Available Online at www.ijcsmc.com

International Journal of Computer Science and Mobile Computing

A Monthly Journal of Computer Science and Information Technology

ISSN 2320–088X

IJCSMC, Vol. 2, Issue. 5, May 2013, pg.425 – 429

RESEARCH ARTICLE

Comparison and Simulation of POR and E-POR Routing Protocols in MANETs

M. Chandrika[1], N. Papanna[2]

[1]M. Tech Student, Sree Vidyanikethan Engineering College, Tirupati, AP, India

[2]Assistant professor, Sree Vidyanikethan Engineering College, Tirupati, AP, India

[1] *Chandrikanecg@gmail.com;* [2] *n.papanname@gmail.com*

Abstract— A Mobile Ad hoc Network (MANET) is a group of mobile nodes that form a multi-hop wireless network. The topology of the network can change randomly due to unpredictable mobility of nodes and propagation characteristics. POR and EPOR protocols are on-demand routing protocols. First Position-based Opportunistic Routing (POR) protocol which takes advantage of the stateless property of geographic routing and the broadcast nature of wireless medium. When a data packet is sent out, some of the neighbor nodes that have overheard the transmission will serve as forwarding candidates, and take turn to forward the packet if it is not relayed by the specific best forwarder within a certain period of time. In E-POR (Enhanced-POR) is some wants better to the POR. Here decreasing the end-to-end delay and increasing throughput. In this paper, we compared the performance of POR and E-POR protocol by using simulation parameters with ns-2simulation. And E-POR is better performance than that of POR protocol. In network simulation E-POR protocol end-to-end delay is less than POR protocol. In E-POR may achieve the better throughput evolution than the POR.

Key Terms: - Ad-hoc network; mobile ad hoc network; POR; E-POR; communication channel

I. INTRODUCTION

Mobile ad hoc networks (MANET) [1] consist of mobile platform which communicate with each other through wireless links without any predetermined infrastructure. Each node not only is a host but also as a router that maintains routes to and forwards data packets for other nodes in the network that may not be within direct wireless transmission range. Topology of a mobile ad-hoc network often changes rapidly. However, due to the error prone wireless channel and the dynamic network topology, reliable data delivery in MANETs, especially in challenged environments with high mobility remains an issue. Previously existing topology-based MANET routing protocols (e.g., DSDV, AODV, DSR [2]) are quite susceptible to node mobility.

In AODV routing protocol is single node data transmit to the all neighboring nodes and collect the information as RREQ and delivers to the reverse path of that RREQ path and send the source node. Here time consuming and robustness is very less and overcome this issue we propose an AOMDV. This routing protocol is sends the RREQ to the multiple RREQs and we have to send all neighboring nodes and then transmit the packets as reverse path .The path is selects the best forwarder then transmit it, but some time link breaks occurred that time we can propose the POR protocol. It could be realized using many kinds of location service ([3], [4]).

This POR protocols may collects the information to the all neighboring nodes and send it. And single channel will be performed, whenever the link failure is occurs best forwarder does not forwards the packets then sub-optimal candidates as transmit the packets in certain period of time. Here some want reliable information is delivered some of times packet loss is occurred. Then we have to propose the E-POR protocol.

E-POR protocol may having a multi-channels are used and information is very sufficient. No packet loss is occurring and reliably data is delivered to receiver node. And evaluate the performance of POR and E-POR. Finally, we evaluate the performance of E-POR through extensive simulations and verify that E-POR achieves excellent performance in the face of high node mobility while the overhead is acceptable. Node mobility is propose a Enhance- position-based opportunistic routing mechanism which can be deployed without complex modification to MAC protocol and achieve multiple reception without losing the benefit of collision avoidance provided by 802.11.

II. ENHANCED POSITION BASED OPPORTUNISTIC ROUTING [E-POR] PROTOCOL

The design of POR is based on geographic routing and opportunistic forwarding. The packet is transmitted as uni cast (the best forwarder which makes the largest positive progress toward the destination is set as the next hop) in IP layer and multiple receptions are achieved using MAC interception. The use of RTS/CTS/DATA/ACK significantly reduces the Collision and all the nodes within the transmission range of the sender can eavesdrop on the packet successfully with Probability due to medium reservation.

In POR may collect the information as satisfies the two conditions i.e., 1. Positive progress to the destination and 2.the node will be half of the transmission range(R/2).here it is based on the position information and selects the candidate nodes

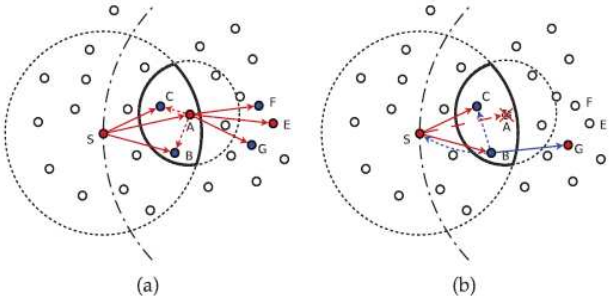

Fig. 1. (a) The operation of POR in normal situation. (b) The operation of POR when the next hop fails to receive the packet.

In this figure sender request to the neighbors, selects the candidate nodes to the half of transmission area then data packets are delivered. At the same time link fails that particular path then choose another root path. Here single communication is transmitted to the packets as time consuming and energy consuming that means one node will transmit the packets as 50 nodes per sec overcome this issue introduce the E-POR protocol. Better performance than POR.

This E-POR protocol is uses the multiple interfaces and we have to communicate with the channels. Node will send the packets to the all neighbor nodes and then transmit the packets to the sender and receiver. If node will transmit the packets as 50 per sec but, in this use multiple channels as 2 only that means 100 nodes per sec as transmitted. Reducing the duplicate relaying packets and reduce the latency and time consuming.

III. PERFORMANCE EVALUATION

In this section, we first describe the simulation environment used in our study and then discuss the results in detail [5].

3.1. **Simulation parameters**

Our simulations are implemented in Network Simulator (NS-2). The simulation parameters are as follows [10]:

1. Number of nodes: 10, 20, 30, 40, 50, respectively;
2. Testing area: 1000m x 1000m;
3. MAC layer: IEEE 802.11
4. Mobile speed: uniformly distributed between 0 and MAXSPEED (we choose MAXSPEED = 2, 5, 10, 25, 50, 75m/s, respectively);
5. Mobility model: random way point model (when the node reaches its destination, it pauses for several seconds, e.g., 1s, then randomly chooses another destination point within the field, with a randomly selected constant velocity);
6. Traffic load: UDP, CBR traffic generator;
7. Radio transmission range: 250 m;

3.2 simulation results

To evaluate performance of POR with that of E-POR protocol, we compare them using two metrics:

1. **Packet Delivery Rate**: the ratio of packets received by the destination to those generated by source.

PDR = $\sum_{i=1 \text{to } m}$ (sum of data packets received by each destination)/ m

Where,

i= number of output files

m=total number of output files.

2. Average End-to-End Delay [7]: the interval time between sending by the source node and receiving by the destination node, which includes the processing time and queuing time, propagation time.

$$D_{end\text{-}to\text{-}end} = N[D_{tran} + \mathbf{D_{prop}} + \mathbf{D_{proc}}]$$

Where,

D_{tran}=transmission delay

D_{prop}=propagation delay

D_{proc}=processing delay

N= number of links (number of routes+1)

3. Average Throughput

It is a data transmission is determined by the amount of data moved from one node to another in a certain period of time. And Average Throughput [9] is the number of bytes received successfully and is calculated by

*Average Throughput= (Number of bytes received x*8)/ *(Simulation time x* 1000) *kbps*

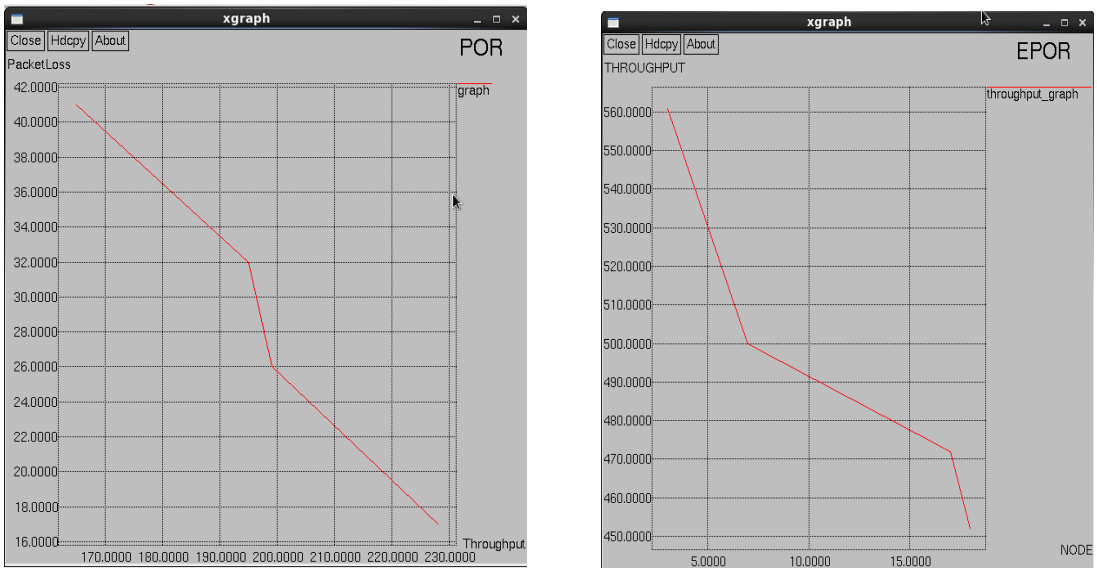

Figure: 2. (a) POR- throughput (b) E-POR-throughput

In this above figure individual through put values are calculated and POR protocol as increasing the throughput values at that time packet loss is increased at some conditions. Overcome this packet loss introduce E-POR protocol. This E-POR protocol as increasing the throughput values and packet loss is decreased at the same time packet delivery ratio also increased. And average End-to End delay is compared at POR and E-POR then E-POR is better than the POR protocol.

E-POR protocol is very sufficient and data is efficiently delivered. It is calculated at simulation parameter values, then data delivery is efficiently and timely manner that means time consuming and energy consuming of that Enhanced POR (E-POR) protocol. The comparison of throughput of node capacity is calculated at particular condition as using network simulation (NS-2) of X-graphs. Here E-POR is better than that of POR protocol.

Figure: 3. Performance comparison of POR and E-POR

In this figure performance comparison of POR and E-POR protocols is calculated and it is time consuming and energy consuming. POR is decrease the packet loss some want better than the further one that is E-POR, and E-POR packet loss is reduced and duplicate relaying packets also reduced to that POR performance.

E-POR protocol is introduced at multi-interface of mobile nodes, that nodes are communicated with each other. Very less time data packet will be reach at destination.

At the same time communication voids also avoided and single packet will be delivered to multiple neighbors, we use this protocol no interruption has occur. In simulation results nam file and trace file is generated, such that all nodes are delivered at nearest neighbor nodes and trace the total information. That information is stored in routing table.

IV. CONCLUSION

This paper mainly the comparison of POR and E-POR routing protocols. In E-POR we can perform the results as multiple channels will be introduced and then those packets should be transmitted to destination node for building multiple routes. According to the simulation results with ns-2(version 2.34) [6] [8], and analyzing the parameters Packet delivery ratio, End-to-End data delivery and throughput with the help of generated X Graph. This E-POR is better than other version of POR selection process. For the future work, In E-POR the concept of energy is also included and so assigns the priority of different dedicated paths between source and destination on the basis of both energy as well as the stability of nodes or paths. In future work is introducing the better new approach and new approach is also works well.

REFERENCES

[1] Vicomsoft, “Knowledge share whitepapers wireless networking Q&A”, Vicomsoft connect and protect, Jan 2003.

[2] J. Broch, D.A. Maltz, D.B. Johnson, Y.-C. Hu, and J. Jetcheva, “A Performance Comparison of Multi-Hop Wireless Ad Hoc Network Routing Protocols,” Proc. ACM MobiCom, pp. 85-97, 1998.

[3] Darlan Vivian, Eduardo Adilio Pelinson Alchieri, Carlos Becker Westphall: “Evaluation of QoS Metrics in Adhoc Networks with the use of Secure Routing Protocols”, Network and Management Laboratory, Department of Computer Sciences, Federal University of Santa Catarina.

[4] Charles E.Perkins and Elizabeth M. Royer, “Ad hoc on demand distance vector (AODV) routing (Internet-Draft)”, Aug-1998.

[5] N.Jaisankar, R.Saravanan, “An Extended AODV Protocol for Multipath Routing in MANETs”, August 2010, IACSIT International Journal of Engineering and Technology, Vol.2, No.4.

[6] The Network Simulator ns-allinone-2.34, http://www.isi.edu/nsnam/ns/

[7] Md.Anisur Rahman, Md. Shohidul Islam, Alex Talevski, “Performance Measurement of various routing

protocols in Ad hoc network", IMECS March 18-20, 2009, Hong Kong, Vol I, 2009.

[8] The Network Simulator ns-2, http://www.isi.edu/nsnam/ns, 2011.

[9] Christopher L. Barrett, Martin Drozda Achla Marathe, Madhav V. Marathe,"Characterizing the Interaction Between Routing and MAC Protocols in Ad-hoc Networks", 3rd ACM International Symposium on Mobile Ad Hoc Networking and Computing (MOBIHOC), Lausanne, Switzerland, June 2002.

