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Tutorial Review / Networks

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Exercise 1

The LocalIR on which your company depends has just assigned you the IP address 214.123.155.0. You need to create 10 distinct subnets for the company's 10 branches using this IP address.

1. What is the class of this network ?
2. What subnet mask should you use ?
3. How many IPv_4 addresses (for machines or routers) can each subnet accommodate ?
4. What are the network and broadcast addresses of the fifth usable subnet ?
5. How many distinct IPv_4 addresses is it possible to use with such a mask, considering all possible subnets ?

Exercise 2

Given the network topology depicted in Figure 1.
— Provide the routing table for R1.

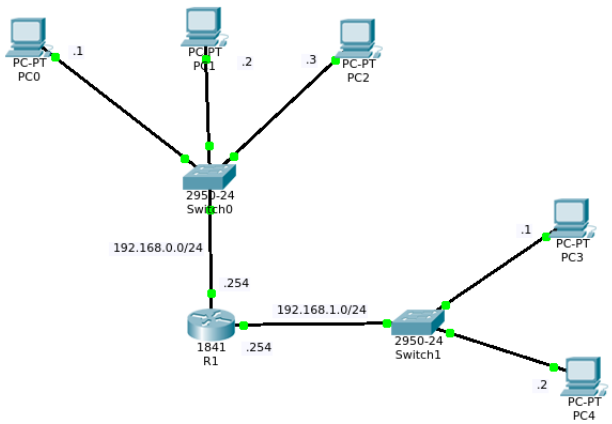

FIGURE 1 – Network topology

Reminder

How to build a routing table for a host ?

1. Identify the networks to which the host is connected
2. Specify the default route
3. List any other networks that the host cannot reach with the previous two steps

Exercise 3

Given the network topology depicted in Figure 2. It represents a TCP/IP network of a company. The IPv_4 addresses are explicitly mentioned in Figure 2. $M1$, $M2$, ..., $M15$ denote MAC addresses. $S1$, $S2$, and $S3$ are switches, and $R1$, $R2$, and $R3$ are routers.

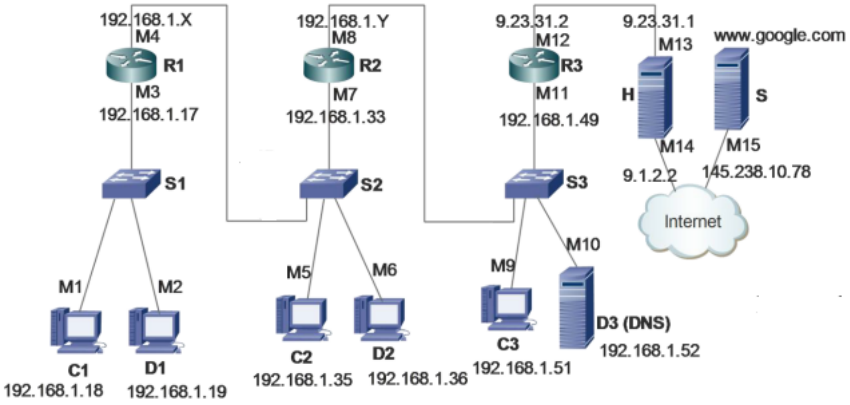

FIGURE 2 – Network topology.

$D3$ is a DNS server for this network. The machines $C1$, $D1$, $C2$, $D2$, and $C3$ are configured to use $D3$ as their DNS (IP=192.168.1.52, port=53).

This network is connected to the Internet via a PROXY machine (i.e., a machine equipped with two network interfaces and running NAT software).

All interfaces with IPv_4 addresses between 192.168.x.y are configured with a subnet mask of 255.255.255.240. The default gateways are as follows :

— For C1 and D1, the gateway is 192.168.1.17
— For C2 and D2, the gateway is 192.168.1.33
— For C3 and D3, the gateway is 192.168.1.49

1. Provide a possible value for X (which appears in the IPv_4 address 192.168.1.X of interface $M4$). The same question for Y (which appears in the IPv_4 address 192.168.1.Y of interface $M8$).
2. Assuming that routers $R1$, $R2$, and $R3$ are configured in static mode (i.e., manually), provide their routing tables in this case.

Exercise 4

Given the network topology depicted in Figure 3.

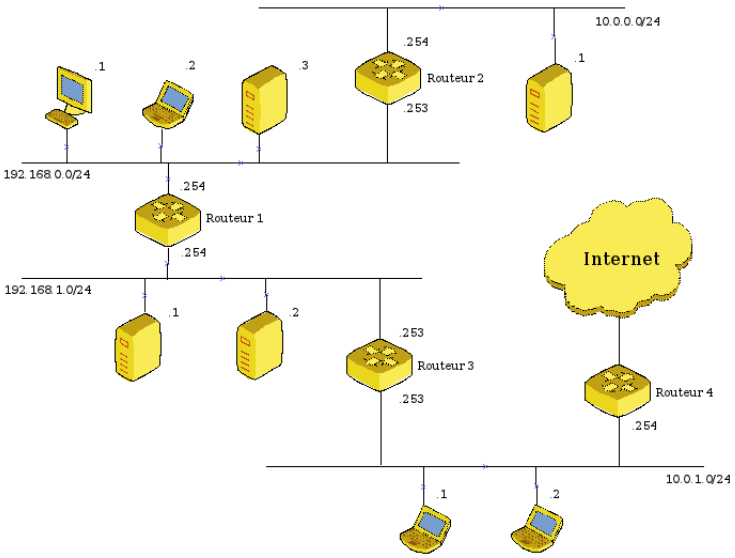

FIGURE 3 – Network topology

1. Provide the routing table for router R1.
2. Provide the routing table for the machine 192.168.0.1.