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A Novel Efficient ADHOC on Demand Routing Protocol

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Abstract— In Ad hoc network there no any vital infrastructure however it permits mobile devices to set up communication path. In view of the fact that there is no vital infrastructure and mobile devices are moving indiscriminately, gives increase to different types of problems, for instance protection and routing. Here we are taking into consideration problem of routing. Routing is one of the chief concerns in MANET for the reason that of extremely dynamic and disseminated nature of nodes. Particularly energy efficient routing is most significant for the reason that all the nodes are battery power-driven. Breakdown of one node may influence the complete network. If a node runs out of power the possibility of network partitioning will be augmented. In view of the fact that every mobile node has restricted power supply, energy exhaustion is turn out to be one of the key threats to the existence of the ad hoc network. Consequently routing in MANET should be in such a way that it will use the remaining battery power in a competent way to augment the life time of the network. In this thesis, we have proposed Novel Adhoc on Demand Routing (NAODV) which will competently make use of the battery power of the mobile nodes in such a way that the network will get additional lifetimes. Multiple paths are employed to send data and load balancing approach is used to keep away from over exploited nodes. Load balancing is done by selecting a route which contains energy prosperous nodes.

Keywords: AODV, Load Balancing, Lifetime, Mobile Ad hoc Network, Protocol.

I. INTRODUCTION

An Ad-hoc network is a network with a cluster of mobile nodes/hosts which will communicate with each other via wireless links provided that they are within the radio range. The term "ad hoc" means, nodes that are self-organized which means that they do not have a central entity to govern them [8]. Consequently, that's how the term mobile ad hoc network (MANET) was created. Contrasting networks which are utilizing committed nodes to support some of the basic functions similar to routing, packet advancing as well as network administration, in adhoc networks these are carried out by all nodes [9]. Nodes that present in an adhoc network move in all different directions with any speed but still they are connected to the network because of the wireless associations. These ad-hoc networks don't have in the least type of fixed infrastructure and are also called by the names MANET and adhoc networks. Energy efficient routing is very essential in MANET. There are many existing MANET routing protocols, each one is having its own advantages as well as drawbacks. Subsequent to seeming through this accessible protocol, we decided to design an energy efficient routing protocol which reduces the total energy consumption in the network and thus maximize the life time of the network.

We projected a novel power competent routing protocol which is customized edition of AODV.

II. RELATED WORK

[1] decrease the energy utilization by dynamically controlling the transmission power, Jin Man Kim and jong Wook Jang Maximize network lifetime by calculating mean energy of node [2], Thomas Kunz and Ed Cheng use multicasting and compare AODV and ODMRP [3].

In MANET routing area is the most dynamic investigation area. Particularly over the previous few years, numeral of routing protocols and algorithms has been proposed and closely studied and compared. MANET routing protocols are mainly categorized into three:

1) *Topology based approach*: In this approach a mobile node uses its knowledge about recent connectivity of the network including the state of network links [4]. Based on the time at which the routes are revealed and restructured, these kind of routing protocol are categorized into three categories
   - Proactive Routing Protocol
   - Reactive Routing Protocol
   - Hybrid Routing Protocol

2) *Location based approach:* To make routing decision this type of approach uses the geographic position of nodes. We can use GPS or some other mechanism to obtained Location information. One of geographical-based routing protocols is location-aided routing (LAR) [6]. Here route request packets are limitedly flooded in a small group of nodes which belong to a demand region. To attain this demand region, we have to obtain first the expected zone of the destination node.

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3) *Power/energy aware approach:* Common power (COMPOW) is based on power aware approach. In this approach every node maintains a routing table at each power levels that is available on the wireless license. Routing tables at diverse authority intensity is built by exchanging hello messages at each authority intensity Pi, consequently the routing table RTi communication to the routing table at ith power level [7].

I had study the literature review and find that most of routing protocols are find the route from source node to destination node and send packet via single path. In my present work I proposed Modified AODV in which we are use multiple paths to send packet. By doing this lifetime of network in extends.

III. AD HOC ON DEMAND ROUTING PROTOCOL (AODV)

The Ad hoc On-Demand Distance Vector (AODV) algorithm enables dynamic, multihop routing between participating mobile nodes wishing to establish and maintain an ad hoc network [5]. AODV allows mobile nodes to obtain routes quickly for new destinations, and does not necessitate nodes to preserve routes to destinations that are not in active communication.

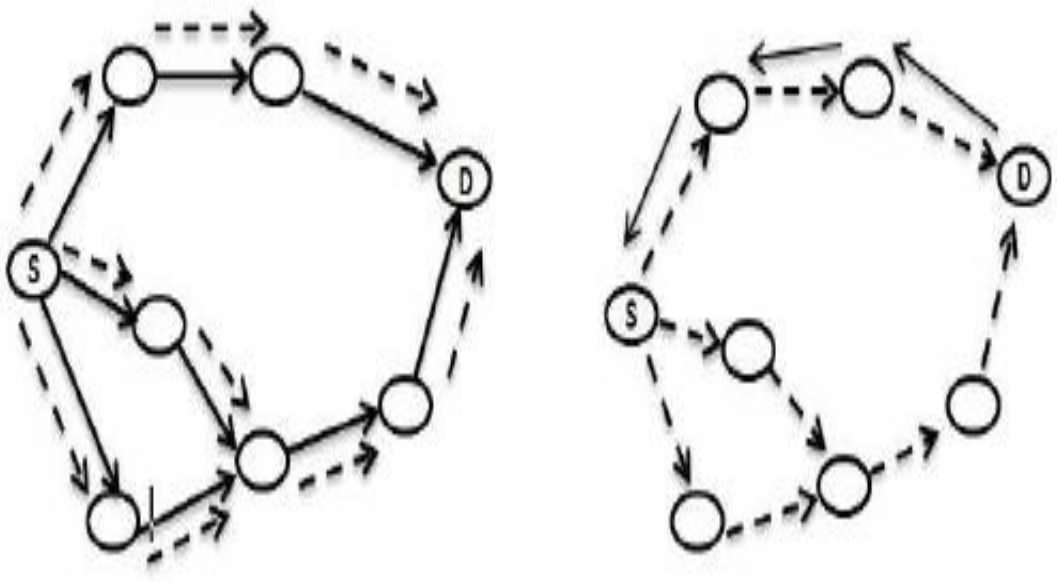

Figure 1: Route discovery by AODV

1) AODV Operation

This section describes the scenarios under which nodes generate Route Request (RREQ), Route Reply (RREP) and Route Error (RERR) messages for unicast communication towards a destination, as well as how the communication data are gripped. With the intention of process the communications in the approved manner, definite status information has to be preserved in the route table entries for the destinations of concern.

2) Maintaining Series Numbers

Every route table entry at every node MUST include the latest information available about the series number for the IP address of the destination node for which the route table entry is maintained.
A destination node increases its own series number in two circumstances:

- Straight away earlier than a node originates route detection, it MUST increase its own series number. This keep away from inconsistencies with previously recognized invalidate routes in the direction of the instigator of a RREQ.
- Straight away earlier than a destination node instigates a RREP in reply to a RREQ, it MUST revise its own series number to the highest of its existing series number and the destination series number in the RREQ packet.

A node may change the series number in the routing table entry of a destination only if:

- it is itself the destination node, and presents a novel route to itself, or
- it accepts an AODV message with novel information about the series number for a destination node, or
- the path towards the destination node terminates or smashes.

3) Route Table Entries

When a node receives an AODV control packet from a neighbour, or creates or updates a route for a particular destination or subnet, it ensures its route table for an entrance for the destination. In the occurrence that there is no

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consequent entry for that destination, an entrance is produced. The route is merely restructured if the new series number is either

- advanced than the destination series number in the route table, or
- the series numbers are equal, but the hop tally (of the novel information) in addition one, is lesser than the accessible hop tally in the routing table, or
- the series number is unidentified.

4) Generating Route Requests

A node broadcasts a RREQ when it resolves that it wants a route to a destination and does not have one accessible. This can take place if the destination is formerly unidentified to the node or if a formerly applicable route to the destination terminates or is marked as unacceptable. The Destination Series Number field in the RREQ message is the final identified destination series number for this destination and is derivates from the Destination Series Number field in the routing table.

If no series number is identified, the unidentified series number flag MUST be positioned. The Instigator Series Number in the RREQ message is the nodes own series number, which is increased before to its incorporation in a RREQ. The RREQ ID field is increased by one from the last RREQ ID utilized by the existing node. Each node preserves merely one RREQ ID.

5) Processing and Forwarding Route Requests

It first increases the hop tally value in the RREQ by single, to report for the novel hop from side to side the transitional node. Subsequently the node explores for a turn around route to the Instigator IP Address, by means of longest-prefix corresponding. If necessitate be, the route is formed, or restructured by means of the Instigator Series Number from the RREQ in its routing table. This turn around route will be required if the node accepts a RREP turn around to the node that instigated the RREQ (recognized by the Instigator IP Address). When the turn around route is formed or restructured, the subsequent proceedings on the route are also carried out:

- the Instigator Series Number from the RREQ is compared to the corresponding destination series number in the route table entry and copied if greater than the existing value there
- the valid series number field is set to true;
- the subsequent hop in the routing table turn out to be the node from which the RREQ was received ;
- the hop tally is copied from the Hop Tally in the RREQ message;

6) Generating Route Replies

A node generates a RREP if either:

- it is itself the destination, or
- it has an active route to the destination, the destination series number in the nodes existing route table entry for the destination is valid and greater than or equal to the Destination Series Number of the RREQ

7) Route Reply Generation by the Destination

If the generating node is the destination itself, it MUST increment its own series number by one if the series number in the RREQ packet is equal to that increased value. Or else, the destination does not modify its series number before generating the RREP message. The destination node places its series number into the Destination Series Number column of the RREP, and enters the value nil in the Hop Tally field of the RREP.

8) Route Reply Generation by an Intermediate Node

If the node producing the RREP is not the destination node, but instead is an intermediate hop along the path from the instigator to the destination, it copies its known series number for the destination into the Destination Series Number field in the RREP message.

IV. PROPOSED METHOD

In our proposed method, we use two approaches one is Load Balancing and second is multiple path approach.

In load balancing, we select route which is rich in energy to ensure that packet will send exclusive of breakdown. By choosing this route, each node will have energy greater than threshold level.

In multiple path approach, we use more than one path. We are selecting multiple paths because, if we send via single path, nodes in that path will use more energy or it will possibly discharge the energy of the nodes present in that path completely and can not be part of the network. This may break link between source and destination. There is a possibility of network disjoint.

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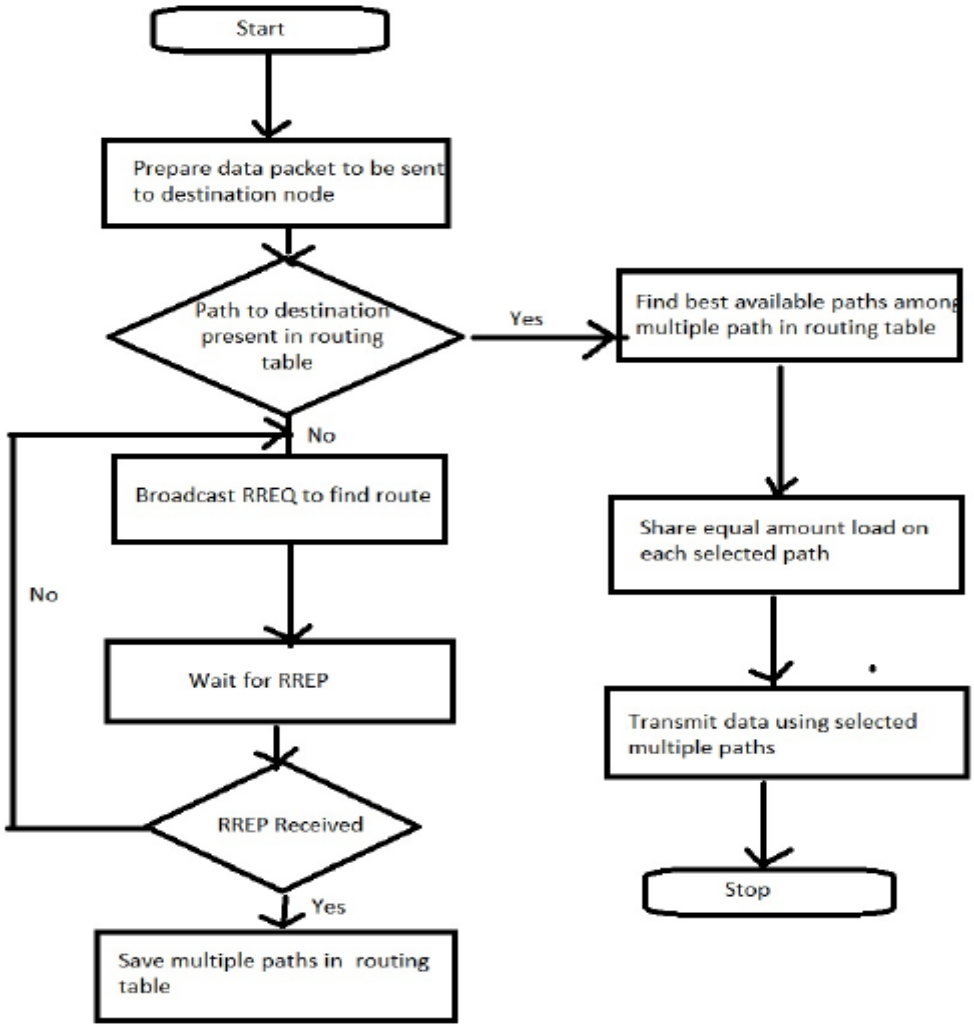

Figure 2: Flow chart of proposed method

V. CONCLUSIONS

In this paper, we have contrasted two protocols namely AODV and customized AODV. AODV utilizes single path to send packets for the reason that of this, node which comes in the route gets low on authority or releases absolutely. Because of this, there is possibility of network bereavement. If we utilize customized AODV which make use of manifold path to send data, lifetime of the network is lengthens. In Ad hoc network there no any fundamental infrastructure except it permits mobile devices to institute message path. In view of the fact that there is no fundamental infrastructure and mobile devices are touching indiscriminately, gives augment to a variety of types of problems, for instance protection and routing. At this point we are taking into consideration problem of routing. Routing is one of the main concerns in MANET for the reason that of extremely active and disseminated character of nodes. Particularly power competent routing is vital for the reason that all the nodes are battery motorized. Breakdown of one node may have an effect on the whole network. If a node runs beyond energy the likelihood of network partitioning will be augmented. Because each mobile node has restricted power make available, energy exhaustion is turn out to be one of the key intimidations to the lifetime of the ad hoc network.

As a result routing in MANET be supposed to be in such a way that it will use the remaining battery power in an efficient way to increase the life time of the network.

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