DEPARTMENT OF COMPUTER ENGINEERING, FACULTY OF ENGINEERING, UNIVERSITY OF JAFFNA
EC9520– ADVANCED COMPUTER AND DATA NETWORKS

ASSIGNMENT 2

Name:
Student ID number:
Submission Date: Friday 5th January 2024

Please answer all the questions based on the following article (attached)
Article: Aveiro Tech City Living Lab: A Communication, Sensing, and Computing Platform for City Environments

Question 1: Network QoS

This article provides a few quality and QoS issues. Write all the problems you have understood from it. To improve QoS in one of the issues, describe the appropriate technique you have studied in the class notes/slides. The NS2 is a simulation tool designed specifically for communication networks. To analyze the QoS and the link quality given in this article, NS2 can be used. What are the components in NS2 which

a) Find the optimal route,
b) Propagate topology and routing information,
c) Forward the packet based on the routing information.

NOTE: Do not write more than a page.

Question 2: Advanced Features of MPLS

In this article, some services are considered. If you are asked to use the advanced features of MPLS, how can you enhance the Service Provisioning? Using Wireshark, capture the traffic (TCP, HTTP, etc.) you wish/learned from the article and answer the following questions.

a) What is the IP address and TCP port number used by the client computer (source)
b) What is the sequence number of the TCP segment containing the HTTP POST
    a. command?
c) To analyze the advanced features of MPLS, service provisioning is upgraded using some metrics such as Round Trip Time (RTT). Identify and analyze the metrics from the captured traffic.

[**Maximum 500 words**].

Question 3: Multimedia

According to the theory (Multimedia over IP) studied in the class, video-on-demand (VoD) delivery techniques are considered for developing low-cost video transmission services. Write all key requirements for the VoD delivery. Using these key requirements, how do you improve the data rate of LiDAR given in this article?

NOTE: Do not write more than 300 words.

Question 4: Network Requirements and Technologies

Section IV of the article describes the latest networks and technologies used in Communication, Sensing, and Computing platforms for City Environments. Discuss the routing concepts used in the software-defined vehicular networks. Briefly describe the following network problems.

a) One of the congestion control techniques
b) Named Data Network
c) Emerging technologies for automation.

NOTE: Do not write more than 300 words.

Question 5: Traffic engineering

This article discusses data and vehicle traffic monitoring. How do you improve the traffic engineering for both these traffic? Using Mininet and Command Line Interface (CLI) concepts, write the necessary commands for the essential operation of SDN. [**Hint:** You may use the Mininet Tool learned from the laboratory session].

NOTE: Do not write more than 300 words.