CSC 102

HOW THE INTERNET WORKS PLEASE SUBMIT YOUR WORK ON MOODLE AS A PDF FILE.

Part One: Moodle Quiz (20%)

Complete the second Moodle quiz with a grade of at least 8.5/10.

Part Two: Domain Registration and Web Hosting (30%)

For this portion of the homework, you will find and compare three commercial services offering domain name registration and three offering web hosting. List each site (giving a name and URL) along with the terms of its basic offer. How much does it cost to register a domain name for a period of at least one year? Does it matter which top-level domain you choose? How much does it cost to host a web site for one year? Are there limits on storage and bandwidth, and if so how much? Do the hosting services compete in any other areas?

Part Two: IP Packet Analysis (50%)

Suppose that a particular packet contains the data shown below as hexadecimal digits. Please analyze the packet to answer the questions that follow.

45	00	00	40	00	01	00	00	3C	11	Е0	31	CE	D9	8F	1 F	C7	в6	78	СВ	04	89
00	35	00	2C	AB	в4	00	01	01	00	00	01	00	00	00	00	00	00	04	70	6F	70
64	02	69	78	06	6E	65	74	63	6F	6D	03	63	6F	6D	00	00	01	00	01		

For this portion of the homework, you should refer to documentation on IP packet structure. (See, for example, <u>http://en.wikipedia.org/wiki/IPv4#Packet_structure</u>.)

Figure out which bits in the sequence above fall into each of the sections (called fields) of the packet header by counting the correct number of bits from the start. For example, the *Header Checksum* field is in a row that begins 64 bits into the message, and starts at a column that is 16 bits in addition to that, so to find the corresponding data in the packet you would skip 80 bits and then read the next 16. Recall that each hexadecimal digit represents four bits, according to the table shown at right. (You may also use an online converter.)

Continuing the example above, you would skip 20 hex digits (80 divided by 4) to find the header checksum, and then read the next four hex digits that form the field (e.g., E0C1, or 57537 in decimal). You can find hexadecimal converters on the web, for example, at <u>http://easycalculation.com/hex-converter.php</u>.

a.) Write the first 16 hex digits as the equivalent 64-bit string of zeros and ones.

Hex	Bits
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
Α	1010
В	1011
С	1100
D	1101
Е	1110
F	1111

b.) Break these 64 bits into their corresponding fields, according to the IP packet header documentation. (For example, the first four bits (0100) are the version field.)

c.) What size is indicated for this packet in the total length field? If this is the number of bytes in the packet, does it match the actual length of the data shown above? After subtracting the header information, how many bytes of this packet comprise the payload? (Assume that no optional header information is included.)

d.) What are the hex digits of the destination IP address? Convert this to conventional decimal xx.xx.xx notation.

e.) What are the hex digits of the source IP address? Convert this to conventional decimal xx.xx.xx notation.

f.) How many times (maximum) may this packet be forwarded from host to host before it will be destroyed, assuming it does not reach its destination first?

Thought question (not graded): Which parts of the packet, if any, would be expected to change each time the packet is forwarded to a new host?