Exercices for Computer Networks

Mohammad Nassiri

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1. **IP Addressing :**
   - Write the IP address 10.10.1.32 in its binary form.
   - To which class does it belong ?
   - Does IP address 10.10.1.44 match 10.10.1.32/27 ?
   - Does IP address 10.10.1.90 match 10.10.1.32/27 ?
   - Provide the range of IP addresses (of form xxxx.xxxx.xxxx.xxxx to yyyy.yyyy.yyyy.yyyy) that can be assigned to subnet 10.10.1.32/27 .

2. **IP Addressing :** Consider the network shown in Figure 1. Each of the subnets A-D contains at most 30 hosts ; subnet E connects routers R_1 and R_2.

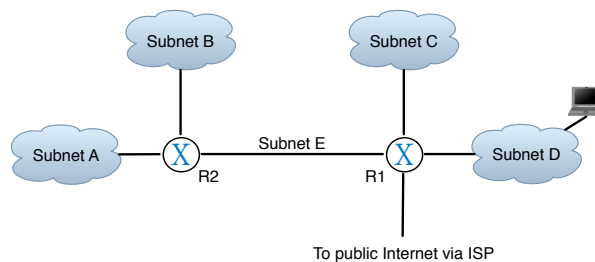

Fig. 1 – 5 subnets in a organization

   - Assign network addresses to the five sunets shown in the figure.
   - Suppose that there are 17 hosts in A-D. Does your answer change ? If so why or why not ?
   - What is the network prefix advertised by router R_1 t o the public Internet ?

3. **IP Addressing :** A company is made of 3 subnetworks and will have the structure shown in Figure 2 :
   - Give the addressing plan for each department knowing that the first address of the company will begin with 204.133.176.1 .
   - Which range of addresses will you ask to the Internet Service Provider (CIDR format) ?

4. **IP Addressing :** A company has the network shown in Figure 3. Its Internet Service Provider (ISP) gives the IP subnet 192.108.116.0/22.
   - Let detail the available IP addresses range.
   - How many bits are required for subnets ?
   - We assume that we do not have more than 60 stations per subnetwork. Let assign IP addresses, i.e. for each subnetwork A, B, C, D, give the IP subnet and possible IP addresses for stations.

   The network administrator decided to assign the fist addresses to stations (in increasing order), and the last IP addresses to routers (in decreasing order).
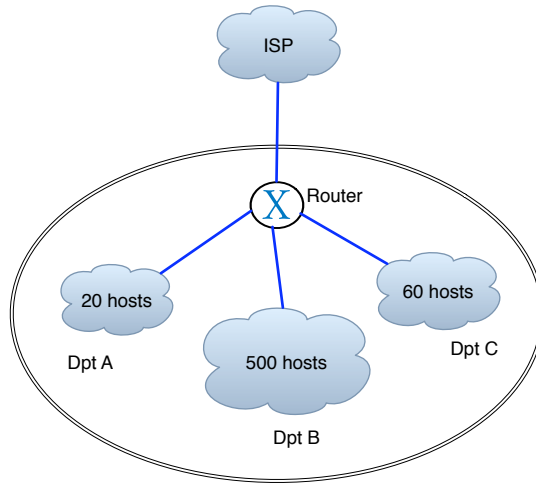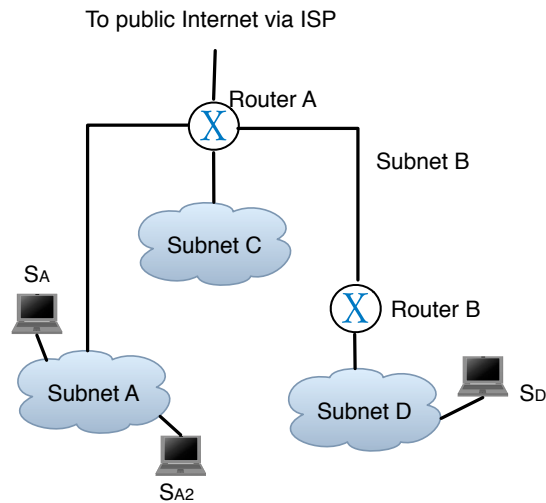
FIG. 2 – 3 subnets in a company

FIG. 3 – 5 subnets in a organization

– Assign IP addresses to routers
– Give the routing tables of routers A and B
Let be the stations S_A, S_{A2} and S_D in respectively subnetworks A, A and D.
– Let decompose the whole communication between S_A and S_{A2}
– Let decompose the whole communication between S_A and S_D

NB : for the next tutoring session please study section 1.4 of Kurose's book.