METHOD AND SYSTEM FOR FLOODING AND MULTICAST ROUTING IN AN AD-HOC NETWORK

ABSTRACT

A wireless ad-hoc multicast network including a plurality of nodes, each of the nodes being designated with a dynamically determined role, a plurality of the nodes being designated with the role of super-node and the remaining nodes being designated with the role of ordinary-node, the super-node designated nodes forming a routing backbone of the network, the nodes forming at least one multicast group, each of the nodes including a transmitter, a receiver, a local topology processor, a network topology processor, a backbone multicast processor and a local multicast processor, the local topology processor being coupled with the transmitter and with the receiver, the network topology processor being coupled with the transmitter, the receiver and with the local topology processor, the backbone multicast processor being coupled with the transmitter, the receiver and with the network topology processor, the local multicast processor being coupled with the transmitter, the receiver, the backbone multicast processor and with the local topology processor, the transmitter transmitting packets and messages over a wireless medium, the receiver receiving packets and messages over the wireless medium, the local topology processor maintaining a local topology database, and dynamically determining the role of the node, the network topology processor being operative when the role of the node is designated with the role of super-node, for maintaining a network topology database, and for establishing and terminating a dedicated backbone routing link with one-hop super-node neighbors, the backbone multicast processor being operative when the node is designated with the role of super-node, for

maintaining a backbone multicast registration table, for transmitting backbone multicast update messages and for forwarding multicast packets, the local multicast processor maintaining a local multicast registration table and transmitting local multicast update messages to each one-hop ordinary-node neighbor only when the node is designated with the role of super-node, the local multicast processor being further operative for transmitting a multicast group subscription message to a selected one-hop super-node neighbor when the node is designated with the role of ordinary-node, and forwarding a multicast packet to a one-hop super-node neighbor serving one of the multicast groups associated with the multicast packet, each of the nodes attempting to communicate with a minimal number of one-hop super-node neighbors.

Fig. 2A