and click on the desired location.

d. Click on the router to bring up the Configuration Window. This window has three modes: Physical, Config, and CLI (Physical is the default mode). The Physical mode is used to add modules to a device, such as a WAN Interface Card (WIC). The **Config** mode is used for basic configuration. Commands are entered in a simple GUI format, with actual equivalent IOS commands shown in the lower part of the window. The CLI mode allows for advanced configuration of the device. This mode requires the user to enter the actual IOS commands just as they would on a live device.

e. In the Physical mode, click on the router power switch to turn the device off.

f. Select the WIC-2T module and drag it to Slot 0 on the router. Then drag a WIC Cover to Slot1.

g. Power the device back on.

h. Click on the Network Component Box and select Connections. Then select **a Copper Straight-through connection** to connect the router to the hub.

NOTE: The Smart Connection can be used to automatically select the appropriate cable type. However, the user will have no choice as to which interface the connection is assigned to; it will take the first available appropriate interface.

i. Click on the hub and choose Port 3. Then click on the router and choose interface FastEthernet 0/0.

Basic router configuration

a. Click on the Config mode tab of Router0 to begin configuring the device.

b. After the device has finished booting, change the display name of the router to CISCO_1.

Changing the display name does not affect the configuration.

NOTE: If the device hangs up in the booting process, save the activity. Then close the application and reopen the file.

c. Click in the Hostname field and type CISCO_1, and then press the TAB key.

Note the equivalent IOS command is entered in the lower portion of the window.

d. Click on interface FastEthernet 0/0 and assign the IP address 192.168.1.1, then press the TAB key. Enter the subnet mask 255.255.255.0.

e. Click the Port Status to On to enable the port (no shutdown).

Create a copy of the existing router complete with WIC modules already in place

a. Make sure that the existing router is selected (it will be grayed out).

b. In the Main Tool Bar click on the Copy tool.

c. Click on the Paste tool and the copied device will appear in the work area.

d. Drag the new device to the desired location.

e. Click on the Network Component Box and select Connections. Then select the Serial DTE connection.

f. Click on the CISCO_1 router and connect to the Serial 0/0/0 interface.

g. Click on the new router (copy CISCO_1) and connect to the Serial 0/0/0 interface.
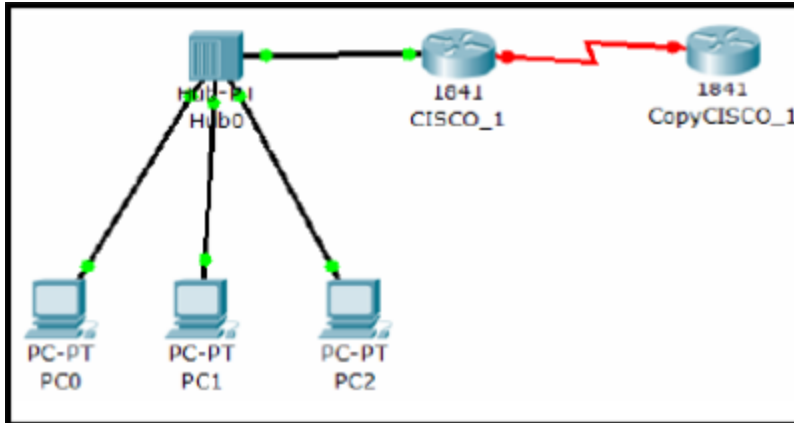
Configuring the WAN link

a. Click on the CISCO_1 router and select the Config mode

b. Select interface Serial 0/0/0

c. Configure the interface Serial 0/0/0 with the IP address 192.168.2.1, then press the TAB key and enter the subnet mask 255.255.255.0 on the interface.

d. Set the clock rate to 56000

e. Click the Port Status to On to enable the port (no shutdown).

f. Click on the new router and select the Config mode.

g. Change the Display Name and Hostname to CISCO_2.

h. Configure the interface Serial 0/0/0 with the IP address 192.168.2.2, then press the TAB key and enter the subnet mask 255.255.255.0 on the interface.

i. Click the Port Status to On to enable the port (no shutdown).

NOTE: The link lights on the serial link should change from red to green to indicate the

link is active.

Configure the routing protocol

a. Click on the CISCO_1 router and select the Config tab. Then click on RIP and add the network address 192.168.1.0 and 192.168.2.0.

b. Click on the CISCO_2 router and select the Config tab. Then click on RIP and add the network address 192.168.2.0.

NOTE: To configure RIP routing protocol, you add the directly connected networks ID IP addresses to each router.

c. Go to each PC and set the Default Gateway to 192.168.1.1

NOTE: The default gateway is the fastethernet port which the PC is connected to.

Set the default gateway on the PCs

a. Click on PC0 and select the Config tab. Enter the default gateway address 192.168.1.1.

b. Click on PC1 and select the Config tab. enter the default gateway address 192.168.1.1.

c. Click on PC2 and select the Config tab. Enter the default gateway address 192.168.1.1.

Test the connectivity of the network

a. Click on the Simulation mode.

b. Select a Simple PDU and click on PC-A as the source, then click on Cisco_2 as the destination. The ping should be successful.

Save the Packet Tracer file

a. **copy startup-config running-config**