The National University of Singapore  
School of Computing  
CS3103 - Computer Networks and Protocols  
Tutorial 1

Week 3 August 25-29, 2014

NOTE:

- You are expected to work on the tutorial problems before class and bring your solution to class.
- All students must be prepared to participate in the discussion. Tutorial session will be interactive and it would depend on you to make it a livelier and a useful session.

Q1.

DIY

a) Find out whether you get a private IP address or a Public IP address when you use your note book in NUS’s SPnP network, and at home.

b) Find the Ethernet address of your note book and/or your home PC (figure it out how to get this info).

c) If a network has Class B IP addresses with 16 subnets, what will the subnet mask be?

Quick Oral Discussion (please work these problems out and come prepare to the class)

d) (Forouzan chapter 5, problem 32) In a classless addressing, we know the first address and one of the addresses in the block. Can we find the prefix length? Explain.

e) In a classless network, the first address is 200.10.10.16 and the last address is 200.10.10.31. What is the prefix length?

f) Assuming reservation of the first and the last subnets, answer the following:
   i) If a network has Class C IP addresses with 14 useable subnets, what will the subnet mask be?
   ii) If a network has Class B IP addresses of the form 165.65.y.z and has 6 useable subnets, what is the network address of the first useable network?
   iii) If hosts connect to a network which has been allocated the address of 16.6.y.z and use a subnet mask of 255.255.224.0. For the fourth useable subnet, what is the network-id, broadcast-id, first assignable IP address, and last assignable address.

g) You have 3 subnets, subnet A requires 14 hosts, B requires 250 hosts, and C requires 100 hosts, connected in a star-topology. Assume that interfaces 1, 2, and 3 are connected to subnets A, B, and C respectively.

   i) What is the minimum consecutive address allocation you need to support the three networks?
   ii) From the address space 192.1.0.0/16, assign addresses to the subnet so that you use the smallest number of consecutive addresses as stated in part (a), starting from 192.1.0.0.
Q2. A company has a 165.65.0.0/22 and wants to form subnets for six departments, with hosts as follows.

- a. Manufacturing unit 1 200 hosts
- b. R and D 70 hosts
- c. Manufacturing unit 2 400 hosts
- d. Admin 50 hosts
- e. Marketing 28 hosts
- f. Sales 26 hosts

Suggest a possible way of sub-netting by providing subnet –id and broadcast- id for each subnet in the table shown below. Assume no reservation of the first and the last subnets.

<table>
<thead>
<tr>
<th>Subnet</th>
<th>Subnet Id (A.B.C.D/n)</th>
<th>Broadcast Id</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Manufacturing unit 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. R &amp; D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Manufacturing unit 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Admin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Marketing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Sales</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q3. (Forouzan chapter 5, problem 33) An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to customers as follows:

The first group has at least 200 medium sized businesses, each need 128 addresses.
The second group has at least 400 small businesses, each need 16 addresses.
The third group has at least 2000 households, each need 4 addresses.

Design an address allocation scheme for each sub-block and give your answer in the slash notation for each sub-block in the table provided. Assume no reservation of first and the last subnets. If you make any other assumptions, please write it clearly.