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Winter 98-99

EE384A: Network Protocols and Standards

Homework #5

IP Multicast

Due Date: Thursday March 4, 1999

This homework assignment is to be done in groups of two.

I. IGMP

Read the following documents (the class web page has links to them):

- S. Deering, *Host Extensions for IP Multicasting*, Internet RFC 1112, August 1989.
- W. Fenner, *Internet Group Management Protocol, Version 2,* RFC 2236, November 1997.
- B. Cain, et al., *Internet Group Management Protocol, Version 3,* Internet Draft draft-itf-idmr-igmp-v3-00, November 1997.

Question:

Write a unified description of IGMP that includes all the functions and features specified in the three documents (Versions 1-3); you are required to describe the messages used in implementing the functionality. You are not required to address the interoperability issues between the different versions. Furthermore, no reference needs to be made in your description to the version numbers.

II. IP Multicast Routing

Referring to the following documents included in the course reader:

1. DVMRP

- T. Pusateri, *Distance Vector Multicast Routing Protocol*, Internet Draft, draft-ietf-idmr-dvmrp-v3-07, August 1998.

2. MOSPF

- J. Moy, *Multicast Extensions to OSPF*, Internet RFC 1584, March 1994.

3. CBT

- A. Ballardie, *Core Based Trees (CBT version 2) Multicast Routing*, Internet RFC 2189, September 1997.

4. PIM-DM

- S. Deering, et al., *Protocol Independent Multicast Version 2, Dense Mode Specification*, Internet Draft draft-ietf-idmr-pim-dm-06, August 1997.

5. PIM-SM

- D. Estrin, et al., *Protocol Independent Multicast-Sparse Mode (PIM-SM): Protocol Specification*, Internet RFC 2362, June 1998.

Question:

Consider the IP multicast routing protocols described in the above references, namely, DVMRP, CBT, MOSPF, PIM-DM and PIM-SM. Describe each focusing on, and compare them with respect to, the following:

a) Formation of the routes used in multicasting;
b) Information exchanged among routers for the purpose of creating the multicast routes; and
c) State information held in routers.

In answering the above questions group together the IP multicast routing protocols that are similar in nature and give for each group specific illustrative examples based on the sample network given in the MOSPF RFC 1584 and the two groups (Group a and Group b), with all hosts H1, H2, …, H5 being possible sources for both groups.

Note: Be as structured, explicit and clear in your answer and examples as possible.