## Q9-3

**CSE316**

**Assignment 3 Solutions**

**Chapter – 9**

**Problems: Q9-3, P9-6, P9-10, P9-13**

Two hosts in two different networks can theoretically have the same link-layer address because a link- layer address has only local jurisdiction. However, the tendency is to avoid this for the future development of the Internet. Even today, manufacturers of network interface cards (NIC) use different set of link-layer addresses to make them distinguished

## P9-6

We can think of one journey with three links in this case: home-to-airport, airport-to-airport, and airport-to-home

## a.

End-to-end addresses (the whole journey) Source: 2020 Main Street, Los Angeles Destination: 1432 American Boulevard, Chicago

## b.

**First Link**

Source: 2020 Main Street Destination: Los Angeles Airport **Second Link**

Source: Los Angeles Airport Destination: Chicago Airport **Third Link**

Source: Chicago Airport

Destination: 1432 American Boulevard

## P9-10

**a.**

Router R1 gets the frame received from interface L2, decapsulates the network-layer packet (N1, N2, Data). The router then consults its routing table to find what is the next router for destination N2. It finds that the packet should be delivered to router R2. It sends an ARP packet to find the link layer address of R2, which is L5. Router R1 now encapsulates the network layer packet in a frame with source address L4 and destination address L5.

## b.

Router R2 gets the frame received from interface L5, decapsulates the network-layer packet (N1, N2, Data). The router then consults its routing table to find what is the next router or host for destination N2. It finds that the packet should be delivered to host N8. It sends an ARP packet to find the link-layer address of N8, which is L8. Router R1 now encapsulates the network-layer packet in a frame with source address L6 and destination address L8.

## P9-13

Two approaches can be used. In the first approach, system A has a table to match the network-layer addresses to data-link addresses, it can use the table to find the data-link address of system B. In the second approach, system A has only the list of all data-link layer addresses, it can send unicast ARP packet to all stations to find out the one which matches the network-layer address. None of the approaches are practical because a host may change its data-link layer address without notice. Some networks support tunneling, in which the network encapsulates a broadcast or multicast packet in a unicast packet and send them to all stations.

# Chapter – 23

## Problems: Q23-3, Q23-7, P23-3, P23-5, P23-9, P23-12









