NOVEL MULTICAST ROUTING PROTOCOL FOR MANETS

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ABSTRACT
This paper presents a novel multicast routing protocol for mobile ad hoc wireless networks. The Adhoc Multicast Routing Protocol (AM Route) presents a novel approach for robust IP Multicast in mobile adhoc networks by exploiting user-multicast trees and dynamic logical cores. It creates a bidirectional, shared tree for data distribution using only group senders and receivers as tree nodes. Unicast tunnels are used as tree links to connect neighbours on the user-multicast tree. Thus, AM Route does not need to be supported by network nodes that are not interested/capable of multicast, and group state cost is incurred only by group senders and receivers. Also, the use of tunnels as tree links implies that tree structure does not need to change even in case of a dynamic network topology, which reduces the signalling traffic and packet loss. Thus AM Route does not need to track network dynamics; the underlying uncast protocol is solely responsible for this function. AM Route does not require a specific uncast routing protocol; therefore, it can operate seamlessly over separate domains with different uncast protocols. Certain tree nodes are designated by AM Route as logical cores, and are responsible for initiating and managing the signalling component of AM Route, such as detection of group members and tree setup. Logical cores differ significantly from those in CBT and PIM-SM, since they are not a central point for data distribution and can migrate dynamically among member nodes. Simulation results demonstrate that AM Route signalling traffic remains at relatively low level for typical group sizes. The results also indicate that group members receive a high proportion of data multicast by senders, even in the case of a highly dynamic network.

KEY WORDS: Ad-hoc networks, Unicast Routing Protocol, Unicast signalling, Unicast tunnels.