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A novel adaptive routing algorithm for Wireless adhoc network

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Abstract: *Wireless AD-HOC Network is the most frequently used network these days. The traditional routing involves a fixed path for the routing process. It consists of a centralized system. The packets are forwarded from the source to the destination, through the fixed path. Disadvantage of this type of routing is that it cannot change path according to the need of the packet. Wireless ADHOC network overcomes the disadvantages of the traditional routing. It consists of a number of mobile nodes working coherently with each other, without any centralized infrastructure. The traditional routing is not able to broadcast the data and also it can't enjoy the wireless communication for transmission of data. The adaptive routing in wireless ADHOC network enjoys the transmission of data through broadcast method and also all the other approaches of the wireless system. In this paper we have proposed an adaptive routing algorithm for wireless ADHOC network, which minimizes the average per packet cost in transmitting a packet from source to destination.*

Keywords:- Adaptive Routing, Algorithm, Wireless AD-HOC Network.

1. INTRODUCTION

Adaptive routing is the routing process in which the packets of data are transferred from source to destination through the path which is not fixed; the packet changes the path according to its requirement.

Different protocols are used for adaptive routing, they are RIP, OSPF, IS-IS, and IGRP or EIGRP. The systems using the adaptive routing are termed as using the dynamic routing.

The systems using the non-adaptive routing are termed as using the static routing, in which the fixed path is determined before the transmission of the packet starts. The packets can't change the path even if any fault occurs or the traffic is high in that path. The wireless AD-HOC network is also known as mobile AD-HOC network (MANET). The MANET are mobile network so

they use wireless method for the transmission of the packet. The wireless schemes used by MANET can be the Wi-Fi, cellular transmission or the satellite transmission. In some cases the MANET are restricted only to the local area, for e.g.-group of computers. But in some cases they are connected to the internet. VANET (Vehicular AD-HOC network) is a type of MANET which is allowed to communicate with the roadside equipments. The mobile nodes in case of MANET can be the laptops, the smart phones and the PDA (personal digital assistance). The functioning resources in these devices are very limited, like the battery or the bandwidth. So due to the limited amount of these available resources the ad-hoc network are not feasible. In this paper we are comparing the traditional routing method and the wireless ad-hoc method. What are the differences among both, comparing them on the basis of their advantages and disadvantages? Which is better among both and how?

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2. RELATED WORK

In case of traditional routing there is fixed route of transmitting the packets. So these types of networks are not able to enjoy the facilities of the broadcasting or the one given by the wireless communication. So the main objective of this paper is to overcome the problems of the traditional routing protocol and to propose a new method in ad-hoc routing protocol, to transmit the packets from source to destination efficiently.

3. PROPOSED WORK

We will propose an adaptive opportunistic Routing scheme for the MANET, which will make real time routing decisions on the basis of the actual transmission outcomes as well as a rank ordering of neighboring nodes. It will minimize the expected average per packet cost for routing a packet from a source node to a destination node.

3.1 Methodologies:-

We have investigated the problem of opportunistically routing packets in a wireless multi-hop network when zero knowledge of transmission success probabilities and network topology is available. By using a reinforcement learning framework, we will propose an adaptive opportunistic routing algorithm which minimizes the expected average per packet cost for routing a packet from a source node to a destination.

3.2 Stages of Proposed work:-

The proposed work functions in four steps:-

- The Initialization stage

- The Transmission Stage
- The Acknowledgement Message Passing
- The Relay Stage

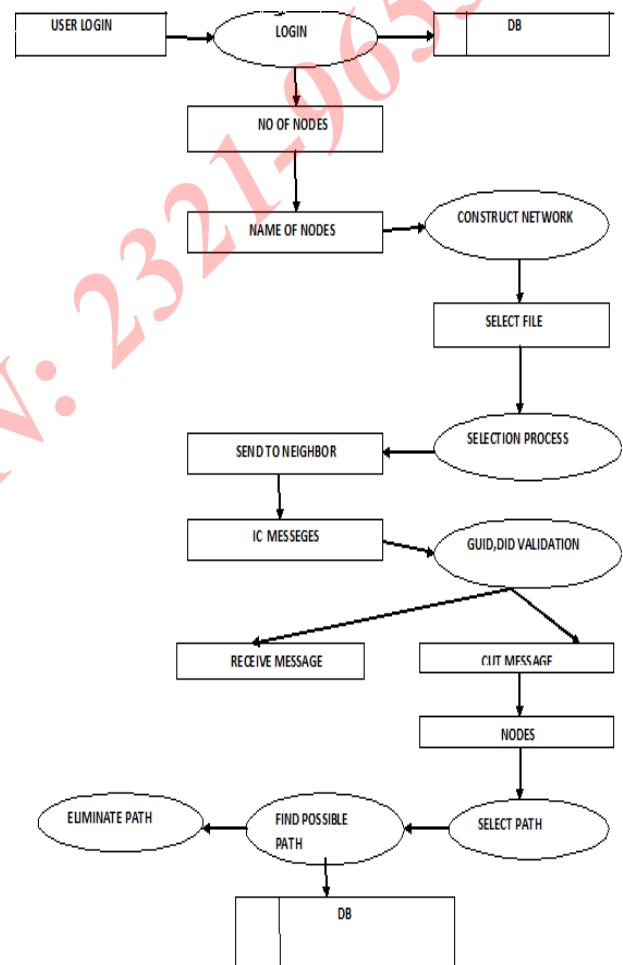


Figure 1. Data flow diagram

1. The Initialization Stage:

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At this stage the source node and the destination node are decided. zero numbering is given to the source node and (d+1) is given to the destination node.

2. The Transmission stage:

At this stage the packets are transmitted from one node to another.

3. The Acknowledgement Message Passing:

At this stage the acknowledgement message is send from the node which received the message to the node which send the message.

4. The Relay Stage:

We are given a successful transmission from node i to the set of neighbor nodes S, the next routing decision includes

- retransmission by node i,
- relaying the packet by a node $j \in S$
- Dropping the packet all together. If node j is selected as a relay then it transmits the packet at the next slot while other nodes removes that packet.

4. RESULTS

The proposed scheme will result in low complexity, low computational overhead, and distributed asynchronous implementation.

4.1 Few characteristics of the proposed scheme are:

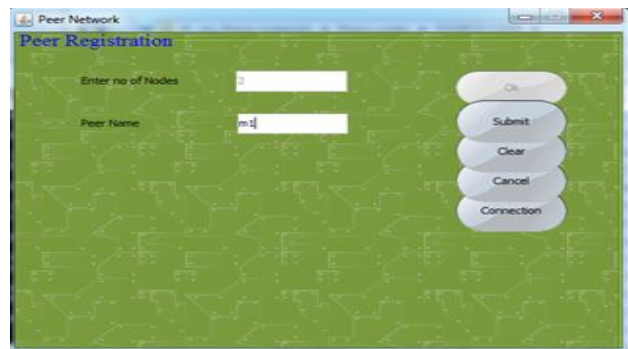
It will minimize the expected average per packet cost for routing a packet from a source node to a destination.

- It is unaware to the initial knowledge of network.
- It is distributed. So each node makes decisions based on its belief using the information that it obtained from its neighbors.
- It is asynchronous. So at any time any subset of nodes updates their corresponding beliefs.

4.2 Few steps to show how nodes are created and how messages are exchanged among them.

Step.1.

In this part number of nodes to be created is entered. There can be any number of nodes.



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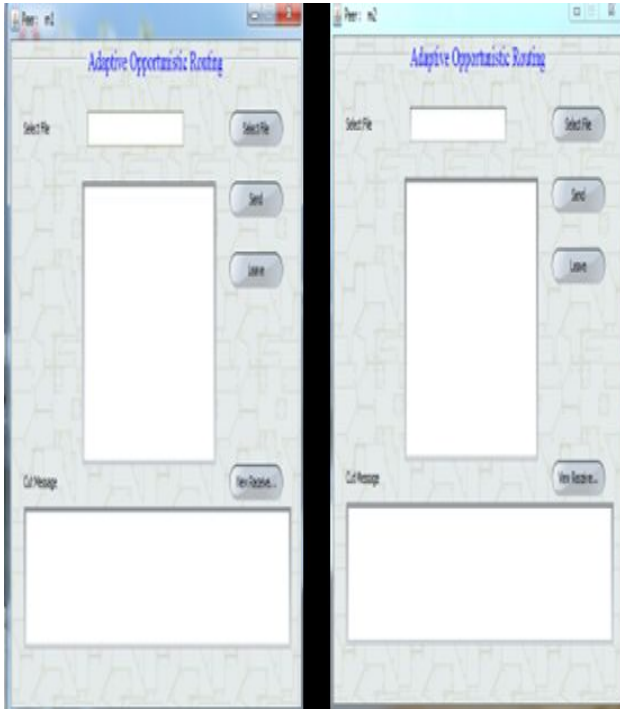


Step 2:
In this step the source node and the destination node is entered, and the connection is established among both the nodes.

Step 3:
In this step the nodes are formed and the messages are exchanged among the nodes.



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In the above diagram two nodes are present and the exchange of messages takes place among both the nodes.

5. CONCLUSION

In this paper the adaptive routing for wireless ad-hoc network has been proposed. The movement of the packets on the network is shown through the packet tracers. The nodes are created with the help of window programming in java, and the exchange of messages among the nodes is also shown. After studying the aspects of Ad-hoc networks in depth, we believe that they will be the future of wireless networking. The performance suffers as the number of devices grows and large ad-hoc networks become difficult to manage and route. However, much time is being devoted in achieving routing stability, and a few technical issues need to be solved before they are used commonly. The field of ad hoc networks is a very fast growing field, and due to the vast research in them, we are seeing these problems disappear and they are coming into a world of their own.

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