Batch: **SY-IT (B2)** **Experiment Number: 4**

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Aim of the Experiment: To write a program to implement TCP header

Program/ Steps:

list =(input("Enter a hex value to scan : \n"))

if len(list) == 40:

   print("THE INPUT IS VALID !")

else:

   print("THE INPUT IS INVALID ...")

mylist6 = []

mylist7 = []

tcp_1 = list[0:4]

print("Your source port address : ", tcp_1)

tcp_2 = list[4:8]

print("Your destination port address : ", tcp_2)

tcp_3 = list[8:16]

print("Your sequence number : ", tcp_3)

tcp_4 = list[16:24]

print("Your acknowledgemnt number : ", tcp_4)

tcp_5 = list[24:25]

print("Your HLEN number : ", tcp_5)

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tcp_6 = list[25:28]

for i in range(25,28):

    mylist6.append(list[i])

for j in range(0,3):

    mylist7.append("{0:04b}" .format(int(mylist6[j])))

print(mylist7)

str_1 = " "

str_2 = str_1.join(mylist7)

print(str_2)

print("Your Reserved number :",str_2[0:6])

print("Your Flag number :",str_2[6:12])


tcp_7 = list[28:32]

print("Your Window size number : ", tcp_7)

tcp_8 = list[32:36]

print("Your check sum number : ", tcp_8)

tcp_9 = list[36:40]

print("Your urgent pointer number : ", tcp_9)
```

Output/Result:

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Output

Enter a hex value to scan :
9F8E7D6C5B4A39182736455433221100998877
THE INPUT IS VALID !
Your source port address :  9F8E
Your destination port address :  7D6C
Your sequence number :  5B4A3918
Your acknowledgemnt number :  27364554
Your HLEN number :  3
['0011', '0010', '0010']
0011 0010 0010
Your Reserved number : 0011 0
Your Flag number : 010 00
Your Window size number :  1100
Your check sum number :  9988
Your urgent pointer number :  7766

=== Code Execution Successful ===
```

Post Lab Question-Answers:

1. The unit of data transfer between two devices using TCP is called a <u>segment</u>.

2. Which type of addressing is used at Transport Layer?
a) Port addressing

b) Logical addressing

c) Physical Addressing

d) None of the Above

Answer **:** a) Port addressing

3. What is the difference between TCP and UDP?

TCP (Transmission Control Protocol) is connection-oriented, meaning it establishes a connection before data is sent and ensures the data reaches its destination in the correct order. It's reliable but slower.
UDP (User Datagram Protocol) is connectionless, meaning it sends data without establishing a connection, making it faster but less reliable as it doesn't ensure data delivery or order.

Outcomes:

CO2. Enumerate the layers of the OSI model and TCP/IP model, their functions and Protocols

Conclusion (based on the Results and outcomes achieved):

From this experiment number 4, I learned about to implement the TCP header using wireshark. I also wrote a python code to find out, the details such as source port address, destination port address, sequence number, etc from a 40bit hex input.

References:

Books/ Journals/ Websites:

- Behrouz A Forouzan, Data Communication and Networking, Tata Mc Graw hill, India, 4th Edition
- A. S. Tanenbaum, "Computer Networks", 4th edition, Prentice Hall