



# International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 5, Issue 3, March 2017

## Congestion Control in MANET based on Time Segmentation

Sukhdeep Singh<sup>1</sup>, Navneet Kaur<sup>2</sup>

Student, Chandigarh Engineering College, Landran, Mohali, Punjab, India <sup>1</sup>

Assistant Professor, Chandigarh Engineering College, Landran, Mohali, Punjab, India<sup>2</sup>

**ABSTRACT :** Mobile ad hoc network is a type of ad hoc network that can change locations and configure itself on the fly. MANETs uses self configurable connections to connect various nodes. Due to less infrastructure in MANET there are various security and congestion issues in the network. Congestion Control is an advanced area in research and new development in mobile ad hoc network. Congestion occurs when resources are limited and demand is more. Different types of techniques have been proposed to overcome the congestion in the mobile ad hoc network. Congestion control mechanism tries to control congestion either before congestion occur or after congestion takes actually place.

There is a possibility associated with a load imbalance on account of that the computing/processing power of the systems usually is non-uniform (i. e., several nodes may be idle and few is going to be overloaded). A node which has high finalizing power finishes a unique work quickly and is estimated to obtain less or no load whatsoever quite often. So, inside the presence associated with under-loaded nodes, you need for over-loaded nodes are usually undesirable.

Time segmentation if time taken to deliver the packet ie sent time and receive time will be above average then we can stop packets to sent on this route for shorter period of time till the test packet time will be improved. So the node worst case can be avoided. This type of approach will substantially improve the system throughput. In this research various decision parameters are being evaluated like Throughput, Packet Delivery Ratio. In our research these parameters has shown improvements over to the previous research. These results has been tested on different packets sizes and different sizes of the networks. So from the research it is clear that the time stamping based technique will remain suitable for congestion control mechanism.

**KEYWORDS:** routing protocol, MANET, AODV, Timestamp, multipath

### I. INTRODUCTION

Mobile Ad hoc network (MANET) provides extremely flexible technology for communication between the mobile wireless devices (nodes). The infrastructure less network is supported by the MANET and it has no requirement for the fixed infrastructure. MANET have very enterprising use in emergency scenarios like military operations & disaster relief operation or some temporary requirement like conference & seminar at new place where there is no earlier network infrastructure exist and need alternative solution. In MANET each mobile node acts as an intermediate switch and extends the transmission range of mobile nodes and act as transceivers also .The routing is the primary task by all mobile nodes for transmission of packets to the destination nodes. In MANET, routing packets in an efficient manner is the challenging task .It is very important and complicated one. In the last decades wireless technology has tremendous growth in all fields. The wireless communication technology takes two forms of communication between the devices; Fixed (infrastructure) wireless communication and ad hoc (infrastructure less) wireless communication. In Fixed (infrastructure) wireless communication as shown in Fig. 1, the packet transmission and communication is done between the wireless nodes by the Access Points (AP), but not directly between in wireless nodes. The AP act as a bridge for both of the wired and wireless networks.



# International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 5, Issue 3, March 2017

## Ad Hoc On-Demand Distance Vector Routing (AODV)

Ad-Hoc On-Demand Distance Vector Routing (AODV) Protocol is based on On-Demand Routing Protocol which is fundamentally an improvement on DSDV & it is designed for network in such a way that they support thousands of mobile nodes. It only supports the use of symmetric link. It minimizes the number of broadcasts by creating routes based on demand [16]. In this protocol each node maintains sequence number & broadcast-id. To send any packet from source node to destination node, a route request (RREQ) packet is broadcasted. The neighboring nodes receive the packet and broadcast it further to their neighbors and this process continues until the packet reaches the destination. It typically uses distance-vector routing algorithms that keep information about next hops to adjacent neighbors.

## II. THEORETICAL FRAMEWORK

### A Timestamp Based Multipath Source Routing Protocol for Congestion Control in MANET (Advance Computing Conference, 2009. IACC 2009. IEEE International)

In this paper, they propose a new routing protocol for ad hoc wireless networks, which is based on DSR (Dynamic Source Routing) on-demand routing protocol. Congestion is main reason for packet loss in mobile ad hoc networks. If the workload is distributed among the nodes in the system based on the delay of the paths, the average execution time can be minimized and the lifetime of the nodes can be maximized. We propose a scheme to distribute load between multiple paths according to the Time Stamp values of the packets of associated paths. Our simulation results confirm that TASR improves the throughput and reduces the number of collisions in the network[1].

### MOBILE AGENT BASED CONGESTION CONTROL USING AODV ROUTING PROTOCOL TECHNIQUE FOR MOBILE AD-HOC NETWORK (International Journal of Wireless & Mobile Networks (IJWMN) Vol. 4, No. 2, April 2012).

In Mobile Ad hoc Networks (MANETs) obstruction occurs due to the packet loss and it can be successfully reduced by involving congestion control scheme which includes routing algorithm and a flow control at the network layer. In this paper, they propose to agent based congestion control technique for MANETs. The information about network congestion is collected and distributed by mobile agents (MA) A mobile agent based congestion control AODV routing protocol is proposed to avoid congestion in ad hoc network. Some mobile agents are collected in ad-hoc network, which carry routing information and nodes congestion status. When mobile agent movements through the network, it can select a less-loaded neighbor node as its next hop and update the routing table according to the node's congestion status. With the support of mobile agents, the nodes can get the dynamic network topology in time. By simulation results, we have shown that our proposed technique attains high delivery ratio and throughput with reduced delay when compared with the different existing technique[2].

### Congestion Control Routing Protocol Using Priority Control for Ad-hoc Networks in an Emergency (IEEE, International conference on ITS telecommunications)

The ad-hoc network is paid to attention aiming at the achievement of the ubiquitous society. In ad-hoc network, multi-hop communication is used and source node constructs routes to destination. Applications of ad-hoc network are inter vehicle communication and sensor network and so on. Among them, wireless sensor network is attractive in an emergency such as disasters. In this application, one of the problems is congestion for increasing of traffic of the urgent and medical data packets on wireless communication routes. It is a problem to be solved to guarantee quality of service in ad-hoc network in an emergency. In this paper, we pay attention to congestion and propose the protocol to improve transmission delay for ad-hoc network in an emergency. The main routes (the shortest routes) are constructed by using a proactive routing protocol.



# International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 5, Issue 3, March 2017

## III. PROPOSED WORK

### Algorithm Taken

- Step 1. In first step route requests are sent. It will be broadcasted to all the direction.
- Step 2. Various route replies are received. Will be kept in increasing order of there hop count
- Step 3. That path will be chosen which has least no. of hops.
- Step 4 packets are sent on the chosen route.
- Step 5. Each packet arrival time period will be noted down . and compared to standard time.
- Step 6.If time grows the average time then it will be considered a sign of congestion.
- Step7 In that case alternative route will be chosen till the previous route time period improves.
- Step 8.It will helps in improving the drop ratio. And avoid dying of node.

## III. RESULTS

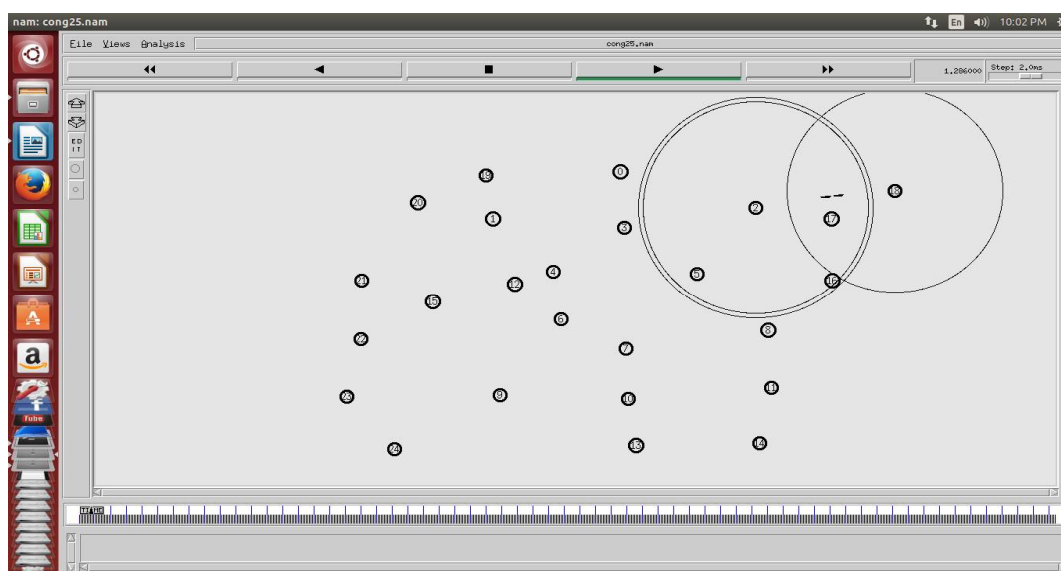


Figure 1 Nam Animation

### Throughput of the xg file over tr file without congestion

GeneratedPackets = 1242 ReceivedPackets = 1231 Packet Delivery Ratio = 99 Total Dropped Packets = 0 Average Throughput = 89%

# International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 5, Issue 3, March 2017

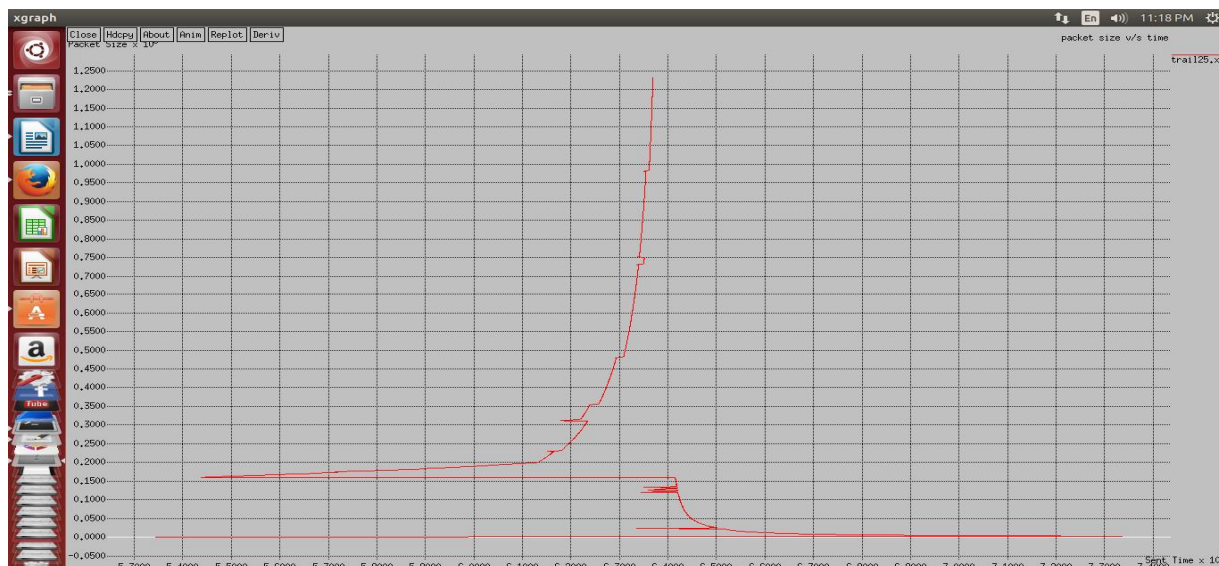


Figure 2 Throughput with congestion

## Discussion

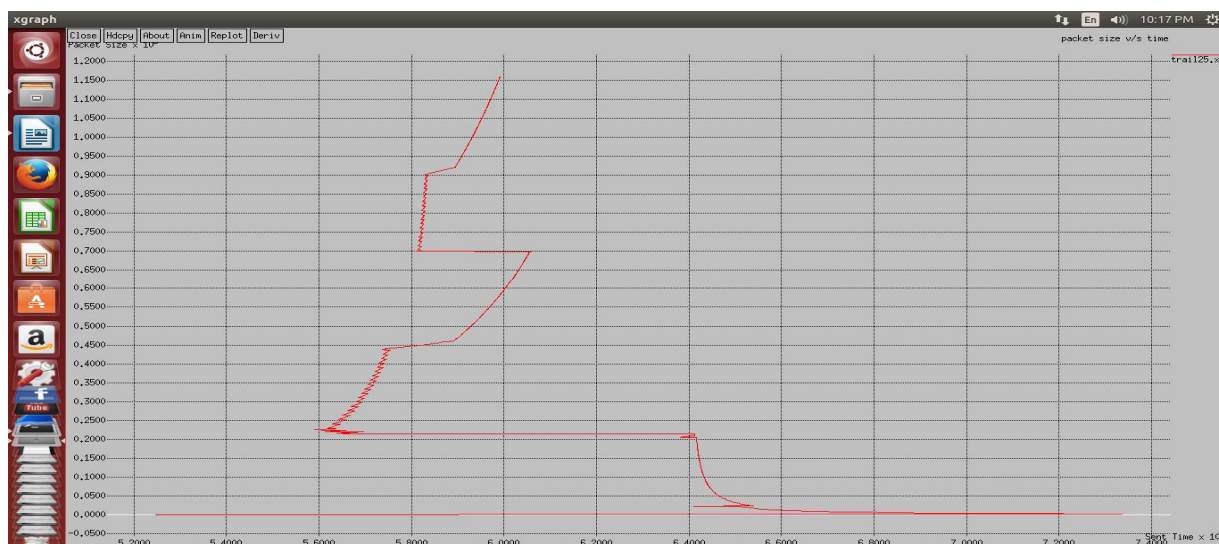


Figure 3 Throughput without congestion

From the implementation it has been cleared that with the congestion the throughput will be decreased in terms of packet delivery for the shorter period of time. This process will continue till the alternative route will be taken. But with our technique with time segmentation if time taken to deliver the packet is sent time and receive time will be above average then we can stop packets to sent on this route for shorter period of time till the test packet time will be improved. So the node worst case can be avoided. This type of approach will substantially improve the system throughput as shown in the results.



# International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: [www.ijirccce.com](http://www.ijirccce.com)

Vol. 5, Issue 3, March 2017

## IV. CONCLUSION

From our research it is clear that with the awareness of each node on the path, packet routed time for sending the packet to the destination it can be checked for congestion to happen. This will improve the throughput. This type of algorithm substantially improves the system throughput. Also avoid the nodes from dying.

## V. FUTURE WORK

In future work we can say the work can be further improves by adopting pro-active routing protocol for manet. Each node maintain best available nodes routes in to its memory. I always remain in updated mode. So that any path adopted can be best path at given point of time. So that each time sending route request can be avoided.

## REFERENCES

- [1] Congestion Control Routing Protocol Using PriorityControl for Ad-hoc Networks in an Emergency NS", <http://www.scribd.com/doc/13072517/Tutorial-Ns-Full-by-MARC-GREI>
- [2] mobile agent based congestion control using aodv routing protocol technique for mobile ad-hoc network", University of Illinois at Urbana-Champaign, 2004.
- [3] V.Ramesh et al "Performance Comparison and Analysis of DSDV and AODV for MANET" (IJCSSE) International Journal on Computer Science and Engineering Vol. 02, No. 02, 2010, Pg.no 183-188.
- [4] congestion based route recovery technique for manet" 1998 Lulea University of technology.
- Yinfei Pan "Design Routing Protocol Performance Comparison in NS2:AODV comparing to DSR as Example", Department of Computer Science SUNY Binghamton.
- [5] a study of congestion aware adaptive routing protocols in manet "National Institute of Technology.
- [6] FaseeUllah, Muhammad Amin and Hamid ulGhaffar,"Simulating AODV and DSDV For Adynamic Wireless Sensor Networks" IJCSNSInternational Journal of Computer Science and Network Security, VOL.10 No.7,July 2010.
- [7] AsmaTuteja , Rajneesh Gujrl and Sunil Thalia,"Comparative Performance Analysis of DSDV, AODV and DSR Routing Protocols inMANET using NS2",International Conference on Advances in Computer Engineering, 2010.
- [8] Md. ArafaturRahman, Farhat Anwar, JannatulNaeem and Md. Sharif MinhazulAbedin, "A Simulation Based Performance Comparison of Routing Protocol on Mobile Ad-hoc Network (Proactive, Reactive and Hybrid)",International Conference on Computer and Communication Engineering (ICCE 2010), 11-13 May 2010, Kuala Lumpur, Malaysia.
- [9] Sapna S. Kaushik1 & P.R.Deshmukh2, "Comparison of effectiveness of AODV, DSDV and DSR routing protocols in Mobile Ad-HocNetwork" International Journal of Information Technology and Knowledge Management , Volume 2, No. 2, July-December 2009.
- [10] P. Udayakumar and AshaAmbhaikar, "Experimenatal comparison of AODV and DSR protocols", International J. of Engg.Research &Indu.Appls. (IJERIA) ISSN 0974-1518, Vol.2, No. III , 2009
- [11] Nor SurayatiMohamadUsop, Azizol Abdullah and Ahmad Faisal AmriAbidin, "Performance Evaluation of AODV, DSDV & DSR Routing Protocol in Grid Environment", IJCSNS International Journal of Computer Science and Network Security, VOL.9 NO.7, July 2009.
- [12] David Oliver Jorg, "Performance Comparison Of MANET Routing Protocols In Different Network Sizes", University of Berne,Switzerland, 2003.
- [13] S. Corson and J. Macker , "Mobile Ad hoc Networking (MANET):Routing Protocol Performance Issues and EvaluationConsiderations" , University of Maryland,January 1999.
- [14] Shikhar Kr. Sarma, SumitaDharChoudhury, FakhruUddin Ahmed, & Abdul Hannan, "Efficiency Analysis of Routing Protocols for MobileAd Hoc Networks for Heterogeneity", International Journal of Computer Networks, Volume 2, Issue 1.
- [15] V.Ramesh et al "Performance Comparison and Analysis of DSDV and AODV for MANET" (IJCSSE) International Journal on Computer Science and Engineering Vol. 02, No. 02, 2010, Pg.no 183-188.
- [16] David B. Johnson "DSR: The Dynamic Source Routing Protocol for Multi-Hop Wireless Ad Hoc Networks" IJCSNS International Journal of Computer Science and Network Security, VOL.9 No.7,July 2010.
- [17] P. Mohapatra, L. Jian and C. Gui "QoS in mobile ad hoc networks" IEEE Wireless Communications Magazine, vol. 10, no. 3, June 2003,pg no 44-52.
- [18] Kapang Lego et. Al "Comparative Study of Adhoc Routing Protocol AODV, DSR and DSDV in Mobile Adhoc network" Indian Journal of Computer Science and Engineering Vol. 1 No. 4 364-371 .
- [19] Mukesh Kumar et. al. "Comparative Analysis of CBRP, DSR, AODV Routing Protocol in MANET" (IJCSSE) International Journal on Computer Science and Engineering Vol. 02, No. 09, 2010, 2853- 2858.
- [20] JiaUddin Md. RabiulZasad "Study and Performance Comparison of MANET Routing Protocols" (IJCSSE) International Journal on Computer Science and Engineering Vol. 06.
- [21] Razan Al-Ani "Simulation and Performance Analysis Evaluation for Variant MANET Routing Protocols" International Journal of Advancements in Computing Technology, Volume 3, Number 1, February 2011
- [22] Elizabeth M. Royer, University of California, Santa Barbara Chai- KeongToh, Georgia Institute of Technology "A Review of Current Routing Protocols for Ad Hoc Mobile Wireless Networks," IEEE personal communications, April 2007