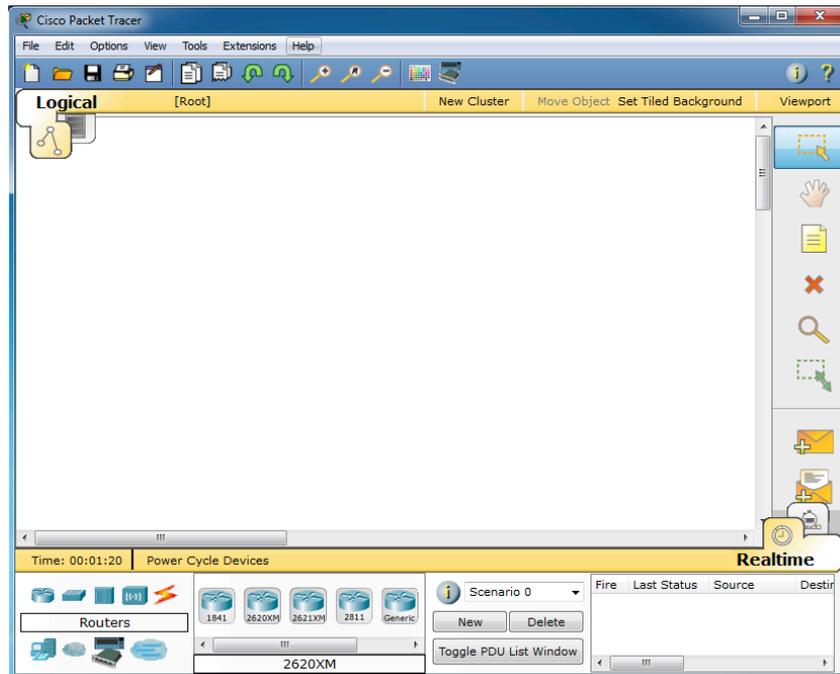


LAB 1 – Introduction to packet tracer

Objectives:

- Learn Packet Tracer to design and simulate networks.
- Learn to create a simple LAN with two PCs using an Ethernet hub and two straight-through cables to connect the workstations.
- Learn to configure and verify the network connectivity.
- Learn about various network related commands.
 - 1.) Click on Packet Tracer Icon on the desktop of your computer screen.
 - 2.) You will see a window appear as below.

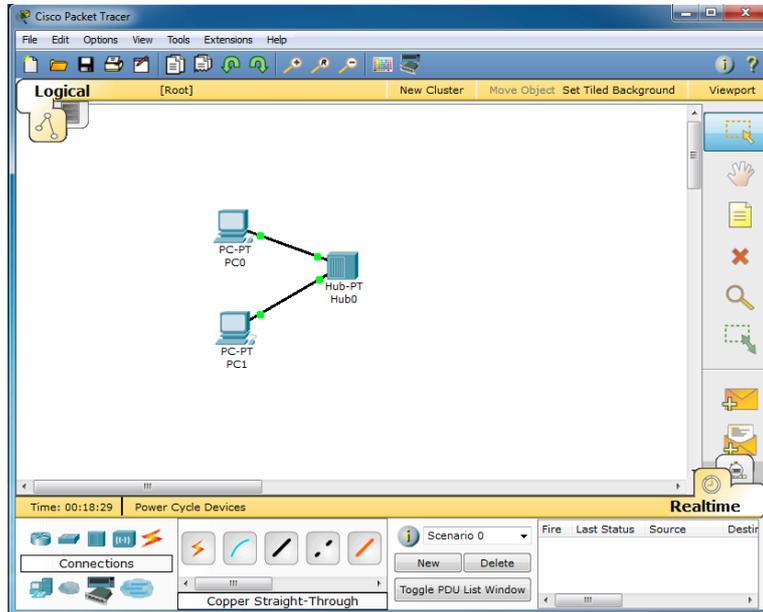


3. Click on Help then click on Tutorials. Under Tutorials -> Click on Interface Overview. An automated tutorial will begin. Try to understand it as much as possible. When finished with the tutorial start the next tutorial. Under Logical Workspace -> click on Creating a Network Topology. Again an automated tutorial will begin and go through it. After finishing, you will now design a simple network next.

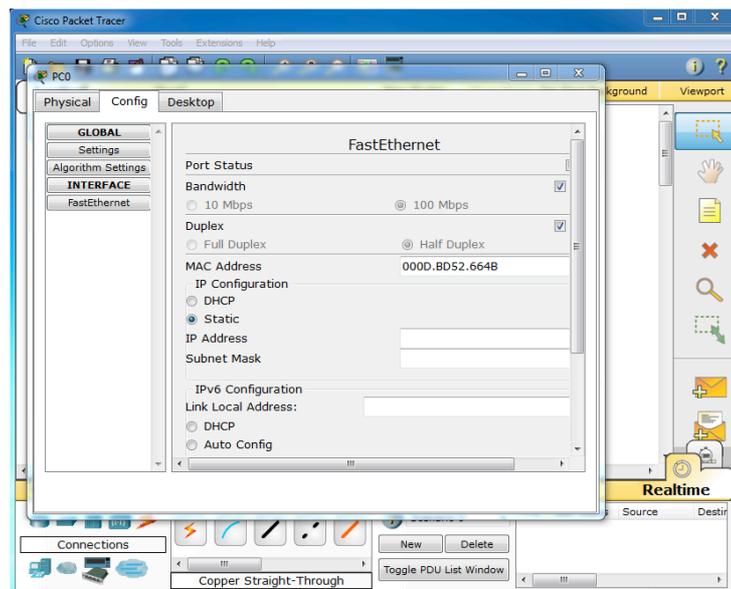
4. By now you should have a basic understanding of Packet Tracer. Now let us make a simple network with 2 PC and a hub or a switch. Move your mouse cursor to lower left corner over the PC icon. Now click on PC icon. On the window right, you will see Generic under a PC icon. Click on it and drag the mouse to main window and drop it. You will see a picture of PC0. Again click on PC icon and drag the mouse to the main window and let it go. You will see another PC1 appearing. That is you have 2 computers on the main window.

5. Now choose a hub. You do this by going to the lower corner and choosing the third icon, note in the box the word Hubs will appear. On the right window next to it, you will see 2 generic devices. Click on it and drag the mouse to main window and let go. This is what you should have by now, 2 PCs and 1 Hub.

6. Now we want to connect the cables. Again lower left corner the 5th icon (zig-zag orange in color) click on it and in box the word connections will appear. Now on the window on right you will see different types of cables appearing. Choose the third on "Copper Straight-Through". Click on this cable and drag it to the PC0 and to the Hub. You will see ports with numbers you may connect to anyone. Again repeat between PC1 and the Hub. This is what you should have by now.



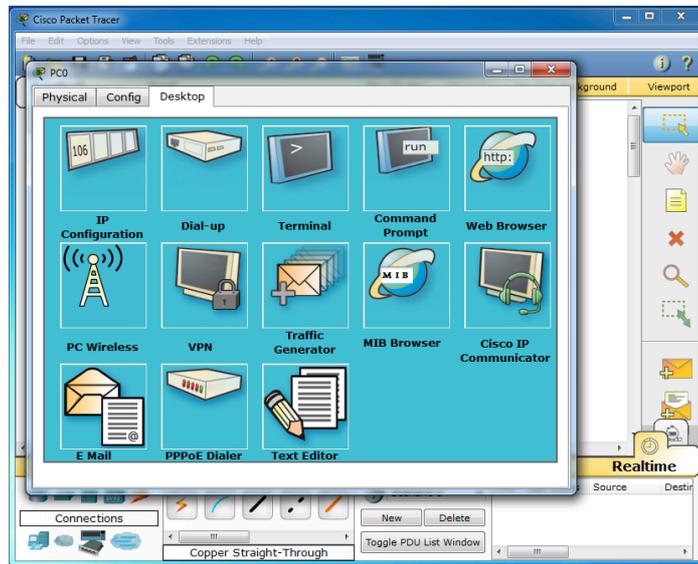
7. Now that we have the simple network, we need to assign IP addresses to the 2 PCs. Fast double click on PC0. You will get pop-up window of PC0 and click on "Config" menu to get the window below. Click on FastEthernet. In the IP Address type in **192.168.7.5** and for subnet mask type **255.255.255.0**. Click on X to close this box afterwards.



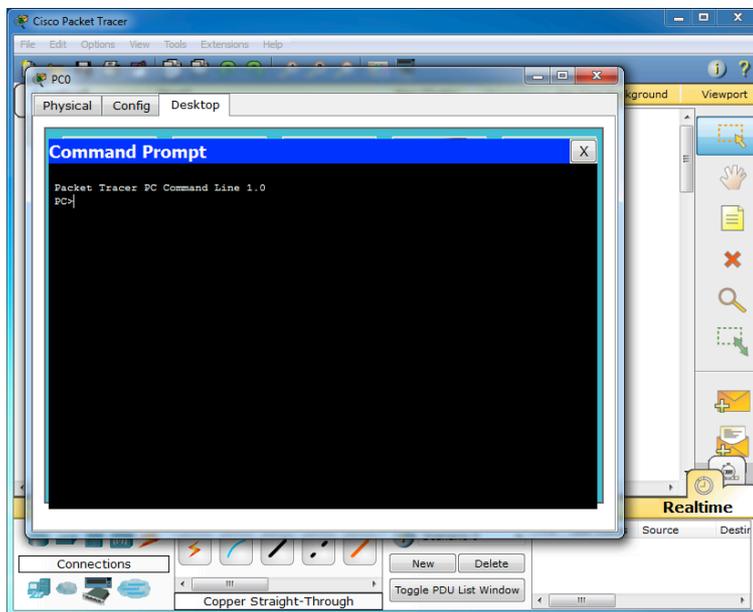
8. Similarly do with PC1 but assign the following IP address **192.168.7.10** and subnet mask **255.255.255.0**

Click on X to close the sub window.

9. To test the ping command. Fast double click on PCO to get the following. Under desktop click on “COMMAND PROMPT” window.



10. You will get the following and in the window type: **ping 192.168.7.10 < press enter >**.



You will see that 4 packets are sent to PC1 and get a reply back. If you do not get a reply then something is wrong with your network. The ping utility shows if the connection between source pc and destination pc is working or not.

11.) After testing out the “ping” command. Do the following exercises.

12.) In the Command Prompt as above instead of typing ping. Now type **ipconfig** < press enter >.

Write down what you get:

IP address	
Subnet mask	
Default gateway:	

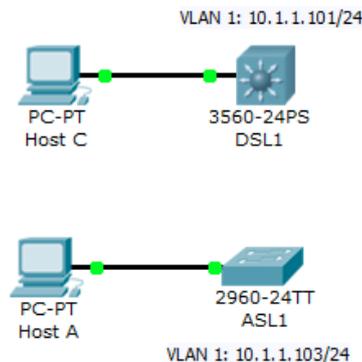
13.) Next type **tracert 192.168.7.10** < press enter >. What do you see ?

14.) Next type **arp -a** <press enter>. What do you see ?

15.) Practice by adding more PCs to your network and assigning IP addresses.

Exercise 3 – Connecting to a Switch and navigating the Cisco Command Line Interface

Create the following topology in Packet Tracer:



There are two ways to access the CLI of the switches in packet tracer: The first one is to click in the switch and then choose the CLI tab, the other is to access them remotely via the client PCs (has would be the case in a real network).

However to access the switches via the PCs some configuration has to be already in the switches, namely the creation of a vty port and the configuration of a management IP address. Connecting via the console port to the equipment is usually how we perform these configurations. To simplify we will do them using the Packet Tracer interface.

1) Select the 2960 Switch1, enter the CLI in the CLI tab of the packet tracer window.

In the terminal you can see that after pressing return you're placed into Cisco CLI with the ">" greater than sign next to the hostname. This is called user mode.

- 2) Press ? to get a context mode sensitive help list of available commands to execute from your current privilege level. Navigate using the space bar and quit using the q key.
- 3) In user mode you can elevate your privileges by issuing the command enable. If an enable password or enable secret is configured then you'll be prompted to provide such authentication information to elevate your privileges.
- 4) In privileged mode enter the command configure terminal. This command will place you into global configuration mode where you can make device configuration changes. The global configuration mode is denoted by the (config)# prompt.

5) Start by erasing the VLAN database file and the startup config:

In privileged EXEC mode, type **delete flash:vlan.dat** and press Enter. If you are asked to confirm, press Enter until you are back to the original prompt.

```
Switch# delete flash:vlan.dat
Delete flash:vlan.dat? [confirm]
Switch#
```

After deleting the vlan.dat file, you can erase the startup configuration on the switch by typing **erase startup-config**. You again have to press Enter to confirm.

```
Switch# erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue?
[confirm]
[OK]
Erase of nvram: complete
Switch#
```

After clearing the switch configuration, reload the switch by typing **reload** and pressing Enter. If you are asked whether to save the current configuration, answer **no**. Press Enter to confirm. The switch starts reloading. Your output might look different depending on the switch model that you are using. This step might take a few minutes, because the switch needs time to reload.

```
Switch# reload

System configuration has been modified. Save? [yes/no]: no
Proceed with reload? [confirm]
```

The switch might log messages to the console, such as interfaces coming up and down. When you see the "Press RETURN to get started!" prompt, press Enter.

If you are asked to enter an initial configuration dialog, type **no**. This places you at the user EXEC prompt. If you accidentally type yes, you can break out of the initial configuration dialog at any time by pressing Ctrl-C. If you are asked whether you want to terminate autoinstall, press Enter for "yes."

6) Perform the same operations in the 3560 switch.

7) Perform initial switch configurations for both switches

Assign each switch a hostname and configure an IP address on the management VLAN according to the diagram. By default, VLAN 1 is used as the management VLAN.

Enter basic configuration commands on each switch according to the diagram.

DLS1 example:

```

Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# hostname DLS1
DLS1(config)# interface vlan 1
DLS1(config-if)# ip address 10.1.1.101 255.255.255.0
DLS1(config-if)# no shutdown

```

(Optional) On each switch, create an enable secret password and configure the vty lines to allow remote access from other network devices.

DLS1 example:

```

DLS1(config)# enable secret cisco
DLS1(config)# line vty 0 15
DLS1(config-line)# password cisco
DLS1(config-line)# login

```

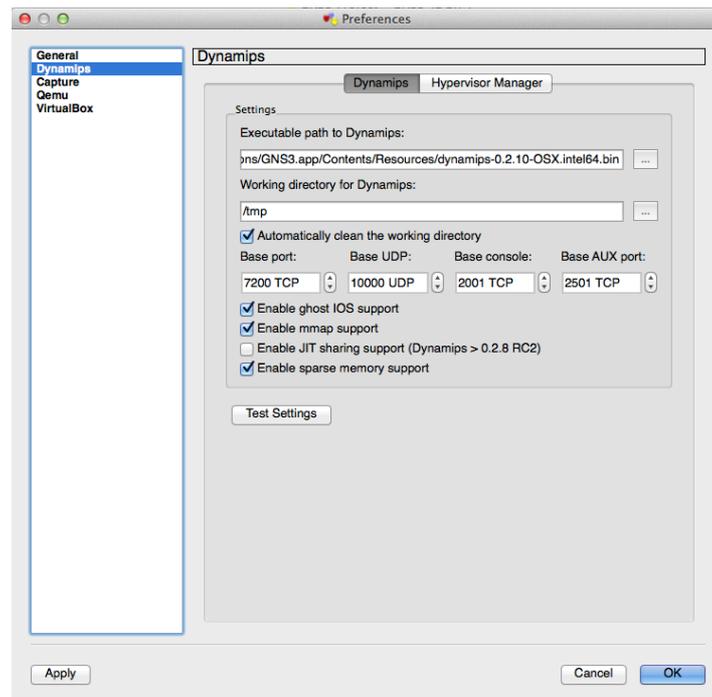
8) After the configuration of the switches you can click in the PCs and in the config tab choose the FastEthernet tab. For host C configure a manual IP address of 10.1.1.100 with a 255.255.255.0 mask. Do the same for host A with address 10.1.1.99 255.255.255.0.

9) Now open the desktop tab in the pc window and start a command prompt. You can now reach the CLI of the switches by telnet to their VLAN 1 IP addresses.

LAB 1 – Introduction to GNS3

1) Install the GNS3 network simulator from the <http://www.gns3.net/> site. GNS3 depends on several other programs to operate. Those dependencies include WinPCAP, Dynamips and Qemu. You should select them for installation during the setup procedure. You can find detailed setup instructions in <http://www.gns3.net/documentation/>.

2) After the installation start the GNS3 Simulator. Verify if Dynamics is running correctly. For this you should go to the preferences menu under the dynamics tab the path for the dynamics file should be file. You can press the test settings button to start dynamics and see if it is operating correctly.



3) The next step is installing IOS images for the routers. GNS3 uses Dynamips as a Hypervisor to run IOS images and provide virtual machines executing the router operating system. You need to provide a path for those images and associate them with the desired router. In the course web page you can find image files to use.

4) Once you have obtained your own copy of a Cisco IOS for one of the supported platforms, you are ready to continue. Supported platforms are Cisco 7200, 3600 series (3620, 3640 and 3660), 3700 series (3725, 3745) and 2600 series (2610 to 2650XM, 2691).

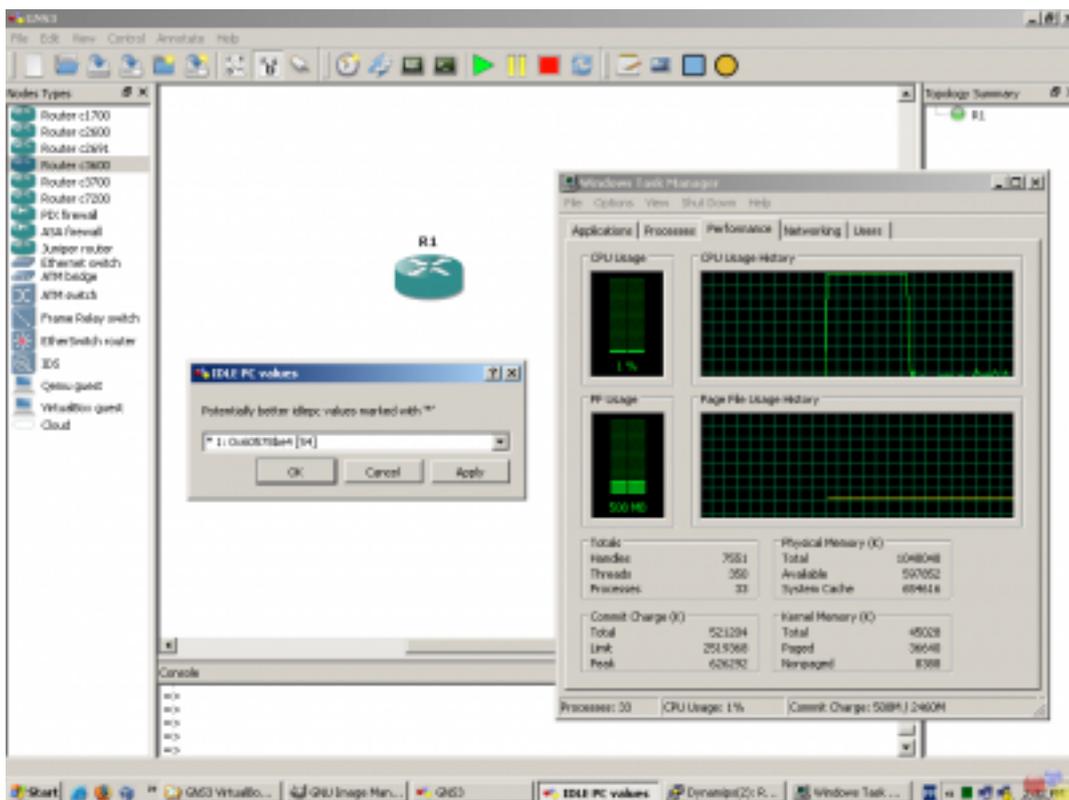
5) On the *Edit* menu, choose *IOS image and hypervisors*. Then under the *IOS Images* tab, click ... and then find your Cisco IOS file and click *Open*. The file will appear as your Image file. Next, click the drop-down arrow next to *Platform* and choose the platform that corresponds to your IOS file.

6) Now click the drop-down arrow next to *Model* and choose the model corresponding to your IOS file. For now, we'll accept the default values that remain. However, there is a very important value called the *IDLE PC* value that we will want to include. We'll get to that later. Click the *Save* button and then the *Close* button. This will return you to the default GNS3 window.

You may need to press *Enter* once initially in the Console window. After a few seconds, your virtual router should have started.

10) Apply an IDLEPC value. Be sure you can see the prompt of your router in Putty window. Right-click R1 and choose *Idle PC*. GNS3 will spend a moment calculating an Idle PC value before presenting the screen to the right. If you click the drop-down arrow, you see a list of possible idlepc values. Potentially better idlepc values are marked with an asterisk. Choose one of the values with an asterick and click *OK*.

If you choose *IOS images and hypervisors* on the *Edit* menu, and double-click on the image under the *IOS Images* tab, you'll see the new idlepc value displayed under *Settings*.



You can use the task manager (windows) activity monitor (MAC OS) or *System Monitor* (Ubuntu) to see the results in the CPU usage by the Dynamips process when you apply different IDLEPC values.

11) Return to the terminal window to use your router. You are actually running the Cisco IOS that you chose. All commands supported by the IOS are available. Take a brief tour entering in the 3 different modes of IOS.