

HOMEWORK 5

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Yuji Shimojo

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Instructor: Michael Tarquinio

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1) Since the IP protocol is connectionless what will I not see in the protocol header for IP?

Since the IP protocol is connectionless, the protocol header for IP doesn't have TCP's synchronized (SYN) and acknowledged (ACK) packets as like TCP. On the other hand, for TCP is connection oriented, the client and the server exchange SYN and ACK packets in TCP segments to establish a connection before data transfer which is called the three-way handshake method.

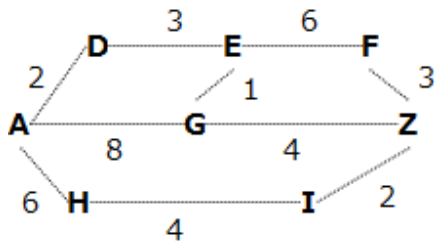
2) The IP network is a virtual network and must rely on a link layer network to transport a frame. What elements support getting an IP frame over an Ethernet LAN?

The address resolution protocol or ARP maps IP addresses to MAC addresses by using the ARP table. ARP is actually a layer 3 protocol which uses ARP packets instead of IP packets, TCP/IP requires source and destination IP addresses in an IP packet and source and destination MAC addresses in a frame for all data communications; therefore, if a sender device such as a router doesn't know the destination MAC address, it sends a ARP request which is a broadcast message, and the receiver which has the destination IP address receives the request and sends a ARP reply to the sender. Other receivers of the message discard the packet. After that, the sender inserts an entry to map the sender to the receiver into its ARP table.

3) Given the following circuit diagram and the cost for each circuit.

What is the least cost path for communications between point A and Z? What path has the minimum amount of hops?

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As shown in the following tables, the least cost path for communications between A and Z is A - D - E - G - Z, and the cost is 10. The path which has the minimum amount of hops is A - G - Z, and the amount of hops is 2.

Paths between A and Z	Cost paths
A - D - E - G - Z	10
A - G - Z	12
A - H - I - Z	12
A - D - E - F - Z	14
A - G - E - F - Z	18

Paths between A an Z	Amount of hops
A - G - Z	2
A - H - I - Z	3
A - D - E - F	4
A - G - E - F - Z	4
A - D - E - G - Z	4