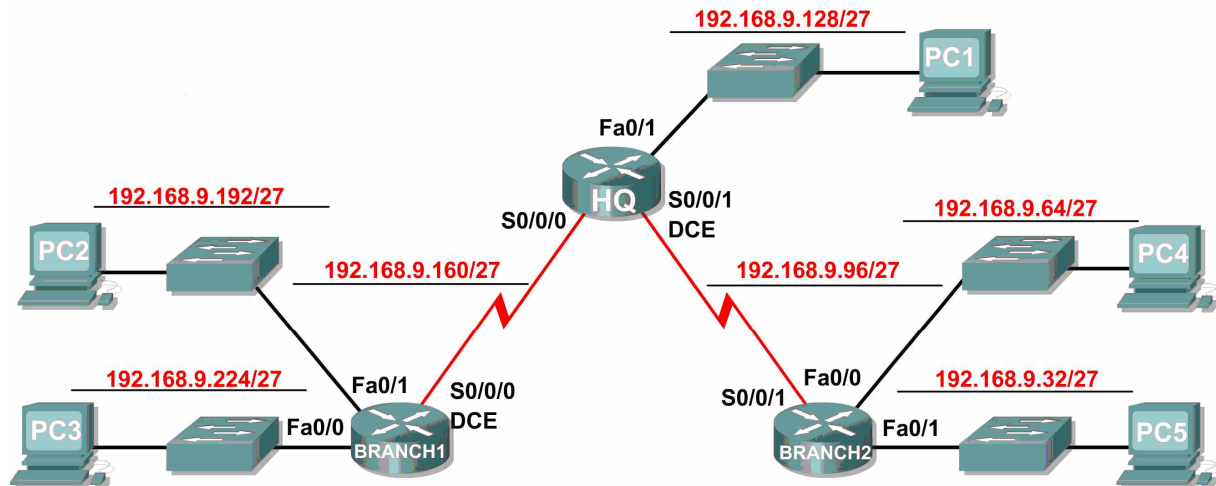


Activity 3.5.2: Subnetting Scenario 1 (answers)

Topology Diagram



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
HQ	Fa0/0	192.168.9.129	255.255.255.224	N/A
	S0/0/0	192.168.9.161	255.255.255.224	N/A
	S0/0/1	192.168.9.97	255.255.255.224	N/A
BRANCH1	Fa0/0	192.168.9.193	255.255.255.224	N/A
	Fa0/1	192.168.9.1225	255.255.255.224	N/A
	S0/0/0	192.168.9.190	255.255.255.224	N/A
BRANCH2	Fa0/0	192.168.9.65	255.255.255.224	N/A
	Fa0/1	192.168.9.33	255.255.255.224	N/A
	S0/0/1	192.168.9.126	255.255.255.224	N/A
PC1	NIC	192.168.9.158	255.255.255.224	192.168.9.129
PC2	NIC	192.168.9.222	255.255.255.224	192.168.9.193
PC3	NIC	192.168.9.254	255.255.255.224	192.168.9.225
PC4	NIC	192.168.9.94	255.255.255.224	192.168.9.65
PC5	NIC	192.168.9.62	255.255.255.224	192.168.9.33

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.

- Assign addresses and subnet mask pairs to device interfaces and hosts.
- Examine the use of the available network address space.
- Determine how static routing could be applied to the network.

Scenario

In this lab, you have been given the network address 192.168.9.0/24 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 10 host IP addresses.
- The BRANCH1 LAN 2 will require 10 host IP addresses.
- The BRANCH2 LAN 1 will require 10 host IP addresses.
- The BRANCH2 LAN 2 will require 10 host IP addresses.
- The HQ LAN will require 20 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.

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? 7

What is the maximum number of IP addresses that are needed for a single subnet? 21

How many IP addresses are needed for each of the branch LANs? 11

What is the total number of IP addresses that are needed? 69

Task 2: Design an IP Addressing Scheme.

Step 1: Subnet the 192.168.9.0 network into the appropriate number of subnets.

What will the subnet mask be for the subnetworks? 255.255.255.224 or /27

How many usable host IP addresses are there per subnet? 30

Fill in the following chart with the subnet information.

Subnet Number	Subnet Address	First Usable Host Address	Last Usable Host Address	Broadcast Address
0	192.168.9.0	192.168.9.1	192.168.9.30	192.168.9.31
1	192.168.9.32	192.168.9.33	192.168.9.62	192.168.9.63
2	192.168.9.64	192.168.9.65	192.168.9.94	192.168.9.95
3	192.168.9.96	192.168.9.97	192.168.9.126	192.168.9.127
4	192.168.9.128	192.168.9.129	192.168.9.158	192.168.9.159
5	192.168.9.160	192.168.9.161	192.168.9.190	192.168.9.191
6	192.168.9.192	192.168.9.193	192.168.9.222	192.168.9.223
7	192.168.9.224	192.168.9.225	192.168.9.254	192.168.9.255

Step 2: Assign the subnets to the network shown in the Topology Diagram.

When assigning the subnets, keep in mind that routing will need to occur to allow information to be sent throughout the network. The subnets will be assigned to the networks to allow for route summarization on each of the routers.

1. Assign subnet 1 to the BRANCH2 LAN 2: _____ 192.168.9.32 /27 _____
2. Assign subnet 2 to BRANCH2 LAN 1 subnet address: _____ 192.168.9.64 /27 _____
3. Assign subnet 3 to link from HQ to BRANCH2 subnet address: _____ 192.168.9.96 /27 _____
4. Assign subnet 4 to HQ LAN subnet address: _____ 192.168.9.128 /27 _____
5. Assign subnet 5 to link from HQ to BRANCH1 subnet address: _____ 192.168.9.160 /27 _____
6. Assign subnet 6 to BRANCH1 LAN 2 subnet address: _____ 192.168.9.192 /27 _____
7. Assign subnet 7 to BRANCH1 LAN 1 subnet address: _____ 192.168.9.224 /27 _____

Task 3: Assign IP Addresses to the Network Devices

Assign the appropriate addresses to the device interfaces. Document the addresses to be used in the Addressing Table provided under the Topology Diagram.

Step 1: Assign addresses to the HQ router.

1. Assign the first valid host address in the HQ LAN subnet to the LAN interface.
2. Assign the first valid host address in link from HQ to BRANCH1 subnet to the S0/0/0 interface.
3. Assign the first valid host address in link from HQ to BRANCH2 subnet to the S0/0/1 interface.

Step 2: Assign addresses to the BRANCH1 router.

1. Assign the first valid host address in the BRANCH1 LAN 1 subnet to the Fa0/0 LAN interface.
2. Assign the first valid host address in the BRANCH1 LAN 2 subnet to the Fa0/1 LAN interface.
3. Assign the last valid host address in link from HQ to BRANCH1 subnet to the WAN interface.

Step 3: Assign addresses to the BRANCH2 router.

1. Assign the first valid host address in the BRANCH2 LAN 1 subnet to the Fa0/0 LAN interface.
2. Assign the first valid host address in the BRANCH2 LAN 2 subnet to the Fa0/1 LAN interface.
3. Assign the last valid host address in link from HQ to BRANCH2 subnet to the WAN interface.

Step 4: Assign addresses to the host PCs.

1. Assign the last valid host address in the HQ LAN subnet to PC1.
2. Assign the last valid host address in the BRANCH1 LAN 1 subnet to PC2.
3. Assign the last valid host address in the BRANCH1 LAN 2 subnet to PC3.
4. Assign the last valid host address in the BRANCH2 LAN 1 subnet to PC4.
5. Assign the last valid host address in the BRANCH2 LAN 2 subnet to PC5.