

To summarize:

*Membership in an IP multicast group is dynamic: a computer can join or leave a group at any time. Group membership defines a set of receivers; an arbitrary application can send a datagram to the group, even if the application is not a group member.*

### 26.16.2 IGMP

How does a host join or leave a multicast group? A standard protocol exists that allows a host to inform a nearby router whenever the host needs to join or leave a particular multicast group. Known as the *Internet Group Management Protocol (IGMP)*, the protocol is used only on the network between a host and a router. Furthermore, the protocol defines the host, not the application, to be a group member, and specifies nothing about applications. If multiple applications on a given host join a multicast group, the host must make copies of each datagram it receives for local applications. When the last application on a host leaves a group, the host uses IGMP to inform the local router that it is no longer a member of the group.

### 26.16.3 Forwarding And Discovery Techniques

When a router learns that a host on one of its networks has joined a multicast group, the router must establish a path to the group and propagate datagrams it receives for the group to the host. Thus, routers, not hosts, have responsibility for the propagation of multicast routing information.

Dynamic group membership and support for anonymous senders makes general-purpose multicast routing extremely difficult. Moreover, the size and topology of groups vary considerably among applications. For example, teleconferencing often creates small groups (e.g., between two and five members) who may be geographically dispersed or in the same organization. A webcast application can potentially create a group with millions of members that span the globe.

To accommodate dynamic membership, multicast routing protocols must be able to change routes quickly and continually. For example, if a user in France joins a multicast group that has members in the U.S. and Japan, multicast routing software must first find other members of the group, and then create an optimal forwarding structure. More important, because an arbitrary user can send a datagram to the group, information about routes must extend beyond group members. In practice, multicast protocols have followed three different approaches for datagram forwarding:

- [Flood-And-Prune](#)
- [Configuration-And-Tunneling](#)
- [Core-Based Discovery](#)