

ECE3076a,b QUIZ 2
Nov. 12, 2007

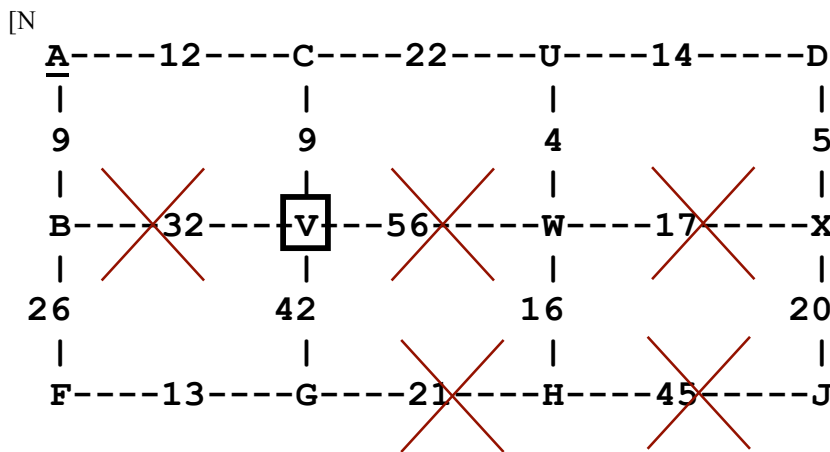
RULES.

- i This quiz is **not** open book. One new original sheet of hand-written notes may be used. Calculators are ok.
- ii Answer all questions and show all work to receive full credit. Use back of sheets only if necessary.
- iii Please do not ask the proctors any questions during the exam about exam questions. Part of the test is understanding the question, as written, without supplemental information. If you feel additional data is needed to solve the problem, make (and state) an assumption and then work the problem.
- iv This is a time-limited test. All papers must be turned in 45 minutes after the start. If you find you are taking more than 10 minutes on a particular problem, move on and come back to that problem after finishing the others.
- v The Georgia Tech Honor Code applies (see last page).

Question 1– Routing, Link State, OSPF

Every router (A, B, ..., J) has advertised the costs (delays) to all the other nodes. Based on all the advertisement messages, the network topology and link costs can be mapped. The letters below represent the nodes (routers) on the network. The numbers represent costs (delay-times) on the links between them.

These nodes are all routers (no networks) and for simplicity links have the same cost in both directions.



- A. Using Dijkstra's technique, calculate the Sink Tree for node V. Cross out (X) the links that are not on the sink tree for node W.
- B. Fill in the Routing Table for Node V (indicate Port by the node to which it connects).
- C. List the nodes in the order they were added to the Sink Tree (at left).

B. Routing Table

Node V Table	
Destination	Port
A	<u>C</u>
F	<u>G</u>
D	<u>C</u>
J	<u>C</u>
C	<u>C</u>

C. Node List (after V)

- 1. C
- 2. A
- 3. B
- 4. U
- 5. W
- 6. G
- 7. D
- 8. X
- 9. H
- 10. F
- 11. D

Question 2. Based on the following routing table (first two columns), on which port should a IP datagram be forwarded if the destination is 66.64.39.31 ? Calculate the network mask and the largest IP matched (right column). (10 points)

Sub-net	Physical Port	Net Mask (dot-decimal)	Largest IP Matched
66.64.0.0 / 17	eth0	255.255.128.0	66.64.127.255
66.64.24.0 / 21	eth1	255.255.248.0	66.64.31.255
66.64.38.0 / 23	eth2	255.255.254.0	66.64.39.255
66.64.39.128 / 25	eth3	255.255.255.128	66.64.39.255

Question 3. Aggregate the following routing table into two lines. Put them in the correct order (so that the first match will be the correct one).

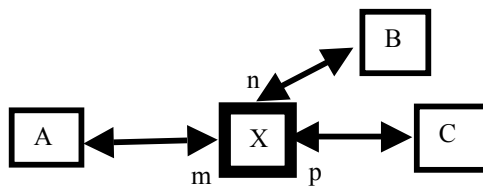
Sub-net	Physical Port
10.25.32.0 / 23	A
10.25.34.0 / 24	B
10.25.35.0 / 24	A

Answer:

Sub-net	Physical Port
10.25.34.0 / 24	B
10.25.32.0 / 22	A

Question 4. Ethernet Switch - Learning

Assume the Ethernet switch X's forwarding table is empty. Show any lines added to the forwarding table (Host - Port, like "A - m") after each of the following frames are sent, and which hosts see the frame(A, B, and/or C).



Frame (source -> destination)	Which hosts see it	Line added
A -> B	B,C	A-m
B -> A	A	B-n
C -> A	A	C-p
A -> C	C	none*

** time stamp updated*

Question 5. Network Techniques (words or acronyms)

Allows you to assign IP addresses to your private home network.

[NAT]

Allows automatic network configuration of a laptop connected to a new network.

[DHCP]

Used to find Ethernet addresses when the IP address is known.

[ARP]

Used to separate a network using Ethernet Hubs into multiple collision domains.

[Switch]

Three routing protocols, normally used for:

for small networks,

[RIP]

GT-size networks,

[OSPF]

Inter-AS routing.

[BGP]

Honor Code - I affirm that I have obeyed the rules of the Georgia Tech Honor Code*.

Signature _____

*Basically, I did not cheat, and I reported any observed cheating. A grade will not be recorded if there is no signature.