Assignment 3

Due Thursday, December 7. Show your work. Submit your assignment using the appropriate dropbox on the course web site. Assignments submitted after the solutions are made available will be given a mark of zero.

Question 1

(a) Write out your name. How many characters are there in your name?

(b) Compute the SHA-1 cryptographic hash of your name. *Hint: there are various utilities and web sites that can compute various cryptographic checksums, including SHA-1. For example, on most Unix-like systems* `echo -n "My Name" | shasum` *will compute the SHA-1 hash value.*

(c) What is the length of the hash value in bits? What is the length in characters when the hash value is represented in hexadecimal notation?

(d) Change one character of your name between upper case and lower case. How many bits in the string changed? What is the hash value for the new string?

(e) How many of the characters in the hexadecimal representation did not change? How many changed?

(f) (optional) On average, how many characters would you expect to change if the value of each bit for the new hash value is independent of its value for the previous string?

Question 2

(a) How many bits are there in an IPv6 address? How many of these bits define the network? How many are used to select a host within a network?

(b) Does your ISP support IPv6 addressing? Does your operating system?

(c) What is the IPv6 address of www.bcit.ca? Of net-flix.ca?

Question 3

(a) What is the purpose of the Cisco IOS command:

`Router(config)#` **ip dhcp ping packets** `number`

(b) When might you want to use manual IP address configuration?

Question 4

You have been hired by a small company and, because of your extensive Telecom experience, you've been asked to set up their DNS name server.

This company has purchased the domain name `schoolbuds.ca` and is leasing a server with the fixed IP address 104.238.64.106.

Your company would like this server to appear at the domain name `www.schoolbuds.ca` and would also like software on this server to handle e-mail for the domain `schoolbuds.ca`.

Show the two lines in a BIND-format file that would enable this.

Only show the lines that define these two DNS entries. You may assume the lines appear after an SOA line for `schoolbuds.ca.`. You can use any value for the priority for the mail server.