# A Frame Work for Comparing AMRIS and ODMRPOf Multicasting in Ad-Hoc Networks

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***Abstract****—Multicasting can well carry a range of applications that are characterized by a close degree of teamwork, typical for many ad-hoc applications currently envisioned. Surrounded by the wired network, well-established routing protocols survive to offer a well-organized multicasting provision. When nodes develop into progressively more mobile, these protocols need to evolve to equally provide an efficient service in the new environment. This paper talk about the performance of two proposed multicast protocols for ad-hoc networks: Ad Hoc Multicast Routing Protocol Utilizing Increasing ID Numbers (AMRIS) and On-demand Multicast Routing Protocol (ODMRP).AMRIS assemble and keep up a multicast tree based on hard state information, ODMRP maintains a mesh based on soft state. Our Outcome demonstrates that in many situations On- Demand Multicast routing protocol is a mesh architecture protocol, i.e, it has multiple paths from the sender to the receivers and uses a forwarding group concept. It applies on-demand procedures to dynamically build route and maintain multicast group membership. By maintaining a mesh instead of a tree, the drawbacks of multicast trees in ad hoc networks like frequent tree reconfiguration and non-shortest path in a shared tree are avoided. In ODMRP, group membership and multicast routes are established by the source on demand when a multicast source has packets to send, but no route to the multicast group, it broadcasts Join-Query control packets to the entire network.*

**Keywords—**Multicasting.AMRIS, ODMRP, Ad-Hoc Networks

## I. INTRODUCTION

In this paper, we present a comparative performance of two multicast protocols for Mobile Ad hoc Networks ODMRP and AMRIS focusing on the effects of changes such as the increasing number of receivers or sources and increasing the number of nodes. Although some simulation results of MANET protocols have been published before, these two protocols have not been compared in isolation. In recent years, a number of new multicast protocols have been proposed for ad hoc networks. A systematic performance evaluation of these protocols is done by performing certain simulations under NS-2. The applicability of multicast protocols to diverse situation are also studied and discussed.
AMRIS is a source-initiated multicast routing PROTOCOL in which a shared-tree is constructed to support multiple sources and receivers. The main idea in this protocol is that each tree node has a session specific multicast session member identifier (MSM-ID) which indicates its logical height in the shared tree. The purpose of MSM-ID is to avoid any loop formation and repair the broken links locally.

## II. PROBLEMS IDENTIFIED IN AMIRS

After a critical analysis of the AMRIS protocol, the following problems were observed.

1) Wastage of bandwidth due to usage of beacons. A beacon is a very small message which is periodically sent by each node to show the connectivity with the network. Due to these beacons some amount of bandwidth is wasted.
2) (2) Loss of data packets due to collisions with beacons. Sometimes data packets use full channel bandwidth. At this stage the beacon collides with the data packets and results in loss of some data packets.
3) (3) The protocol follows hard state route maintenance scheme. When a parent node leaves network or it fails, its child node needs another parent node so that it could remain connected in the network. To find suitable parent node, the child node has to search a potential parent amongst the existing nodes in the network. This search process, wastes a lot of time, delays packet delivery and loss of data packets.
4) (4) Selection of potential parent nodes based on MSM-ID. In the existing protocol, the selection of potential parent node by a new node is based upon the MSM-ID value. This results in increase in the average hop-length between the receivers and the source, leading to increased delay and increased probability of packet losses.

### *A. Drawbacks ofAODV:*

The performance of the AODV protocol is poor in larger networks. A long path is more vulnerable to link breakages and requires high control overhead for its maintenance. Furthermore, as a size of a network grows, various performance metrics begin decreasing because of increasing administrative work, so-called administrativeload.

## III. COMPARATIVE STUDY

This section presents the solutions to the problems which are occurred from AMIRS and the solutions are proposed by ODMRP Protocol

### *A. On-Demand Multicast Routing protocol(ODMRP):*

On-Demand Multicast routing protocol (ODMRP) [8] is a mesh based source-initiated protocol, i.e., it uses forwarding group concept and multiple paths exist between sender and receiver. It applies on-demand procedures to build route and maintain multicast group membership dynamically. By maintaining a mesh, instead of a tree, the drawbacks of multicast trees in ad hoc networks like frequent tree reconfiguration and non-shortest path in a shared tree are avoided.

### *B. Algorithm:*

In ODMRP, group membership and multicast routes are established by the source on-demand. When a multicast source has packets to send but no route to the multicast group, it broadcasts a Join-Query control packet to the entire network. This control packet is periodically broadcast to refresh the membership information and updates routes. When the Join-Query packet reaches a multicast receiver, it creates and broadcasts Join-Reply to its neighbors. When it has been received by the node, it checks if the next hop id is its own id. If it matches, the node realizes that it is on the path to the source and becomes the part of the forwarding group by setting the FG_FLAG (Forwarding Group flag). When receiving a multicast data packet, a node forwards it only when it is not a duplicate, hence minimizing traffic overhead. Because the nodes maintain soft state, finding the optimal flooding interval is critical to ODMRP performance.

ODMRP uses location and movement information to predict the duration of time that routes will remain valid.

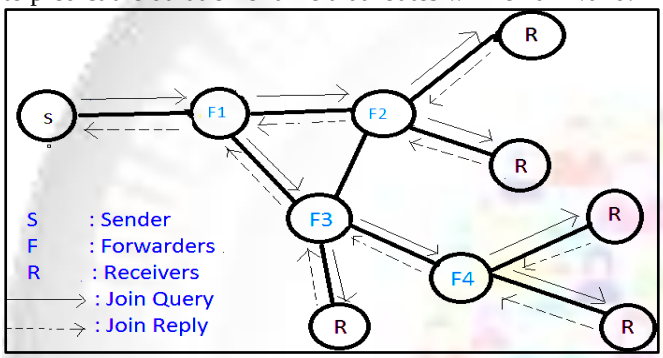


Fig. 1: On-demand procedure for membership setup and maintenance

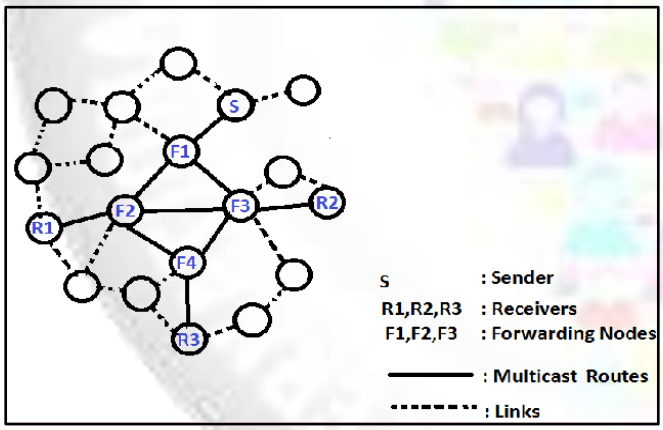


Fig. 2: ODMRP Illustration

With the predicted time of route disconnection, a "join data" packet is flooded when route breaks of ongoing data sessions are imminent. It reveals that ODMRP is better suited for adhoc networks in terms of bandwidthutilization.

Fig 1, Fig 2 is an example to show the robustness of a mesh configuration. Sender „S" send multicast data packets to three receivers (R1, R2, and R3) via three forwarding group nodes (F1, F2 and F3). In case the route from S to R1 is <S-F1- F2-R1>. In a tree configuration, if the link between nodes F1 and F2 breaks R1 cannot receive any packets from S until the tree is reconfigured but in ODMRP has a redundant route <S-F1-F3-F2-R1> to deliver packets without going through the broken link between nodes F1 and F2.

### *C. Merits ofODMRP*

- Usage of up-to-date shortestroutes
- Robustness in terms of hostmobility
- Exploitation of the broadcast nature of the wirelessenvironment
- Capability to perform UnicastRouting.
- multiple redundant paths are maintained andexploited.

## IV. Conclusion

In MANETs, both unicasting and multicasting can be used. But according to the performance analysis, specifically for group communications, multicast routing increases the efficiency and provides better performance when compared to unicast routing.

## V. Future Enhancements

Wireless mesh Networks (WMN) has been widely accepted in the traditional application sectors of ad hoc network. With increasing demand for real-time services in the next generation wireless networks, quality-of-service (QoS)-based routing offers significant challenges in WMNs. The multi constrained QoS-multicast routing has been proved as NP-hard problem. Further, based on genetic algorithm approach, multiple QoS parameters can be optimized simultaneously.

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