

CS8601 -MOBILE COMPUTING

UNIT 3

MOBILE NETWORK LAYER

3.7. MULTICAST ROUTING PROTOCOL(ODMRP)

Multicast is the delivery of a message to a group of destination nodes in a single transmission. Multicast Protocols are

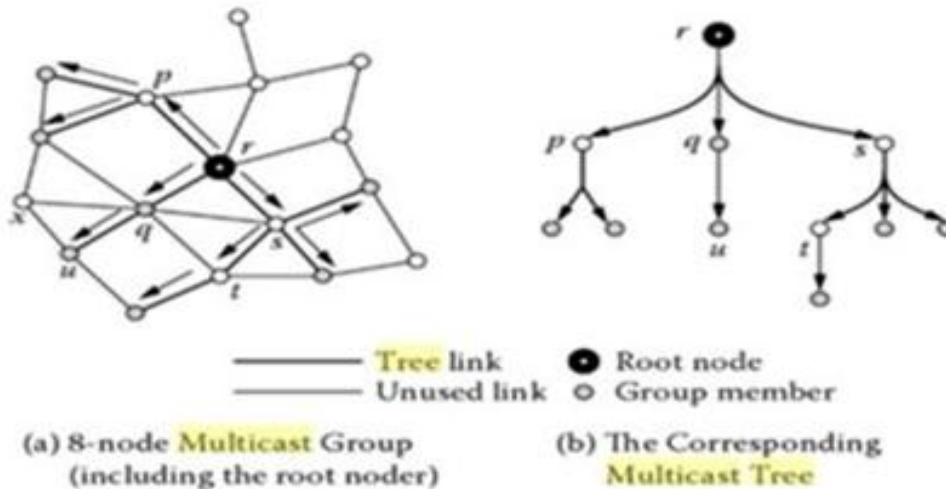
Tree based Protocol and Mesh based Protocol

a) Tree based Protocol

This establishes a single path between any two nodes in the multicast group.

Example: AMRoute, AMRIS

The tree consists of root node(r), three intermediate nodes (p,s,t) and seven group members. For node u, the packet transmission is relayed through two tree links, that is, from r to q and then q to u. To maintain the tree structure even when nodes move, group members periodically send Join Request message.



b) Mesh Based Protocol

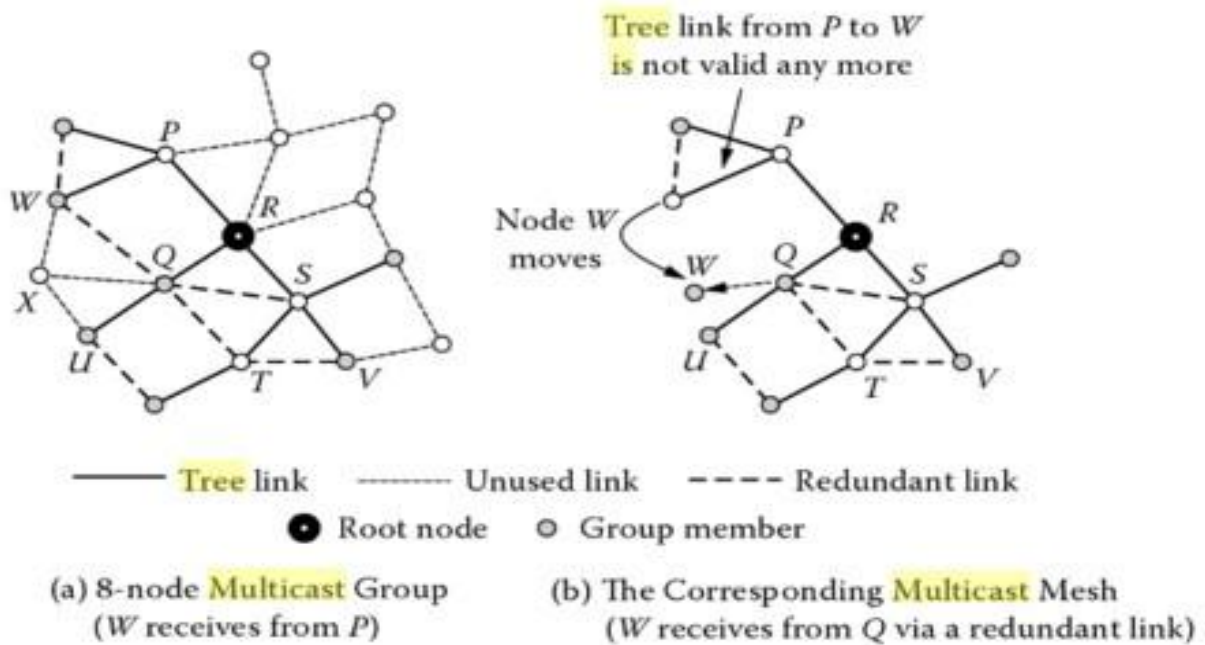
This establishes a multiple path between source - receiver pair.

Example: ODMRP, CAMP

Tree based protocols, may not perform well in the presence of highly mobile nodes because multicast tree structure is fragile and needs to be frequently readjusted. Each node in a mesh can have multiple parents. Multiple links exist and other links are immediately available when the primary link is broken due to node mobility. This avoids frequent reconfigurations. Sending a Packet from R to U involves three transmissions(R,Q,U) & fourteen receives(5 neighbours of R,6 neighbours of Q and 3 neighbours of U).

For eg, the transmission from node Q is received not only by U but also by neighbour nodes R,S,T,W and X; the redundant link from Q to W may be useful when the path from P to W is broken

Drawback of this scheme is that multiple copies of the same packet are forwarded through the mesh.



ON-DEMAND MULTICAST ROUTING PROTOCOL (ODMRP)

Provides richer connectivity among multicast members using a mesh based approach.

- Supplies multiple route for one particular destination.
- Helps in case of topology changes & node failures.
- Use the concept of Forwarding Group - A subset of nodes forwards multicast packets.
- Operation of ODMRP:

1. A sender node wishing to send multicast packets periodically floods a JOIN REQUEST to entire network.
2. A Node receiving a non-duplicate JOIN REQUEST, stores the upstream node ID (i.e. backward learning) into routing table & rebroadcasts the packet.

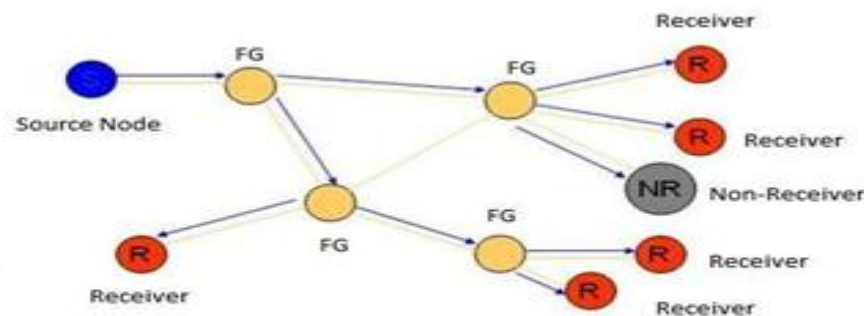


Fig - Flooding of JOINT REQUEST

3. A multicast receiver getting the JOIN REQUEST creates or updates the source entry in its member table.
4. As long as valid entries in receiver's member table, JOIN TABLE are broadcasted periodically.

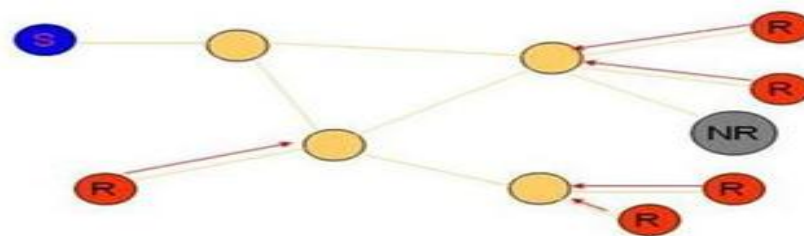


Fig. Propagation of JOINT TABLE

5. An intermediate node, receiving the JOINT TABLE, compares it's Node ID with the entries of that table.
6. If there's a match, it is a member of the forwarding group. Then it sets FG- FLAG & broadcasts its JOIN TABLE.
7. This process is going to create a mesh between all forwarding group members.
8. JOIN TABLE is propagated by each forwarding Group member until it reaches source via a shortest path.
9. Routes from source to receivers builds a mesh of nodes called "Forwarding Group"

