Improving LVZC Routing For Power Heterogeneous MANETs

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Abstract - *In our existing system, we use the loose virtual cluster based protocol for power heterogeneous MANET. In this project we develop LVC algorithms to construct a hierarchical network and to eliminate unidirectional links. To reduce the interface raised by high power r nodes, develop routing algorithms to avoid packet forward via high power nodes. In this project we use the loose virtual zonal based clustering protocol to reduce topology maintenance overhead and support more reliable multicasting. It uses virtual zone based structure to implement scalable and group membership organization with effective manner. LVZC built protocol uses node life time prediction algorithm during which if there are two nodes that have the similar residual energy state a vigorous node that's utilized in several data forwarding methods consumes energy more quickly and therefore it's a shorter time period than the remaining inactive node.*

***Key Words*: clustering, multicast, routing, protocol**

1.INTRODUCTION

An Adhoc network is fashioned by wireless nodes with none of facilitate of base station or infrastructure. In the network the mobiles nodes are communicating dynamically. The network characterized by the absence of central administration devices like base station or access points. The first challenge of this network is to endlessly maintain the information needed for route traffic. An adhoc network represents a system of wireless nodes which will self-organize freely and dynamically into absolute and temporary network configuration. For adhoc network the two main tasks are route discover y and maintenance of the routing protocol. It's necessary to investigate the designed protocols formally before protocols are deployed or applied. In these Manet nodes act as routers, routers play a crucial role in route discovery and maintenance of routes from supply to destination. If the breakages occur network must keep operational by building new routes. The most technique used is multi-hopping is to extend the network capability and performance. By victimization multi-hopping one node will deliver information to a determined destination. Multicast is to send the data or message to a bunch of destinations at the same time in an exceedingly single transmission using routers only if the topology of the network needs it.

2. EXISTING SYSTEM

Here they established a loose virtual clustering based (LVC) routing protocol for power heterogeneous MANETs. LRPH takes double edged nature of high power nodes. Touse the advantage of high-energy nodes, a unique data structure is maintained in LVC. We developed routing algorithms to avoid packet forwarding via high power nodes. We have a tendency to conduct in depth analysis, simulations to validate the effectiveness of LRPH.

3. PROPOSED SYSTEMS

We use the loose virtual zonal based clustering protocol (LVZC) to reduce topology maintenance overhead and support more reliable multicasting. It uses virtual zone based structure to implement scalable and efficient group membership management. Loose virtual zone based clustering protocol uses node life time prediction algorithm in which if there are two nodes that have the same lasting energy level an active node that is used in many data forwarding paths consumes energy more rapidly and thus it has a shorter lifetime than the remaining inactive node. In Loose virtual zone based clustering protocol use of the position data to design a scalable virtual zone based scheme for efficient membership management, which allows a node a join and leave a group quickly. Efficient Geographic Multicast Protocol uses node life time prediction algorithm. The protocol is designed to be comprehensive and self-contained, simple and efficient for more reliable operation. EGMP used to construct a virtual-zone-based structure to implement scalable and efficient group membership management.

4. PROCEDURE

In a dynamic network, it is acute to maintain the connection of the multicast tree, and adjust the tree structure the topology changes to optimize the multicast routing. In the zonal structure due to the movement of nodes between different zone, some zone became empty. The empty zone problem is critical to handle in zone based protocol.

Compared to controlling the connections of particular nodes a much lower rate of zone membership changes and hence a much lower overhead in maintaining the zone based tree.

The location information used to guide the tree construction, a disconnected zone can quickly restore its network to the tree. In addition a zone may be subdivided into several clusters due to fading and signal delaying. A zone leader nominated through the cooperation of nodes and maintained regularly in a zone. A node shows in the network; it sends out a beacon announcing its existence. Then, it waits for an interval max period for the beacons from others nodes every interval minimum will check its neighbor table and determine its zone leader under different cases.

1) The neighbor table consists of no different nodes within the same zone; it'll broadcast itself as the leader.

2) The flags of all the nodes within the same zone are unset which implies that no node within the zone has declared the leadership role. If the node is nearer to the zone center than different nodes, it'll announce its leadership role through a beacon message with the leader flag set.

3) More than one node within the same zone have their leader flags set, the one with the best node ID is selected.

4) Only one of the nodes within the zone has its flag set, so the node with the flag set is that the leader. A node constructs its neighbor table without additional communication. Once receiving a beacon from a neighbor, a node records the node ID, position, and flag contained within the message in its neighbor table.

In this zone based mostly on the structure we tend to use the algorithmic program named as node life time algorithm. During this algorithm we tend to calculate the energy state for all the nodes within the zone based mostly structure.

If there are two nodes that have an equivalent residual energy state, an active node that's used in several data-forwarding methods consumes energy more quickly, and thus, it's a shorter time period than the remaining inactive node. The node time period supported its current residual energy and its past activity solution that doesn't have to be compelled to calculate the expected node time period from every information packet. an exponentially weighted moving average methodology to estimate the energy drain rate evi . Eire presents this residual energy of node i, and eviis the speed of energy depletion. Eican merely be obtained on-line from battery management instrument and eviis the applied math worth that's obtained from recent history.

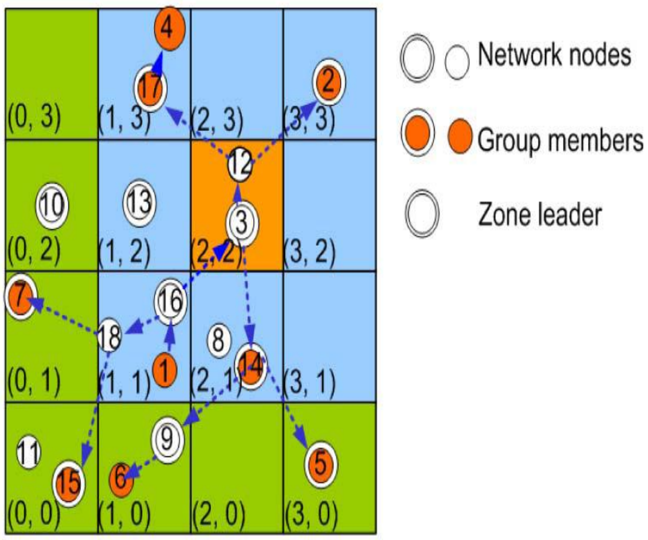

Fig-1 Zone structure and multicast session example.

The estimated energy drain rate in the nth period, and ev (n−1) iis the estimated energy drain rate in the previous (n − 1) th period. αdenotes the coefficient that reflects the relation between evnand evn−1, and it is a constant value with a range of [0, 1].

The zone ID of the sending node is calculated from its position, as mentioned earlier. To avoid routing failure thanks to outdated topology data, an entry is removed if not reinvigorated at intervals a period Timeout or the corresponding neighbor is detected unreached by the mac layer protocol. once a member node moves to a brand new zone, it ought to rejoin the multicast tree through the new leader. once a frontrunner is moving away from its current zone, it should delivery its multicast table to the new leader of the zone, in order that all the downstream zones and nodes can stay connected to the multicast tree.

Whenever a node M moves into a new zone, it will rejoin a multicast group G by sending a JOIN_REQ message to its new leader. During this joining process, to reduce the packet loss, whenever the node broadcasts a BEACON message to update its information to the nodes in the new zone, it also unicasts a copy of the message to the leader of its previous zone to update its position. Since it has not sent the LEAVE message to the old leader, the old leader will forward the multicast packets to M. This forwarding process helps reduce the loss of packet and facilitates seamless packet transmissions during zone crossing. When the rejoining process finishes M will send a LEAVE message to its old leader.

For handle leader mobility problem, if a leader catches its distance to the zone border is less than a threshold or it is already in a new zone, it assumes it is moving away from the zone where it was the leader, and it starts the handover process. To look for the new leader, it compares the positions of the nodes in the zone it is leaving from and selects the one closest to the zone center as the new leader. It then sends its multicast table to the new leader, which will announce its leadership role immediately through a BEACON message. It will also send a JOIN_REQ message to its upstream zone. During the transition, the old leader may still receive multicast packets. It will forward all these packets to the new leader when the handover process is completed. If there is no other node in the zone and the zone will become empty it will use the method introduced in the next section to deliver its multicast table. In the case that the leader dies suddenly before handing over its multicast table the downstream zones and nodes will reconnect to the multicast tree through the maintenance process

- EGMP used for a virtual-zone-based structure to implement ascendible and economical cluster membership management.
- A network broad zone-based bidirectional tree is made to realize a lot of economical membership management and multicast delivery.
- The position data is employed to guide the zone structure building, multicast tree construction, and multicast packet forwarding that with efficiency reduces the overhead for route looking and tree structure maintenance.
- Making usage of the position info to style a scalable virtual-zone-based theme for economical membership management that permits a node to affix and leave a bunch quickly.
- Geographic unicast is improved to handle the routing failure attributable to the utilization of calculable destination position with respect to a zone and applied for causation management and information packets between 2 entities in order that transmissions square measure a lot of sturdy within the dynamic atmosphere Supporting economical location search of the multicast
- Group members, by combining the placement service with the membership management to avoid the necessity and overhead of employing a separate location server
- A vital concept is zone depth that is economical in guiding the branch building and tree structure maintenance, particularly within the presence of node quality.
- Nodes self-organizing into zones, zone-based bidirectional-tree-based distribution methods will be designed quickly for economical multicast packet forwarding.

EGMP supports ascendable and reliable membership management and multicast forwarding through a two-tier virtual zone- primarily based structure. At the lower layer, in respect to a predetermined virtual origin, the nodes within the network self-organize themselves into cluster of zones and a pacesetter is elective in an exceedingly zone to manage the native group membership. At the higher layer, the leader is a representative for its zone to hitch or leave a multicast cluster as required. As a result, a network wide zone-based multicast tree is constructed. For reliable and economical management and transmissions, location information are going to be integrated with the planning and used to guide the zone construction, cluster membership management, multicast tree construction and maintenance, and packet forwarding. The zone-based tree is shared for all the multicast sources of a bunch. Reduce the forwarding overhead and delay, EGMP supports two-way packet forwarding on the tree structure. That is, rather than sending the packets to the base of the tree first, a supply forwards the multicast packets directly on the tree. At the higher layer, the multicast packets can flow on the multicast tree both upstream to the base zone and downstream to the leaf zones of the tree. At the lower layer, when an on-tree zone leader receives the packets, it'll send them to the cluster members in its native zone. Many problems need to be addressed to create the protocol absolutely purposeful and scalable. The problems associated with zone management include: the schemes for additional efficient and robust zone construction and maintenance, the ways for election and maintenance of a zone leader with minimum overhead, zone partitioning as a results of severe wireless channels or signal obstruction, potential packet loss once multicast members move across zones. the issues related to packet forwarding include: the efficient building of multicast paths with the zone structure, the handling of empty zone downside, the efficient tree structure maintenance throughout node movements, the reliable transmissions of control and multicast information packets, and getting location data to facilitate our geometric design without resorting to an external location server. The zone structure is virtual and calculated supported a reference point. Therefore, the development of zone structure doesn't depend on the shape of the network region, and it's very simple to find and maintain a zone. The zone is employed in EGMP to supply location reference and support lower-level cluster membership management. A multicast cluster will cross multiple zones. With the introduction of virtual zone, EGMP doesn't have to be compelled to track individual node movement however only needs to track the membership change of zones, which significantly reduces the management overhead and will increase the hardiness of the planned multicast protocol. we elect to design the zone without considering node density thus it will give a lot of reliable location reference and membership management in an exceedingly network with constant topology changes.

5. PERFORMANCE EVALUATION

The performance of the EGMP protocol is evaluated via network simulator. Performance metrics are utilized in the simulations for performance comparison:

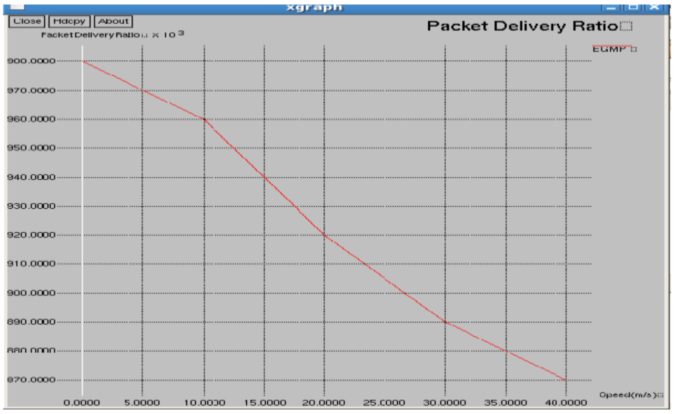

Chart-1 Packet delivery ratio of EGMP protocol

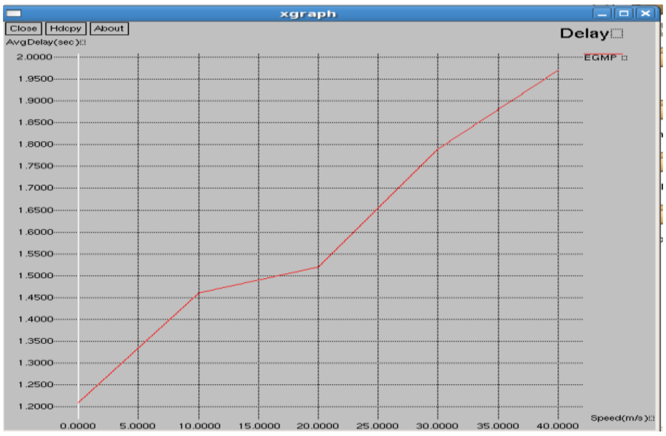

Chart-2 Delay of EGMP protocol

- **Packet arrival rate.** The ratio of the number of received data packets to the number of total data packets sent by the source.
- **Average end-to-end delay.** The average time elapsed for delivering a data packet within a successful transmission.
- **Energy consumption.** The energy consumption for the entire network, including transmission energy consumption for both the data and control packets.

6. CONCLUSION

An efficient and scalable geographic multicast protocol, EGMP, for MANET. The scalability of EGMP is achieved through virtual-zone-based structure which takes advantage of the geometric information to greatly simplify the zone management and packet forwarding. The position information is used in the protocol to guide the zone structure building, multicast tree construction, maintenance, and multicast packet forwarding. Compared to LVC the LVZC structure using the EGMP protocol is very efficient in all performance evaluation

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