SWINBURNE UNIVERSITY OF TECHNOLOGY

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

Preparation:

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

Task Completion

- Upon completion of this task you are to demonstrate and explain your successful subnetting to the lab instructor who will then mark you as having completed this task. Your instructor will ask you some questions to allow you to show the depth of your understanding.

Due Date:

- All tasks in this lab are to be completed and demonstrated to your Lab instructor preferably during or at the end of the current lab, but if you do not complete the tasks you may demonstrate it at the beginning of your next lab class.

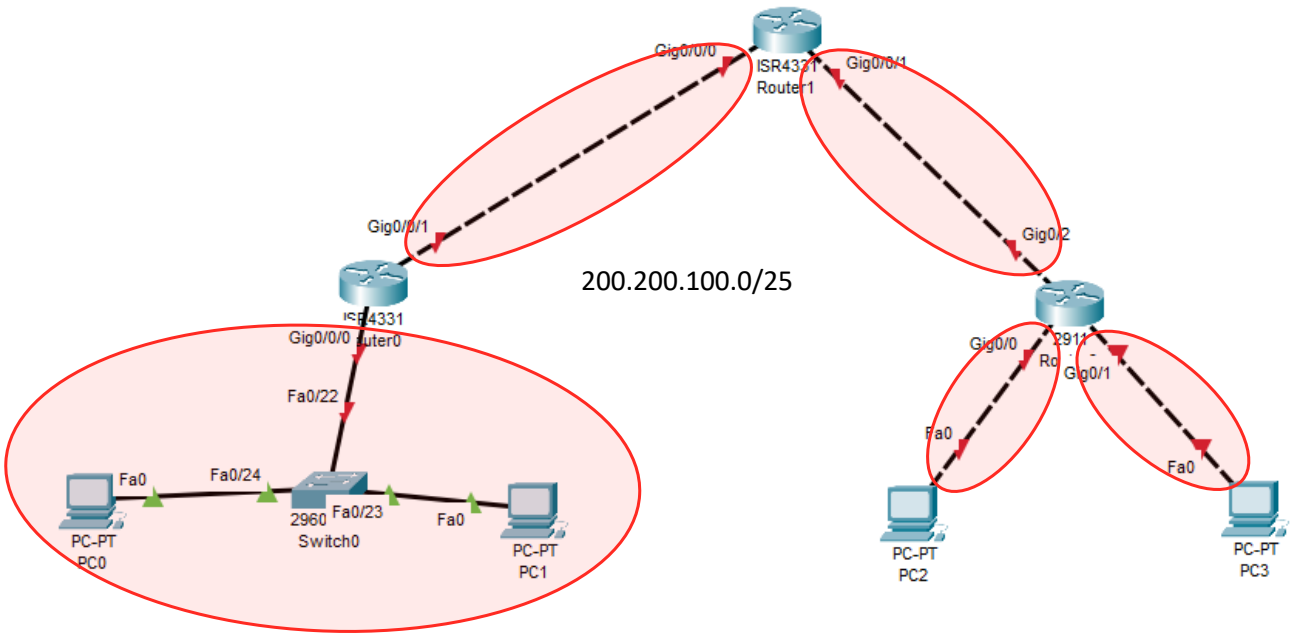
Subnet and Address a Network According to Provided Requirements

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.



Some things you may want to consider are:

What class of network is the given address?

Class C, since the first octet of the major network is 200, and 200 belongs to class C network (191 to 223)

How many networks do I have in the diagram?

There are five networks in total, including the connection from Router0 to Switch0, Router 2 to PC2 and PC3 and the two point-to-point connections between Router0 and Router1, Router1 and Router 2

How many host addresses are possible per network/subnetwork?

The number of possible host addresses per network/subnetwork is 14 network

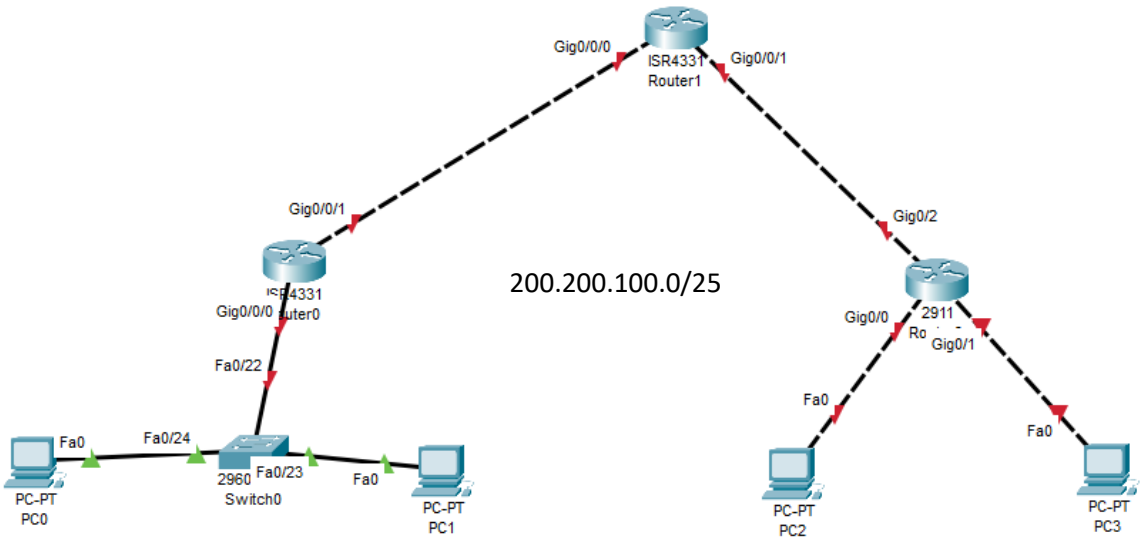
WORKING OUT

Since there are five networks on this diagram, we have to adjust the subnet mask for a correct adjustment for representing five networks. For five networks, we will need to borrow three bits from the host address to the network address (since $2^3 = 8 > 5$) of the subnet mask for creating the subnets. If we break down the /25 to the binary, it should looks like this 11111111.11111111.11111111.10000000. As I have mentioned before, we have to borrow three bits from the host address, so the new subnet mask will look like this: 11111111.11111111.11111111.1111000. Therefore, the new subnet mask will be /28. With this subnet, we can easily calculate the number of possible host address, which is $2^4 - 2 = 14$ host addresses (subtract of 2 because the first and last addresses are reserved for network and broadcast address).

Portfolio Task – Lab 2 Credit Task

Aims:

- Using the addressing you carried out in the Pass Task of this lab you must build and implement an addressed network according to the given network diagram below on Packet Tracer (PT)



Preparation:

- View "TNE20003 Lab1-P_Student" for instruction on Packet Tracer implementation.

Task Completion

- Upon completion of this task you are to demonstrate your network implemented on PT. Your lab instructor will then mark you as having completed this task. Your instructor will ask you some questions to allow you to show the depth of your understanding.

Due Date:

All tasks in this lab are to be completed and demonstrated to your Lab instructor preferably during or at the end of the current lab, but if you do not complete the tasks you may demonstrate it at the beginning of your next lab class.

LAB 2 Credit Task Explanation

After obtaining the new subnet mask, which is /28 and the number of networks on the topology, which is five, we are now able to calculate the network address for each network.

With the /28 subnet mask, the increments between each subnet is 16. This is because in /28, there are four host bits and that allows me to create a “gap” between each network address, which is 2^4 = 16 possible host addresses per network.

First address
IP Address: 200.200.100.0
Subnet Mask: /28: 255.255.255.240

Second address
IP Address: 200.200.100.16
Subnet Mask: /28: 255.255.255.240

Third address
IP Address: 200.200.100.32
Subnet Mask: /28: 255.255.255.240

Fourth address
IP Address: 200.200.100.48
Subnet Mask: /28: 255.255.255.240

Fifth address
IP Address: 200.200.100.64
Subnet Mask: /28: 255.255.255.240

PC0
IP Address: 200.200.100.1
Subnet Mask: /28: 255.255.255.240
Default Gateway: 200.200.100.4

PC1
IP Address: 200.200.100.2
Subnet Mask: /28: 255.255.255.240
Default Gateway: 200.200.100.4

PC2
IP Address: 200.200.100.51
Subnet Mask: /28: 255.255.255.240
Default Gateway: 200.200.100.50

PC3
IP Address: 200.200.100.70
Subnet Mask: /28: 255.255.255.240
Default Gateway: 200.200.100.69

Router0
g0/0/0 IP Address: 200.200.100.4
g0/0/1 IP Address: 200.200.100.18
Subnet Mask: /28: 255.255.255.240

Router1
g0/0/0 IP Address: 200.200.100.19
g0/0/1 IP Address: 200.200.100.34
Subnet Mask: /28: 255.255.255.240

Router2
g0/0 IP Address: 200.200.100.35
g0/1 IP Address: 200.200.100.50
g0/2 IP Address: 200.200.100.69
Subnet Mask: /28: 255.255.255.240

Portfolio Task – Lab 2
Distinction Task

Aims:

- Demonstrate successful end-to-end connectivity of the addressed network implemented in Packet Tracer from the Credit Task above.

Preparation:

- Using Self-Directed learning find out about static routes
    - What are they?
    - What are they used for?
    - How do you implement them?
    - Which device(s) are they placed on?
- Static routes are vital for you to be able to achieve end-to-end Connectivity.

Task Completion

- Upon completion of this task you are to demonstrate and explain your successful implementation of static routes to the lab instructor who will then mark you as having completed this task. Your instructor will ask you some questions to allow you to show the depth of your understanding.

Due Date:

All tasks in this lab are to be completed and demonstrated to your Lab instructor preferably during or at the end of the current lab, but if you do not complete the tasks you may demonstrate it at the beginning of your next lab class.

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