Assignment -4

CS 470 Spring 2018

Note: Only typed submissions are accepted.

Q1. (8 points)

Consider a datagram network using 32-bit host addresses. Suppose a router has four links, numbered 0 through 3, and packets are to be forwarded to the link interfaces as follows:

Destination Address Range	Link Interface
11100000 00000000 00000000 00000000 Through 11100000 00111111 11111111 11111111	0
11100000 01000000 00000000 00000000 through 11100000 01000000 11111111 11111111	1
11100000 01000001 00000000 00000000 through 11100001 01111111 11111111 11111111	2
otherwise	3

a. Provide a forwarding table that has five entries, uses longest prefix matching, and forwards packets to the correct link interfaces.

b. Describe how your forwarding table determines the appropriate link interface for datagrams with destination addresses:

11001000 10010001 01010001 01010101

11100001 01000000 11000011 00111100

11100001 10000000 00010001 01110111

Q2. (7 points)

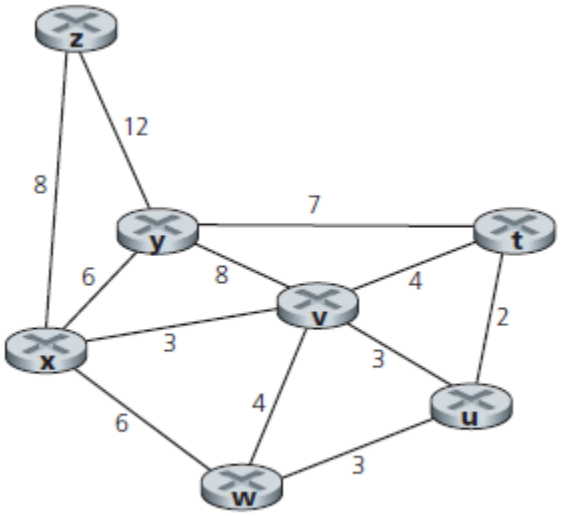
a. Consider sending a 2400-byte datagram into a link that has an MTU of 700 bytes. Suppose the original datagram is stamped with the identification number 422. How many fragments

are generated? What are the values in the various fields in the IP datagram(s) generated related to fragmentation?

b. Suppose datagrams are limited to 1,500 bytes (including header) between source Host A and destination Host B. Assuming a 20-byte IP header, how many datagrams would be required to send an MP3 consisting of 5 million bytes? Explain how you computed your answer.

Q3. (10 points)

Consider the following network. With the indicated link costs, use Dijkstra's shortest-path algorithm to compute the shortest path from x to all network nodes. Show how the algorithm works by computing a table similar to your textbook.



Q4. Use this link: https://gaia.cs.umass.edu/wireshark-labs/Wireshark_IP_v7.0.pdf to find the Wireshark lab for IP. Read the document carefully and answer the questions from the document. In addition attach the print screen of your screen capture with each answer (or set of answers). (15 points)

Q5. Use this link: https://gaia.cs.umass.edu/wireshark-labs/Wireshark_NAT_v7.0.pdf to find the Wireshark lab for NAT. Read the document carefully and answer the questions from the document. In addition attach the print screen of your screen capture with each answer (or set of answers). (10 points) (Extra credit: 3 points, see at the end of the pdf)

Q6. Use this link: https://gaia.cs.umass.edu/wireshark-labs/Wireshark_ICMP_v7.0.pdfto find the Wireshark lab for ICMP. Read the document carefully and answer the questions

from the document. In addition attach the print screen of your screen capture with each answer (or set of answers). (10 points)