ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

IJARMATE International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)
Vol.7, Issue 3, March 2021

Performance Evaluation of AOMDV protocol for Group mobility model

Nitin K[1], Rahul K[2]
[1]ECE Dept, Guru Nanak Dev Engg College Bidar
[2] CSE Dept, Guru Nanak Dev Engg College Bidar

***Abstract*—Manets find applications in battlefield communication where soldiers are going to move in groups. As a result we consider the movement of mobile nodes to be in groups, for which we have considered RPGM mobility model. Bonnmotion tool is used to generate the group mobility model. The performance of AODV protocol is evaluated through simulations in ns2. Packet delivery ratio, normalized routing load & end to end delay are the performance metrics being measured.**

***Index Terms*— RPGM, Bonnmotion, AOMDV, NS2**

I. INTRODUCTION

With the growing demand in pervasive computing, there is dramatically exponential growth in number of mobile devices. Mobile adhoc network forms dynamic topologies and are infrastructure less. With the cooperation of each & every node, data communication occurs from source node to the destination node. Routing of data plays an important role in manet. Based on some set of rules & regulations, a routing protocol works. Route discovery is the first step for route establishment between source & destination. With minimum routing overhead & less end to end delay, maximum data should reach the destination node. Here we have choosen a on demand multipath distance vector routing protocol AOMDV. It is an extension of single path routing protocol AODV. Manets have great application in battlefield communication where combating troops move in groups. So as a result we have considered the movement of mobile nodes in groups. For group mobility we have considered RPGM mobility model.

II. ADHOC ON DEMAND MULTIPATH DISTANCE VECTOR (AOMDV) ROUTING PROTOCOL

AOMDV [1] shares several characteristics with AODV[5][6]. It is based on the distance vector concept and uses hop-by-hop routing approach. Moreover, AOMDV also finds routes on demand using a route discovery procedure. The main difference lies in the number of routes found in each route discovery. In AOMDV, RREQ propagation from the source towards the destination establishes multiple reverse paths both at intermediate nodes as well as the destination. Multiple RREPs traverse these reverse paths back to form multiple forward paths to the destination at the source and intermediate nodes. Note that AOMDV also provides intermediate nodes with alternate paths as they are found to be useful in reducing route discovery frequency.

The core of the AOMDV protocol lies in ensuring that multiple paths discovered are loop-free and disjoint, and in efficiently finding such paths using a flood-based route discovery. AOMDV route update rules, applied locally at each node, play a key role in maintaining loop-freedom and disjointness properties. Here we discuss the main ideas to achieve these two desired properties. Next subsection deals with incorporating those ideas into the AOMDV protocol including detailed description of route update rules used at each node and the multipath route discovery procedure.

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

IJARMATE International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)
Vol.7, Issue 3, March 2021

AOMDV relies as much as possible on the routing information already available in the underlying AODV protocol, thereby limiting the overhead incurred in discovering multiple paths. In particular, it does not employ any special control packets. In fact, extra RREPs and RERRs for multipath discovery and maintenance along with a few extra fields in routing control packets (i.e., RREQs, RREPs, and RERRs) constitute the only additional overhead in AOMDV relative to AODV. [3] discussed that the activity related status data will be communicated consistently and shared among drivers through VANETs keeping in mind the end goal to enhance driving security and solace. Along these lines, Vehicular specially appointed systems (VANETs) require safeguarding and secure information correspondences. Without the security and protection ensures, the aggressors could track their intrigued vehicles by gathering and breaking down their movement messages.

III. MOBILITY MODELS

A. Random Waypoint Mobiliy Model (RWay)

RWay [2][8] is the most widely used entity mobility model in MANET research. In RWay, each MN randomly chooses a destination inside the simulation area and a speed uniformly distributed between [*MinSpeed, MaxSpeed*]. Then the MN travels toward the destination with the selected speed. Upon arriving, the MN pauses for a certain period of time and then, starts the selection process again.

B. Reference Point Group Mobility Model (RPGM)

In RPGM,[7][8] each group has a group leader, whose movement defines the entire group's movement, including speed, direction, etc. Group leaders' movement trajectories can be predefined or based on RWay. A number of reference points are placed around the group leader. The distance and direction between the reference points and their corresponding group leader are fixed during whole simulation. Each group member will be assigned one of the reference points and moves around its corresponding reference point.
When a new position for one group leader is generated, new positions for reference points are also defined accordingly. Each group member also chooses a new position randomly around its reference point. Then, all mobile nodes in this group will move to their new positions in a same time period with constant speed.

IV. SIMULATION ENVIRONMENT

We have used the network simulator version 2.35 for carrying out the simulations for mobile adhoc network. The CBRGEN tool in NS2 [4] is used to generate the traffic file with 512 bytes data packet and send rate of 4 packets/second. The SETDEST tool is used to generate a scenario file for random waypoint mobility model. The Bonnmotion tool is used to generate a scenario file for RPGM mobility model. The table I shows the simulation parameters

Simulation parameter	**Value**
Simulation time	300s
Transmission range	250m
Mobile nodes	50
Pause time	0s
Traffic pairs	10,15,20,25
Speed of mobile nodes	15m/s
Simulation area	1000m*1000m

Table I: Simulation parameters

V. PERFORMANCE METRICS

Following are the performance metrics
1. Packet delivery ratio: It is the total number of data packets received by all destination nodes over the total number of data packets sent by all source nodes in network.

2. Normalized routing overhead: It is the total number of non-data packets transmitted at the IP layer over the total data packets received during the simulation.

3. Average end to end delay: It is the time the packet generated at the source and the time the packet arrived at the destination

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

IJARMATE International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)
Vol.7, Issue 3, March 2021

V. SIMULATION RESULTS

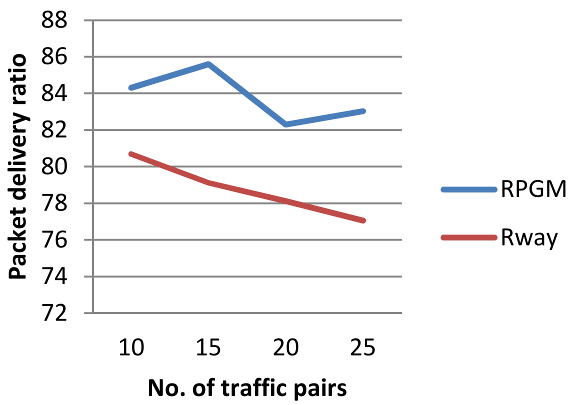

Fig 1. PDF for AOMDV

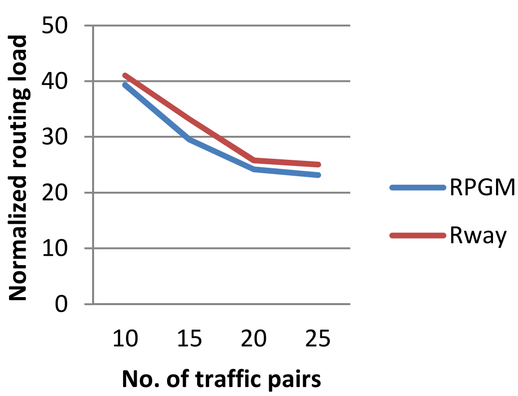

Fig 2. NRL for AOMDV

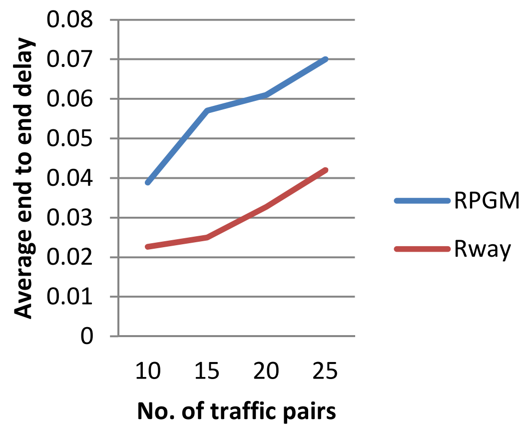

Fig 3. Average EED for AOMDV

VII. CONCLUSION

Here we have compared the performance of AOMDV routing protocol for random way point mobility model & reference point group mobility model. Fig1 shows that the packet delivery ratio for RPGM is better than the RWAY model. Fig 2 shows that the NRL is better for RPGM model than the RWAY model. Fig3 shows that average end to end delay is better for RWAY compared to RPGM.

REFERENCES

[1] Mahesh K. Marina and Samir R. Das, Ad hoc on-demand multipath distance vector routing, *Wirel. Commun. Mob. Comput.* 2006; **6**:969–988

[2] T. Camp, J. Boleng, and V. Davies, “A survey of mobility models for ad hoc network research,” *Wireless Communications and Mobile Computing*: *Special issue on Mobile Ad Hoc Networking: Research, Trends and Application*, pp. 483-502, 2002.

[3] Christo Ananth, Dr.S. Selvakani, K. Vasumathi, “An Efficient Privacy Preservation in Vehicular Communications Using EC-Based Chameleon Hashing”, Journal of Advanced Research in

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

IJARMATE International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)
Vol.7, Issue 3, March 2021

Dynamical and Control Systems, 15-Special Issue, December 2017,pp: 787-792.

[4] K. Fall and K. Varadhan, "The ns Manual," The VINT Project, UC Berkeley, LBL, USC/ISI, and Xerox PARC, March 2008.

[5] Rahul Kulkarni, S Asha, Nitin Kulkarni, Comparative Analysis Of AODV, DSR Routing Protocols In Mobile Ad-Hoc Networks, IJERT, Vol 2, issue 7, 2013

[6] Nitin K, Rahul K, Performance analysis based on energy efficiency of AODV & DSR routing protocol in MANETs, IJERT, vol 5, issue 6, 2016

[7] Nitin K, Rahul K, Performance of DSR Routing Protocol for RPGM Mobility model in Manets, IJIRT, Vol 5, Issue 2, 2018

[8] Nitin K, Rahul K, Performance Analysis of AODV Routing Protocol for RPGM Mobility Model in MANETs, IJSRD, vol 5, Issue 5, 2017