TNE20003 – Internet and Cybersecurity for Engineering Applications

Portfolio Task – Lab 2 Pass
Task

Aims:

- To subnet a network according to the given class address and network diagram in figure 1 (task 1)

- Build and implement an addressed network according to the given network diagram in figure 2 below on Packet Tracer (PT) (task 2)

Preparation:

- View "IP Subnetting" & "IP address and subnetting task-1" & "Network Addressing & Subnetting"

Due Date:

- Task1 must be completed before the lab and uploaded to Canvas. Your demonstrator will check the answers to the questions and your working out for task 1 and may ask questions during the lab session. Task 2 will be assessed via an online quiz. You must score at least 70% to pass the test. You will be allowed up to 5 attempts to reach this score. You are encouraged to complete the test during the lab but if you do not, you must complete it before your next lab class.

Task 1.

Subnet and Address a Network According to Provided Requirements

In this task, you will

- Undertake the subnetting needed for the network shown in the diagram below and provide Addressing for each network/subnetwork in that diagram.

Instructions

1. Using the examples provided in the documents under the tutorial section under modules on Canvas for this unit, carry out the relevant subnetting to completely address the network shown below.
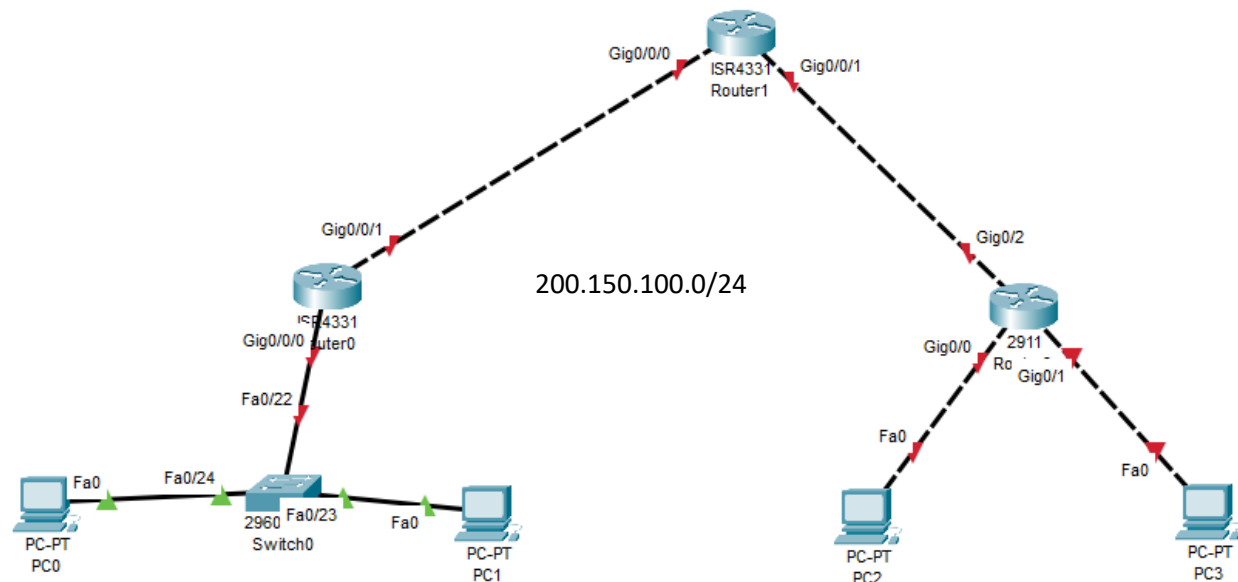

Figure 1

Some things you may want to consider are:

What class of network is the given address? Network Address: 200.150.100.0/24 -> class C (192-223 in the first octet)

How many networks are shown in the diagram? Identify them on the diagram.

6 networks: R0-R1, R1-R2, R0-S0, PC0 and PC1 - S0, PC2-R2, PC3-R2.

How many host addresses are possible per network/subnetwork?

Number of host bit: 32 - 24 = 8 (because the subnet mask is /24)
Number of usable host per subnet: 2^8 - 2 = 256 - 2 = 254

WORKING OUT

Task 2.

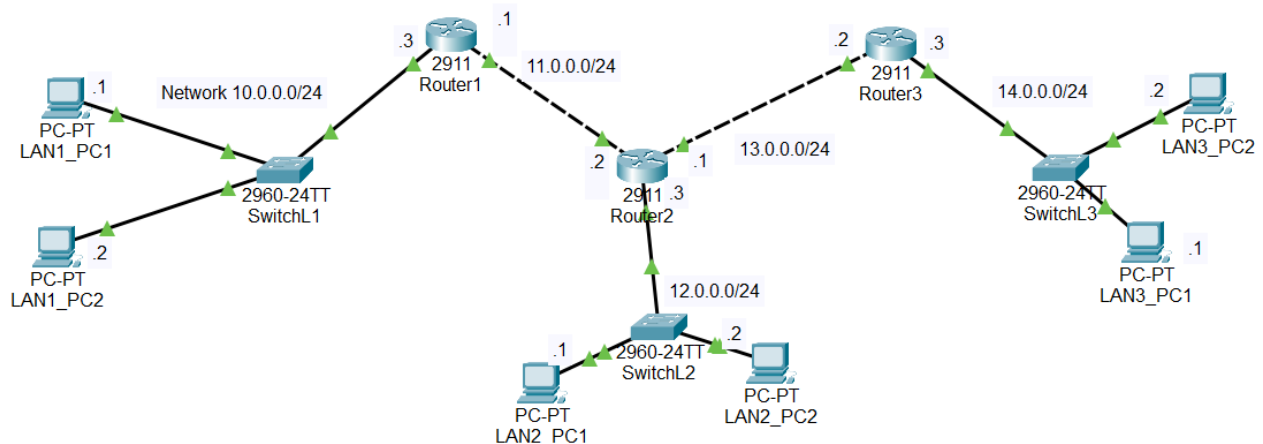- For the network given in figure 2 you must build and implement it on Packet Tracer (PT)

Figure 2

Instructions

Start up the PT software and go to the bottom left-hand corner of the Packet tracer screen which displays the icons that represent device categories or groups, such as **Routers**, **Switches**, or **End Devices**.

Moving the cursor over the device categories will show the name of the category in the box. To select a device, first select the device category. When the device category is selected, the options within that category appear in the box next to the category listings. Select the device option that is required.

a. Select **End Devices** from the options in the bottom left-hand corner. Drag and drop 6 PCs onto your design area.

b. Select **Switch** from the options in the bottom left-hand corner. Add 3 2960 switches to your network by dragging them onto your design area.

c. Select **Router** from the options in the bottom left-hand corner. Add 3 2911 routers to your network by dragging them onto your design area.

d. Double click on each of the devices and name them as per the network diagram in figure 2.

e. Select **Connections** from the bottom left-hand corner. Choose a copper straight-through cable type. Connect all PCs to their respective switches using this cable type as per the network diagram. You may choose any of the **FastEthernet** ports.

f. Select **Connections** from the bottom left-hand corner. Choose a copper straight-through cable type. Connect each of the Switches to their respective Routers as per the network diagram. Again, you may choose any of the **FastEthernet** ports on the switch and any of the **GigabitEthernet** ports on the Routers.

g. Select **Connections** from the bottom left-hand corner. Choose a copper cross-over cable type. Connect each of the routers to each other as per the network diagram.

There should be green dots at both ends of each cable connection after the network has converged. If not, double check the cable type selected. Note, with the routers in particular, you may need to turn that interface on by clicking the **"on"** button under the interface tab or by issuing the command **"no shut"** on the interface in the CLI mode.

See below:

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#no shut
```

1. Configure Host names and IP Addresses on the PCs, the switches and the routers

   a. Click on one of the PCs connected to SwitchL1. Select the **Config tab**. Change the PC Display Name to **LAN1_PC1**. Select **FastEthernet tab** on the left and add the IP address and subnet mask as 10.0.0.1/24. Close LAN1_PC1 when done.

   b. Click on the other PC connected to SwitchL1. Select the **Config tab**. Change the PC Display Name to **LAN1_PC2**. Select **FastEthernet tab** on the left and add the IP address and subnet mask as 10.0.0.2/24. Close LAN1_PC2 when done.

   c. Click on the switch connected to Router 1. Select the **Config tab**. Change the Switch Display Name to **SwitchL1.**

   d. Click on **Router1**. Select the **Config tab**. Change the Router Display Name to **Router1**. Find the **GigabitEthernet** interface which has been turned then add the IP address and subnet mask as 10.0.0.3/24.

   e. Repeats steps a)-d) above for the other 2 clusters of router, switch and PCs so that the complete network has been named and configured with the relevant IP addresses as per the network diagram shown in figure 2.

2. Carry out some basic connectivity tests.

    a. Click on Lan1_PC1 and choose "**desktop**" and then click on the "**command prompt**"
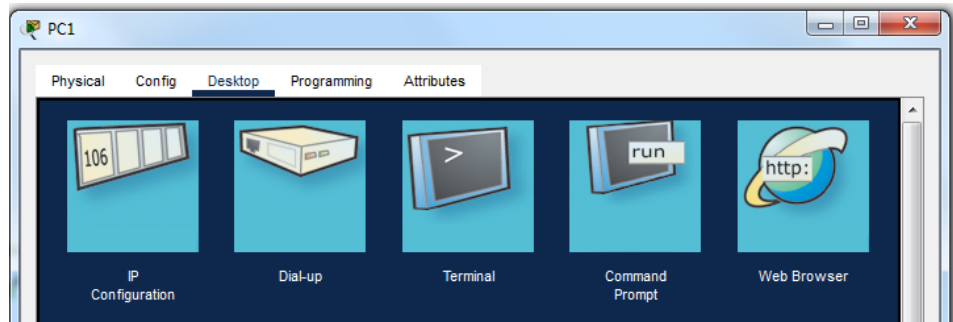
    b. In the "**command prompt**" window type "**ping 10.0.0.3**"

    c. Note what is displayed. Did the ping work?

    d. In the "**command prompt**" window type "**ping 10.0.0.2**"

    e. Note what is displayed. Did the ping work?

    f. In the "**command prompt**" window type "**ping 11.0.0.1**"

    g. Note what is displayed. Did the ping work?

~~~~~ End of Lab ~~~~~