FACULTY OF INFORMATION TECHNOLOGY
BACHELOR OF SCIENCE IN INFORMATICS AND COMPUTER SCIENCE
ICS 2203 - Advanced Networking
Lab Assignment 2-IP Version 4 Static Route Configuration

Instructions: *This assignment is due on Tuesday 18th September, 11:55 pm for C*

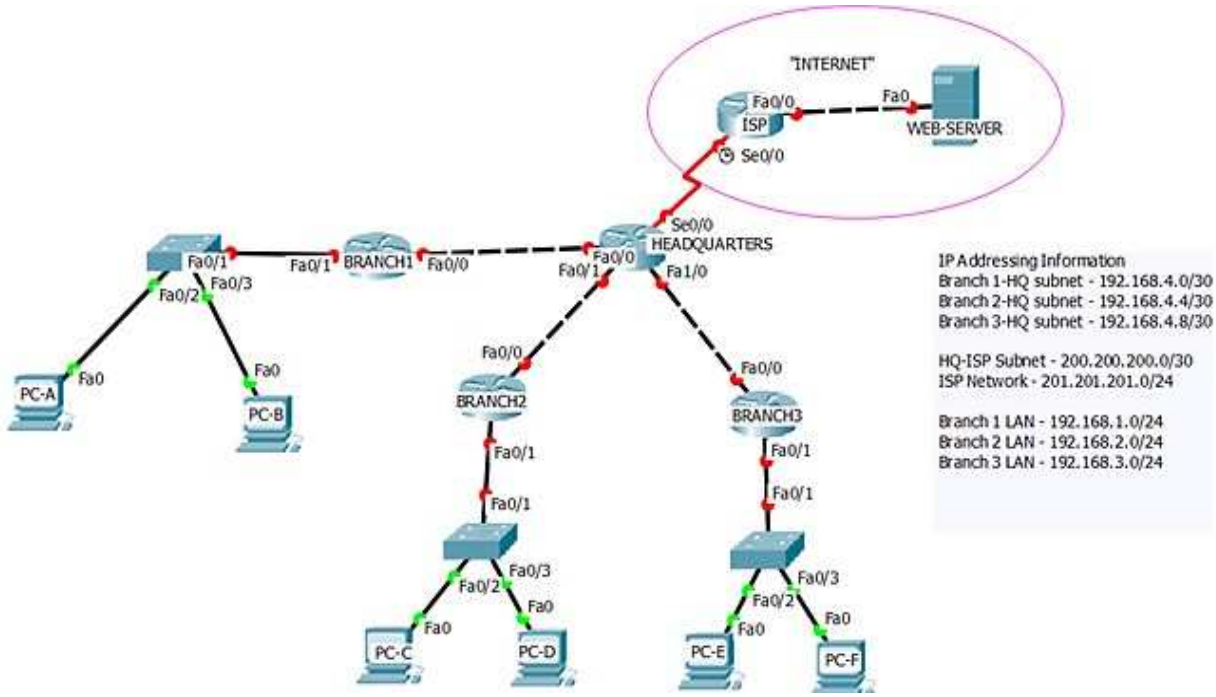
Assignment Objectives:

At the end of the assignment you should be able

i. To apply your subnetting skills in address allocation
ii. To apply the correct syntax for IPv4 static routing
iii. To apply various types of static routes: summary static, default static and standard static routes
iv. To troubleshoot various static routing issues

The Scenario

In the topology below, there are three branches of a company connected to a single headquarter (HQ) router, which is connected to a single service provider as shown.



Note:

- The routers used are: 2621XM *(found in Miscellaneous in Packet Tracer 7.0 and in Custom Made Devices in Packet Tracer 6.2).*
- The switches used are 2960

- Clocking will done by the ISP. The clock rate used is 128000
- The IP address allocation will use the following policy:
  - For the branch LANs, the last usable address of the network is assigned to the branch router interface, the rest of the addresses can be assigned to the PCs in each LAN
  - For the branch-HQ subnet, the lowest usable address in subnet will be assigned to the HQ router
  - For the HQ-ISP subnet, the lowest usable address in subnet will beassigned to the HQ router
  - For the ISP network, the first usable address in network will be assigned to the ISP router, while the last usable address is assigned to the webserver

REQUIRED:

Examine the topology above, the IP addressing given and the notes and use the information to perform the following tasks:

Task 1: Using the policy given in the notes, determine the IP addresses that you will configure and fill the table below. *Show working where necessary.*

Device	Interface	IP Address	Subnet Mask	Default Gateway *(where applicable)*
HQ	S0/0			
ISP	S0/0			
ISP	Fa0/0			
HQ	Fa0/0			
Branch 1	Fa0/0			
HQ	Fa0/1			
Branch 2	Fa0/0			
HQ	Fa1/0			
Branch 3	Fa0/0			
Branch 1	Fa0/1			
Branch 2	Fa0/1			
Branch 3	Fa0/1			
PC-A				
PC-B				
PC-C				
PC-D				
PC-E				
PC-F				

Webserver				

Task 2: Connect your devices as shown in the topology on page 1. Ensure you use the correct equipment cables and interfaces. *Refer to the notes and the topology on page 1.*

Task 3: Configure PCs and webserver

a. Using the information determined in Task 1 above configure the PCs and webserver's IP settings.
b. Ensure that the PCs in each LAN can communicate with each other.

Task 3: Configure the following basic router settings

a. Router names *(refer to the topology)*
b. Appropriate banners
c. Interface addressing (*refer to topology and table in task 1)*
d. Appropriate interface descriptions
e. Ensure that each routers can communicate with each directly connected router interface
f. Ensure that the webserver can communicate with the ISP

Task 4: Examine the Routing Tables

a. Examine the routing tables of the HQ router and ISP and note down the routing table entries
b. Examine the routing tables of each of the branch routers starting from branch 1, and note down the routing table entries
c. Summarise all the networks listed in (b) above.
d. Is your summary address above a supernet or regular summary address?

Task 5: Test for Connectivity

a. Does the ping between the following pair of devices succeed?
    i. PC-A to PC-B
    ii. PC-A to PC-C
    iii. PC-A to PC-E
    iv. PC-A to Webserver
    v. PC-C to PC-E
    vi. PC-C to Webserver
    vii. PC-F to Webserver
b. Explain your answers in (a) above

Task 6: Configure Static Routing

a. Examine your topology again to determine the remote networks and their IP addresses
b. On ISP configure one static route to the branches and HQ using the summary address determined in task 4 (c) above. Ensure that the exit interface points in the direction of the branches
c. On HQ configure a default static route pointing towards the ISP *(NB: you will need to Google for the command to use)*
d. On HQ configure static routes to each of the branches

e. On branches configure static routes to enable them (branches) to reach each other
f. On the each of the branches configure a default static route pointing towards HQ to allow them to reach the webserver and ISP

Task 7: Test for Connectivity again

b. Does the ping between the following pair of devices succeed?
    i. PC-A to PC-B
    ii. PC-A to PC-C
    iii. PC-A to PC-E
    iv. PC-A to Webserver
    v. PC-C to PC-E
    vi. PC-C to Webserver
    vii. PC-F to Webserver
c. Explain your answers in (a) above

Task 8: Submit the Assignment

a. Save the Packet tracer file using your admission number and surname e.g. 091823-Mwangi
b. Save your answers to tasks 1, 4, 5 and 7 in a word document. Name the file using your admission number and surname
c. Upload your files on e-learning.

NB: *On e-learning, this assignment allows you to upload 2 unzipped files as long as you pick them one file after the other before you click on the submit button. You can also edit the submission if the assignment has not expired.*