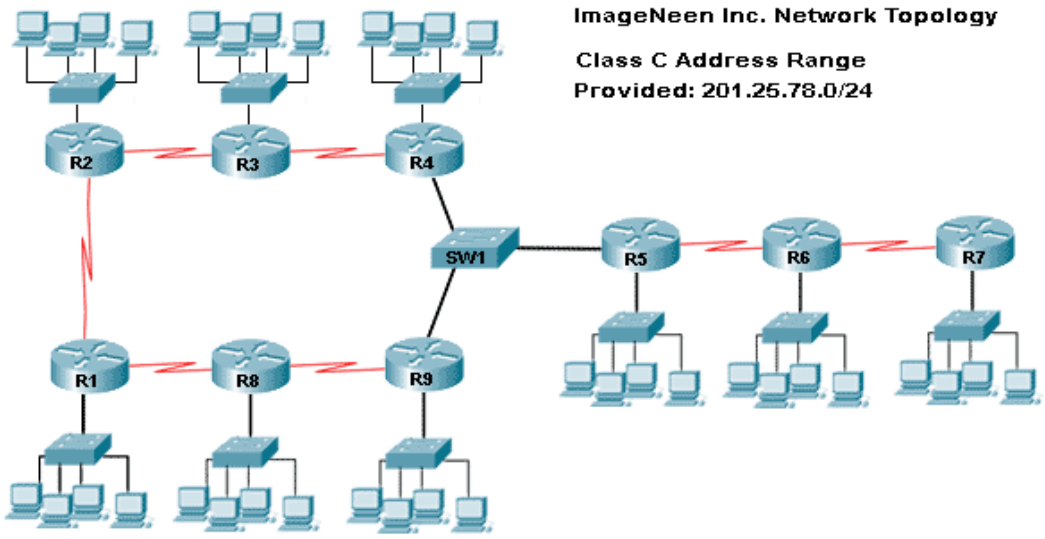
Intro:

Another company called ImageNeen Inc. contacted you; they need a network project.

The Scenario:

After a quick talk to the ImageNeen people, you make a draft of their future topology. The topology is shown below:

Topology:



Since the company will have direct access to the internet, with all its devices using valid IP Addresses, the ISP provided an entire class C IP Address range: 201.25.78.0/24.

Because the topology has 17 networks, 17 different IP address ranges must be created. Since the Ethernet segments must support at least 13 hosts, we have:

13 hosts per network = 4 bits on the last octet reserved for hosts which leaves to only 4 bits to create networks. (2^4 = 16 networks)

Based on that, you concluded that regular sub-netting processes won't give enough host addresses/networks to be assigned to the topology.

A more careful analysis shows that even though 17 networks are necessary, not all the 17 networks must have the same number of hosts. The serial links only need 2 valid host addresses because there are only 2 devices on that link. A VLSM approach is needed.

Variable Length Subnet Mask (VLSM) allows networks with different sizes to coexist within a domain.

Your job at ImageNeen is to address its computer network based on the following requirements:

1. Each ImageNeen individual internal network (the networks behind internal ImageNeen routers) must support a maximum of 13 User PCs.
2. All the 17 segments must be addressed.
3. Only the class C range provided by the ISP, 201.25.78.0/24, is available. Use the addresses wisely!

Question 1:

a. Which is the most suitable mask for the serial links?
b. Which is the most suitable mask for the Ethernet segments?

Question 2:

a. Assign the networks you created to the links of the topology shown above.

Answers:

1a. /30 which gives 2 valid addresses per network.

2b. /28 which leads to 16 possible sub-networks with 14 valid addresses per sub-network.