Efficient Routing Protocol for route discovery and recovery (Load Link Fitness)

Gayatree Singh
Department of Computer Science &
Engineering
Madan Mohan Malaviya University of
Technology, Gorakhpur

A.K Daniel
Professor/Department of Computer Science &
Engineering
Madan Mohan Malaviya University of
Technology, Gorakhpur

Abstract – A mobile ad hoc network is collection of nodes or computers. It is multi hop wireless system that is capable of working self-governingly, whose principle work is to gives dependable start to finish communication between nodes in network because of changing issues in topology give rise to node mobility, and it is accomplishing reliable transmission of packet in mobile wireless network which is crucial. The recently communication network is becoming more and more varying.

This is a significance of the growing number of the wired and wireless both devices and services. Their are different kinds of protocols that provides easier communication in an ad hoc network, such as DSR and TORA. Although these methodologies finish up in ineffective usage of assests after the connection is failed and issues of congestion. In this paper proposes a way to deal with gets overcome this problem and provides efficient route and reduce congestion.

Index Terms – Mobile Ad- hoc network, mobility, routing protocol,

I. INTRODUCTION

Ad-hoc networks are firmly changing network. Mobile ad-hoc network (MANET) is a set of nodes or computers. In MANET performs communication one node to another node through wireless associate.
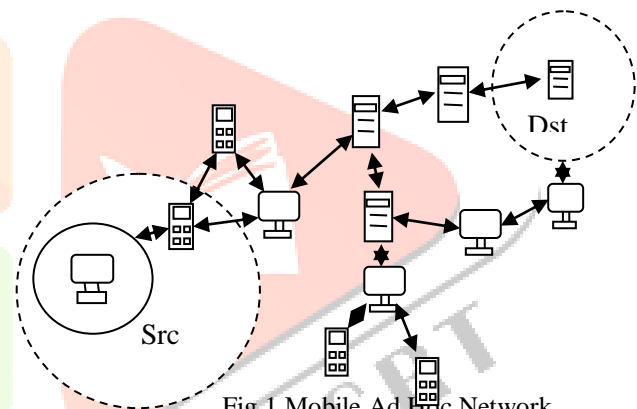

Fig.1 Mobile Ad Hoc Network

Mobile Ad-hoc network uses various multi-hop routing instead of a fixed network infrastructure to provide network connecting. In mobile ad-hoc network every nodes are mobile and all nodes connected to each other without wire. There is no incorporated manage or not yet any specialist provider of service for an ad hoc network.

In the other words, a mobile ad hoc network is self-sufficient network as in it needn't bother with any infrastructural or framework support other than what is worked inside nodes. In mobile ad-hoc network the participating nodes behave like routers, the job of directing packets from source to destination is done by routing. This is difficult in mobile ad-hoc network due to issue of mobility of node and insufficiency of central control.

The Routing is a main problem in networks for transmitting data from one node to another node.

There are various routing protocols have been introduced for mobile ad-hoc networks. Here in section second we discuss about the related work, in third section covered about the propose work and finally

fourth section represents conclusion

II.   RELATED WORK

Here In section, we discuss about some of the existing routing protocol those are previously used. Routing protocols categorized in two parts, Proactive protocols and Reactive protocols. Proactive routing protocols are having pre-decided routing table with topology (i.e.) every nodes having at least one routing table, which characterizes entire topology of networks [4] and the proactive routing protocols are GSR, DSDV and OLSR etc. Reactive routing protocols operates two tasks for example route maintenance and route discovery [4, 9]. In reactive protocols routing activity movement of networks nodes isn't kept up and not exist any communication, for instance sending a data packets to different nodes, this protocols searches for a way in an on-request strategy and sets up an association (link) with transmit and gets the packets. In the network proceed of discovering the path is ended by flooding the RRQ (route request) messages in the network. Famous reactive protocols are DSR[1,2,3,4,5,9] AODV[4,6] and TORA [1,2,3,4].

A. Distance Source Routing Protocol (DSR)

DSR Protocol is a fully on-demand protocol for routing. It is used in mobile ad hoc network. But it gives single path routing, even if, it could be better to assist more than one path routing. This is endure from issue of a scalability because of the link failure. In case, whenever the system network gets larger, and packets of message and control packets also additionally gets larger.

In mobile ad hoc network every mobile host participant keep going a route caches. Which is learned by cache just for information storing. Whenever a node sent one data packets to the another node, then sender node initially checks their route caches for source to target node (destination). Whenever found the route, then that route is used by sender for transmitting the data packet [2]. On condition that no route discovered, the sender may endeavor to find one utilizing the route discovery protocol.

The node starts Route Discovery to found route, that is called initiator of Route Discovery, and the target of data packet is called Discovery's target. The initiator transmits a RRQ and RRQ is known as ROUTE REQUEST, RRQ data packets like locally transmitted. Every nodes getting ROUTE REQUEST, whether this request identifier recently follow by from initiator, and rejects the REQ. Or else, this supply their own nodes location to an list in RRQ and retransmitted the REQ. At point when the RRQ arrives at their target node, then the target node sends RRP (means ROUTE REPLY) to backwards to initiator of REQ, as well as duplicate of aggregated records of locations from REQ. This is the system by which a nodes that sends a packets along an given route to the target discovers whether that the route is broken, for instance because of two nodes in it have moved excessively far separated when sending the packets, originator records in header of packets the total succession of nodes all the time (through) which packets is to be sent.

Distance source routing protocol (DSR) depends on source routing protocol whenever they sent data packets, then originator records in header of data packets the total grouping of nodes by way of which data packets is to be sent. Every node across routes sends packets to the following next hop demonstrated in that packet's header & endeavors to affirm that packets were gotten by that the following next node; a node it may be affirm it by methods for link-layer granting. On condition that, after a predetermined number of locally retransmissions of data packets, a node in route can't make it affirmation, that returns RE (ROUTE ERROR) to original source of data packet, distinguishing the connection from by itself to following next nodes as failed. Then the sender removed failed link (broken link) from the Route Caches; for ensuring data packets to the target location, sender may use some different routes to target location in it Cache, or then again it might endeavor another Route Discovery for that goal whether required.

In the network for high speed system networks, the repairing dependents on reinforcements path [1, 2] gives a way to insuring their survivability. This technique particularly decreases the utilization of reinforcement limit while as yet keeping up a high level of survivability.

TORA [2,3,4,6] is protocol and it is distributed routing protocol ,it is used in mobile, multi hop , wireless networks. This routing protocol has three working phases. First one is Creating routes, second is maintaining routes and third is erasing route. The Maintenance of routes reason of the network to the tolerate inordinate overhead.

III.   PROPOSED WORK

Route Creation

When one node send the packet to another node or destination (target) and does not found route to the Destination in the route cache then the

node perform Route Discovery to the find route; this process is called initiator of Route Discovery of the path; and the destination of data packets is called Discovery's target of the node.
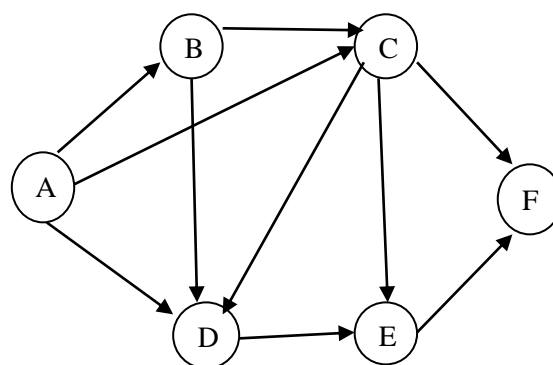

Fig.1

Table 1 Dynamic Table of the node 'A'

Position	Path	Hop Count
1	A-C-F	3
2	A-B-C-F	4
3	A-D-E-F	4
4	A-C-E-F	4
5	A-B-D-E-F	5
6	A-B-C-E-F	5
7	A-C-D-E-F	5
8	A-B-C-D-E-F	6

A is source node and it will be organized these path basis on the distance, that means maintain the table for shortest path 1st.

Here figure 1 shows six nodes in the wireless network, where source node is A and destination node is F.

{A, B, C, D, E, F}= these are nodes frame.

Total paths from source node A to the Destination node F from given figure 1.

1. P1. A-B-C-D-E-F
2. P2. A-B-C-E-F
3. P3. A-B-C-F
4. P4. A-B-D-C-E-F
5. P5. A-B-D-C-F
6. P6. A-B-D-E-C-F
7. P7. A-B-D-E-F
8. P8. A-C-B-D-E-F
9. P9. A-C-D-E-F
10. P10. A-C-E-F
11. P11. A-C-F
12. P12. A-D-B-C-E-F
13. P13. A-D-B-C-F
14. P14. A-D-C-E-F
15. P15. A-D-C-F
16. P16. A-D-E-C-F
17. P17. A-D-E-F

Selection of active or working path

In choice of working way process the sender currently sorts the rundown route dependent on the distance. Shortest path is selected as the active path or working way and remaining of routes fill in as the reinforcement ways (Path) and they are spared with the sender.

All connections of the present working paths are stored in the table. Every data related with a connection is the status of the connection and the location of the sender utilizing the connection.

We have expected three sorts of connections to be specific (Active link, Inactive link and broken link) is this strategy.

Route Maintenance

This is the system by which a nodes that sends a packets along an given route to the target discovers whether that the route is broken, for instance because of two nodes in it have moved excessively far separated when sending the packets, originator records in header of packets the total succession of nodes all the time (through) which packets is to be sent.

Every nodes along that route onwards the packets to following next hop and showed in packet's header and endeavors to affirm that the next node has gotten the packet; a node can affirm this by recognizing the link-level. On condition that, after a set number of nearby retransmissions of packets, the node in route can't make this endorsement then the occurrence appeared in figure 3 occur. In case every route are found whenever got the all paths from source (sender) to the destination (receiver) and stored the all route path in cache of source nodes. .
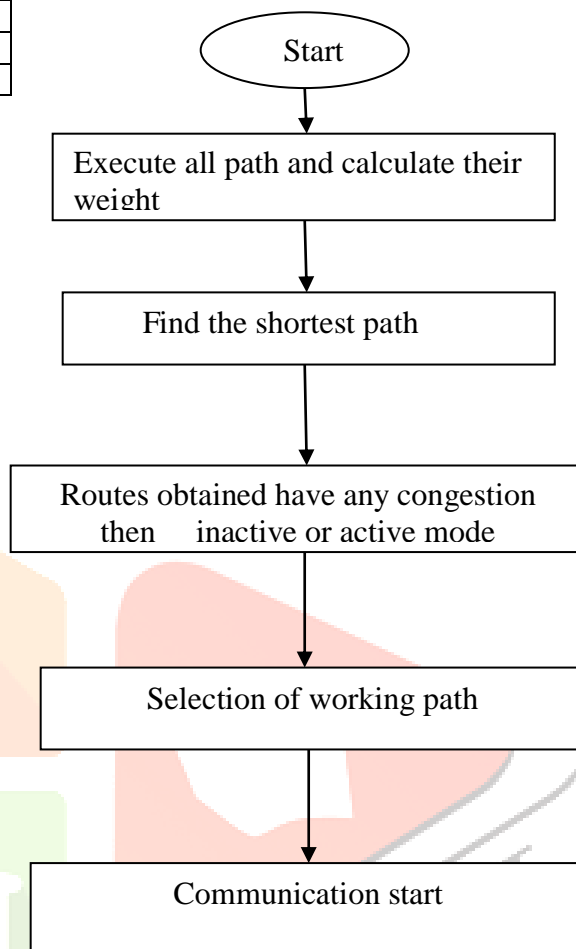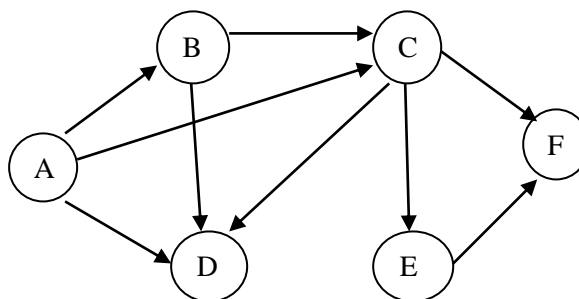

Figure .3

When DE link is fail.

Table. 2 of Source A, when link DE fails.

Position	Path	Hop count
1	A-C-F	3
2	A-B-C-F	4
3	A-C-E-F	4
4	A-B-C-E-F	5

At the sender nodes

(1) It picks the following route from the arranged rundown which doesn't contain the broken connection.

(2) When any link failure or then choose the other route and provides the connection, established the communication.
Now resumes the communication. After sender completes its whole sending process.
This procedure helps in managing congestion also. At whatever point there is delay in getting affirmation because of congestion, the sender switches the following best way.
This procedure is completed similarly in which a node Figure.4 (Case 1) Link between D and E fails

V. REFERENCES

[1] A.K. Daniel et al: A Globally Accessible List(GAL) Based Recovery Concept In Mobile Ad-hoc Network ./ International Journal on Computer Science and Engineering (IJCSE)(2011).

[2] A.K. Daniel et al: A Congestion Controlled Multipath Routing Algorithm Based On Path Survivability Factor./International Journal on Computer Science and Engineering (IJCSE)(2011).

[3] Sagnik Dutta, Ritupama Chaki, and Nabendu Chaki, Member,: Optimal Reactive Routing Protocol (ORIRP): A New Reactive Routing Protocol for the Shortest Path in Ad Hoc Networks, IEEE(2006).

[4] R.Thiagarajan and Dr.M.Moorthi: Efficient Routing Protocols for Mobile Ad Hoc Network, (AEEICB17)(2017).

[5] Zeyad Ghaleb Al-Mekhlafiand Rosilah Hassan: Evaluation Study on Routing Information Protocol and Dynamic Source Routing in Ad-Hoc Network , /7th International Conference on IT in Asia (CITA)(2011).

[6] P.Parvathi: Comparative Analysis of CBRP, AODV, DSDV Routing Protocols in Mobile Ad-hoc Networks, IEEE (2012).

[7] Senthil kumar K B et al: Hybrid on Demand Multipath Distance Vector Routing Protocol,

manages interface disappointment or link failure or connection break.

IV. CONCLUSION

The proposed method provide efficient route and it also established connection between nodes. It consumed minimum assets or resource as expected in efficient way as contrasted with DSR and TORA. It is additionally expected to give quick correspondence among source and goal hubs (destination) on account of a connection disappointment or in situation of link failure. It is always choose minimum distance path or route and provides efficient communication between nodes.

The exhibition of DSR debases when the system size (network size) increments (more noteworthy than 100 nodes).It works very efficiently in the network. It likewise is required to decrease the pointless handling at the conveying nodes and lessen congestion. This Proposed method will perform better under such conditions. In this way it expands the efficiency and versatility of network henceforth gives better QoS to organize (network).

IEEE(2015

[8] Tanya Koohpayeh Araghi, Mazdak Zamani, Azizah BT Abdul Mnaf: Performance Analysis in Reactive Routing Protocols in Wireless Mobile Ad Hoc Networks Using DSR, AODV and AOMDV/International Conference on Informatics and Creative Multimedia (2013).

[9] Ankit Chopra: Comparison of Ad hoc Reactive Routing Protocols: AODV and DSR with Respect to Performance Parameters for Different Number of Nodes, IEEE (2014).

[10] Khalid A. Farhan et al: Survey Paper on Multicast Routing in Mobile Adhoc Networks , /IEEE Jordan International Joint Conference on Electrical and Information Technology (JEEIT)(2019).

[11] A.K. Daniel and R Singh: Swarm Intelligence Based Multicast Routing and Bandwidth Management Protocol for AD-hoc Wireless Network Using Backpressure Restoration, IEEE(2010).