Homework-Computer Networks-06082140

Q1: Given the IP address 201.14.78.0 and the company needs to create 8 subnets, what is the second subnet address and its broadcast address?

To create 8 subnets from the given IP address 201.14.78.0, you need to borrow 3 bits from the host portion of the IP address since 2^3 = 8. The subnet mask for the second subnet would be 255.255.255.224 (or /27 in CIDR notation) because the first subnet uses the default subnet mask.

To find the second subnet address, you can follow these steps:

1. Start with the given IP address: 201.14.78.0
2. Apply the subnet mask: 255.255.255.224
3. Increment the third octet by the subnet size (32 in this case): 201.14.78.32

So, the second subnet address is 201.14.78.32.

To calculate the broadcast address for the second subnet, you can use the formula: Broadcast address = Subnet address + (Number of hosts - 1)

Since the subnet size is 32 (2^5 - 2 = 30 usable hosts), the broadcast address would be: Broadcast address = 201.14.78.32 + 31 = 201.14.78.63

Therefore, the second subnet address is 201.14.78.32, and the broadcast address is 201.14.78.63.

Q2: Byte-stuff the data in Figure.2.



Fig.2

In the byte-stuffed version, an escape character (ESC) is inserted before each instance of the flag character to distinguish it from the flag used to mark the beginning and end of a frame. The escape character serves as an indicator that the following character should not be interpreted as a flag but as literal data.

Note that the original data had an extra "ESC" after the last flag. In the byte-stuffed version, the escape character is inserted before each flag but not after the last flag since it is not followed by any data that needs to be escaped.

Q3: In Figure.1, assume that the communication is between a process running at computer A with port address i and a process running at computer D with port address j. Show the contents of packets and frames at the network, data link, and transport layer for each hop.

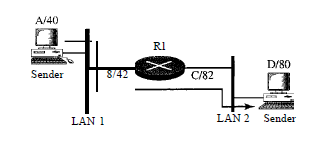


Fig.1

Hop 1: Sender (A) to LAN1

Network Layer (IP Packet): Source IP: A Destination IP: D Source Port: i Destination Port: j Payload: Application data

Data Link Layer (Ethernet Frame): Source MAC: MAC of A Destination MAC: MAC of LAN1 Ethernet Payload: IP Packet from the network layer

Hop 2: LAN1 to LAN2

Network Layer (IP Packet): Source IP: A Destination IP: D Source Port: i Destination Port: j Payload: Application data

Data Link Layer (Ethernet Frame): Source MAC: MAC of LAN1 Destination MAC: MAC of LAN2 Ethernet Payload: IP Packet from the network layer

Hop 3: LAN2 to Sender (D)

Network Layer (IP Packet): Source IP: A Destination IP: D Source Port: i Destination Port: j Payload: Application data

Data Link Layer (Ethernet Frame): Source MAC: MAC of LAN2 Destination MAC: MAC of D Ethernet Payload: IP Packet from the network layer

Please note that the information provided above is a general representation of the layers and their contents during communication between A and D in Figure 1. The specific headers and fields may vary depending on the protocol being used and the encapsulation format at each layer.