Smart Routing Protocol for MANET

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ABSTRACT

A mobile ad hoc network is a collection mobile node and those nodes are dynamic. MANET has several advantages over other wireless network. As in traditional wireless network, reactive protocols and pro-active protocols are used to obtained route. Lifetime extension is a key design issue for MANET with battery-operated nodes. The residual battery (capacity) at each node remains can be utilize to find route with the objective of maximizing lifetime of MANET. Based on these works, a new Smart Routing protocol (SRP) is proposed to improve the lifetime of MANET. In this protocol residual energy information (REI) of sensor nodes are considered to choose the Smart Route and time constrained is enforce so that this route must be short route. In this paper, route discovery process according to Smart Routing Protocol, Frame sequencing and several advantages are discussed.

Keywords : MANET, Frame, route discovery process, smart routing algorithm, advantages.

I. INTRODUCTION

MANET stands for "Mobile Ad Hoc Network". During the 1980 emergence of Internet Emerging Task Force (IETF) termed the Mobile Ad Hoc Network. A MANET is a type of ad hoc network where change in position and configuration of those mobile devices itself on the fly, this makes MANET more reliable. Because MANETS are mobile, they can use wireless connections to connect to various networks. This can be a standard Wi-Fi connection, or another medium, such as a cellular or satellite transmission. Some MANETs are restricted to a local area of wireless devices (such as laptop computers), while others may be connected to the Internet.

Since, MANET is a self-organizing and self-configuring multi-hop wireless network where the structure of the network changes dynamically. This is mainly due to the mobility of the nodes. In this network, data is sending from one node to the other node or I can alleged that to and from each node in the network this stated that each node present in the network behaving as router. Each node in the MANET uses wireless interface to communicate with the other nodes. These networks are fully distributed, and can work at any place without the help of any fixed infrastructure such as access points or base stations. [4]

This type of network is inexpensive and can be convenient to use where infrastructure is not available. Also this can useful in the field of tactical network to maintain an information network between the soldiers, vehicles, and military information head quarters. Power saving is one of the decisive consequences for almost all kinds of mobile devices supported by battery powers. Without power, any mobile device will become useless. Battery power is a restricted(fixed)resource, computing and communication technologies is advance but the research in battery technology is not likely progress as fast as necessary. Hence, how to lengthen the lifetime

of batteries is an important issue, especially for MANET, which is all supported by batteries.

Most of the time network fails due to various reasons but power consumption is one of the fare problems. Hence, defining Smart Routing protocol which is working on present battery percentage at each node .The node having maximum battery percentage will stamped as route this process continue till the packet reached to the destination in defined time limit and accordingly route will discover and define this route as Smart Route. In this way data will transferred from sender to receiver successfully through obtained smart route [1].

II. EXISTING SYSTEM

As shortest path routing protocol is widely used in wireless network. This protocol uses lots of algorithm to find the shortest path from source to destination. Dijkstra's, link state and bellman-ford algorithms are famous which used in real time wireless network.

All above mentioned algorithm find the shortest path according to different criteria but no algorithm assured the lifetime of network. Even, if the protocol find shortest path but would not be best for transmission of large amount of data. Because network may be fail due to energy constrained nodes. Hence, proposed system find the path according to current battery percentage and uses time constrained to find path. In this way, protocol will overcome the existing protocols.

III. FRAME SEQUENCING

While designing smart routing protocol, I am consider the sequence of frames from source-node-destination. As data sending process start, first route finding frame send from source. This frame travel till destination using each possible route by getting (or stamping) battery percentage and address of all nodes including source and destination. Then smart route will be calculated according to smart routing

algorithm and frame will reverse as a route frame till the source having smart route as content.

Now source will get routes from route frame and smart route will be obtained from this frame. Then source will send data frame content as legitimate data according to chosen path and this data frame is unique because it has Frame ID which is nothing but auto generated random number.

As the data arrived at destination, pop up box will shown that new message is arrived .After clicking on OK button data will be save at receiver side and acknowledgement will be send using ACK frame through smart route.

IV. ROUTE DISCOVERY PROCESS:

Consider the below network, connecting five mobile devices altogether wirelessly named as node1, node2, node3, node4, node5 and has a present battery percentage 40%, 70%, 65%, 85%, 95% respectively. Whereas node1 is a source and node5 is destination and the rest node are intermediate nodes. whenever data is send from node1 i.e. source node to node5 i.e. destination node at this time first route finding frame will broadcasted to find the route instead of sending directly data frame (i.e. data). This route frame will move forward by stamping each host name and current battery percentage of each node in his node list whenever this route move backward this frame called as dirty frame and will destroy on this node. This can be illustrated as: when route finding frame moves forward from node2 to node1, node3, node5 and this frame may be travel backward to node2 to find the multiple route but this creates circular weights hence on node2 this frame will destroy so that merely unique frame will reached to the destination. Now the possible route will be obtained at receiver side having host (node) name with its battery percentage. According to Smart Routing Algorithm route will calculated and obtained route is node1 to node4 to node5 having minimum battery percentage is 85 which is maximum battery percentage while looking at others minimum battery

percentage. In this packet, no node is present who have battery percentage less than 85% by default source and destination is 100% because here operation is going on which should be active all time. Hence, while performing operation, I had assumed that source and destination will not be drained because those are the two nodes where operation is going on and result will be found. As the data reached to the destination i.e. node5 will send an acknowledgement to source node that data is successfully received by distinguishing frame id which will be generated automatically by using automatic random generator. After all this data might not be transmitted due to any cause which is not considered before then source node will get negative acknowledgement which will again send the same data and whole operation or process will be again performed [2].
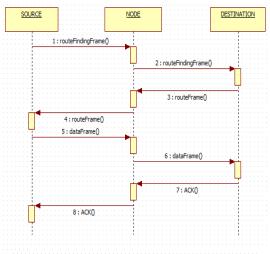

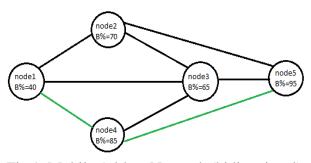Fig. Sequence Diagram of Frame Transfer Between Source-Node-Destination

Fig.1. Mobile Ad-hoc Network (bidirectional)

V. SMART ROUTING ALGORITHM

Suppose the following routes are obtained at receiver side, from above fig: 1. Mobile Ad-hoc Network (bidirectional). Here node1 is a source and node5 is destination so consider those nodes has 100% battery percentage because this node should not be drained or algorithm should not consider them as a node having little battery percentage than any other nodes while performing calculation which may result in invalid discovery of route.

Syntax: Intermediate node name (battery percentage)

(1)   node1→ node2(70) →node5, here 70% is minimum battery percentage

(2)   node1→ node3(65) →node5, here 65% is minimum battery percentage

(3)   node1→ node4(85) →node5, here 85% is minimum battery percentage

(4)   node1→ node3(65) →node2(70) →node5, here 65% is minimum battery percentage

(5)   node1→ node2(70) →node3(65) →node5, here 65% is minimum battery percentage

(6)   node1→ node3(65) →node4(85) →node5, here 65% is minimum battery percentage

(7)   node1→ node2(70) →node3(65) →node4(85) →node5, here 65% is minimum battery percentage

(8)   node1→ node4(85) →node3(65) →node5, here 65% is minimum battery percentage

(9)   node1→ node4(85) →node3(65) →node2(70) →node5, here 65% is minimum battery percentage

Here, minimum battery percentage is calculated from all obtained route and from which the route which has maximum battery percentage i.e. route number 3 has 85% as maximum battery percentage is selected as **"SMART ROUTE"** which shown in fig.1 using green colour. It assures that no node is having less battery percentage than 85% in selected route hence this is our smart route which will definitely maximize the lifetime of MANET.

VI. ADVANTAGES

A. Network Lifetime: As this protocol, discovered route using maximum battery present at each node even if the power consumption is more but the network will stay longer than traditional network which is not working on present battery percentage.

B. Route is short: Number of route are obtained but the route which come in defined time limit only this route will consider for smart route calculation. Time constrained is enforces on the obtained route so that selected route should be short.

C. Router Free: In this internet can be connected without any wireless router is one of the vantage of using MANET. As MANET has no centralized authority i.e. data is flowing to from each node hence all node act as router.

D. Cost: This is a type of network where infrastructure is not consider hence the network becomes more economical.

E. Scalable: This type of network allows accommodation of more nodes.

F. Fault tolerance: smart routing protocol help to prolong the network lifetime. Also routing and transmission protocols are designed to support connection failure in MANET.

G. Data loss decreases: As the route obtained assured that it maximize the lifetime hence data will successfully transmitted till the connection has no disturbance. Also ACK frame letting know whether data is transmitted or not.

H. Support Large Data: Using this protocol large and very large data can be sent because it assured that this network would survive more than any other type of network. Hence network would not fail in between data transmission if data is large.

VII. CONCLUSION

In this paper, I am elaborating Smart Routing Protocol (SRP), a routing protocol to enhance the lifetime of a mobile ad hoc network. In a concern of disseminating data more fairly among nodes it is crucial to define a battery-based ad-hoc routing protocol. A battery based smart routing algorithms would take into account the current battery level of nodes to determine the route in the network. The intention of such approach is to prevent smart routing path from node (discharging) having little battery comparatively other node in network so that the communications will stay longer as such node will fail probably before transmission of data.

VIII. REFERENCES

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