Computer Networks and Communication
Task 5.1P

Module Summary

1. Activity 1: Transport Layer Protocol

    - Conversation in Groups: The assignment was to talk about two packing scenarios that are comparable to TCP (Transmission Control Protocol) and UDP (User Datagram Protocol), two protocols used at the transport layer. Similar to UDP, which is used for quick but unreliable data delivery, the first scenario put speed before accuracy. Similar to TCP, which guarantees dependable and well-organized data transport, the second scenario concentrated on careful packing.
    - Comparison of TCP and UDP: According to the discussion, UDP is better suited for applications where speed is essential, like online gaming or live broadcasting, whereas TCP is best for situations demanding reliability, such big file transfers.

2. Activity 2: Packet Analysis using Wireshark

    - UDP Packet Analysis and capture: Using Wireshark, I had to record UDP packets and examine the header fields—Source Port, Destination Port, Length, and Checksum—of each packet. The research also included information on UDP protocol number, maximum payload size, and port number relationships between successive packets.
    - Recognizing Port Numbers that are Specific to Application: The test demonstrated that multiple UDP ports are used for different apps, including online browsing and Microsoft Teams. This demonstrates how UDP may handle a wide range of applications with flexibility.

3. Activity 3: Using UDP, a client-server application

- Department of Programs: The assignment was to create and present a UDP client-server application. The application demonstrated the useful application of the UDP protocol by requiring the client to communicate with the server by sending a message, waiting for a response, and then continuing the conversation.
- Improved Functionalities: Making the program capable of managing more interactive communication activities, like name exchanges and customized welcomes between the client and server, was one of the additional responsibilities.

Reflecting on the content

Upon reflection, I discovered that the module's content was both intellectually stimulating and practically applicable to comprehending the nuances of TCP and UDP in particular, two transport layer protocols. The trade-offs between network communication speed and dependability were clearly illustrated by drawing an analogy between packing scenarios and these protocols' features. The abstract ideas become more understandable and relatable as a result of this contrast. The practical experience using Wireshark was especially beneficial since it allowed academic information to be applied in a practical setting. My study of the structure and analysis of UDP packets has improved my understanding of data transmission and reception via networks.

Moreover, by enabling me to apply the ideas in a concrete manner, creating the client-server software with UDP strengthened the ideas. This hands-on approach helped me retain what I had learned and gave me valuable abilities that I will need in the future. In general, the assignments were made to close the knowledge gap between theory and practice, guaranteeing a comprehensive grasp of network protocols and their uses. The learning process was both successful and enriching because of the course team's clear emphasis on conceptual knowledge and practical application.