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Implementation on Geographical Location Based Energy Efficient Direction Restricted Routing In Delay Tolerant Network

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Abstract- DTN has been a highly emerging research area, particularly in an age where the ultimate goal is to provide ubiquitous connectivity, even in regions previously considered inaccessible. Delay Tolerant Network (DTNs) are wireless network that experience frequent connectivity and due to mobility of nodes long duration partitions occured during transmission of data and performance challenging environments where continuous end-to-end connectivity cannot be assumed. In Delay Tolerant Network (DTN), traditional routing protocol for mobile Ad-hoc protocol to be ineffective to extend of messages transmmsion between diffrent nodes. Routing with minimum energy consumption is major issue in such network. The propose design model restrict the broadcasting area by forming an angle between source and destination. Geographical routing technique find the location of destination after that routing is restricted according to destination sector. due to limited broadcasting the energy consumption for message transmission will be minimize. In this paper We propose a design model for moving nodes in DTN that will energy efficient for message broadcasting.

Keywords- Delay Tolerant network, Geographical Routing, Limited Broadcasting.

I. INTRODUCTION

Delay Tolerant Network (DTN) is a wireless network that experiences frequent connectivity. Due to mobility of nodes long duration partitions occurred during transmission of data. DTN has the main feature that there is no fixed path available from source to destination. In Delay Tolerant Network majority of traditional routing protocols are less effective in messages transmission.

Delay Tolerant Networks (DTN) have the special feature of intermittent connectivity, which provides opportunistic communication [1] and makes routing in delay tolerant network different from other wireless networks. For successful transmission of packets in network require end-to-end connectivity between nodes. In DTN, connectivity is not constantly maintained still it is desirables to allow communication between nodes. Traditional routing protocols [2] require end-to-end connectivity between nodes. They unable to deliver packets between the hosts. If mobility pattern is unknown, it introduces the problem of lack of knowledge about current position of nodes. In deep space communication or situations like crisis environments the delay tolerant network are applicable.

There are some key properties of DTN which makes a great deal of divergence from conventional wireless networks like contemporaneous connectivity, opportunistic communication, large delay and low data rate.

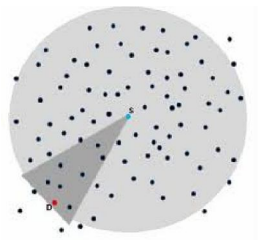


Fig 1. Injection of false Report , Gray-Hole Attack and detecting it.

Geographic location based routing (also known as georouting) relies on geographic position information appears as a promising approach for enhancing the routing efficiency in DTNs. Based on geographic location of destination source sends message instead of using the network address like in traditional network. In Geographic routing [3], each node determines its own location as well as it aware the location of the other node. With this information, a message can

be routed to the destination without knowledge of the network topology or a prior route discovery. By using geographical location information of destination, source find the optimal route and limit the transmission area. Restricted message transmission in Delay Tolerant Network improves the energy efficiency. Energy required for broadcasting message in whole transmission area of source node is large. Thus, by providing restriction on transmission range minimize the energy consumption in delay tolerant network.

Our major Contribution should be to provide restrictions on the broadcasting of the message in Delay Tolerant Network by identifying the expected zone of destination location. Due to limited broadcasting, energy consumption is less as well as bandwidth required for message transmission will be minimize.

II.OBJECTIVES

The main objectives of Proposed Model are:

A) Provide Restriction on Message Broadcasting (Limited Broadcasting):

Instead of broadcasting messages to all nodes which present in transmission range of source. Provide restriction on broadcasting by considering encounter angle between the source and destination

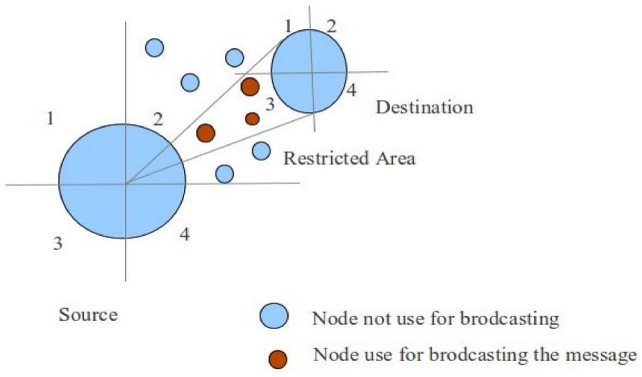
B)To Minimizing Bandwidth Consumption and Control Congestion in Delay Tolerant Network:

Due to limited broadcasting the bandwidth required for message transmission is less. On using whole transmission area of source for broadcasting, network congestion is high. By providing the restriction on broadcasting, the network congestion will be controlled in Delay Tolerant Network.

III. IMPLEMENTED WORK

In delay tolerant network limit the message broadcasting by providing restriction on the transmission range of source depending upon location of destination. Propose model is mainly focused on improving energy efficiency by restricting the range of transmission.

In delay tolerant network nodes are moving and position is changing frequently. In such scenario, Source node find the expected zone of destination node by using geographical location base concept. Depends upon location of the destination an angle is form in between the source and destination by using initial and final value of position of destination node. Each node maintain a network information table and update that information when network change occurs.



The Fig-1 shows the network nodes are moving and each node have partitioning transmission range. Source node first finds the expected zone of destination using geographical scheme and depends on location of the destination the transmission range is restricted and provide limited broadcasting. Instead of using whole area of the available trasmission range, proposed model provide restrictions on broadcasting which will minimize energy consumption for message transmission. Network congestion is controlled by using this routing scheme. The propose work expected to overcome the energy consumption in network for message transmission by providing restriction on broadcasting in delay tolerant network.

Algorithm for GLEDR.

SN: -Source Node SE:- Relative Sector
DN:- Destination Node P-:Packet
M:- Message NN:- Neighbor Node
ANG:- The angle between source and destination
DS: Distance
1 .For each encounter between SN and DN do
2 .Check the DN
3 .If Direct delivery of P from SN to DN then
4. Deliver P to DN
6. else
7 .find DS between DN and SN and
Compute ANG
8 .select the SE
9. Find NN in respective SE
10.select best NN
11.transmit P by unicast
12.Set the origin at NN as SN
13. repeat step-3
14.end if

In delay tolerant network limit the message broadcasting by providing restriction on the transmission range of source depending upon location of destination. Propose model is mainly focused on improving energy efficiency by restricting the range of transmission. It consists of three elements:

I)Detect the destination:

In delay tolerant network nodes are moving and position is changing frequently. In such scenario, Source node find the expected zone of destination node by using geographical location base concept.

II) An angle Computation:

Depends upon location of the destination an angle is form in between the source and destination by using initial and final value of position of destination node.

III)Data Transmission:

Propose model limit the broadcasting by restricting the transmission range by forming an angle. Message will transmitted from source to destination within limited transmission range of source and destination.

IV. SIMULATION RESULT

A. Simulation Parameter.

A grid of 340 x570 is considered. Number of groups are 8 The scenario of moving nodes is based on map base routing The nodes are constantly changing the position with respect to time and move on map base road .The speed for mobility is parametrized as 2 Mbps with a scenario end time of 43200s.

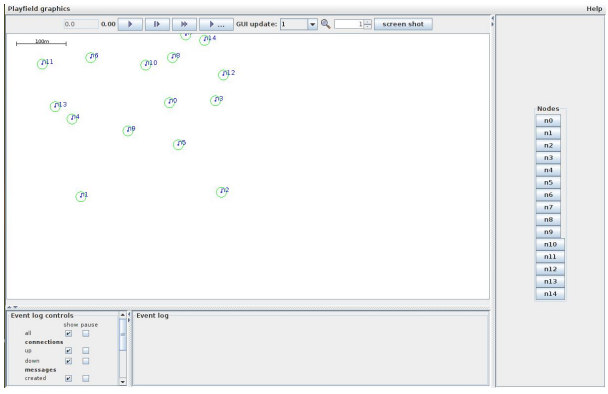


Fig 3. Broadcast the data from one node to other node

Figure-3 .shows that while stimulating through ONE simulator the sender while sending the message to destination it transfers through an intermediate node. The source will find the destination location and as well as all neighbour nodes .If source node is present in first sector then the node which belonged to sector first will forward the message to destination. At initial stage we considered the simple network of node 15 and track the location of source and destination.

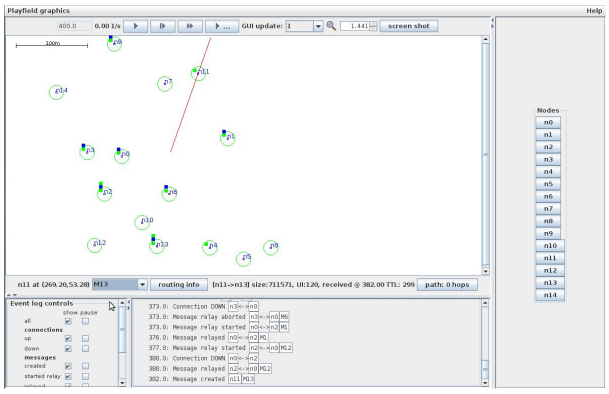


Fig 4Transmission between nodes with location and path in DTN

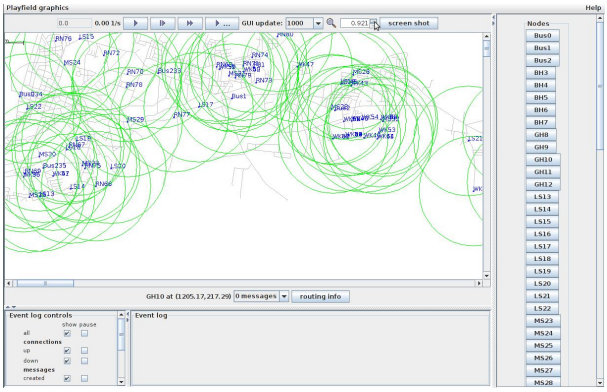


Fig 5Transmission between nodes using GLED Routing protocol in DTN

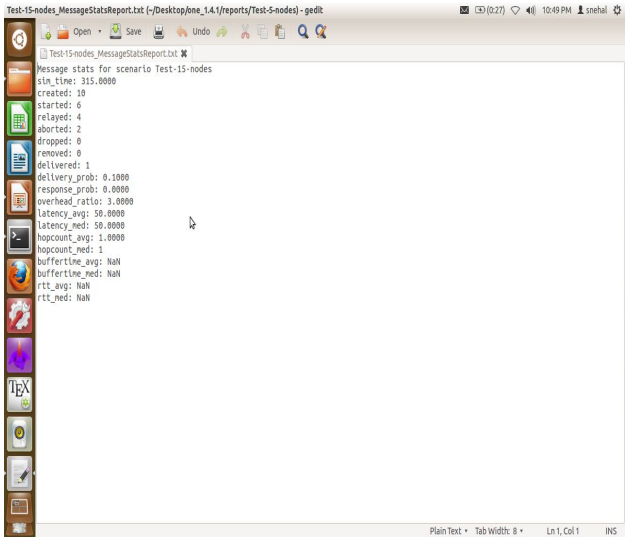


Fig 6. Statistics for all the nodes with report generated in report module.

In figure-6 shows the distance between nodes in network. As per the scenario of network fifteen the distance between each node as well coordinates of each nodes is calculated for find the angle between source to destination

The nodes communication was analyzed through Report module in one_1.4.1.

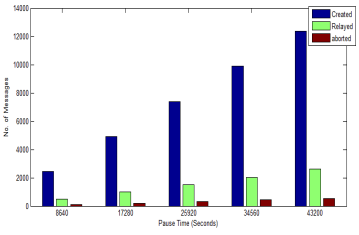


Fig 7.Number of message created, relayed in network.

The report are generated after compilation of script in report module in one_1.4.1. generation code of report is written in default script code by which number of reports are generated. On using this report we compared the our proposed routing protocol with existing routing protocols in ONE.

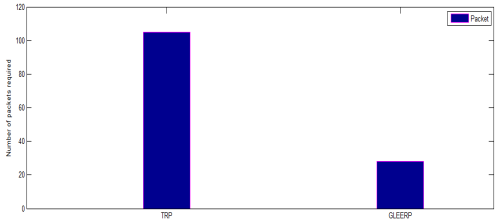


Fig.8. Broadcasting Packet in network of 15 nodes.

V.CONCLUSION

we proposed possible efficient protocol solution for seamless ene-to-end communication in network where connected paths between a source and destination cannot be guaranteed to exist and also adaptive communication protocols targeting energy efficient network operation. In this paper we propose geographical location based an energy efficient direction restricted routing algorithm. It consists of three elements: (i) gradients to disseminate message over broadcasting from a source to sink and energy consumption is saved evidently.(ii) an angle computation between source and destination. (iii) data transmission. Energy efficient direction restricted algorithm provide an energy-efficient routing as well bandwidth consumption is minimize. In future work, we compared the proposed algorithm to other related algorithm from perspectives of average dissipated energy and minimum bandwidth for message broadcasting in DTN

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