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Grading:

For each question there is exactly one correct answer. 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 $\Rightarrow -\frac{1}{3}$ 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:

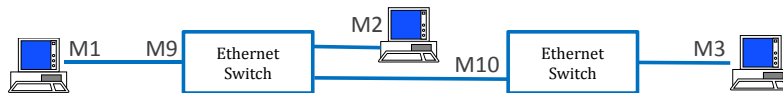
Question 1 Joe builds a LAN with several bridges and connects them as a ring.

- | | |
|---|--|
| <input type="checkbox"/> This does not work as there is a loop in the topology. | <input type="checkbox"/> The spanning tree protocol computes a broadcast tree but some forwarding loops might occur for some source-destination pairs. |
| <input type="checkbox"/> The spanning tree protocol prevents forwarding loops by computing appropriate MAC forwarding tables. | <input checked="" type="checkbox"/> The spanning tree protocol disables one of the ports and forces the active topology to be a tree. |

Question 2

- | | |
|--|--|
| <input type="checkbox"/> Bridges decrement the TTL field in IPv4 packets but do not modify the HL field in IPv6 packets that they forward. | <input type="checkbox"/> Bridges do not modify the TTL field in IPv4 packets but decrement the HL field in IPv6 packets that they forward. |
| <input checked="" type="checkbox"/> Bridges do not modify the TTL field in IPv4 packets and do not modify the HL field in IPv6 packets. | <input type="checkbox"/> Bridges decrement the TTL field in IPv4 packets and the HL field in IPv6 packets that they forward. |

Question 3 M1 sends one IPv6 packet to M2 and one to M3. The MAC destination addresses observed at M1 are ...



- | | |
|--|--------------------------------------|
| <input checked="" type="checkbox"/> M2 and M3. | <input type="checkbox"/> M9 and M10. |
| <input type="checkbox"/> M9 in both packets. | <input type="checkbox"/> M2 and M10. |

Question 4 At home in Lausanne, Joe receives IPv4 Internet service from Swisscom. Joe's PC, at home, sends an ARP request.

- | | |
|--|--|
| <input type="checkbox"/> The ARP request is sent to Joe's DHCP server. | <input type="checkbox"/> The ARP request is sent to the DNS server configured in Joe's PC. |
| <input checked="" type="checkbox"/> The ARP request is broadcast to all hosts in the same LAN as Joe's PC. | <input type="checkbox"/> The ARP request is broadcast to all hosts in Swisscom's network. |

Question 5 A link-local address such as `fe80::a00:20ff:fe78:30f9...`

- can be used to communicate with all other hosts in the same private network made of one IP router and several Ethernet switches. DHCP server.
- can only be used to communicate with a DHCP server. cannot be used to communicate with other hosts.
- can be used to communicate only with destinations in the same LAN.

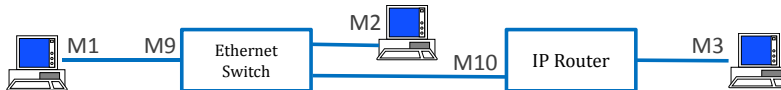
Question 6 On a full-duplex Ethernet link ...

- the medium access protocol is CSMA/CD. there is no medium access protocol.
- the medium access protocol is CSMA/CA. the medium access protocol is Aloha.

Question 7 A host A in Lausanne communicates with a host B in the US (no VPN is used). With ARP, A can learn...

- the MAC address of A's next-hop router the IPv4 address of B
- the IPv4 address of A's next-hop router the MAC address of B

Question 8 M1 sends one IPv6 packet to M2 and one to M3. The MAC destination addresses observed at M1 are ...



- M9 in both packets. M9 and M10.
- M2 and M3. M2 and M10.

Question 9 A machine M that runs both IPv4 and IPv6 receives one IPv4 packet with Time To Live (TTL) = 255 and one IPv6 packet with Hop Limit (HL) = 255.

- The sources of both packets are onlink with M. the same thing for the source of the IPv6 packet.
- We cannot conclude for sure that any of the two packets is onlink with M. The source of the IPv6 packet must be onlink with M but we cannot conclude the same thing for the source of the IPv4 packet.
- The source of the IPv4 packet must be onlink with M but we cannot conclude the same thing for the source of the IPv6 packet.

Question 10 Elaine's PC uses IPv6 and streams music on the EPFL network using iTunes; iTunes sends IPv6 packets with Hop Limit equal to 1.

- These packets will never be forwarded by any router. These packets may be forwarded to any host in the public Internet.
- These packets may be forwarded only by EPFL routers. These packets may be forwarded by Elaine's default router but not further.