Quiz Number 4 – Solutions

Open Book; Open Notes
Time Given=15 minutes (15/04/2003)

“I certify that I have neither received nor given unpermitted aid on this examination and that I have reported all such incidents observed by me in which unpermitted aid is given.”

Signature __________________________

Name __________________________ Student ID __________________________

Question 1: [4pts] As mentioned in the reading, NHLFE stands for “Next hop label forwarding entry”. This is quite similar to an entry in the routing table. State all information this entry should contain.

Solution:

1. Next hop
2. Operation to perform on the label stack (“POP”, “Replace with new”, or “Replace with NEW and PUSH another”)
3. Datalink encapsulation
4. Way to encode the label stack, and
5. Information to properly dispose of packet

Question 2: [3pts] As mentioned in the assigned reading, when a packet reaches a label switching router (LSR), the next hop could be the same LSR itself. In such a case, the “label stack operation” MUST be to “pop the stack”. What could be the reason for this?

Solution: This is to avoid packet proliferation. If the router does not “pop the stack”, the packet may keep coming back to the router indefinitely.

Question 3: [3pts] The “incoming label map” (ILM) maps an incoming label to a SET of NHLFEs; the SET may contain one or more NHLFEs. State at least one reason why a label may be mapped to more than one NHLFE?

Solution:

1. To provide load balancing on multiple paths
2. To cater for multicasting