Chapter 10

IGMP

- Multicasting
- IGMP
- Encapsulation
- MBONE
- IGMP Design

Figure 10-1

Class D address

Group identifier

Class D address
Range: 224.0.0.0 to 239.255.255
Figure 10-2  Position of IGMP in the network layer

Network layer

IP

ARP  RARP

Figure 10-3  IGMP messages

Host  Report  Router

Query
Figure 10-4

**IGMP message format**

- **Type:** Query (1) Report (2)
- **Ver:** 8 bits
- **Type:** 8 bits
- **Unused:** 8 bits
- **Checksum:** 8 bits
- **Group address in report, all 0s in query**

Figure 10-5

**Operation of IGMP**

- **LAN**
- **Hosts**
- **Multicast router**
- **List of groups having loyal members:**
  - 225.70.12.8
  - 231.24.60.9
  - ...
  - 229.60.12.8
Four situations of IGMP operation

- **a. Joining the group**
  - Host sends a Group address Report to the Router.

- **b. Monitoring the group**
  - Host sends a Group address Query to the Router.

- **c. Membership continuation**
  - Host sends a Group address Report to the Router.

- **d. Leaving the group**
  - No response to query from the Router.

Operation of IGMP in a part of a spanning tree

- Network A
- Network B
- Network C
- R1
- R2
- R3

To the rest of the Internet
Figure 10-8  
**Mapping class D to Ethernet physical address**

32-bit class D address

1110 23 bits of multicast address

5 bits unused

0000000100000000010111100 23 bits of physical address

48-bit Ethernet address

Figure 10-9  
**Tunneling**

Multicast IP datagram

Header  Data

Unicast IP datagram

Header  Data
Figure 10-10  
Encapsulation of IGMP packet

Figure 10-11  
IGMP design
Figure 10-12  

<table>
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<tr>
<th>State</th>
<th>Interface No.</th>
<th>Group Address</th>
<th>Reference Count</th>
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