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PERFORMANCE IMPROVEMENT OF POWER HETEROGENEOUS MANET USING DISTANCE BASED ASSOCIATIVE HEAD SELECTION ALGORITHM

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ABSTRACT

A Mobile Ad hoc Network (MANET) is a collection of nodes that move in different directions and speeds and need to maintain connectivity with existing network infrastructure. This paper considers the problem of routing in such networks of large scale and proposes Cluster based routing protocols, realized through our loose virtual Clustering protocol. The LVC algorithm is used to construct a hierarchical network and to eliminate unidirectional links. However, the throughput of power heterogeneous MANETs can be severely impacted by high power nodes. In order to address this issue, this project present a loose virtual clustering (LVC) based routing protocol for power heterogeneous (LRPH) MANETs. In addition the existing scheme reduces the interference raised by high power nodes, and develops routing algorithms to avoid packet forwarding via high power nodes. In this paper, we propose Distance based associative Head Selection algorithm of clustering approach for dynamic routing in wireless networks to reduce network overhead. A game theoretic model is built for CH selection. It has adopted to reduce burden of cluster head selection and maximize life time of the network. The proposed scheme improve the lifetime and perform perfect routing through the cluster head and further reduces the processing delay in the network.

Keywords: MANET, Mobile Nodes (MN), LVC, LRPH, Cluster Head.

I.INTRODUCTION

Mobile ad hoc networks (MANET) are self configuring networks. Clustering in Mobile Ad Hoc Networks (MANETs) has many advantages compared to the traditional networks. But the highly active and unstable nature of MANETs makes it difficult for the cluster based routing protocols to divide a mobile network into clusters and determination of cluster heads for each cluster. The clustering of wireless nodes for various network management. The author proposes a clustering procedure for MANET nodes in order to achieve a range of objectives related to network management. In MANET, the Wi-Fi limitations in coverage and capacity of the channel, the mobility of the nodes, the presence of obstacles generate packet loss, frequent topology changes, and network fragmentation. Thus, new MAC access strategies are adopted for the design of efficient routing protocols. In turn, in such kind of networks, routing is a challenging task, since there is no central entity in charge of finding the routing paths among the nodes. Different routing strategies have been defined based on prior ad hoc network architectures by targeting the specific MANET needs of scenarios and applications. Most of MANET applications critically rely on routing protocols. Thus, an optimal routing strategy, that makes better use of resources, is crucial to deploy efficient MANET that actually works in volatile networks. Finding well suited parameter configurations of existing mobile ad hoc network protocols is a way of improving their recital, making the difference between a network that does work or does not, e.g., the networks with high routing load suffer from congestion and cannot ensure timely and reliable delivery of messages.

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II. Related Work

In this section we describe several differences larger than m, the packet is not accepted even protocols proposed in papers that try to improve performance of original AODV routing protocol. These protocols try to decrease the number of loss packets and end-to-end delay. Many of these improvements are in building backup routes around the active route or in building multiple paths between source and destination nodes.

In the protocol that proposed by TANG and ZHANG the route is built on-demand and maintained by locally updating route information. Multiple backup routes are built around the active route and the highest priority backup route will be switched to become the new active route when the current active route breaks or is less preferred.

Protocol tries to enhance AODV with multiple paths. It generates multiple routes without propagating more control messages than AODV. In this protocol, the RREQ process is the same as in AODV. When the RREP is sent back to the source node, each intermediate node builds the forwarding route and the nodes, which neighbor the route and overhear the RREP, build backup routes.

In the protocol that proposed by Sakurai and Katto by applying a newly developed route update procedure with combined metrics of delay, hop count and disjointness, each intermediate node deliberately selects multi-path candidates while contributing to suppression of unnecessary routing packets. Extension of RREQ/RREP packets with a source route list is also incorporated, not only to alleviate limitation of the hop count based approaches but rather to provide more efficient multiple routes. Protocol extends the route discovery process by letting each intermediate node select reverse routes and forward routes in a distributed manner according to a specified metric.

Protocol specifies two methods with different metric definitions. The first one is based on a hop count minimization principle. Both the reverse routes and the forward routes are updated when delayed RREQ/RREP packets shows less hop counts. In this case, reunicast or rebicast applies to inform the update to a source node. The second method is based on a delay minimization principle. Since the metric is delay, RREQ/RREP packets are accepted in their arrival order and no re unicasting or re bicasting is performed.

Problem Definition

Existing research results show that routing protocols over unidirectional links perform poorly in multihop wireless networks. In LVC, unidirectional links in the network can be discovered using a BN discovery scheme.

To exploit the benefit of high power nodes establishes a hierarchical structure for the network. However, the existing routing protocols in power heterogeneous MANETs are only designed to detect the unidirectional links and to avoid the transmissions based on asymmetric links without considering the benefit of high power nodes. Hence the problem is to improve the routing performance of power heterogeneous MANETs by efficiently exploiting the advantages and avoiding the disadvantages of high power nodes.

Clustering in MANET

Clustering means a way to reconfigure all nodes into small virtual groups according to their regional vicinity and is defined as Cluster Head and cluster member that are determined with the same rule. Every clustering algorithm consists of two mechanisms, cluster formation and cluster maintenance. In cluster formation, cluster heads are selected among the nodes to form clusters. Cluster Head is the node which manages the cluster activities like managing cluster process, updating routing table, discovery of new routes. The nodes other than the Cluster Head inside the cluster are called Ordinary Nodes (ON). Nodes having inter cluster links which can communicate with more than one clusters are called Gateway Nodes (GN).

Routing Components in LRPH

The routing components in LRPH, including the route discovery and route maintenance. In the route discovery, the route to the destination can be obtained effectively based on LVC. In the route maintenance procedure, we deal with cases such as route failure. To improve the network performance

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and to address the issues of high power nodes, they propose an LRPH MANETs. To exploit the benefit of high power nodes, a novel hierarchical structure is maintained in LVC, where the unidirectional links are detected effectively. Clustering is a known scheme to improve the performance of the networks. However, in the existing clustering schemes, each node in the network should play a certain role (e.g., cluster head, member, or gateway). They define this as a strong coupling cluster. In a strong coupling cluster, the cost of constructing and maintaining a cluster may increase significantly and affect the network performance. In our clustering, a loose coupling relationship is established between nodes. Based on the LVC, LRPH is adaptive to the density of high power nodes. Recall that high power nodes with larger transmission range will create large interference areas and low channel spatial utilization. In such a case, they developed routing algorithms to avoid packet forwarding through high power nodes.

III. Proposed Distance Based Associative Head Selection algorithm

In Distance based routing protocol, the location information of mobile nodes are used to confine routing space into a smaller range. It reduces routing overhead and broadcast storm. Thus have proposed a cluster based routing protocol, named Distance Based Associative Head Selection (DBAHS) algorithm. The characteristics of this algorithm are stated that the lifetime is increased in the entire network. In each cluster, the selection of cluster head is done by a cluster head election algorithm. The number of nodes responsible for routing and data transfer is decreased considerably by the usage of the cluster mechanism. It also diminished the routing overhead and increased the route lifetime massively.

Main objective of this algorithm is to identify the flooder attacker and prevention mechanisms. Maintain a local connectivity is a important task. Some misbehaving nodes in the network flood the Hello packet continuously without maintaining the hello interval.

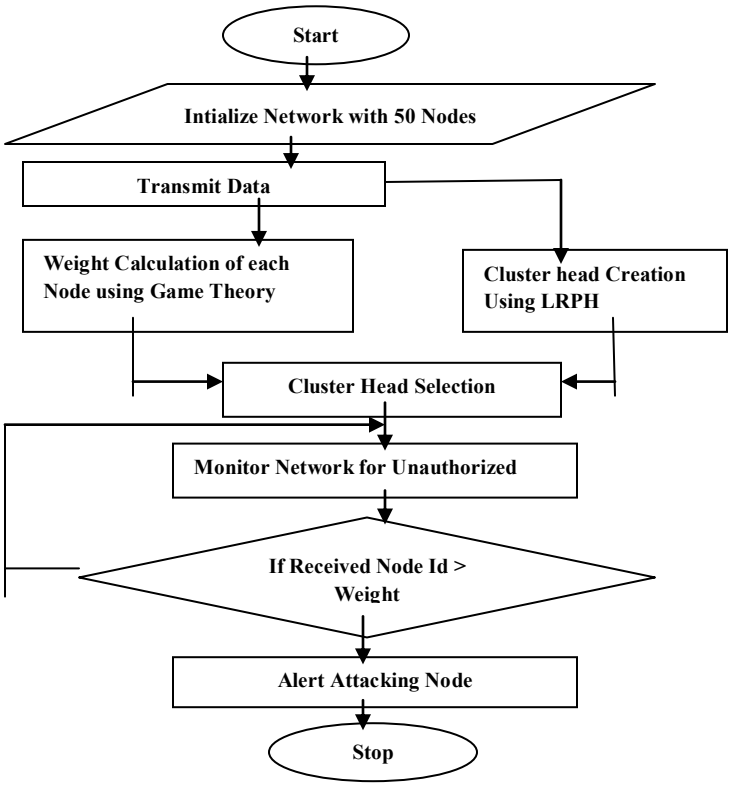

Fig:1 Flowchart of proposed scheme

It creates the disturbances in the network operation. It shows the hello flooding in the network. In this method assumes, hello interval values are changed in a random manner. This value is encrypted and attached in the header part of the data packet. Nodes that are located in the coverage area, are able to process the header part of the packet and update this hello interval value and changing the time of sending hello packets its neighbor. But the malicious won't concentrate the processing of other packets; it continuously sends large number hello packets to its neighbor. It is unaware of these changes of hello interval.

A node which receives a packet avoids unnecessary re-transmission by checking if all its 1 hop neighboring nodes have received the same packet or if the local transmission area has been covered by the packet sender. It also avoids any unnecessary delay by transmitting immediately if it has the greatest additional coverage area among all the nodes in the 1-hop neighborhood. Stateless flooding techniques for heterogeneous MANETs do not require prior knowledge of the neighborhood. The main drawback of stateless flooding techniques are that they fall short on reducing the retransmission

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delay of packets since some delay will be incurred at every node before forwarding any packet.

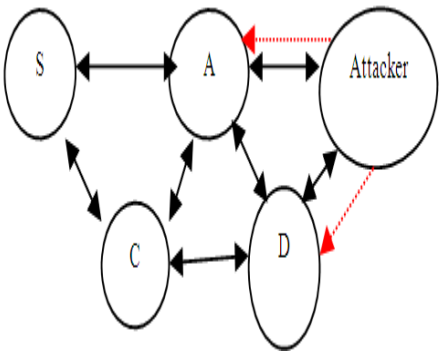

Fig 2: Hello flooding attack

ABS-DBDT is a stateless technique that supports heterogeneous manets. ABS is then used to identify that the coverage area of a node has been covered by all redundant re transmissions that a node has received (if the union of all the Cover Angles of redundant packets equals 360, the area is covered and the node drops the packet). In summary, ABS-DBDT reduces the number of unnecessary re-transmissions and delivery latency whilst maintaining high network coverage. Malicious nodes are not aware of this change of hello interval, so it does not change the interval and continuously send the packet to its neighbor. This behavior exhibits the confirmation of malicious activity and the neighbor node ignores the processing of packets Red lines are indicating the malicious action of the attacker node. The nodes A and D unable process the continuous hello packets so it is indicated as unidirectional.

Cluster Head Determination

The selection of Cluster Heads in the WSN is a challenging issue as efficient cluster head selection algorithm can improve the lifetime of the network and can reduce the communication overhead in the network

Based on the game theoretic model, the cluster head determination turns into a nodes' decision making procedure which can be described as: All nodes calculate its payoff value p and broadcast a massage to announce it to others. Any received node that has larger payoff value becomes a new cluster head candidate and broadcasts a new message with its own information otherwise, the received node with smaller payoff value broadcasts the original received message. Nodes with equal payoff value compare the ID and assume that node with a smaller ID wins. Once all sensor nodes have been compared, node with the largest payoff value is chosen as one cluster head. As aim to find k cluster head, the procedure performs in k rounds periodically. However, different from DEER, we notice that neighboring nodes of the determined cluster head often have similar density value which is large enough for disturbing the determinations in following rounds, so later such neighboring nodes are excluded. So focus on nodes outside the transmission range of the determined cluster heads.

. Cluster head determination can be regarded as a k-stage dynamic game. Moreover, since every player knows the payoffs and strategies available to other players and each choose its strategy based on the observation of previous stages, it is a finite complete and perfect information game for determining the cluster heads.

Routing Procedure

After determining all cluster heads, s nodes send data to one cluster head directly within one hop. The corresponding cluster head should be determined with the least energy consumption for the transmission cost along the path. The inter-cluster algorithm can be formulated as to find the node with smallest distance to the cluster head and routed through dynamic routing.

1V. Performance Evaluation

In order to evaluate dynamic routing, we run a number of simulations for several values of parameter w. In an area 50mx50m we randomly placed N = 50 nodes that remained stationary throughout the simulation time. The destitination was placed at position thus it was located at least 75m from the closest node of the network.

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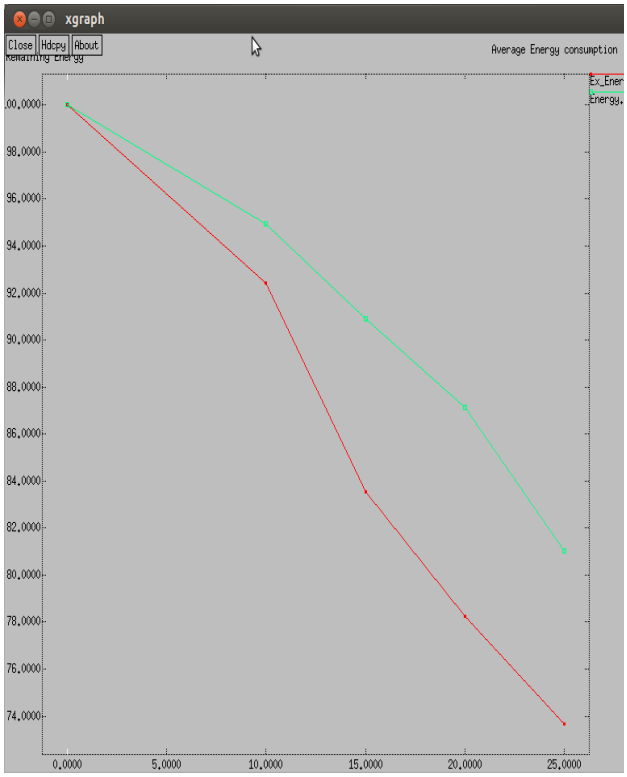

Fig 3: Energy consumption versus time

Distance based associative Head Selection algorithm of clustering approach for dynamic routing in wireless networks to reduce network overhead.

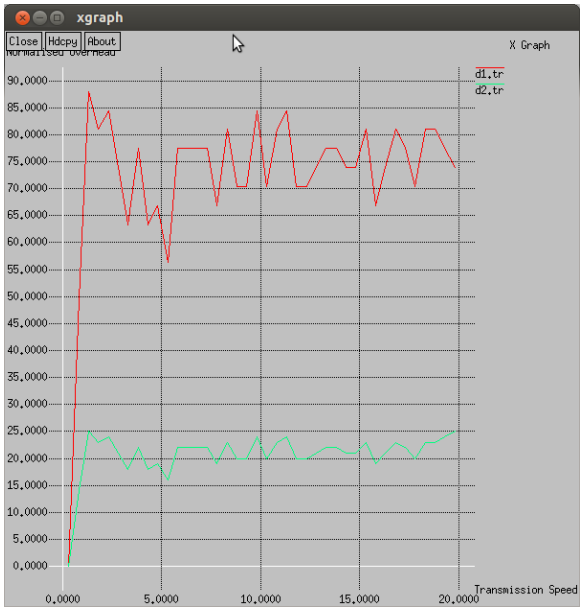

Fig: 4 Normalized overhead versus transmission speed

The most important metric that reveals the performance of any clustering technique is the network lifetime. Here, we use the most common definition (although alternative definitions exist), i.e. the network lifetime is the lifespan of the node that first among all the others depletes its energy. We assume that a node's energy is exhausted if 99.9% of its initial energy has been consumed.

V.CONCLUSION

The proposed system with a loose virtual clustering based routing protocol named LRPH for power heterogeneous MANETs. To designed a loose virtual clustering algorithm to eliminate unidirectional links and to benefit from high-power nodes in transmission range, processing capability, reliability, and bandwidth. To developed routing schemes to optimize packet forwarding by avoiding data packet forwarding through high power nodes. Hence the channel space utilization and network throughput can be largely improved. In this paper, we proposed an enhancement on weighted clustering
Algorithm as distance based associative Head Selection algorithm of clustering approach for dynamic routing in wireless networks to reduce network overhead.

In our algorithm, the energy consumption is increased and overhead is reduced .We assumed a predefined threshold for the number of nodes to be created by a clusterhead, The simulation clustering algorithms have a better performance on average Through a combination of analytical modeling and an extensive set of simulations, to demonstrate the effectiveness of LRPH over power heterogeneous MANET. This work shows that our proposed angle based associative Head Selection game theoretic approach can be applied in the selection of cluster heads in the wireless network. This approach is better than the existing LVC and LRPH algorithms in terms of network lifetime and optimal selection of cluster heads. The game parameters can be dynamically adjusted which in turn the cluster head is selected and process done through dynamic routing. Finally, plan a new real tests (using nodes traveling through

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different kinds of roads) in order to validate our simulations.

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