International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075 (Online), Volume-3 Issue-1, June 2013

A New Efficient Routing Protocol for MANET

Himanshu Ratawal, Bharti Nagpal

***Abstract*— MANET can be defined as a accumulation of mobile hosts which move in different directions and speeds with no need to create connectivity with existing network infrastructure. Various routing protocols have been made from the time of the existence of ad hoc networks. We proposes a new routing protocol for ad hoc networks which will reduce network overhead, power consumption, Multi-user Interference (MUI), and provide link reliability.**

***Index Terms*—MANET, ROUTING, OAODV, ROUTING PROTOCOL.**

I. INTRODUCTION

An ad-hoc Wireless Local Area Network (WLAN) is a type of network in which no infrastructure connectivity is their various types of hosts are found; such as PDAs (personal digital assistants), laptops and cellular phones. These nodes contain short range transmitters and receivers, and antennas which can be omni directional , highly-directional , or a combination of the two. [1] Wireless networking protocols allow nodes to relay data packets among nodes that are at different places. Direct communic -ion is possible if nodes are within transmission range ,intermediate nodes is required if they are far away from each other. Wireless routing protocols in MANET are defined into two different types, topological based, and position based. Topological based routing protocols use the present information about links in the network to flood (forward) packets. routing strategies are of two types: topological based; proactive protocols [2] which maintain routing information for every node in the network and collect this information in its routing tables, such as Destination- Sequenced Distance Vector [3], Cluster-head Gateway Switch Routing [3], Wireless Routing Protocol [4], and Optimized Link State Routing Protocol [5].

The another type is reactive routing protocols which create route on demand, like Ad hoc On-Demand Distance Vector [6], Dynamic Source Routing [7], Temporally Ordered Routing Algorithm [4], and Associatively - Based Routing)[3].

Position based routing protocols make use of positional information to put flooding towards the goal in order to reduce network overhead and power consumption, Location Aided Routing Protocol (LAR) , GRID , Compass , and Greedy Perimeter Stateless Routing (GPSR) [11] are few examples of position based routing protocols.

Manuscript published on 30 June 2013.
*Correspondence Author(s)
Himanshu Ratawl, Research Scholar,Ambedkar Institute Of Advanced Communication Technologies &Research ,New Delhi, India.
Bharti Nagpal, Assistant Professor Cs Depatment,Ambedkar Institute Of Advanced Communication Technologies &Research., India.

In this paper we proposes a new routing protocol w.r.t its position, velocity and direction of nodes. A source node will create an imaginary line which will be perpendicular to the line connecting the source and destination. Only those nodes within the imaginary line and destination react to route requests (RREQ) and nodes which outside this line will not respond in order to reduce network overhead.

When node will forwards RREQ, it will adds RREQ header to all neighbour nodes which are covered within its transmission range, while accepting node confirm the covered nodes in its received RREQ header, if some of them received RREQ, it neglect them and modify its transmission power to cover the furthest uncovered neighbour node in order to decrese power.

When two nodes are moving in the same direction, they can push forward RREQ in order to achieve link reliability.T he remainder of this paper is organised as follows: section 2 summarises related work, section 3 presents the proposed routing protocol, and section 4 presents a summary.

If you are using *Word*, use either the Microsoft Equation Editor or the *MathType* add-on (http://www.mathtype.com) for equations in your paper (Insert | Object | Create New | Microsoft Equation *or* MathType Equation). “Float over text” should *not* be selected.

II. RELATED WORK

A. *Ad hoc On-Demand Distance Vector (AODV)*

AODV [6] are a the class of Distance Vector routing protocols . In a Distance vector routing protocol , every node is aware of its neighbours and the costs incurred in order to arrive at them using the Bellman-Ford algorithm [12].AODV is a fast smallest single path wireless routing protocol based on the DSDV protocol. When a source wants to forward a message to a address, it will checks routing table, and if there is a valid path to destination, it will send packet immediately. If not, it will broadcasts a RREQ to all neighbour nodes . It should be keep in mind that the RREQ has the fields: hop count, source and destination sequence numbers, destination and source addresses, RREQ ID, and other pre-determined fields. When an neighbour node get a RREQ, it see its routing table for a path to the final address if it exists, it unicasts a route reply (RREP) to the source, otherwise, it will add the hop count by one, and adds its ID to the RREQ and then re- broadcasts it to its neighbours. It continues to do so until the RREQ reaches its destination. Then, the destination will choose the earliest coming RREQ, and unicasts the RREP using the inverse path to the source node. When the source receives various RREPs, it will choose the route of greatest sequence number and lowest hop count, and then create the route and starts sending packets. Source node make use sequence number and add it it in RREQ to ensure that their is loop freedom.

Whenever a node get a control message (RREQ, RREP, or RRER), it see its routing table for an entry to the specified adderess, if there is no entry in the routing table about the destination, it will make a new one. If entry exists in the routing table, the route is only updated if and only if the new sequence number is either greater than the destination sequence number in the routing table, the sequence numbers is equal, but the hop count on adddition of one is smaller than the present hop count in the routing table, or the sequence number is not known Also the source make use of a time to live (TTL) count to control the flooding of RREQ packets and controls the overhead connected with the network. At last, a HELLO message is broadcasted periodically to inform immediate nodes about node existence. When an active node (a node on the active route) find a route failure (the neighbour node is unreachable; , it broadcast a route error (RERR) packet to the final address, which in turn, initiates a new RREQ.The overhead occured in the above process is a major loss of AODV mainly due to the flooding of these control messages on the network

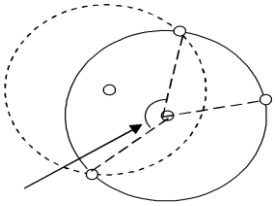
B.Optimized AODV (OAODV)

OAODV [13] is an enhancement to the AODV protocol by using the theory of a 'reliable distance'. This is always lesser than the actual transmission range. It also vary with the node's velocity and direction information obtained from GPS. Here, the source node transfer a RREQ which contain the GPS information (location, velocity and direction), then neighbour nodes evaluate the new position of the source according to information in RREQ. After that it will finf the initial and final distances between them as they move. If the final distance is more than the initial one and the initial distance is greter than the reliable distance, the two nodes are moving in different directions and so the link is unreliable and RREQ is discarded. Otherwise, the resulting sequence is not different Key to the function of OAODV is the reliable distance, which is used to choose whether the node can receive RREQ from its immediate and can determine if the link state between the two nodes is reliable or not. The new protocol proposed in section 3 improve the reliability of routes as compared with conventional AODV.

C. Angle-Based Scheme with a Distance-Based Defer Time(ABS-DBDT)

ABS-DBDT [14] is a flooding technique which help nodes with different transmission ranges in MANET. In this particular method a node which acquire a packet avoids unnecessary re-transmission by checking if all its 1- hop immediate nodes have received the same packet or if the local transmission area has been acquired by the packet sender. It also avoids any unnecessary delay by sending immediately if it has the largest additional coverage area among all the nodes in the 1-hop neighbourhood.

Stateless flooding techniques for heterogeneous MANETs don't need previous knowledge of the neighbourhood. The main drawback of stateless flooding techniques are that they don't reduce the retransmission delay of packets since some delay will occured at every node before forwarding any packet. ABS-DBDT is a stateless method that supports heterogeneous MANETs. The DBDT element help to calculate the time that node should wait for re- transmitting a packet. The delay time is indirectly proportional to the Cover Angle as shown in fig. 1. ABS is then used to find that the coverage area of a node has been covered by all redundant re-transmissions that a node has received). In short form , ABS-DBDT decrease the number of unnecessary re-transmissions and delivery latency whilst maintaining high network coverage



III. PROPOSED ROUTING PROTOCOL

A. Routing Strategy

Each node is aware of its position, speed, and direction. , the node knows the destination's position.When a source node wants to transfer data packets to a destination, it create an imaginary line perpendicular to the line connecting the source and destination.

2. All nodes located within the area that is confined by the line and destination node rreact to RREQ. Other nodes which are not in the the area do not respond to RREQ.

Source node sends RREQ including all neighbor nodes which are in the transmission range in the RREQ header, every receiving immediate node checks the RREQ header to differentiate the covered nodes, if all its neighbours are found in the RREQ header, it cancel the message, if few of them are not included, it calculate the current distance to sending node, velocity and direction of the previous sending node, and if both nodes (sender and receiver) move in different directions, the receiving node discards the message . If they move in the one direction, the node forwards the RREQ including all its covered neighbor nodes with maximum transmission range equal to the farthest uncovered neighbor node as shown in fig. 4. It continues to do this until RREQ reaches the f, which replies to first RREQ.

B. Route Maintenance

After setting up the connection in the proposed routing protocol, the connection can be canceled by MUI noise or the movement of nodes. Here an neighbour node which detects a link failure sends a RERR to the source, and then the source node will start another RREQ.

IV. CONCLUSION

In this paper, a new routing protocol for MANET is told, which exploits position, velocity and directional information to reduce overhead, power consume and MUI and thus increase the reliability of the route. In the proposed protocol, only nodes located in the area between the source and the destination perform the task to a RREQ packet in order to limit flooding of RREQ packets, and therefore decrease the overhead and also packet interfering.

REFERENCES

1. M. Scott Corson and Joseph Macker, "Mobile Ad hoc Networking (MANET): Routing Protocol Performance Issues and Evaluation Considerations", 1999.

Published By:
Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP)

2. Martin Mauve, Jörg Widmer, and Hannes Hartenstein, "A Survey on Position-Based Routing in Mobile Ad Hoc Networks", IEEE Networks, pages 30–39, Nov. Dec. 2001.
3. Mehran Abolhasan a, Tadeusz Wysocki a, Eryk Dutkiewicz, "Areview of routing protocols for mobile ad hoc networks", Received 25 March 2003; accepted 4 June 2003, Elsevier B.V
4. Elizabeth M. Royer, Santa Barbara, Chai-Keong Toh, "A Review of Current Routing Protocols for Ad hoc Mobile Wireless Networks", IEEE Personal Communications, April 1999..Nodes move in the same direction
5. T. Clausen, P. Jacquet, A, Laouiti, P. Muhlethaler, A. Qayyum, and L.Viennot, "Optimized Link State Routing Protocol," in Proceedings ofIEEE INMIC, 2001.
6. C. Perkins, E. Belding-Royer, and S. Das, "Ad hoc On-DemandDistance Vector (AODV) Routing", July 2003.

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)