CpE/NIS654 Design and Analysis of Network Systems
Fall 2017
Homework 04

Please Note that these assignments are to help you learn the covered subject. Your analysis, justification and logic behind your answers is, therefore very important. We are looking for your supportive text with your answers to understand your rationale behind your answers. We encourage you to take every opportunity to explain and expand on what is being asked.

Q1. Please do Exercise 1, Chapter 6 (McCabe p293):

Represent each address below in binary format. What is the class of each address?
a. 192.12.102.0
b. 10.20.30.100
c. 130.5.77.15

Q2: Please do Exercise 3 Chapter 6: (page 294)

Subnet 136.178.0.0 into 16 subnets. Show the binary and dotted-decimal forms of each subnet, as well as the subnet mask.

Q3. Please do Exercise 6, Chapter 6 (McCabe p294):

Given the network address 129.99.0.0/16, develop a variable-length addressing scheme that best fits the design, with the following numbers of users:

Note: Please note that addressing and routing go together. You want to assign addresses (subnetting) to have efficient routing of the traffic.

AS Number	Location	Department	Users
	Chicago Campus	Legal	120
1	Building 1	Accounting	370
	Chicago Campus	HQ	1580
	Building 2	Engineering	200
2	Toronto	Sales	75
	Boston	Sales	110
		Operations1	2150
3	Philadelphia	Operations2	975
		Sales	575

Chapters refer to the text book for the course: James D. McCabe, “Network Analysis, Architecture and Design”, Third Edition, Morgan Kaufmann Publishers.

Q4. Please read Section 6.4.3 and critique it.

Note: The purpose of this exercise is to help you appreciate the complexities associated with routing traffic through the BGP protocol.

Q5: Please do Exercise 8 Chapter 6 (McCabe p295)

Consider the following. You are an ISP and have a group of addresses (CIDR blocks) to allocate to your customers. You have allocated addresses to a number of customers from a CIDR block of 198.9.128.0/18 (equivalent to the block of Class C addresses 198.9.128.0 through 198.9.191.0). Now one of your clients wants to stop using your ISP service and move to another ISP, while keeping their /24 that you had allocated to them (198.9.145.0/24). You are in a dilemma, as you cannot take back this address (their lawyers are better than yours!), yet advertising a CIDR block that contains that address seems to break the rules of CIDR routing.

a. Show how routing based on the longest (most specific) match allows you to continue advertising this CIDR block.

b. Show what happens to the ex-customer's traffic if there is a bug in the Internet and their route gets dropped.