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Power and Position Optimization Techniques for MANETs

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Abstract: ***Energy efficiency, Reliability and on demand data delivery are the usual challenging factors encountered in mobile ad hoc networks. Previously used ad hoc routing protocols where guard nodes relay the packet with prioritized back off time when the intended node fails and becomes a contender nodes themselves are inefficient considering MANET susceptibility due to node mobility. So we propose a MAC independent approach called Position-based Opportunistic Routing (POR) that uses location information to guide the data flow and can always achieve near optimal paths during data transfers. Utilizing on demand routing table backup mechanism, communication is maintained without being interrupted. Forwarding candidates are coordinated using the candidate list comparison available at every node. Although this method addresses the problem of node mobility, it introduces power drain issues with entities involved in the communication. So we propose to extend POR with Quorum-based asynchronous power-saving (QAPS) protocol such that this implementation offers optimal performance in terms of energy savings and supporting many nodes. According to the proposed approach, all the nodes of a locality are divided into clusters with every cluster having a cluster leader with some others being one-hop neighbors. Prior approaches operated within an individual cluster. And the QAPS protocol operates among cluster heads. All the cluster heads are organized as a virtual backbone to help route data. We perform simulations and compare the protocol with the related protocols. We find that the proposed protocol is more power-efficient and scalable.***

Index Terms: ***Mobile ad hoc network, Opportunistic forwarding, end-to end delay, QAPS protocol, optimal path.***

I. INTRODUCTION

A MANET (Mobile Adhoc Network) is a self Organizing configurable network of mobile devices connected by wireless. An Adhoc routing protocol is [1] [2] a standard, it controls how the nodes are decide which way is better for packet sending between computing devices in a mobile Adhoc network. In MANET nodes are not familiar with the topology of their networks. They are discovering the available paths for sending information from sender to receivers [2]. MANET server announcements the broadcast for their neighbors then each node verify their individual near routes for sending information. Every node learn about others nearby and how much time will be taking to reach them, all the details can be achieved by the other nodes.

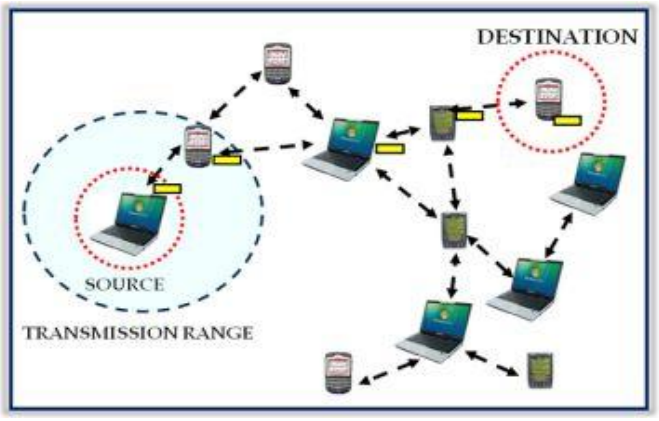

Figure 1: Message passing in MANET

In this architecture we will send information from source to destination using some signal credentials passing in between them. In traditional mechanism using some proactive protocols like DSDV, RREP, RREQ, DSR, AODV intended path while the nodes are nearby [3] by guard nodes presented in the 802.11 medium access control (MAC). Guard nodes are relay the packet with prioritized back off when intended node fails. Geographic routing (GR) uses location information to packet forwarding in between nodes. In hop by hop fashion data forwarding is used [4] to select next hop forwarder with the largest positive progress to the destination. [2] A MANET requires no centralized administration fixed network infrastructure such as base station to access points, and quickly and inexpensively setup is needed. Periodic protocols and on-demand protocols are the two types of routing protocol present in the Mobile Adhoc Network.

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Due to above reactive protocol generation in the MANET we are introducing the Position Based Opportunistic Routing protocol can be achieved in our traditional techniques but there is more power consumption can be done in the realistic implementation of the POR [2] [3]. Our main aspect is that we are implementing self configurable network for achieving real time use of MANETs.

In this paper we are implementing to use POR in combination with Quorum-based asynchronous power-saving (QAPS) protocol. As the name suggests that, In QAPS protocol it will divide host localities into clusters. Every cluster can be act as a leader and it will organize each event present in the network efficiently.

II. RELATED WORK

In MANETS, reliability is the main aspect for data transmission. Multipath routing is the solution for increasing the reliability of data transmission in wireless networks. It allows multiple paths establish in between source and destination [5]. Existing techniques are classified into 3 categories for sending information in wireless networks. They are 1) using alternate paths for backup of routes 2) packet replication along with previous paths 3) split multi path delivery using some reconstruction coding techniques presented in our network environment. [4] In recent years we are introducing the reactive protocols (Like AODV, DSR, RREP, RREQ, and DSDV) for sending information from source to destination.

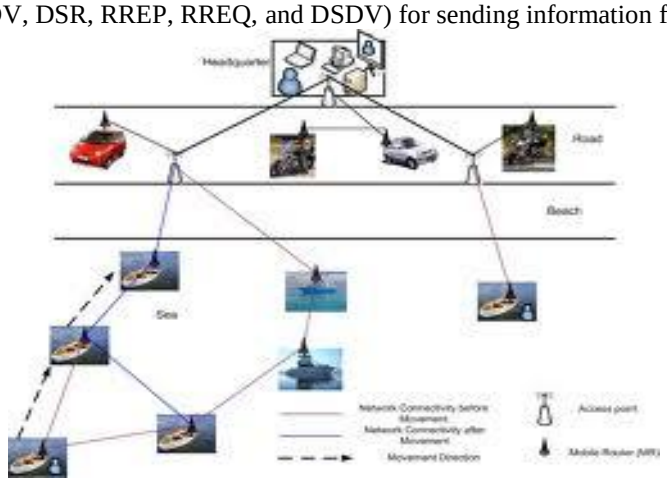

Figure 2: Network connectivity's with proactive protocols.

In the context of earlier technologies are introduced PRO protocols on the basis of opportunistic retransmit ion protocol [3]. PRO leverages on the path loss information Receiver Signal Strength Indicator (RSSI) to select and prioritize relay nodes. By assigning the higher priority relay a smaller contention window size, the node that has higher packet delivery ratio to the destination will be preferred in relaying.

III. EXISTING SYSTEM

Traditional ad hoc routing mechanism is used to discover an intended path while the nodes nearby act as guard nodes [2]. Leveraging on a modified 802.11 MAC, guard nodes relay the packet with prioritized bakeoff time when the intended node fails. If the failure time exceeds a certain threshold, the guard node who has recently accomplished the forwarding will become the new intended node. Efficient for small scale MANETS Node mobility is a problem when size of the network increases in MANETS driven by the above protocols Size of the network influences routing [4]. Packet loss and long latency are some of the side effects of this system uses only one/multiple forwarding nodes. Propose to replace DSDV/AODV/DSR reactive protocols with POR protocol Prior routing protocols for MANETs can be classified into two categories. One uses the end-to-end redundancy, e.g., multipath routing, while the other leverages on the hop-by-hop redundancy which takes advantage of the broadcast nature of wireless medium and transmits the packets in an opportunistic or cooperative way [3]. Our scheme falls into the second category. POR protocol uses location information to guide the data flow and can always achieve near optimal path. On the other hand, our scheme focuses on the route discovery from the perspective of network layer and no such complex MAC modification is necessary. Forwarding candidates are coordinated using the candidate list and no contention would happen [5]. By limiting the forwarding area, duplication can also be well controlled. POR reduces all nodes to update their location specifies for a each small burst of time POR address the following issues

a) Packet delivery ratio: The ratio of the number of data packets received at the destination(s) to the number of data packets sent by the source(s).
b) End-to-end delay: The average and the median end-to end delay are evaluated, together with the cumulative distribution function of the delay.
c) Path length: The average end-to-end path length (number of hops) for successful packet delivery.

Uses varying forwarding nodes with large number estimated to be 2 starting from 0.

IV. PROPOSED SYSTEM

Power saving is a critical issue for portable devices supported by batteries. This is because battery power is a limited resource, and battery technology is not likely to progress as fast as computing and communication technologies do. How

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to save the energy consumption in a MANET, in which devices are all supported by batteries, has been intensively studied recently.

Although POR protocol addresses the problem of node mobility and communication voids, this type of comparison is a severe drain on power resources of each node involved in the communication So we propose to use POR in combination with Quorum-based asynchronous power-saving (QAPS) protocol. According to the proposed protocol, all the hosts of a locality are divided into clusters. [2] Every cluster has one cluster leader with others being cluster members. The members are one-hop neighbors of the head and are synchronous with it. Prior approaches operated within an individual cluster. And the QAPS protocol is operated among cluster heads. All the cluster heads are organized as a virtual backbone to help route data. Experimental results suggest that the proposed scheme can extend MANETs [1] saving more energy and accommodating number hosts resulting in a better network performance.

V. EMPIRICAL RESULTS

In evaluation our proposed protocol QAPS we will use techniques presented in the previous POR protocol. Because QAPS protocol is extension process for the POR protocol in the form of mobility management and power consumption. These two are the backup utilities in POR protocol. [4] Performance results of the traditional technique is based on the following factors

1) Packet delivery ratio.
2) End to end Delay
3) Path Length
4) Packet forwarding times for hop
5) Packet forwarding times for Packet.

Using some simulation techniques presented in networks we are calculating the every packet sending information with delivery ratio of the data. In that it will find the every node transmit ion time with reactive protocols as follows.

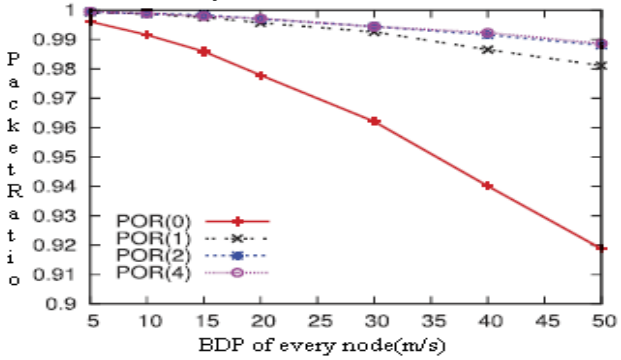

Figure 3: Packet ratio with speed.

Above results are shown packet ratios with transmission speed of every packet in POR protocol. [4] Using these results we are describing the efficient results of the mobility of every node. In our simulation setup, 80 mobile nodes are located in a 1; 200 m 600 m rectangular region, similar to that used in the previous experiments, but all the nodes move according to the RWP model. [3] For traffic, 10 CBR flows are simulated and each flow sends at a rate of 4 Kbps. Again we will find the problem of power consumption every node sharing data in POR protocol, then we will describe efficient results when compared each node band width delay product with others node data transmit ion in a network.

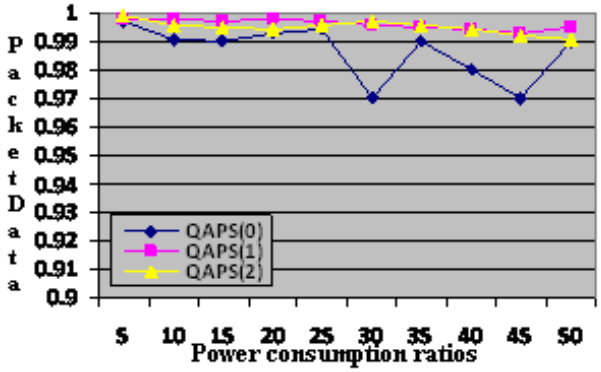

Figure 4: Power consumption ratios with data transmit ion.

As shown in Fig 4 we are divide the overall hosts into clusters. Every cluster must be act as a leader and that cluster can organize the every other node present in the MANET. [5] We are taking results in synchronous node transmit ion between every node, and then every node can be achieved by the asynchronous Quarter in packet sending in the region. These results can be achieved equality of [4] the power saving in between every node in the asynchronous manner.

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VI. CONCLUSION

POR protocol uses location information to guide the data flow and can always achieve near optimal path. [4] On the other hand, our scheme focuses on the route discovery from the perspective of network layer and no such complex MAC modification is necessary. Forwarding candidates are coordinated using the candidate list and no contention would happen [3][2]. By limiting the forwarding area, duplication can also be well controlled. In this paper we propose to extend POR with Quorum-based asynchronous power-saving (QAPS) protocol such that this implementation offers optimal performance in terms of energy savings and supporting many nodes. [5] According to the proposed approach, all the nodes of a locality are divided into clusters with every cluster having a cluster leader with some others being one-hop neighbors. Prior approaches operated within an individual cluster. And the QAPS protocol operates among cluster heads. [4][5] All the cluster heads are organized as a virtual backbone to help route data. We perform simulations and compare the protocol with the related protocols. We find that the proposed protocol is more power-efficient and scalable.

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