INTRODUCTION TO NETWORKS LAB

Today's lab will focus on creating a small network in Cisco Packet Tracker. The application is a very powerful tool that allows users to emulate a network topology.

Cisco Packet Tracker is installed on all machines in AIT (Engineering), if you are working from home, please download it from the Cisco Website. The download is free, but you must register.

For this lab, students will set up a simple network consisting of a router and two PC's. In addition, students will also use the command line interface, and explore the use of ping within simulation model to visually trace network communication.

CONFIGURATION

STEP 1: HARDWARE SETUP

Hardware setup requires the selection of virtual network components such as routers, switches, and hubs. Once these have been selected students connect these using virtual cabling, ensuring the note which ports they are interfacing with as this will be important later.

1. First click the routers icon in the devices area at the bottom left of Packet tracker and select the 1841 router.
2. Move your mouse to the logical workspace and click to place the router in the logical workspace.
3. Next Click End devices in the device area, and choose PC and place it in the workspace
4. Repeat step 2 to add a second PC.
5. To connect them, click connections and choose the cooper cross over cable.
6. Click on PC 0 and click "FastEthernet" to connect the cable to the PCs fast Ethernet interface. Whilst still in control of the cable connect the other end to Router0 FastEthernet 0-0 Interface.
7. Repeat for PC1 and the remaining "FastEthernet" interface on Router 0.
8. It is possible to move the equipment around the workspace – This is important when dealing with the design of large networks later.

We have now physically set up a network in Packet Tracer!

STEP 2: CONFIGURE THE NETWORK

Although the devices are physically connected, they still cannot communicate with each other. They require some additional network configuration to facilitate this. In this section, students are guided step-by-step through the network configuration process.

1. Click Router 0, and a window will be displayed showing the multiple configuration options for that specific network device.
   - Select the Command Line Interface (CLI) tab.

- You should be prompted with the question "Continue with configuration dialog [Yes/No]:
- Type No and hit return
- We will manually configure the router with commands
- As the prompt suggests, press return to get started.
- At the Router> prompt, type "enable" to enter privileged exec mode

- You should now see Router#

2. Type in "configure terminal" to enter global configuration mode.
3. Type: "hostname myFirstRouter" to name the router.
   - NB: The command prompt now takes in the value of myFirstRouter
4. Next, type "enable secret class" to enable an encrypted password for logging into privileged exec mode
   - NB: Your password is now set to "class"
5. Configure the password for the console line by entering "line console 0"
   - Then enter "password cisco"
   - Enter "login" to enable password prompting
   - Enter "exit" to return to global configuration mode
6. Configure the password for the virtual terminal lines by entering "line vty 0 4"
   - Then enter "password cisco"
   - Enter "login" to enable the password requirement
   - Then enter "exit" to return
7. To configure the FastEthernet interfaces, enter "interface FastEthernet0/0
   - Specify ip address and subnet mask using the command "ip address 192.168.1.1 255.255.255.0"
   - This sets this interfaces IP address and subnet mask.
   - We can optionally specify a description for this interface using "description myFirstRouter FastEthernet0/0"
   - Enter the command "no shutdown" to start the interface
   - Exit back to global config mode "exit"
8. Repeat these steps with FastEthernet0/1 using the following information:
   - "interface FastEthernet0/1"
   - "ip address 192.168.2.1 255.255.255.0"
   - "description myFirstRouter FastEthernet0/1"
   - Type "no shutdown" to enable the interface
   - Exit out of interface config mode "exit"
   - Exit out of global config mode "exit"
9. Hit enter at this prompt and you should be back to the myFirstRouter# prompt
   - i.e. privileged exec mode!
10. Enter "show running-config" to display the current configuration
   - Scroll down by hitting enter

11. To save this configuration so that the router gets it every time it boots up, type "copy running-config startup-config"

- Hit enter at the next prompt to confirm
- The router configuration is now complete!
- Close the myFirstRouter window via the X at the top right hand side of the screen!

STEP 3: CONFIGURE THE PC'S

1. First click PC 0 and go to the Desktop Tab

- Select IP Configuration
- We will set a static IP address
- Specify the IP address as 192.168.1.2 then hit tab
- Leave the default subnet mask as is i.e. 255.255.255.0
- Hit tab again and enter 192.168.1.1 for the default gateway
- Close the PC0 window

2. Repeat for PC 1

- Set IP address as 192.168.2.2
- Hit tab again and enter 192.168.2.1 for the default gateway
- Then close PC1 Window

STEP 4: TEST THE NETWORK

Now we see green dots on the cables on the devices, this means we have configured correctly!

1. Let's try pinging PC1 from PC0

- Click PC0
- Go the desktop tab and click command prompt
- This is the same as a DOS prompt in a windows OS
- Type in "ipconfig" and we will see the details we have just set for the PC0
- Try the ping command to talk from PC0 to PC1
- ping 192.168.2.2

Note: At first you may get request timed out, but then it will reach PC1. Repeat, ping 192.168.2.2 and it should work correctly.

We have successfully created the network, and the end devices can communicate with each other!

Next, lets visually see the ping with simulation mode!

1. In the bottom right corner, there is a button named "Simulation", click on this option and a simulation panel will load on the right of the screen.

- Click "Edit Filters", and click the show all/none box to clear selections
- Select ICMP
- On the top of the screen, click on closed envelope with the plus symbol. This will allow

us to select a source and destination for our protocol data unit

- Click PC0 and then PC1 as shown
- An envelope with a colour will appear at PC0
- Click AutoCapture/Play
- This begins the ping simulation
- PDU travels from PC0 to router0 and then to PC1
- Once it arrives back at PC0, it is verified and checked off i.e. the ping was a success.

LAB COMPLETE

You have created a network, configured it and sent packets from one end point to another.