

Throughput of Multicast Source Routing in Adhoc Network



K.Vanisree, V.S.K.Reddy

Abstract: *The wireless 'Ado Network' is referred as without any specific infrastructure mobile network. The randomly selected nodes are moves freely and communicate directly to end users with no hierarchical structure. In this network, all nodes are receiving the transmitted information in multicast nature and used Omni directional antennas. In multicasting source node sends the copies of the information to all receiver nodes. Movements of nodes can be described by using mobility model, and it is characterized by location, velocity, and direction over a period of time The proposed new routing algorithm, named "Multicast Proactive Source Routing O-CORMAN". This paper discussed routing; evaluate the efficient throughput, Total transmission Power and also Normalized Over-head, compared with unicast type. The proposed new protocol performance is analyzed using the ns-2.32 network simulator.*

Index Term: Adhoc, Multicast, Mobility, Throughput, Over-head.

I. INTRODUCTION

There are mainly two types of wireless networks such as with fixed wired infrastructure and without pre-defined infrastructure, self-configured network and devices are connected without wire. In contrast, the wireless Adhoc MANET each nodes acts, continuously transmit and receive the required information with properly designed routing traffic in frequently changing the topology environment .Therefore design a routing protocol itself a challenging task, based on AODV the proposed algorithm has been developed. The nodes are communicate through single hop and multi hop link paths in point to point communication and all intermediate nodes are behaviors as a routers. In a group based multicasting routing, multiple number of senders and receivers form a group, hence this type routing protocol is very efficient, reliable, and reduces the total power consumption. When design a multicast routing protocol, some important terms should take into consideration, they are updates the routing path information, group member updating and state information. In MANET many number of protocols are been developed, such that tree and mesh type protocols. In

tree based source will create efficient routing path (i.e.) single path, where as in contrast the mesh based type protocol more than one routing path is created form source to destination.

The proposed Multicast O-CORMAN shared tree routing protocol in MANET consumes less total power and gives high throughput , because only once creates the tree structure throughout the communication and also retransmission if nodes fails to transfer the data. Mobility model in MANET describes the movement of nodes with respect to their" location , velocity and direction over a period of simulation time, and these mobility gives plays important role in the design of Adhoc MANET Networks. The performance the proposed protocol is analyzed by using NS-2.32 simulator.

II. LITERATURE OVERVIEW

Relating to multi-antenna systems is considered by author [1], it gives significant power consumes than single antenna model by the diversity techniques. In [2] author the proposed research only on physical layer routing, where as in contrast the authors [3],[4],[5] the cooperative routing protocol, is based on both network layer and physical layer routing , particularly in [3] the author considered static cooperative routing in Ad hoc MANET wireless networks. In [4], the author developed the cooperative routing by using multi-source multi-destination network, to achieve energy savings, and this is the extension of [3].H. Shi, T. Abe [5] the distributed cooperative routing is simulated .The Biswas and R. Morriset al., developed EXOR extension opportunistic proactive routing protocol, in which a lot of packets are conferred, by a sender (for instance 10-100 packets for each batch).List of sent focus focuses are kept up ETX [7].In [8] proposed another routing protocol is known as a "Simple Opportunistic Adaptive Routing protocol"(SOAR) .In [9] creator make the way trade of, in context on focuses instead of 'ricochet' framework called need based sending. Furthermore, for unicast the ExOR calculations is well is reasonable , yet for multicast EXOR won't perform well it may not perform well,Chachulski et al. [10] said well suit .At last, piggybacked ACKs may lose, so' reproduced trans-mission may occur. The creators Zehua Wang and Yuanzhu Chen et al., in [11]proposed a 'Satisfying Opportunistic Routing in Mobile Ad Hoc Networks' (CORMAN) new calculation , maintain a strategic distance from the recreated transmission when gathering is lost ,in adaptable Ad Hoc structures. In an altogether earth shattering environment of flexible Ad Hoc systems, the multicast transmission, simultaneously a proportional information bunch has send to recipients in the MANET.

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As a rule, convey information packets consumes power and move speed and which ought to be avoided[12],[13] by utilizing multi-hurling in MANETs with an extraordinary piece of the time changes topology environment, i.e., focus focuses in the MANET, at whatever point, may join or withdraw the get-together. Xiao Chen and JieWn et al [14] evaluated multicast protocols in conservative adhoc organize. After discover the limitations of two wired multicast tree routing protocol, producer examined four Ad Hoc multi cast protocol what's more broke down two issues i.e., QoS multicast and strong multicast. C. - C. Chiang, M.Gerla, and L.Zhang et al [15] producer applied 'Sending Group Multicast Proto-col'(FGMP), when packets sending this protocol keeps in track with get-togethers of focus focuses not of connections. To stay away from, copy date bunch the sending Nodes in FG set only gets the information packets, and it will convey. In any case, in FGMP the tremendous issue is selection and keep up the set FG of sending focus focuses. Devarapalli, and D.Sidhu et al [16], the multicast routing protocol is proposed by Zone based. To maintain a strategic distance from the above issues, here source started on-demand protocol. In which a multicast conveyance tree is made by utilizing zone routing plan, from this time forward it is a source tree based proto-col. In this protocol topology changes can be constrained, rather spread it through the entire of the network. In [17], ODMRP (On Demand Multicast Routing Protocol) finds the sending focus point among the got information bunch focus point in the system, to beating. Only sending focus will transmit the multicast messages to a party part, by then makes a joint table message, and convey to its neighboring focus focuses. This neighbor focus establishes sending way. In [18] MAODV,(Multicast On-demand Distance Vector Routing Protocol) convey the course demand, on demand basics only the way is found and constructs a routing tree.

III. PROPOSED SYSTEM

The proposed multicast routing scheme is modified version of O-CORMAN direct path routing. In this proposed work, simultaneously more than one flows the data is transfer are done, and shared network tree structure is used. In this proposed multicast proactive source routing protocol each nodes having the information of topology changes to each other and also maintain the list of forwarding nodes. When source nodes likes to send the information first, finds the multi paths to all other nodes in the network. And it creates a vector matrix based on the efficient paths available, and also determines available disjoint paths [3], and then packets are forwarded towards destination node. The highest priority nodes are selected from the list, as a forwarded node which is selected among number of nodes in the list. In this proposed algorithm each node has information about neighboring nodes and updated from the previous node, but in general routing information is updated by source. If any node lost the packet, retransmit the packets also this techniques prevent duplicate retransmission. The Mobility determines the protocol performance in MANET, pause times is included in Random Waypoint Mobility model nodes are moving at a speed of predefined ranges[Misdeed, Massed], Thus results reduces

the total power, control overhead with least link cost and without outage, achieve efficient throughput.

IV. RESULT AND DISCUSSION

In this section, analysis the performance comparison of Multicast O-CORMAN with Unicast O-CORMAN by using Network Simulator ns-2 (version 2.34)

Table1: performance of multicast and Unicast routing algorithm values with density of fixed number (50) nodes

| Mobility | Control_OH | |
|----------|---------------------|------------------|
| | multicast-o-corman | unicast O-CORMAN |
| 5 | 9937 | 160089 |
| 10 | 10280 | 194667 |
| 15 | 11820 | 22254 |
| 20 | 11703 | 25282 |
| 25 | 11643 | 23086 |
| Mobility | Tot.consumed energy | |
| | multicast-o-corman | unicast O-CORMAN |
| 5 | 20.1516 | 10.0508 |
| 10 | 19.9551 | 10.8452 |
| 15 | 21.2573 | 20.4578 |
| 20 | 21.8763 | 17.8971 |
| 25 | 20.9934 | 10.0508 |
| Mobility | Throughput | |
| | multicast-o-corman | unicast O-CORMAN |
| 5 | 506735 | 160089 |
| 10 | 455939 | 194667 |
| 15 | 301614 | 150311 |
| 20 | 219038 | 160089 |
| 25 | 187872 | 150311 |

A. PERFORMANCE PARAMETERS

To evaluate the performance of routing protocols, considered different kinds of parameters in network. The parameters are Total Consumed Energy, Throughput and Control overhead. To check protocol performance in finding an optimal routing towards destination. The throughput determines successful packet deliver in simulation time. High throughput shows, the routing protocol is suit for data transformation. The same way while transmit and receive the data consumes less energy, and then the protocol is called efficient routing protocol in any communication.

B. CONTROL_OH

The control overhead is defined as the ratio of total number of routing control packets to the total number of received data packets the various types of control messages overhead are

- Hello Overhead:
- Cluster message overhead due to link break between cluster members and their cluster heads:
- Cluster message overhead due to link generation between two cluster heads
- Routing overhead:

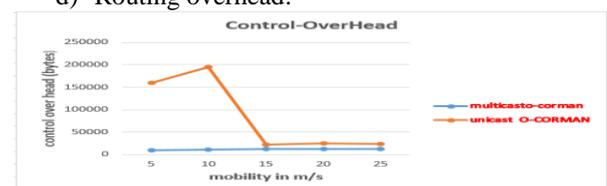


Figure1: Control overhead Vs speed m/s for both unicast and multicast OCORMAN, for 50 nodes

The above figure shows the control overhead Vs nodes for comparison of both unicast and multicast protocol. The network mobility is various from 5, 10, 15, 20, 25 m/s. . Multicast gives less control overhead in comparing with other protocols. It means that this proposed multicast o-corman protocol is well suited for data forwarding in MANETs. In a multicasting shared tree type protocol is used ,it reduces the reconstruction of tree, also intermediate node has complete knowledge about neighbor node and update the route information instead of source node ,this reduces the retransmission,. Hence in multicasting control overhead is reduced.

C. TOTAL CONSUMED POWER

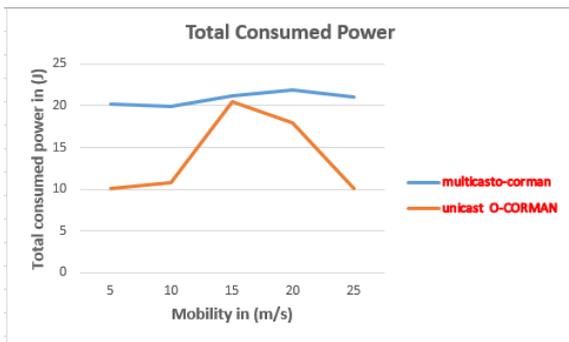


Figure2: Total Consumed power Vs speed m/s Cooperative routing algorithms for 50 node

The above figure 2 shows that Total consumed Energy Vs Speed scenario for 50 nodes in network, deployed in an area of (1000 *1000) m²

D. THROUGHPUT

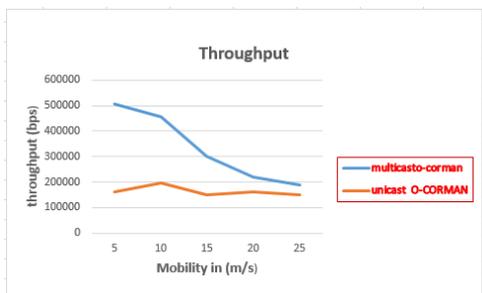


Figure3: Throughput Vs speed m/s for PC-3, CANCP-3, OCORMAN, and Non-Cooperative routing algorithms for 50 nodes

Throughput is referred to as the ratio of the total amount of data that a receiver receives from the sender to the time taken to receive the last packet. A low delay in the network translates into higher throughput. Throughput gives the Utilization fraction of the channel capacity used for useful transmission and is one of the dimensional parameters of the network. It is defined as the total number of packets delivered over the total simulation time.

V. CONCLUSION

In this article develop a proposed algorithm Multicast O-CORMAN for MANETs. The multipath routing for MANET have superior performance measured in Throughput, Total Consumed Power and Control overhead In

future, this algorithm can be extended by using multi flow data transfer and also change the pause time to evaluate the performance of algorithm

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REFERENCES

- Rajaraman, R. —Topology Control and Routing in Ad hoc Networks:A Survey, I SIGA News, vol. 33, pp. 60–73, June 2002.
- Analysis of Different Routing Techniques for Opportunistic Data Transfer, I International Journal of Computer Applications (0975 - 8887), volume 62 – No.5, January 2013 - Sheela Rani Arasu, and Immanuel JohnrajaJebadurai,
- Path diminution in node – disconnected multipath routing for mobile ad hoc networks is unavoidable with single route discovery I , International Journal Ad Hoc and Ubiquitous Computing - Ash Mohammad Abbas, and BijendraNath Jain,
- Online]http://www.inetdaemon.com/tutorials/internet/ip/routing/single_vs_multi.shtml
- Radio Disjoint Multi-PathRouting in MANETI, in CEWIT 2005 Conference, 2005, pp 1-2 KoojanaKuladinithi, Carmelita Gorg and Samir Das Multicast Cooperative Routing For Opportunistic Data Transfer In Mobile Ad Hoc Network DOI: 10.9790/2834-1203012633 www.iosrjournals.org 33 | Page
- The Design and Performance Evaluation of a Proactive Multipath Routing Protocol for Mobile Ad Hoc Networks, at Heriot – Watt University in the School of Mathematical and Computer sciences, May 2012 — Ali AbdallaEtorban
- ExOR: Opportunistic Multi-Hop Routing for Wireless Networks, I in Proc. ACM Conference of the special Interest Group on Data Communication, Philadelphia, PA, USA, August 2005, pp. 133-14 —Ding, W., Biswas, S., and Morris, R..
- SOAR: Simple Opportunistic Adaptive Routing Protocol for Wireless MeshNetworks, IEEE, vol. 8, 2008, pp. 1622-1635 — R.Eric
- ExOR: opportunistic multi-hop routing for wireless networks, I In Proc. of ACM SIGCOMM, Aug. 2005, — S. Biswas and R. Morris
- Trading Structure for Randomness in Wireless Opportunistic Routing, I in Proc. ACM Conference of the Special Interest Group on Data Communication (SIGCOMM), Kyoto, Japan, August 2007, pp. 169–180 — S. Chachulski, M. Jennings, S. Katti, and D. Katabi
- CORMAN: A Novel Cooperative Opportunistic Routing Scheme in Mobile ad Hoc Networks, I IEEE Journal on selected areas in Communications, Vol. 30, No. 2, February 2012 — Zehua Wang, Yuanzhu Chen and Cheng Li.
- On-Demand multicast routing protocol in multihop wireless mobile networks, I in ACM Mobile Networks and Applications, special issue on Multipoint Communication in Wireless Mobile Networks, 2000 - S.Lee, W.Su. and M. Gerla
- E.Royer and C.Perkins, —Multicast operation of the ad-hoc-on-demand distance vector routing protocol, I in Mobile Computing and Networking, 1999, pp.207-218.
- M. K. Marina and S. R. Das, "On-Demand MultiPath Distance Vector Routing in Ad hoc Networks", Proceedings of the Ninth International Conference on Network Protocols (ICNP), IEEE Computer Society Press, 2001, pp. 14-23.
- J.Park, S.Moht and I.Chung I Multipath AODV Routing Protocol in Mobile Ad Hoc Networks with SINR-Based Route Selection, I International Symposium on Wireless Communication Systems, IEEE , 2008, pp:682-688.



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16. L.Wang, L.Zhang, Y.Shu and M.Dong, "Multipath source routing in wireless ad hoc networks", Proceedings of Canadian Conference on Electrical and Computer Engineering, 2000, Vol 1, pp. 479 – 483.
17. S. J. Lee and M. Gerla, "Split Multipath Routing with Maximally Disjoint Paths in Ad hoc Networks", Proceedings of the IEEE International Conference on Communications (ICC), 2001, Vol 10, pp. 3201-3205.
18. X.Li, Ph.D thesis on "Multipath Routing and QoS Provisioning in Mobile Ad hoc Networks", Queen Mary University of London, 2006

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