Lab 3.5.4: Subnetting Scenario 3
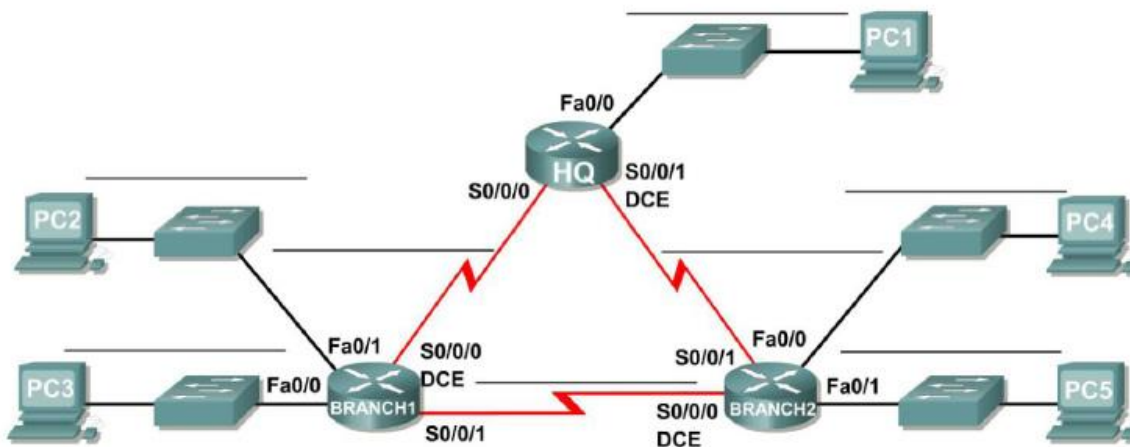
Topology Diagram

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
HQ	Fa0/0			N/A
	S0/0/0			N/A
	S0/0/1			N/A
BRANCH1	Fa0/0			N/A
	Fa0/1			N/A
	S0/0/0			N/A
	S0/0/1			N/A
BRANCH2	Fa0/0			N/A
	Fa0/1			N/A
	S0/0/0			N/A
	S0/0/1			N/A
PC1	NIC			
PC2	NIC			
PC3	NIC			
PC4	NIC			
PC5	NIC			

Learning Objectives

Upon completion of this lab, you will be able to:

- Determine the number of subnets needed.
- Determine the number of hosts needed.
- Design an appropriate addressing scheme.
- Conduct research to find a possible solution.

Scenario

In this lab, you have been given the network address 192.168.1.0/24 to subnet and provide the IP addressing for the network shown in the Topology Diagram. The network has the following addressing requirements:

- The BRANCH1 LAN 1 will require 15 host IP addresses.
- The BRANCH1 LAN 2 will require 15 host IP addresses.
- The BRANCH2 LAN 1 will require 15 host IP addresses.
- The BRANCH2 LAN 2 will require 15 host IP addresses.
- The HQ LAN will require 70 host IP addresses.
- The link from HQ to BRANCH1 will require an IP address for each end of the link.
- The link from HQ to BRANCH2 will require an IP address for each end of the link.
- The link from HQ to BRANCH1 to BRANCH2 will require an IP address for each end of the link.

(**Note:** Remember that the interfaces of network devices are also host IP addresses and are included in the above addressing requirements.)

Task 1: Examine the Network Requirements.

Examine the network requirements and answer the questions below. Keep in mind that IP addresses will be needed for each of the LAN interfaces.

How many subnets are needed? _____

What is the maximum number of IP addresses that are needed for a single subnet? _____

How many IP addresses are needed for each of the branch LANs? _____

What is the total number of IP addresses that are needed? _____

Task 2: Design an IP Addressing Scheme

Subnet the 192.168.1.0/24 network into the appropriate number of subnets.

Can the 192.168.1.0/24 network be subnetted to fit the network requirements? _____

If the "number of subnets" requirement is met, what is the maximum number of hosts per subnet? _____

If the "maximum number of hosts" requirement is met, what is the number of subnets that will be available to use? _____

Task 3: Reflection

You do not have enough address space to implement an addressing scheme. Research this problem and propose a possible solution. Increasing the size of your original address space is not an acceptable solution. (**Hint:** We will discuss solutions to this problem in Chapter 6.)

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Attempt to implement your solution. Successful implementation of a solution requires that:

- Only the 192.168.1.0/24 address space is used.
- PCs and routers can ping all IP addresses.