



Multimedia Networking Technologies, Protocols, and Architectures

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REVIEW QUESTIONS ON IP MULTICAST

QUESTION 1

Assume that a router receives an IP packet with a destination IP address within the ranges indicated below. Select those options in which the router can forward the packet onto its outgoing links:

- Multicast addresses in the range 224.0.0.0-224.0.0.255.
- Multicast addresses in the range 224.0.1.0-238.255.255.255.
- Multicast addresses in the range 239.0.0.0-239.255.255.255.
- Broadcast address 255.255.255.255.

QUESTION 2

Assume an Ethernet network where a router and several hosts are connected. In this network, there are hosts that have joined the multicast groups G1 and G2. Indicate which of the following statements are true:

- If the IP address of the group G1 is 239.145.20.7, the Ethernet frames are sent to the members of the host group in the Ethernet network using the destination MAC address 01.00.5E.15.14.07.
- Hosts that join host groups G1 and G2 must replace their IP unicast addresses with the IP multicast addresses of the groups they join to.
- There are 31 IP multicast addresses that correspond to the same multicast MAC address of host group G2.
- A member of the host group G1 can send IP packets to the host group G2.

QUESTION 3

Indicate which of the following features are incorporated by IGMP version 2 with respect to IGMP version 1:

- It defines the figure of a "Querier" in each local network.
- It introduces a new message, *Leave Group*, which is sent to the address of a host group that is abandoned.
- It defines the *Group-Specific Query* message, which can be responded with *Report* messages.
- It is backward compatible with IGMP version 1.



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QUESTION 4

Indicate which of the following protocols can deliver multicast traffic using shortest path trees:

- Distance Vector Multicast Routing Protocol (DVMRP)
- Protocol Independent Multicast - Dense Mode (PIM-DM).
- Multicast Extensions to OSPF (MOSPF)
- Core-Based Trees (CBT)
- Protocol Independent Multicast - Sparse Mode (PIM-SM).

QUESTION 5

Indicate which of the following statements are true for the *Reverse Path Multicasting* (RPM) technique:

- It requires the periodic broadcast of multicast packets from each source that sends traffic to a host group.
- In general, the routes used to distribute IP multicast packets from each source to the interested receivers are suboptimal.
- Traffic sent to the multicast host groups concentrates on a few routers, leading to potential bottlenecks.
- It presents limitations in terms of scalability.
- DVMRP and PIM-DM are protocols that implement this technique.

QUESTION 6

Indicate which of the following statements are true for *Shared Tree* techniques:

- They require the periodic broadcast of multicast packets from each source that sends traffic to a host group.
- In general, the routes used to distribute IP multicast packets from each source to the interested receivers are suboptimal
- They require to maintain multicast tree state in routers that do not lead to receivers of the host group.
- Traffic sent to the multicast host groups concentrates on a few routers, leading to potential bottlenecks.
- CBT and PIM-SM use shared trees: the former uses unidirectional shared trees, while the shared trees in the latter are bidirectional.



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SOLUTIONS

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