CHAPTER 6

CONCLUSIONS AND SCOPE FOR FUTURE WORK

6.1 IMPORTANCE OF RESEARCH WORK

In many of the scenarios, group communication plays a vital role in exchanging the sensitive information among a particular group of people. Multicast is as such one of the group communications rapidly used in the application of MANET. The primary application of MANET includes emergency rescue operation in a disaster hit area, military application in the battle field, game guidance in a group game, wireless mesh networks and collaborative and distributed computing. As far as multicast communication is concerned the group leader in a multicast group plays a very important role. The task associated with group leader mostly determines the performance of the multicast routing.

Group construction is a very important task in multicast communication. Hence the way group is constructed and the way a group leader is assisted make an impact on the performance of multicast routing. The thesis report explains about the proposed multicast routing protocol MSRDMP aiming at providing robustness and scalability hence increasing the packet delivery ratio, minimizing control overhead, optimizing average path length and minimizing average joining delay.

6.2 CONTRIBUTION OF THESIS

The MANET consists of a self organizing group of nodes and a node in a network acts both as a router and sender. The loss of data in mobile ad hoc network is prevalent as the MANET lacks the centralized access control. In a multicast communication when group leader sends a data packet to its group member, it should be ensured that all of the group members have received the packet. If any of the group members has not received the packet, then the group leader of the multicast group must take a responsibility to send the lost packet to the member which has not received the packet. The task of sending the packet once again will become a burden to the group leader. The proposed multicast routing protocol narrated in this thesis ensure that how lost data packet by the group member would be recovered.

In MSRDMP the group is constructed based on the transmission range of the node with respect to virtual reference point and each group has one group leader and one leadership track node. The leadership track node is one of the group members of the group and it gives the freedom to move away from the group. Though leadership track node moves away it will still be in contact with the group leader by exchanging an alert message. The MSRDMP is the location aware multicast routing protocol. The alert message is created using the locality information provided by global positioning system and received signal strength. On counting the number of collision the optimum contention deferred transmission time is calculated to determine how long a sending station has to wait before start sending the packet.

The MSRDMP introduces the new Interim CTS (ICTS) request to recover the lost data packet by a group member. If any of the group members has not received the packet within the packet delivery time set, it will invoke

the Interim CTS request to leadership track node, on receiving the ICTS request, the leadership track node takes the additional responsibilities to send the lost packet to the group member which has not received the packet. Thus group leader and leadership track node shares the work mutually so that control overhead is reduced as well as robustness is achieved. Thus MSRDMP provides the robustness and effective group management. The thesis report emphasis that robustness and group management is one of the major contributions in devising new multicast routing protocol MSRDMP.

Scalability is another important feature of any network system. The size and density of the network need not be the same throughout the application of the system. A system is said to be more competent when it accepts the change for betterment. In multicast communication number of groups and number of members per group after the deployment may increase. The change in the network should be made known to all other existing groups so that coordination among the group members can be achieved. The control data table maintained by each group member is updated effectively by appendix packet introduced in MSRDMP. The thesis reports emphasis the scalability is another important contribution to achieve the effective multicast routing under varying group size and number of groups.

The thesis report gives the result discussion on comparing the MSRDMP with existing protocol ODMRP, RSGM and SPBM. The performance parameters packet delivery ratio, control overhead, average path length and average joining delay are taken into account for the performance analysis. The performance analysis of MSRDMP due to the impact of moving speed of node and node density is compared with existing protocol ODMRP and RSGM. The performance analysis of MSRDMP due to impact of group size and number of groups is compared with RSGM and SPBM. The

performance study on MSRDMP ensures that the proposed protocol offers better performance than the other multicast routing protocols. The MSRDMP gives 2 % improvement than RSGM and about 15 % improvement than ODMRP and 10% improvement than SPBM on overall average performance.

6.3 LIMITATIONS OF MSRDMP

The proposed MSRDMP also suffer from some limitations. When the MSRDMP is employed in an environment, it requires plotting of the virtual reference point at an equal distance from one another. As far as the LTN is selected, the node with the second highest in NNR is declared as LTN. If two nodes have the equal values of NNR then mutual exclusion should be carried out between them in acting as a LTN. The proposed MSRDMP has one LTN per group but this can be changed. One LTN can be placed at appropriate location for monitoring some set of group leaders. When number of LTN increases the end to end delay increases.

6.4 SCOPE FOR FUTURE ENHANCEMENT

To excel the application of MSRDMP in few areas other than MANET a slight enhancement can be done in a field like wireless sensor node and VANET. In a well organized road traffic where the velocity of the vehicle is considered to be constant, the same principle behind the group construction can be used in VANET to regulate multicast communication among the moving vehicles. When wireless sensor nodes are deployed, the sink node can be given features of MSRDMP to recover the lost packet using interim CTS request.

A threshold value for group membership strength per group could be changed for every group. The threshold value can be allowed to change its

value dynamically according to density of nodes in each group. The provision of this feature would avoid the unnecessary collision among the nodes in a group. The group in MSRDMP is constructed in such a way that each group has one leadership track node with permission to move away from the group. Instead of having one leadership track node per group, a single leadership track node for four groups could be possible while placing leadership track node at the appropriate location so that it can monitor the four different group leaders of four groups simultaneously.