



TCP/IP Networking 2017 Test 4

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Grading:

For each question, exactly one of the four proposed answers is correct. If the good answer and only the good answer box is crossed \Rightarrow +1 point. If one bad answer box is crossed and no other box is crossed $\Rightarrow -\frac{1}{3} = -0.333$ point. If 0 or more than 1 answer box is crossed \Rightarrow +0 point.

\leftarrow Please encode your SCIPER number here and write your full name in the box below. \downarrow

Name, First Name:

Question 1 Say what is true about Software Defined Networking:

1. It is a method to download the software image of a switch or router from a central repository.
2. It allows a central controller to manipulate the forwarding rules in switches or routers.

- Both.
 1 and not 2.
 None
 2 and not 1.

Question 2 Say what is true, with OSPF:

1. All routers in the same area have the same information in their Link State Databases.
2. All routers in the same area have the same shortest path tree to all destinations in the same area.

- 1 and not 2.
 2 and not 1.
 None
 Both.

Question 3 If an OSPF router R happens to find multiple shortest paths (of equal cost) to one destination m , say what is true:

- R can install multiple next-hops to m in the routing table.
- R must pick only one of the shortest paths and install only one next-hop to m because the IP layer does not allow more than one next-hop per destination.
- R must pick only one of the shortest paths and install only one next-hop to m because otherwise this would violate per-flow load balancing.
- This never happens because Dijkstra's algorithm finds only one shortest path to every destination.



Question 4 RIP is a protocol that implements the method of distance vector. In which case does every router have a map of the entire network ?

- Both with RIP and with OSPF Single Area. RIP.
- OSPF multiple areas. OSPF single area.

Question 5 Say what is true: With OSPF in a single area, every router runs Disjktra's algorithm in order to obtain...

1. The distances from self to all destinations.
2. The next hops to all destinations.

- Both. 1 and not 2. None 2 and not 1.

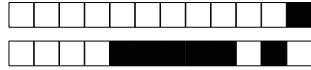
Question 6 Say what is true, for an OSPF domain with more than one area:

1. An area border router belongs to more than one area.
2. The link state database in an OSPF router describes the links in all areas, not just in the area that this router belongs to.

- Both. 1 and not 2. 2 and not 1. None

Question 7 "Source routing" means...

- a routing protocol which uses the reverse of the path from destination to source.
- the path of a packet is written at the source in the packet header.
- a method by which a router verifies whether the interface on which a packet is received is a valid path to reach the source of the packet.
- the next-hop chosen by a router depends on the source address in the packet header.



Question 8 With OSPF, when a link failure occurs, by which mechanism are new routes computed ?

- All routers eventually detect the failure by means of the hello protocol and compute new routes using Dijkstra's algorithm.
- All routers eventually receive updated link state advertisements and compute new routes using Dijkstra's algorithm.
- At least one of the routers adjacent to the failed link detects the failure, computes new routes to all destinations using Dijkstra's algorithm and sends to its neighbours the new values of the distances to all destinations; this eventually triggers recomputation of distances in all routers.
- All routers eventually detect the failure by means of the hello protocol and resynchronize their link state databases with their neighbours; after synchronization, link state advertisements are flooded and new routes are computed using Dijkstra's algorithm.

Question 9 How does a host A know the destination MAC address to be used when sending an IPv6 packet to the multicast address m ?

- A uses the broadcast MAC address.
- A uses the unicast MAC address of the nearest multicast router.
- A uses NDP with the solicited node multicast address derived from m .
- A algorithmically derives the destination MAC address from m .

Question 10 In which case does a host need to contact its multicast router with the IGMP/MLD protocol ?

- Before sending to a multicast group.
- Before receiving from a multicast source.
- None.
- Both.